ASIA PACIFIC FOUNDATION OF CANADA
FONDATION ASIE PACIFIQUE DU CANADA

2021 - 2022

ANNEXES

ANNUAL REPORT

Preparing for a Changed World

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FONDATION ASIE PACIFIQUE DU CANADA

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COVER IMAGE

Eclipse Sound in Pond Inlet, Nunavut, Canada. | Photo Galit Rodan/Bloomberg via Getty Images

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A CANADIAN
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About APF Canada

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas.

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, Digital Media, and a regular Asia Watch newsletter that together support these thematic areas.

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A Canadian Arctic Policy for the Indo-Pacific

In his 2021 mandate letter to the Minister of Foreign Affairs, Prime Minister Justin Trudeau identified the Arctic as an area of key strategic importance for Canada and called on Minister Mélanie Joly to deepen the country's diplomatic relations as a means of securing its regional interests.[1] In parallel, the Prime Minister tasked Minister Joly to develop a whole-of-government strategy integrating trade, development, and security components for Canadian involvement in Asia. Like the Arctic, the Prime Minister's mandate letter identified the Indo-Pacific as a region of strategic importance for Canada.

Notably absent from the letter, however, was any direct linkage between Canada's interests in the Arctic and those in the Indo-Pacific. Indeed, the letter summarily ignored the importance of Indo-Pacific actors in Canada's approach to Arctic affairs. Where the Prime Minister did suggest a potential means for greater Canadian Arctic diplomacy, he did so with reference to the G7, NATO, and "likeminded" states – a well-established euphemism for liberal democracies within Western policy discourse.[2]

Arctic Diplomacy: Canada's Foreign Minister Chrystia Freeland (2nd, R) Russia's Foreign Minister Sergey Lavrov (2nd, L), Finland's Foreign Minister Timo Soini (R), Denmarks's Foreign Minister Anders Samuelsen (C) and Iceland's Foreign Minister Gudlaugur Thor Thordarson (L) speak during the Arctic Council Summit at the Lappi Areena in Rovaniemi, Finland on May 7, 2019. | Photo: Mandel Ngan/AFP via Getty Images

While in line with Canada's historical and contemporary Arctic policies, the Government of Canada's failure to conceptualize its Arctic and Indo-Pacific policies as part and parcel of a singular geopolitical problem set is a strategic liability. More pointedly, Ottawa's near singular reliance on Trans-Atlantic relations, activities, and institutions in its Arctic policy planning does not adequately reflect the region's emerging trends or power dynamics. This oversight leaves

[1] https://pm.gc.ca/en/mandate-letters/2021/12/16/minister-foreign-affairs-mandate-letter

[2] https://blogs.griffith.edu.au/asiainsights/like-minded-states-and-the-liberal-international-order/

Ottawa particularly isolated from an emerging aspect of Arctic affairs, mainly Asian states' interests, activities, capabilities, and influences in the Arctic region, which are developing disproportionately faster than their North American and European counterparts.

To support a more integrated Canadian strategic approach, one capable of advancing the country's national interest across an increasingly complex and at times contradictory operational environment, this policy brief identifies areas of overlapping opportunity in the country's Arctic and Indo-Pacific affairs.

The brief surveys Asia's predominant Arctic actors – China, Japan, Singapore, and South Korea – and maps their Arctic objectives, activities, institutions, and actors. The brief then provides policy options for greater Canadian integration in the Indo-Pacific's emerging Arctic ecosystem with specific references to the country's own national interests in the region, as defined in key Canadian policy documents. Through this approach, the brief's authors provide a new framework for Canadian involvement in the Arctic that is more comprehensive, more inclusive, and more supportive of the country's broader engagement in the Indo-Pacific.

Operating on this logic, this policy brief is organized as follows:

In Part I, the authors provide a historical and contemporary overview of Canada's engagement and policy in the circumpolar region, accounting for changes in Canada's national interests and policies in the Arctic and identifying areas where contemporary policy fails to address the region's contemporary challenges. The authors further demonstrate how Canada's Arctic approach has been, and remains, primarily Trans-Atlantic in conception and operation. The authors also map out and analyze Canada's long-term Arctic objectives and strategies under the Trudeau administration.

In Part II, the authors switch focus to examine the Arctic priorities of China, Japan, South Korea, and Singapore and to identify each state's regional, bilateral, trilateral, or multilateral engagement in the circumpolar region. The authors subsequently map the primary governmental, academic, research, and commercial actors that participate in shaping each state's Arctic agenda.

In Part III, the authors identify areas where Canada can proactively engage Asian states in the Arctic on issues that support its national interests in the region. The authors conclude with recommendations for how Canada can advance its Indo-Pacific policy through co-operation with Asian states in the Arctic.

On Ukraine

The Asia Pacific Foundation of Canada (APF Canada) prepared this brief between June 2021 and March 2022. Toward the end of its completion, the Russian Federation invaded Ukraine, causing an international humanitarian crisis. At the time of writing, Russian troops remain in Ukraine and are advancing toward Kyiv.

While the Arctic theatre remains marginal to the war in Europe, the European Arctic states, Japan, South Korea, and Singapore have all expressed their intentions to cease all foreign policy engagement with Moscow, including on Arctic affairs. While it remains too early to fully understand the implications for the Arctic region's geopolitical and security environment, the suspension of Arctic ties with Russia has the potential to transform the region. The potential for regional tensions and possibly regional conflict in the Arctic are arguably higher now than at any time since the Cold War era.

While the authors believe this policy paper correctly captures Canada's fundamental Arctic priorities, ties, and strategic interest, developments in Ukraine and with Russian security policy may ultimately require reconsideration of aspects of the country's Arctic policy. In particular, Canadian policy-makers may find it necessary to reconsider Russia's involvement in the Arctic Council or to sanction Russian economic activity within the region. Such actions would introduce strategic tensions into Canada's approach to the Arctic that this policy brief cannot anticipate.

The brief's overarching argument, however, remains sound in the face of a new Russian foreign policy. Indeed, Canada's need to work more closely with China, Japan, South Korea, and Singapore is arguably greater than before, as these Asian states have significant influence on the Arctic's development, including on issues related to governance, defence co-operation, crisis avoidance and prevention, and sustainable development. Ottawa must work with these states to strengthen Canada's position in the Arctic and to ensure the region remains as stable as possible.

Aside from these points, the authors have chosen to leave much of the analysis around Russia's Arctic policies in place, including instances where other Arctic states co-operate with Russia. The authors chose this approach for two reasons. First, it is impossible to foresee how the war in Ukraine will affect Arctic geopolitics other than to suggest states' relations with Russia will experience a short- to medium-term disruption. Second, any Canadian policy-maker will require an understanding of previously existing relations involving Russia to develop a new strategic approach to the region – one that excludes Russia.

APF Canada resolutely condemns Russian aggression in Ukraine. Readers should not equate description of Russian foreign policy in the Arctic as acceptance of Russian foreign policy in general.

CANADA AND THE ARCTIC:

Trans-Atlantic Dependency

PART I

CANADA'S HISTORICAL APPROACH TO THE ARCTIC:

Changing Motivations and Analytical Lenses

Canada has been an active Arctic state for at least 100 years, albeit to varying degrees of preoccupation and involvement. While Canada's approach to the region has evolved over four distinct periods – the pre-Cold War era, the Cold War era, the post-Cold War era, and the early 2000s – the country's focus and reliance on North American and Trans-Atlantic states and institutions for its diplomacy has been a distinct constant. Indeed, as demonstrated below, Canada remains primarily dependent on its relations with Finland, Iceland, Norway, Russia, Sweden, and the United States to execute its Arctic policy, whether bilateral or multilateral.

1. The Pre-Cold War Era

In the pre-Cold War era, the Inuit primarily drove Canada's Arctic engagement, as such engagement informally manifested. Inuit-led interaction with police and traders constituted Canada's North-South dialogue, while the Inuit's traditional economic activities drove Canadian expansion in the High North.[3]

During the Second World War, however, Canada became more involved in the Arctic at the federal level, principally working with the United States to develop wartime infrastructure, including the bilateral Alaska Highway and the Crimson Air Route.[4] Once established, Ottawa sought to solidify its federal presence in the Arctic through the development and deployment of the Canadian Rangers, an Indigenous-led voluntary home defence force and sub-component of the Canadian Army Reserve. The Canadian Rangers became Canada's primary means to monitor Arctic security in 1947.[5]

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[3] "An Ancient Bond with the Land," *Canadian Museum of History*, https://www.historymuseum.ca/cmc/exhibitions/aborig/fp/fpz3a01e.html; P. Whitney Lackenbauer, "Canada's Northern Strategies From Trudeau to Trudeau, 1970-2020," *Documents on Canadian Arctic Sovereignty and Security* 17, (2020): 23.

[4] Ken Coates and William Morrison, *The Alaska Highway in World War II: The US Army of Occupation in Canada's Northwest* (Norman: University of Oklahoma Press, 1992); Robert V. Eno, "Crystal Two: The Origin of Iqaluit," Arctic 56, no.1, (March 2003): 63-75.

[5] P. Whitney Lackenbauer, "The Great White North," *National Defense and the Canadian Armed Forces*, last modified December 21, 2021, http://www.journal.forces.gc.ca/vo6/no4/north-nord-03-eng.asp.

2. The Cold War Era (1947-1991)

Whereas Canada's first phase of Arctic affairs was limited in nature and confined to national territorial defence, the country's second phase of Arctic engagement was shaped by great power competition. More specifically, the Soviet Union and the United States' competing strategic interests, activities, and capabilities in the Arctic drove Canada to take a more proactive, and at times assertive, approach to the region.[6]

In the 1950s, for instance, Canada responded to Russia's securitization of the Arctic through co-operation with the United States on the development of the Distant Early Warning Line (DEW Line) and the joint North American Air Defence Command (NORAD). Partnership with Washington on the DEW Line and NORAD served as a force multiplier for Canada in the region while also strengthening the country's ties to the US-led, Western bloc of states. Concurrently, however, the United States' increased interest and presence in the Arctic challenged Canada's sovereignty, particularly its maritime sovereignty in the Northwest Passage (NWP). In 1969, for example, the American oil tanker *Manhattan* sailed through Canada's NWP, thereby triggering new debates in Canada about the nature of the country's Arctic posture and policy.[7]

In response to these challenges, the Pierre Trudeau administration adopted a new Arctic policy in 1970 – one predicated on the exclusion of outside actors and the protection and conservation of the Arctic's environment.[8] More specifically, the Pierre Trudeau administration argued that foreign presences and commercial activities in the region were a threat to Indigenous rights, marine biodiversity, and environmental conservation.

3. From the Post-Cold War Era to the Early 2000s

Conceptually, the Pierre Trudeau government's 1970s policy marked a sea change in how Canada viewed the Arctic, from defence to environmental conservation and sustainable socio-economic development. This prioritization of Arctic affairs continued at pace throughout the 1980s, spurred on in particular by a national growth of Indigenous awareness.[9] Across Canada, calls for Inuit cultural preservation and for the demilitarization of the North became

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[6] Benjamin Schaller, "The Forgotten Spirit of Gorbachev," *Arctic Yearbook*, https://arcticyearbook.com/arctic-yearbook/2019/2019-commentaries/326-the-forgotten-spirit-of-gorbachev.

[7] Lackenbauer, "Canada's Northern Strategies," op. cit., vi.

[8] Andrew Stuhl, *Unfreezing the Arctic: Science, Colonialism, and the Transformation of Inuit Lands* (Chicago: The University of Cambridge Press, 2016), 126.

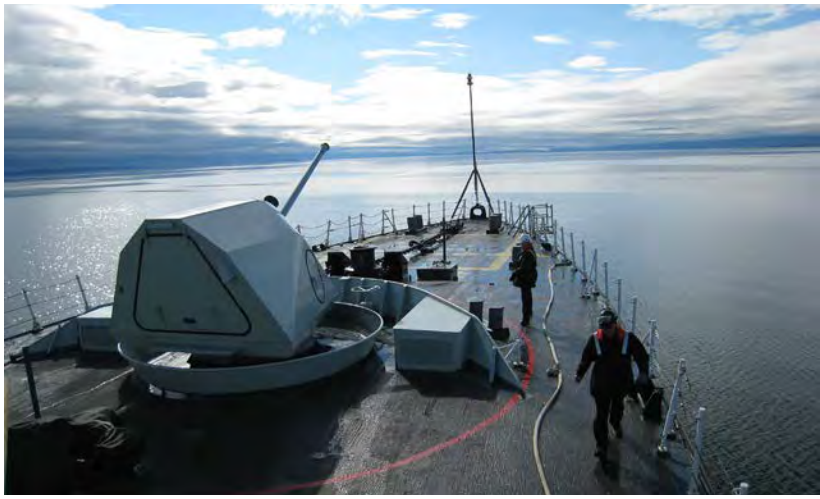
[9] Hamer Foster et al., *Let Right Be Done: Aboriginal Title, the Calder Case and the Future of Indigenous Rights* (Vancouver: UBC Press, 2007).

increasingly prominent, leading Canadian policy-makers to advocate for a human-centric Arctic policy, albeit one that restated Canada's sovereign maritime claim in the NWP.[10]

Parallel to this reconceptualization of Arctic priorities, the Government of Canada (GoC) shifted its diplomatic strategy away from great power alignment toward multilateralism. Between 1990 and the early 2000s, for instance, the GoC strengthened Canadian participation in multilateral organizations and forums such as the Arctic Council that facilitated social, developmental, and environmental dialogues on Arctic issues.[11] The GoC also actively engaged in dialogues hosted by the International Arctic Science Committee throughout the period.[12]

4. The Harper Administration (2006-2015)

Under the Harper administration, Canada's Arctic priorities and perspectives once again shifted to reflect the region's changing geopolitics. With trans-Arctic shipping and resource exploration becoming more possible as a result of Arctic warming, in particular, the region's resource and material wealth increasingly drew the attention of Canadian and foreign firms. As the Harper administration understood economic sovereignty as a national security interest, it thereby viewed the Arctic as a strategic asset for Canada – one that required active development to fully realize.[13] To support its Arctic vision, the Harper government published two consecutive policy documents, the 2009 *Canada's Northern Strategy: Our North, Our Heritage, Our Future*,[14] and the 2010 *Statement on Canada's Arctic Foreign Policy*. These two policy statements articulated a top-down



On Patrol: Canada's HMCS Fredericton on Arctic manoeuvres in Frobisher Bay at the southern tip of Baffin Island, Canada. The Fredericton was taking part in a sovereignty exercise involving a Canadian submarine, Canadian Coast Guard vessel, fighter jets, as well as 800 soldiers, federal police, and Inuit rangers on August 9, 2007. | Photo: Michel Comte/AFP via Getty Images

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[10] Suzanne Lalonde, "The Debate Over the Legal Status of the Northwest Passage," *Senate of Canada*, October 17, 2008, https://sencanada.ca/content/sen/committee/421/ARCT/Briefs/SuzanneLalonde_Briefs_e.pdf.

[11] Government of Canada, "Canada and the Arctic Council," last modified February 18, 2021, https://www.international.gc.ca/world-monde/international_relations-relations_internationales/arctic_council-conseil_arctique/index.aspx?lang=eng.

[12] Malgorzata Smieszek, "25 Years of the International Arctic Science Committee (IASC)," *Arctic Yearbook*, 2015, https://arcticyearbook.com/arctic-yearbook/2015/2015-briefing-notes/161-25-years-of-the-international-arctic-science-committee-iasc.

[13] Petra Dolata, "A New Canada in the Arctic? Arctic Policies under Harper," *Canadian Studies* 78, (2015): 132.

[14] Government of Canada, "Canada's northern strategy: our north, our heritage, our future," last modified April 3, 2013, https://publications.gc.ca/collections/collection_2009/ainc-inac/R3-72-2008.pdf.

approach to Canada's Arctic policy that placed greater emphasis on regional border security and resource development.

5. Canada's Contemporary Arctic Policy: The Justin Trudeau Administration's Arctic Priorities and Policies

Building on the Harper government's approach, the Justin Trudeau administration published two new policy pieces outlining the liberal government's approach to Arctic affairs: the 2017 *Strong, Secure, Engaged* policy brief and the 2019 *Arctic and Northern Policy Framework*.[15] These two policies remain Canada's predominant frameworks for Arctic defence and socio-economic development, respectively.

a. Strong, Secure, Engaged: Canada's Hard Security Approach to the Arctic

The 2017 *Strong, Secure, Engaged* (*SSE*) paper outlines Canada's current national defence plan, including aspects relevant to Canada's Arctic security policy. For example, the *SSE* identifies an enhanced Canadian presence in the Arctic as a national defence priority and outlines the Department of National Defence's means to achieve this strategic goal. Specifically, the *SSE* calls for increased investment in offshore patrol ships to enhance the Canadian Armed Forces' Arctic mobility and for additional technologies to re-connect Canada's Arctic air, land, sea, and space surveillance capacities.[16] Acknowledging the rising international interest in the Arctic, the *SSE* also identifies Canada's close collaboration with its Arctic allies – particularly the United States – on surveillance as a force multiplier.[17] To ensure advanced warning of potential security challenges, the *SSE* also calls for deeper Canadian collaboration with Norway and Denmark.[18]

b. The Arctic and Northern Policy Framework – An Inuit-Centred Arctic

Departing from the Harper administration's Northern Strategy Framework, which, as noted above, identified the Arctic's value in largely economic terms, the 2019 *Arctic and Northern Policy Framework* (*ANPF*) instead outlined an "Inuit-specific" approach to Arctic affairs prioritizing socio-economic development and Indigenous reconciliation.[19] To support this

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[15] Government of Canada, "*Strong, Secure, Engaged*," last modified May 31, 2019, http://dgpaapp.forces.gc.ca/en/canada-defence-policy/docs/canada-defence-policy-report.pdf; Government of Canada, "*Canada's Arctic and Northern Policy Framework*," last modified November 18, 2019, https://www.rcaanc-cirnac.gc.ca/eng/1560523306861/1560523330587.

[16] Government of Canada, "Strong," op. cit., 80.

[17] Ibid., 83.

[18] Ibid., 90.

[19] Peter Kikkert and P. Whitney Lackenbauer, "Canada's Arctic and Northern Policy Framework: A roadmap for the future?" (briefing note), 2019, 3, https://arcticyearbook.com/images/yearbook/2019/Briefing-Notes/9_AY2019_BN_Kikkert_Lackenbauer.pdf.

approach, the *ANPF* also outlined a devolution process by which the Trudeau administration delegated the central government's authority to Inuit governing bodies. The *ANPF*, as a result, reflects the joint priority-setting of the Arctic's Indigenous population and of the GoC, incorporating insights from the federal government, three territorial governments, three provincial governments, and over 25 Indigenous organizations.[20]

With its emphasis on the well-being of the Northern Inuit population, the *ANPF* seeks to project Canada's domestic priorities into the international sphere. The framework consists of eight priorities, elaborated in detail below:

- **Ensuring the Arctic and northern Indigenous peoples in Canada are resilient and healthy:** This priority seeks to build strong people and communities by addressing issues including low life expectancy, erosion of Indigenous languages and culture, high poverty rates, income inequality, food insecurity, low education attainments, and inadequate health provisions in the High North. Based on these social problems, the *ANPF* proposes better health and education services, following strengthened local partnerships to bridge the existing social gaps;[21]
- **Strengthen infrastructure to close standard of living gaps with other regions of Canada:** This priority focuses on providing comprehensive infrastructure development for Canada's northern communities, including transport, energy, port, airport, and railroad facilities. At the local level, the GoC will finance development projects to address chronic problems such as insufficient housing and broadband network issues;[22]
- **Ensure strong, sustainable, diversified, and inclusive local and regional economies:** This priority focuses on sustainability development across the Arctic region, achieved primarily through a shift in economic activity away from mining toward sustainable resource extraction. The GoC will provide additional support to assist small business development and promote traditional economic activities across the Arctic;[23]
- **Ensure knowledge and understanding guides decision-making:** This priority emphasizes the importance of local and Indigenous involvement in decision-making and planning on science and research in the Arctic, prioritizing the incorporation of Indigenous knowledge and institutions into locally led research initiatives;[24]

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[20] Government of Canada, "Statement on Canada's Arctic Foreign Policy," last modified May 12, 2017, https://www.international.gc.ca/world-monde/assets/pdfs/canada_arctic_foreign_policy-eng.pdf.

[21] Ibid.

[22] Ibid.

[23] Ibid.

[24] Ibid.

- **Pursue reconciliation to support self-determination and to nurture mutually respectful relationships between Indigenous and non-Indigenous peoples:** This priority particularly focuses on leveraging the voice of Indigenous youth through implementing stable federally funded programming related to Indigenous land, language, and culture;[25]
- **Ensure the Canadian Arctic and northern ecosystems are healthy and resilient:** This priority focuses on protecting and conserving the Arctic and northern ecosystems against pollution and climate change. To achieve this goal, the GoC will undertake activities including Indigenous-led conservation, implementation of robust mitigation plans, and emphasis on conservation economies;[26]
- **Ensure the rules-based international order in the Arctic responds effectively to new challenges and opportunities:** This priority highlights Canada's intention to contribute to and to enforce international rules and standards within the Arctic's order. To achieve this goal, the GoC will promote collaboration in the Arctic through strengthening north-to-north co-operation, engage with multilateral organizations, and integrate the voices of the Indigenous participants; and[27]
- **Ensure the Canadian Arctic and North and its people are safe, secure, and well-defended:** The *ANPF's* final priority outlines how Canada will increase its regional presence and exercise its sovereignty rights to combat regional security challenges associated with climate change and increased commercial interests in the Arctic. To ensure safe maritime transportation and expanded search and rescue capacities, the GoC will leverage the presence of the Canadian Rangers, the Canadian Armed Forces, and the Canadian Coast Guard in the Arctic region.[28]

To address this litany of policy aims, the Trudeau government has prioritized bilateralism and multilateralism in its Arctic policy approach. While the GoC has taken some incremental steps to diversify its Arctic relations toward the region's "new" actors, including China, Japan, Singapore, and South Korea (described in detail below), its contemporary diplomatic approach remains almost entirely dependent on Trans-Atlantic bilateral ties and Trans-Atlantic Arctic institutions.

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[25] Ibid.

[26] Ibid.

[27] Ibid.

[28] Ibid.

TRANS-ATLANTIC BILATERALISM

The GoC works primarily with Denmark, Iceland, Norway, Sweden, and Finland (the Nordic States), Russia, and the United States on bilateral issues related to its Arctic priorities, most notably socio-economic development, Indigenous affairs, environmental protection, and security and defence.

From this perspective, Canada's reliance on its Trans-Atlantic ties in its Arctic policy is rational in its functionality, particularly when one views such engagement from a historical perspective. For most of Canada's Arctic eras – outlined above – these "Arctic states" dominated the region's development and security affairs and constituted the region's predominant regimes. Indeed, all the eight Arctic states (of which Canada is one) remain important, influential regional actors within Canada's Arctic priority areas. While this policy document will demonstrate how the Trudeau administration's overdependency on its Trans-Atlantic ties is now a strategic vulnerability – particularly as Canada seeks to advance its national interests in the Indo-Pacific – the authors also recognize the importance of Canada's continued engagement with these traditional Arctic actors to the country's strategic regional position.

Canada and the five Nordic states – the Kingdom of Denmark (Greenland), Iceland, Norway, Sweden, and Finland – share overlapping Arctic priorities, including combating climate change, protecting the Arctic marine environment, and enhancing cross-cultural research collaboration. In addition, like Canada, most Nordic states have Arctic policy frameworks that specifically seek to advance the Indigenous populations' interests.[29]

These shared interests and priorities provide a solid foundation for the GoC and its Nordic counterparts to co-operate on Arctic affairs. While a significant amount of such engagement occurs within multilateral institutions such as the United Nations (UN), the Organization for Security and Co-operation in Europe (OSCE), the International Maritime Organization (IMO), and the Arctic Council (AC) (outlined in detail below), Canada's bilateral and trilateral relations with the Nordic states are also robust.[30]

Canada's closest Nordic partners are Norway and the Kingdom of Denmark, primarily with respect to environmental and border security issues. The three countries are UN Sustainable working group members, for instance, and have co-signed the 2008 Ilulissat Declaration on

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[29] "Sami in Sweden," *Sweden Sverige*, June 1, 2021, https://sweden.se/life/people/sami-in-sweden; Rauna Kuokkanen, "The Pursuit of Inuit Sovereignty in Greenland," *Northern Public Affairs RSS*, July 2017, www.northernpublicaffairs.ca/index/volume-5-issue-2-innovations-in-community-health-and-wellness/the-pursuit-of-inuit-sovereignty-in-greenland/.

[30] Arctic Council, "Agreement on Enhancing International Arctic Scientific Cooperation," May 11, 2017, https://oaarchive.arctic-council.org/handle/11374/1916.

Arctic Ocean conservation and resource protection.[31] Further, the Trudeau administration is working to integrate both countries into its North Warning System: a US-Canada atmospheric air defence system covering North America's polar region.[32]

Economically, Canada has a strong partnership with Finland on mining and a robust bilateral trading agreement in place with Norway and Iceland.[33] Canada's diplomatic relationship with Sweden is also noteworthy, particularly as Stockholm has provided Canberra scientific data in support of Canada's continental shelf extension claim in the North Pole.[34]

With Russia, Canada's bilateralism is limited to shared Arctic interests as Ottawa largely suspended direct engagement with Moscow following the country's annexation of Crimea in 2014.[35] With regard to economics, for instance, both countries seek to develop transnational gas pipelines in the Arctic, whereas both states oppose foreign encroachment in the region as a security and defence priority.[36]

U.S. Engagement: The Los Angeles-class submarine USS Annapolis (SSN 760) breaks through a metre of ice during Ice Exercise (ICEX) 2009 on March 21, 2009, in the Arctic Ocean. The U.S. Navy teamed up with the University of Washington Applied Physics Laboratory to train in the Arctic environment. | Photo: Tiffini M. Jones/U.S. Navy via Getty Images)

Indeed, Canada's shared concern with Russia over Arctic maritime sovereignty remains a notable area when the two states' interest merge to the extent of informal bilateral co-operation.[37] Both states' policy frameworks emphasize dialogue and crisis management within the Arctic commons, for instance, suggesting the need for direct dialogue between Ottawa and Moscow on issues related to

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[31] "The Ilulissat Declaration." May 28, 2021, https://arcticportal.org/images/stories/pdf/Ilulissat-declaration.pdf.

[32] P. Whitney Lackenbauer and Suzanne Lalonde ed., *Breaking the Ice Curtain? Russia, Canada, and Arctic Security in a Changing Circumpolar World* (Calgary: Canadian Global Affairs Institute, 2019).

[33] Government of Canada, "Statement," op. cit., 14.

[34] Government of Canada, "Canada and Sweden conclude Arctic cooperation arrangement," Global Affairs Canada (website), last modified December 11, 2015, https://www.canada.ca/en/global-affairs/news/2015/12/canada-and-sweden-conclude-arctic-cooperation-arrangement.html?=undefined&.

[35] Danita Catherine Burke, *International Disputes and Cultural Ideas in the Canadian Arctic* (Denmark: Palgrave Macmillan, 2018): 133.

[36] Government of Canada, "Canadian LNG Projects," last modified August 6, 2020, https://www.nrcan.gc.ca/our-natural-resources/energy-sources-distribution/clean-fossil-fuels/natural-gas/canadian-lng-projects/5683; Natalia Viakhireva, "The Russian and Canadian Approach to Extra-Regional Actors in the Arctic," *Russian International Affairs Council*, July 11, 2019, https://russiancouncil.ru/en/analytics-and-comments/analytics/the-russian-and-canadian-approach-to-extra-regional-actors-in-the-arctic/.

[37] Ibid.

their respective defence postures and priorities.[38] While the Trudeau administration is clearly uninterested in pursuing closer bilateral ties with Russia on Arctic issues, Moscow remains an unavoidable strategic contemporary for Canada in the region.

Predictably, Canada's most willing partner in the Arctic remains the United States. The two countries have extensive collaboration in domains such as military, environmental protection, and research, and they actively co-operate and co-ordinate on Arctic issues through NATO and NORAD.[39] Further, Canada has included the United States (and Denmark) in the Canadian Forces Operation Nanook since 2010, an annual sovereignty operation in the High North.[40] The US-Canada Joint Statement on Environment, Climate Change, and Arctic Leadership in 2016 and the signed international agreement to prevent unregulated commercial fishing in the high sea in 2018 show the two countries' mutual goals of protecting the Arctic environment.[41] As an example of joint research, the annual Fulbright Arctic Initiative funds Canadian and American policy-makers, scholars, and researchers tackling critical issues concerning the High North.[42]

TRANS-ATLANTIC MULTILATERALISM

While Canada's bilateral Trans-Atlantic relations provides it the means to engage with each Arctic state on matters of shared strategic importance, the real core of the CoG's approach to the Arctic rests in Trans-Atlantic multilateralism and institutionalization. Indeed, while this brief treats Ottawa's Trans-Atlantic bilateral and multilateral relations as two equal parts of Canada's Arctic policy, the reality of Canada's Arctic engagement rests much more on multilateralism, with bilateralism often playing a supporting role.

Within Canada's multilateral approach to the region, the Arctic Council has a predominant position. Indeed, consisting of all eight Arctic states, six Inuit organizations, and 39 observers including non-Arctic states, NGOs, and interparliamentary organizations, the Arctic Council functions as a catalyst for Canada to enhance its broader multilateral collaboration.[43] The

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[38] Gunhild Hoogensen Gjørv et al., ed., *Routledge Handbook of Arctic Security* (London: Taylor & Francis Group, 2020).

[39] US Department of State, "US Relations With Canada," Bureau of Western Hemisphere Affairs (website), July 16, 2020, https://www.state.gov/u-s-relations-with-canada/.

[40] Government of Canada, "Statement," op. cit., 6.

[41] Prime Minister of Canada Justin Trudeau, "US-Canada Joint Statement on Climate, Energy, and Arctic Leadership," March 10, 2016, https://pm.gc.ca/en/news/statements/2016/03/10/us-canada-joint-statement-climate-energy-and-arctic-leadership; Government of Canada, "International Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean," last modified June 25, 2021, https://www.dfo-mpo.gc.ca/international/arctic-arctique-eng.htm.

[42] Fulbright Canada, "Canadian Scholars Arctic Initiate," accessed July 2, 2021, https://www.fulbright.ca/programs/canadian-scholars/arctic-initiative.

[43] Jon Rahbek-Clemmensen and Gry Thomasen, "How has Arctic coastal state cooperation affected the Arctic Council?" *Marine Policy* 122, (2020): 2.

Council's ministerial meetings, working groups, and expert groups, for example, function as working groups for a diverse set of Arctic actors including scientists, Indigenous populations, Arctic experts, and countries, thereby providing Ottawa with a single point of entry into a diverse set of Arctic relations and Arctic non-security-related affairs. Similarly, the Council's Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (2011), Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (2013), and Agreement on Enhancing International Arctic Scientific Cooperation (2017) provide Canada with the conceptual and institutional means to work with the Arctic member states on issues that contribute to the region's governance structure and multilateral order.

At present, Canada's policy priorities in the Arctic Council are environmental protection and Indigenous people's empowerment. Specifically, Canada leads Arctic Council working groups on the Arctic Monitoring and Assessment Programme, Protection of the Arctic Marine Environment, and Conservation of Arctic Flora and Fauna with its Trans-Atlantic partners.[44] In recent years, Canada has made a deliberate effort to steer the Arctic Council toward preventing oil pollution and reducing black carbon and methane emissions in the Arctic while promoting Indigenous involvement in the Arctic Council's Sustainable Development working group.[45]

Another key institution for Canadian multilateral involvement in the Arctic is the Arctic Five (A5), a parallel institution to the Arctic Council that includes Canada, Denmark, Norway, Russia, and the United States.[46] Whereas the Arctic Council focuses on socio-economic development and environmental issues, the A5's functional focus is on hard security, primarily with respect to Trans-Atlantic interests in the region. Between 2010 and 2021, for instance, the GoC used the A5 as a forum to negotiate with Russia and Denmark on continental shelf delineation where the three countries' territorial claims overlapped.[47] Between 2015 and 2021, similarly, Canada used the A5 to negotiate an Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean with the A5 states as well as China, the European Union, Iceland, Japan, and South Korea.[48]

Canada also works closely with United Nations entities, including the International Maritime Organization (IMO), the United Nations Environment Programme (UNEP), and the United Nations Development Programme (UNDP), on Arctic affairs such as shipping, search and

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[44] The Arctic Council, *Senior Arctic Officials' Report to Ministers* (Rovaniemi, 2019), https://oaarchive.arctic-council.org/handle/11374/2341.

[45] Ibid.

[46] Rahbek-Clemmensen and Thomasen, op. cit., 1.

[47] Ibid., 5.

[48] Robert W Corell et al., ed., *The Arctic in World Affairs: A North Pacific Dialogue on Arctic Futures* (Busan: Korea Maritime Institute, 2020), 127-138; Government of Canada, "International Agreement," op. cit.

rescue, ocean pollution, marine safety, and environmental protection. While Ottawa works with the UNEP and UNDP primarily through the Arctic Council – where both agencies have observer status – its work with the IMO is more direct. In 2017, for instance, Canada worked directly with the IMO to establish a Polar Code to formalize and co-ordinate international regulations for shipping operations and maritime environmental protection.[49]

On hard security issues in the Arctic, Canada works closely with NATO, which includes all the principal Arctic states except Russia. From 2014 to 2021, for instance, Canada strengthened its ties with NATO by participating in the Norwegian Cold Response exercise and Trident Juncture – one of the most prominent NATO exercises in the Arctic region.[50] In 2019, Canada further invited non-NATO countries, including Sweden and Finland, to participate in Operation Nanook, a Canadian-led multilateral military exercise predicated on Arctic sovereignty.[51] Interestingly, although Canada's *Arctic and Northern Policy Framework* portrays the Arctic as a low-tension region, Canada's recent engagement with NATO shows the country's willingness to adopt a hard security approach and use multilateral military interventions to counteract foreign threats in the Canadian Arctic.

c. Trans-Atlantic Dependency in Canada's Arctic Approach

As outlined above, Canada's past Arctic priorities have vacillated between security, resource exploitation, environmental protection, and Indigenous-led socio-economic development. Under the Trudeau administration, however, Canada's Arctic interests have expanded to include all these issue areas, a development in the GoC's foreign, domestic, and security policy direction indicative of the region's growing importance globally and to Canada.

To achieve its strategic end states in the region, the Trudeau government has built a network of state partners and institutions, drawing almost exclusively from the state's traditional North American and European partners. Bilaterally, as outlined above, the GoC works primarily with the Nordic states and the United States, while remaining strategically oriented toward Russia, the result of shared Arctic interests and postures. Multilaterally, Canada relies exclusively on Trans-Atlantic institutions including the Arctic Council, the Arctic Five, NATO, and the UN (to a lesser extent) to strengthen the region's governance institutions and to demonstrate Canadian leadership on setting key standards and normative prescriptions.

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[49] The International Maritime Organization, *Polar Code: International Code for Ships Operating in Polar Waters*, 2017, https://www.icetra.is/media/english/POLAR-CODE-TEXT-AS-ADOPTED.pdf.

[50] John Higginbotham and Jennifer Spence, ed., "Canada's Arctic Agenda: Into the Vortex," (report), 2019, https://www.cigionline.org/publications/canadas-arctic-agenda-vortex/, 70.

[51] Nazy Gocek, "NATO Up North: Operation Nanook-Nunalivut," *NATO Association of Canada*, May 7, 2019, https://natoassociation.ca/nato-up-north-operation-nanook-nunalivut/.

While Canada's prioritization of Trans-Atlantic relations made sound strategic sense during its early Arctic engagement phases, the Arctic's "internationalization" suggests Ottawa's Trans-Atlantic dependency is now more a strategic liability. Whereas the Arctic remained relatively closed to non-littoral states for much of the twentieth century, advances in technology and climate change have made the region more accessible to outsider powers, particularly those Asian states with Arctic interests. Indeed, as Part II of this brief outlines in detail, the growth in Asian actors has become a definitive trend in contemporary Arctic geopolitics, one that Ottawa has yet to engage with to a meaningful extent.

As Canada's Arctic interests expand in response to greater regional accessibility, so too must its strategic approach to the Arctic expand to accommodate this introduction of new actors outside its Trans-Atlantic comfort zone. Fortunately, the growth in Arctic awareness and activity among Asian states has led to a parallel growth in Asian-based actors, institutions, and dialogues that Canada can readily engage with to balance its Arctic approach. Done with proper understanding of the state and institutional dynamics inherent in Asian states' Arctic approaches, Canada can use such engagement to concurrently strengthen its strategic position in the Indo-Pacific, a key foreign and security policy priority of the Trudeau administration.

The necessary first step in formulating a more comprehensive strategic approach to including Asia's emerging Arctic actors and institutions is the concise and comprehensive mapping of their representatives and activities. Once mapped, it then becomes possible to articulate a national and subnational Canadian approach to engage based on state-led engagement and institutional partnership. Parts II and III of this brief undertake these analytical exercises, respectively.

Mapping Asian States' Institutions, Actors, Interests, and Activities in the Arctic

PART II

While it is wrong to suggest Asian states were inactive in the Arctic until recently, that they remained marginal actors in the region's affairs is clear. For much of the 20th century, for instance, the Arctic's littoral states – those Trans-Atlantic members of the Arctic Council – dominated Arctic affairs to the extent that their priorities and engagements defined the region's strategic environment. The result of proximity and material capability, states including Canada, Denmark, Norway, Iceland, Sweden, Russia, and the United States largely, if not entirely, determined the region's geopolitical, economic, and governance landscapes to any measurable degree.

In 2013, however, the region's dynamics skewed toward greater internationalization with the expanding of the Arctic Council to include China, Japan, South Korea, Singapore, and India as non-Arctic observer states.[52] While falling short of full representation on the region's predominant multilateral institution, the Arctic states' acknowledgment of the Asian states interests and capabilities in the region amounted to a strategic sea change; a redirection of relations and a recalibration of state activity that fundamentally moved the region toward a global orientation.

Building on the momentum of Arctic Council induction, the new Asian observer states (with the exception of India) lost little time in expanding their Arctic presences through unilateral, bilateral, and multilateral engagement, much of which superseded Trans-Atlanticism with Asian regionalism. Indeed, a defining characteristic of the Arctic's post-2013 development is the establishment and expansion of official (Track 1), semi-official (Track 1.5), and civilian (Track 2) dialogue and co-operation mechanisms within Asian led by the non-Arctic Asian states. These developments have necessarily shifted the Arctic's strategic centre away from the region itself toward the Indo-Pacific, albeit only to the degree that Asia's new Arctic focus has resulted in new institutions, standards, and partnerships to balance their more traditional, well-established Trans-Atlantic counterparts.

Predictably, not all the original Arctic states have responded the same to Asia's growing centrality in Arctic affairs, with states like Russia embracing new actors such as China, Japan, and South Korea as convenient means to balance against North American and European states, many of which see Russia's interests and activities in the High North as a strategic challenge to the region's "liberal order." Others, such as Canada and the United States, have remained more circumspect in their engagement, preferring instead to strengthen their ties with and within the Arctic Council and Arctic Five as the principal means to ensure their strategic interests.

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[52] P. Whitney Lackenbauer and James Manicom, *Canada's Northern Strategy and East Asian Interests in the Arctic* (Waterloo: The Centre for International Governance Innovation, 2013), 11.

As the remaining section will demonstrate, however, it is no longer feasible for Canada to overlook the non-Arctic Asian actors in its strategic approach to the region, primarily as China, Japan, South Korea, and Singapore, in particular, have developed and are developing Arctic capacities and interests that have the potential to refine the region's strategic parameters. Just as important, however, are these states' unilateral, bilateral, and multilateral activities and institutions with the Asia Pacific, or Indo-Pacific, that are resulting in new Asian institutions, many of which already include other traditional Arctic actors like Norway and Sweden. Closer collaboration with these Asian states on Arctic issues, therefore, is in Ottawa's strategic interest as collaboration will help balance out Canada's one-sided, Trans-Atlantic approach to Arctic affairs and provide Canada with a more solid foundation to achieve its national interests in the Asian region. In Part III of this brief, the authors provide a framework for how Canada can achieve this strategic integration.

A necessary precondition of this strategic framework, however, is the clear articulation and categorization of the non-Arctic Asian states' actors, motivations, and activities within the region. Only by first identifying when, where, and how China, Japan, South Korea, and Singapore, engage in the Arctic is it then possible to identify the relational linkages and operational nodes Canada should prioritize and pursue in its strategic development. The authors provide a detailed account of these Asian states' Arctic policies throughout the remainder of Part II.

Japan

Japan's Arctic Priorities

Japan has a long history of Arctic engagement and was the first non-Arctic state to join the International Arctic Science Committee and to operate a national observation station in the Arctic.[53] In 2013, Japan also obtained its observer status in the Arctic Council.[54] With its strength in polar research and innovation, Japan is one of the more active non-Arctic states. Fuelled by rapid climate change, rising traffic in the Northern Sea Route, and increased interest in other non-Arctic states, Japan's national Arctic engagement has been especially active in

[53] A.B. Almazova-Ilyina et al., "National interests of Japan and its emerging Arctic policy," *Earth and Environmental Science* 539 (2020): 2.

[54] Ibid.

recent years. This proactive Arctic presence is particularly demonstrated through the country's evolving Arctic and Ocean Policy Framework.

The Basic Plan on Ocean Policy and Japan's Arctic Policy set the institutionalized framework for the nation's Arctic engagement and priorities. First enacted in 2007, Japan's Basic Plan on Ocean Policy functioned as the nation's preliminary Arctic framework before the fruition of a formal national Arctic plan.[55] In particular, the Second Basic Plan on Ocean Policy, published in April 2013, specifically highlighted the importance of Arctic research, international co-operation, and the study of the Arctic sea route.[56] On October 16, 2015, Tokyo established the nation's long-awaited Arctic Policy and condensed Japan's Arctic blueprint down to three priorities: (1) research and development; (2) international co-operation; and (3) sustainable use. Aligning and building on the country's three Arctic priorities, the Third Basic Plan on Ocean Policy further set the Arctic as Japan's primary ocean policy direction for the first time, in May 2018.[57]

As of 2021, one can rationalize Japan's past Arctic engagement using the three priorities – science, diplomacy, and sustainable economic development – listed in the nation's Arctic Policy. First, Japan has strength and a deep-rooted history in scientific research and observation of the polar regions. The nation's robust research network, instruments, and infrastructure are also tools that subtly leverage the nation's influence in global polar policy decision-making. However, as a non-Arctic state, Japan understands the importance of cementing its relations with other Arctic actors, even with its strength in polar research. As a result, Japan has shown great commitment to the UN Sustainable Development Goals, the Paris Agreement, and other international binding documents to engage further with its bilateral, trilateral, and multilateral partners. Finally, as an island state reliant on energy resource imports and vulnerable to climate change, sustainable development is also critical to Japan's Arctic agenda. In particular, Tokyo sees sustainable shipping and Arctic resource development as critical to its future energy diversification.

Japan's Multidirectional Approach to Arctic Engagement

Japan engages with Arctic states, non-Arctic states, and critical intergovernmental organizations through research and economic collaboration to enhance and secure its future Arctic interests. Contextualizing Japan's multipronged Arctic foreign policy approach requires

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[55] Japanese Government, *Basic Plan on Ocean Policy*.

[56] Japanese Government, *The Second Basic Plan on Ocean Policy*.

[57] Japanese Government, *The Third Basic Plan on Ocean Policy*.

an understanding of the nation's paradiplomatic, bilateral, trilateral, and multilateral ties in Arctic affairs, each of which are outlined below.

Paradiplomacy, used here to indicate a regional government's involvement in and/or direction of a country's international relations, is a distinctive characteristic of Japan's Arctic engagement, particularly with respect to the Hokkaidō Prefecture's regional government.[58] Indeed, Hokkaidō, Japan's northernmost island, plays an outsized role in Japan's Arctic engagement due to its geographic and economic linkages with other Arctic states. The Hokkaidō government uses its Tomakomai Port, for instance, to present itself as a decentralized material and ideological gateway to the Arctic. It has also leveraged this status for diplomatic and economic outreach to Arctic actors, including Russia, and for prefecture-level engagement in international Arctic development projects, such as the Finnish Cinia Arctic Connect telecom cable project and the Chinese COSCO Arctic shipping initiative.[59] The prefectural government similarly works directly with the Northern Forum and Arctic Council on Indigenous development and cultural preservation.[60]

Asian Interests: A Japanese military vessel takes part in an exercise near the Russian town of Vladivostok on August 26, 2003. The U.S., Japan, and South Korea joined forces for the Arctic training exercises, deploying 75 ships, 20 aircraft, and 30,000 troops to the region. | Photo: Marina Shatilova/AFP via Getty Images

Bilaterally, Tokyo has limited working ties with all the traditional Arctic states. Tokyo works with Iceland and Norway on maritime governance and marine research collaboration, for instance, and with Denmark and Finland on resource development.[61] Japan collaborates closely with Russia on energy security matters, most notably through the Japan-Russia Yamal liquefied natural gas (LNG) and Arctic LNG 2 projects.[62] Tokyo partners almost exclusively with

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[58] Martin Kossa et al., "East Asian subnational government involvement in the Arctic: a case for paradiplomacy?," *The Pacific Review* 34, no. 4 (2021): 666.

[59] Julie Babin, "Stretching the icecap: Japan's Engagement and Policy in the Arctic," PhD thesis, Laval University, 2021, 185; Kossa et al., op. cit., 674.

[60] Babin, op. cit., 233.

[61] Babin, op. cit., 160; Ministry of Foreign Affairs of Japan, "Tripartite Meeting Between Japan, the Kingdom of Denmark and Greenland," May 2, 2014, https://www.mofa.go.jp/erp/we/dk/page22e_000444.html; Trude Petterson, "Japan, Finland agree to boost cooperation in the Arctic," *The Barents Observer*, 2016, https://thebarentsobserver.com/ru/node/566; Japan Oil, Gas, and Metals National Corporation, "Successful Award of Exploration Licenses offshore Greenland," December 24, 2013, https://www.jogmec.go.jp/english/news/release/news_10_000011.html.

[62] Almazova-Ilyina et al., op. cit., 7.

the United States on hard security Arctic issues, leveraging the two states' alliance relations to ensure stability and security in the High North.

Multilaterally, Japan also works closely with the Arctic Council to promote science co-operation, foster sustainable development, and combat climate change. Japan is particularly active in the Council's Arctic Monitoring and Assessment Programme, Conservation of Arctic Flora and Fauna, and Protection of the Arctic Marine Environment working groups.[63] Tokyo also works closely with the International Maritime Organization and was instrumental in helping develop the 2017 Polar Code.[64]

While such relations and activities provide Japan access to the Trans-Atlantic network of Arctic states, Tokyo's priority approach to Arctic affairs rests closer to home, particularly with respect to its Arctic-oriented engagement with China and South Korea. Tokyo, Beijing, and Seoul hold regularized high-level Arctic dialogues, for instance, on issues such as Arctic shipping routes, fisheries, research, and resource development. The three countries have also established the Asian Forum for Polar Sciences, the region's first multilateral organization aimed at fostering collaborative polar science research between Asian states.[65]

Japan's Arctic Actors

Alongside its foreign policy approach, Japan has developed a robust set of state-sponsored and private-sector actors that are active in and supportive of the state's Arctic affairs. Indeed, while Japan's multidirectional engagement is an important part of its Arctic engagement, the true scope of its Arctic activities and interests only becomes clear through examination of its domestic Arctic supporting network. As outlined below, these domestic actors both shape and direct Japan's Arctic priorities and approaches.

KEY GOVERNMENTAL ACTORS FOR ARCTIC AFFAIRS

While Tokyo lacks a formal, centralized mechanism to direct its state approach to the Arctic, one does see a clear division of labour across its key ministries. Whereas Japan's Ministry of Foreign Affairs directs the nation's Arctic relations, for instance, its Ministry of Education, Culture, Sports, and Science and Ministry of Economy, Trade, and Industry promote its economic and scientific interests. Similarly, its Ministry of Defence manages its security portfolio in the region while its Ministry of Land, Infrastructure, Transport, and Tourism

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[63] Ministry of Foreign Affairs of Japan, "Observer Report 2019-2021," *Arctic Council*, July 2021, https://oaarchive.arctic-council.org/handle/11374/2724.

[64] Babin, op. cit., 67.

[65] Yeadong Kim and Jihoon Jeong, "The development of the Asian Forum for Polar Sciences (AFoPS)," *Polar Science* 9, (May 2015): 338-344.

ensures the safety and stability of its northern sea lanes through close co-ordination with the country's Coast Guard. The following chart outlines these ministries' responsibilities and past engagement efforts in greater detail.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
The Ministry of Foreign Affairs of Japan (MOFA)	MOFA deals with Arctic diplomacy. MOFA played a primary role in helping Japan obtain its Arctic Council observer status in 2013.[66]
The Ministry of Education, Culture, Sports, Science and Technology (MEXT)	MEXT promotes Arctic scientific research and also manages various Arctic research institutions including JAMSTEC, NIPR, JCAR, and JAXA.[67] MEXT also established the Arctic Research Examination working group in 2010.[68]
The Ministry of Economy, Trade, and Industry (METI)	METI is in charge of the business pillar of the Arctic affairs.[69] METI is closely linked with the Japan Oil, Gas, and Metals National Corporation,[70] which is a primary shareholder in Greenland's petroleum exploitation (KANUMAS project).[71] METI plays a critical part in cementing Japan-Russia business ties. In particular, it facilitated Japan's investment in the Russia-based Arctic LNG 2 project in 2019.[72]
The Ministry of Land, Infrastructure, Transport, and Tourism (MLIT)	MLIT shapes the nation's ocean policy and explores the commercial viability of Arctic shipping using the Northern Sea Route (NSR).[73] MLIT also oversees Japan's Coast Guard and the utilization of the Japanese icebreakers *Soya* and *Teshio*.[74]

[66] Leiv Lunde et al., eds., *Asian Countries and the Arctic Future* (Singapore: World Science Publishing, 2016), 176.

[67] National Museum of Nature and Science, "Ministry of Education, Culture, Sports, Science and Technology (MEXT) and Other Research Facilities," https://www.kahaku.go.jp/english/links/other/index.html.

[68] Aki Tonami and Stewart Watters, "Japan's Arctic Policy: The Sum of Many Parts," The Arctic Yearbook, January 1, 2012, 96, https://arcticyearbook.com/images/yearbook/2012/Scholarly_Papers/4.Tonami_and_Watters.pdf.

[69] Lunde et al., op. cit., 179.

[70] Ministry of Economy, Trade, and Industry, "JOGMEC is to Make an Investment in a Project for Exploration for Geothermal Resources for the First Time," July 17, 2015, https://www.meti.go.jp/english/press/2015/0727_02.html.

[71] Japan Oil, Gas, and Metals National Corporation, "JOGMEC Provides Equity Financing for Petroleum Exploration Offshore Greenland," February 29, 2012, https://www.jogmec.go.jp/english/news/release/release0086.html.

[72] Takeo Kumagai and Eric Yep, "Japan eyes participating in Kamchatka LNG reloading terminal: official," *S&P Global Platts*, September 30, 2020, https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/093020-japan-eyes-participating-in-kamchatka-lng-reloading-terminal-official.

[73] Lunde et al., op. cit., 177.

[74] Tonami and Watters, op. cit., 95.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
The Ministry of Defence (MOD)	MOD controls Japan's Maritime Self-Defence Force, which is in charge of the icebreaker *Shirase*.[75] In 2011, MOD also published a report chapter on the future order of the Arctic that highlights Arctic security issues.[76]

KEY RESEARCH INSTITUTIONS FOR ARCTIC AFFAIRS

To support its Arctic activities, Japan has established government-affiliated think tanks and research centres, many of which receive funding directly from and are affiliated with one of the abovementioned foreign ministries. While covering a range of Arctic issues, these institutes tend to overlap with their prioritization of research on Arctic resource development, port infrastructures, and polar navigation. Collectively, Japan's public-private research centres provide the government with the most robust and extensive Track 1.5 capacity of all the Asian Arctic actors and enable Tokyo to participate in a wide range of Arctic dialogues in Asia, Europe, and North America.

Research Institutions	Responsibility and Engagement in Arctic Affairs
The National Institute of Polar Research (NIPR)	NIPR is an inter-university research institute that facilitates Arctic research among universities.[77] NIPR focuses on the terrestrial level of Arctic research.[78] The institute also established the Arctic Environment Research Center in 1990[79] and is one of the three representatives of the ArCS II project.[80]
The Japan Agency for Marine-Earth Science and Technology (JAMSTEC)	JAMSTEC has a history of Arctic research collaboration with the United States.[81] JAMSTEC is engaged in more than 10 Arctic expeditions[82] and is a representative of the ArCS II project.[83]

[75] Ibid.

[76] Ibid., 96-97.

[77] National Institute of Polar Research, "About Our Institute," https://www.nipr.ac.jp/english/outline/summary/overview.html.

[78] Lunde et al., op. cit., 173.

[79] National Institute of Polar Research, "Promoting close collaboration for Arctic studies by Japanese and international researchers," https://www.nipr.ac.jp/english/collaborative_research/arctic.html.

[80] Arctic Challenge for Sustainability II, "Project Overview – About ArCS II," https://www.nipr.ac.jp/arcs2/e/about/.

[81] Lunde et al., op. cit., 173.

[82] Ibid.

[83] Arctic Challenge for Sustainability II, op. cit.

Research Institutions	Responsibility and Engagement in Arctic Affairs
The Ocean Policy Research Institute (OPRI)	OPRI was initially called the Ship and Ocean Foundation.[84] It is a private think tank but is now incorporated within the Sasakawa Peace Foundation.[85] OPRI has a close relationship with the shipping and manufacturing industries in Japan. The Institute also played a critical role in formulating the Basic Act on Ocean Policy in 2007[86] and the production of an Arctic proposal for the Japanese Government in 2012 that viewed Russia as an essential Arctic partner.[87]
The Japan Institute of International Affairs (JIIA)	JIIA is a private, non-partisan think tank.[88] JIIA has deep ties with MOFA and specializes in foreign affairs and Arctic governance issues.[89] In 2012, the think tank initiated the Arctic Governance and Japan's Foreign Strategy project that was funded by MOFA.[90]
The Japan Consortium for Arctic Environment Research (JCAR)	JCAR is monitored by the NIPR and MEXT.[91] JCAR focuses on increasing Japan's capacities on environmental protection and human resource development in the Arctic.[92] JCAR also organized and hosted the Arctic Science Summit Week and the International Symposium on Arctic Research.[93]
Japan Aerospace Exploration Agency (JAXA)	JAXA uses space satellites to study the Arctic sea ice.[94] JAXA has collaborated with the University of Alaska and the International Arctic Research Center on Arctic-specific research.[95]

[84] Ocean Policy Research Institute, "About OPRI," https://www.spf.org/en/opri/profile/.

[85] Ibid.

[86] Fujio Ohnishi, "The Process of Formulating Japan's Arctic Policy: From Involvement to Engagement," *The Centre for International Governance Innovation* no.1 (November 2013): 3.

[87] Aki Tonami, "Future-Proofing Japan's Interests in the Arctic: Scientific Collaboration and a Search for Balance," *Asia Policy*, no. 18 (July 2014): 56.

[88] Ohnishi, op. cit., 4.

[89] Ibid.

[90] Ibid.

[91] Hiroshi Miyaoka, "Promoting Close Collaboration for Arctic Studies by Japanese and International Researchers," National Institute of Polar Research, https://www.nipr.ac.jp/english/collaborative_research/arctic.html.

[92] Ibid.

[93] Ibid.

[94] Sharing Earth Observation Resources, "GCOM (Global Change Observation Mission)," https://earth.esa.int/web/eoportal/satellite-missions/g/gcom.

[95] Linda Jakobson and Seong-Hyon Lee, "The North East Asian States' Interests in the Arctic and Possible Cooperation with the Kingdom of Denmark," *Stockholm International Peace Research Institute* (April 2013): 23.

KEY ACADEMIC INSTITUTIONS FOR ARCTIC AFFAIRS

Japanese universities also play an important role in the country's Arctic affairs. Hokkaidō and Kobe Universities, in particular, play critical roles in promoting Japanese participation in and facilitation of global dialogues on Arctic issues. As with its public-private research centres, Japan's universities are a strategic advantage for the state, particularly in comparison to other Asian states.

Academic Institutions	Arctic Engagement
Hokkaidō University	Hokkaidō University is one of the three representatives of the ArCS II project.[96] The university is also the only Japanese member university in the University of the Arctic (UArctic).[97] Its Arctic Research Center, Institute of Low-Temperature Science, and Slavic-Eurasian Research Center have all conducted Arctic-related research.[98] Along with Niigata University, Hokkaidō University also established a human resources development platform to promote Japan-Russian economic co-operation.[99]
Kobe University	The Polar Cooperation Research Center (PCRC) at Kobe University is actively engaged in Arctic research. PCRC also hosts the annual Polar Law Symposium that encourages global discussions on Arctic affairs.[100]

KEY COMMERCIAL ACTORS FOR ARCTIC AFFAIRS

While Japanese companies express interest in the Arctic's commercial potential, the state-affiliated Japan Oil, Gas, and Metals National Corporation is the only notable Japanese corporate actor in the Arctic at present. Two factors can justify the lack of engagement from private Japanese businesses in Arctic affairs: the high operating cost associated with many Arctic development projects and the ambiguous Japan-Russia relations. Yet, with the melting ice sheets and increased business opportunities in the North, Japanese commercial actors' presence will likely increase in the Arctic in the foreseeable future.

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[96] Ibid.

[97] UArctic, "Members List," https://www.uarctic.org/about-uarctic/members-list/.

[98] UArctic, "Hokkaido University," https://www.uarctic.org/member-profiles/non-arctic/8533/hokkaido-university.

[99] Hokkaido University, "Construction of a top down-type landmark research center," https://u4u.oeic.hokudai.ac.jp/en/landmark-top/.

[100] Kobe University, "About Polar Cooperation Research Centre," https://www.research.kobe-u.ac.jp/gsics-pcrc/centre.html.

Commercial Actors	Arctic Engagement
Japan Oil, Gas, and Metals National Corporation (JOGMEC)	JOGMEC is a state-owned natural resource deposit and development company.[101] It was formerly known as Japan National Oil Corporation and is considered a Japanese incorporated administrative agency.[102] JOGMEC has collaborated with various Arctic states, including Greenland (e.g., KANUMUS),[103] the United States (e.g., recovery of methane hydrate energy resources),[104] and Russia (e.g., Arctic LNG 2) on Arctic resource development projects.[105]

South Korea

South Korea's Arctic Priorities

In contrast to Japan, South Korea is a relative newcomer to Arctic affairs, having only prioritized the region through outreach and planning in the early 2000s.[106] Driven primarily by the region's natural resources and maritime transport potential, however, Seoul has increased its Arctic activities over the past 20 years to become one of the most active non-Arctic states, comparable to Japan and China. Having obtained Arctic Council observer status in 2013, South Korea subsequently developed a comprehensive, whole-of-state approach to the Arctic through publication of its 2013 and 2018 Arctic Policy Master Plans and its 2018 Polar Vision 2050 white paper. South Korea's Arctic policies and priorities – as articulated in these three key policy documents – are highlighted below.

The 2013 Arctic Policy Master Plan identifies Seoul's Arctic priorities in terms of "one vision" and "three policy goals."[107] Specifically, the 2013 Plan calls for South Korea to contribute "to

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[101] "Japan inks MOU for Alberta energy," *Journal of Commerce*, November 24, 2021, https://canada.constructconnect.com/joc/news/government/2021/11/japan-inks-mou-for-alberta-energy.

[102] Jakobson and Lee, op. cit., 22.

[103] Japan Oil, Gas, and Metals National Corporation, "Successful," op. cit.

[104] Office of Fossil Energy and Carbon Management, "Data from Innovative Methane Hydrate Test on Alaska's North Slope Now Available on NETL Website," March 11, 2013, https://www.energy.gov/fecm/articles/data-innovative-methane-hydrate-test-alaskas-north-slope-now.

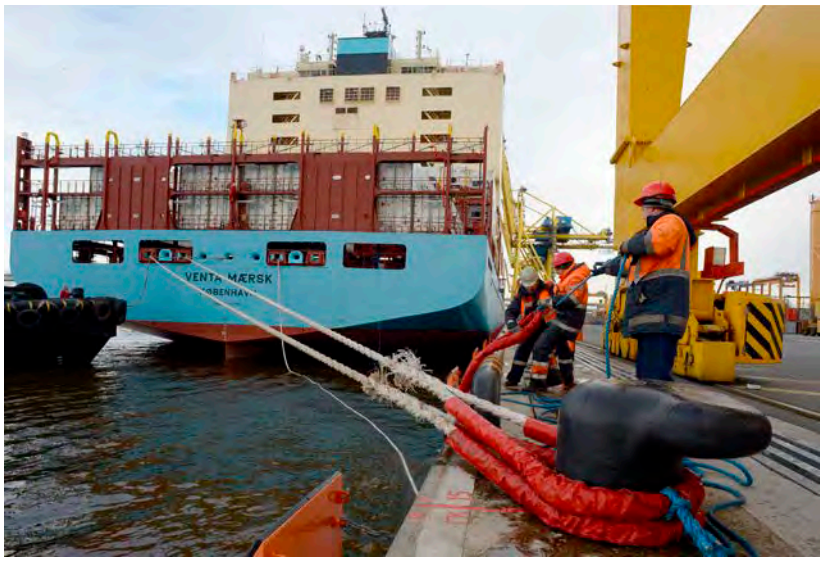
[105] Arctic Challenge for Sustainability II, op. cit.—

[106] Young Kil Park, "Arctic Prospects and Challenges From a Korean Perspective," *The Centre for International Governance Innovation* no.3 (December 2013): 1.

[107] Eunji Kim and Anna Stenport, "South Korea's Arctic policy: political motivations for 21st century global engagements," *The Polar Journal* 11, no.1 (June 2021): 11-29.

[the] sustainable future of the Arctic" through Arctic partnership, scientific research, and business development.[108] The 2018 Plan built on its predecessor's vision and policies to call for Seoul to pioneer and partner in shaping the Arctic's future by becoming more active and responsible in its regional engagement with a specific eye toward sustainable development.[109] Concurrently, the 2018 Polar Vision 2050 expanded South Korea's regional interests to include climate change, sustainable resource development, and Arctic Indigenous peoples' socio-economic development.[110] To operationalize its Arctic policies, South Korea has employed economic, geopolitical, and diplomatic means.

Economically, Seoul has leveraged its status as the world's largest shipbuilder and a foreign trade-dependent country to strengthen its capacity in Arctic shipping and maritime navigation.[111] Some of South Korea's largest industrial conglomerates (chaebols), including Samsung, Hyundai, and Daewoo, have prioritized construction of icebreakers, seeing the new technology as key to the country's Arctic access and operations.[112] These same companies are prioritizing development of new Arctic shipping routes such as the NSR to shorten transport distances between Northeast Asia and Europe.[113] South Korean firms are also active in Arctic resource development, particularly with respect to oil and gas, as Seoul sees Arctic resource exploitation as a critical means to reduce its dependency on energy supplies from the Middle East.[114] With more than 60 percent of its oil imports coming from Saudi Arabia, Kuwait, and the United Arab Emirates



Arctic Collaboration: Maersk's ice-class container vessel, Venta Maersk, docks at the port of Saint Petersburg on September 28, 2018. The Danish vessel was loaded with Russian fish and South Korean electronics and was the first container ship to navigate the Russian Arctic as the ice pack melts and recedes. | Photo: Olga Maltseva/ AFP via Getty Images

[108] Korea Maritime Institute et al., *Arctic Policy of the Republic of Korea*.

[109] Minsu Kim and Maksim L. Marchenkov, "The Republic of Korea and the Arctic region: from policy formulating to policy making." *Arctic and North*, no.37 (2019): 63.

[110] Ministry of Oceans and Fisheries, *2050 Polar Vision Statement*, http://en.koreapolarportal.or.kr/intro/2050PolarVision.do;jsessionid=877264E315FAC2641EBC2022EAF8DAC3.

[111] E.E Krasnozhenova et al., "The Arctic policy of the Republic of Korea," *IOP Conference Series: Earth and Environmental Science* 625, (January 2021): 4; Kim and Marchenkov, op. cit., 59.

[112] Krasnozhenova et al., op. cit., 4.

[113] Kim and Stenport, op. cit., 17.

[114] Ibid.

alone, Seoul hopes the Arctic could supply up to 10 percent of its total hydrocarbon resource imports in the near future.[115]

In addition to economic development, South Korea also prioritizes scientific research in its Arctic approach, primarily with respect to climate change, marine research, ecology, hydrology, and geology research.[116] Since its 2002 opening of the Dasan research station in Svalbard, Norway, in particular, South Korea has increased its Arctic research capabilities and presence, including the construction of its first icebreaker, the *Araon*, in 2009, its hosting of the 12th Arctic Science Summit Week in 2011, and its organization of an Arctic Science Fellowship Program in 2018.[117]

Importantly, South Korea sees itself as an emerging Arctic actor and is specifically seeking to transition from being an Arctic "observer" to a fully integrated Arctic "partner."[118] Indeed, South Korea's most recent Arctic documents are notable for their reprioritization of Seoul's Arctic priorities away from commercial development and toward Arctic co-operation on global challenges, such as environmental protection and Indigenous peoples' socio-economic development.

South Korea's Multidirectional Approach to Arctic Engagement

As with Japan, South Korea's Arctic engagement relies heavily on bilateralism and multilateralism. Since 2013, for instance, Seoul has periodically worked with the United States on "environmental co-operation" in the Arctic and, since 2014, has undertaken research on permafrost, the lithosphere, and methane hydrate deposits in the Beaufort Sea with Canada's permission. South Korea also actively participates in Arctic dialogue forums with the Nordic states, including the Arctic Circle Assembly in Iceland and the Arctic Frontiers organized by Norway.[119] In addition, South Korea has consistent Arctic science co-operation with Greenland, having signed four memorandums of understanding (MoUs) covering polar research collaboration since 2012.[120]

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[115] Ibid.

[116] Korea Maritime Institute et al., op. cit.

[117] Krasnozhenova et al., op. cit., 2; Hyun-Soo Kim et al., "Study on icebreaking performance of the Korea icebreaker ARAON in the arctic sea," *International Journal of Naval Architecture and Ocean Engineering* 3, no.3 (September 2011): 208-215; Kim and Stenport, op. cit., 23; Republic of Korea, "Observer Reports 2019-2021," *Arctic Council*, July, 2021, https://oaarchive.arctic-council.org/bitstream/handle/11374/2709/Arctic-Council-Observer-REPORT-2019-2021_KOREA.pdf?sequence=1&isAllowed=y.

[118] Kim and Marchenkov, op. cit., 64.

[119] Ibid., 62.

[120] Young Kil Park, op. cit., 4.

Of all its bilateral Arctic relations, South Korea's state and commercial engagement with Russia is arguably the most robust. For instance, South Korea and Russia signed an MoU on Arctic resource engagement in 2017, leading to substantial South Korean investment in Russia's Arctic LNG 2.[121] The two states also work closely on Arctic shipping, holding high-level talks about the joint development of a shipping route from Petropavlovsk-Kamchatsky to Murmansk via the NSR, for instance.[122] To support this partnership, South Korean firms, including Samsung, construct ice-class ships for and supply Arctic shuttle tankers to Russia.[123]

In parallel to its bilateral partnerships, Korea is actively contributing to Arctic affairs through intergovernmental organizations like the Arctic Council and the United Nations and advancing Arctic governance through its support of the Paris Agreement and the UN Sustainable Development Goals.[124] Within the Arctic Council, for instance, Seoul supports several working groups: the Arctic Monitoring and Assessment Programme; the Conservation of Arctic Flora and Fauna (CAFF); Emergency Prevention, Preparedness and Response (EPPR); the Protection of the Arctic Marine Environment (PAME); and Sustainable Development (SDWG).[125]

Within Asia, South Korea works with Japan and China, primarily through trilateral dialogue mechanisms. South Korea is an active member of the Forum for Polar Science, for instance, and inaugurated the Korea-Japan-China Trilateral High-Level Dialogue on the Arctic in 2016, which has since become an annual multilateral event.[126] Such engagement is limited, however, by ongoing economic rivalry between the three states on the privileges and usage of the NSR. Tension between South Korea and China has specifically escalated in recent years due to South Korea's ambiguous stance regarding the territorial disputes in the South China Sea and Seoul's perception of Chinese support for North Korea.

South Korea's Arctic Actors

KEY GOVERNMENTAL ACTORS FOR ARCTIC AFFAIRS

South Korea's Ministry of Oceans and Fisheries is the country's lead agency on Arctic affairs, reflecting Seoul's prioritization of shipping and Arctic navigation in its regional approach.

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[121] The Maritime Executive, "South Korea Explores Container Shipping on Russia's North Sea Route," November 9, 2021, https://www.maritime-executive.com/article/south-korea-explores-container-shipping-on-russia-s-north-sea-route; Krasnozhenova et al., op. cit., 3.

[122] Krasnozhenova et al., op. cit., 4.

[123] Jakobson and Lee, op. cit., 34.

[124] Republic of Korea, "Republic of Korea's Commitment on the Sustainable Development of the Arctic," *12th Ministerial Meeting of the Arctic Council*, May 20, 2021, https://oaarchive.arctic-council.org/bitstream/handle/11374/2682/MMIS12_2021_REYKJAVIK_Observer-Statement_State_Republic-of-Korea.pdf?sequence=1&isAllowed=y.

[125] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[126] Republic of Korea, "Observer Reports 2016," *Arctic Council*, November, 2016, https://oaarchive.arctic-council.org/bitstream/handle/11374/1862/EDOCS-4020-v1-2016-11-29_Republic_of_Korea_Observer_activity_report.PDF?sequence=1&isAllowed=y.

Indeed, South Korea's maritime-sector bureaucracies and its maritime-adjacent municipalities have been closely involved in shaping the country's Arctic policy since the early 2000s. Officials from the port city of Busan, for instance, are actively involved in South Korean Arctic affairs, particularly with respect to fishing and shipping.[127] In addition to these lead actors, at least five other ministries play important roles in South Korea's Arctic affairs, as outlined below.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Ministry of Oceans and Fisheries (MOF)	The MOF specializes in issues related to the Arctic maritime environment, port development, and fisheries.[128] The ministry takes the lead in forming the country's Arctic policy master plan and co-operates with other relevant ministries.[129] The ministry is also in charge of funding and is responsible for the Korean Polar Research Institute's major in-house and ministry-commissioned projects.[130] South Korea's icebreaker *Araon* is under MOF's responsibility.[131]
Ministry of Science, ICT and Future Planning (MSIP)	The MSIP partakes in the nation's polar research. The ministry has supported projects such as "Circum-Arctic Permafrost Environment Change Monitoring and Future Prediction Techniques" and "Changes in Environment and Coastal Geomorphology of Svalbard Fjord."[132]
Ministry of Environment (MOE)	The MOE contributes to South Korea's Arctic ecology research and environmental protection. NIE and NIER, two research institutions closely affiliated and funded by the MOE, are particularly engaged in the Arctic Council's migratory birds[133] and enhanced black carbon and methane emission reductions groups.[134]

[127] Over the Circle, "Talking Arctic Affairs in Busan," August 12, 2018, https://overthecircle.com/2018/08/12/talking-arctic-affairs-in-busan/.

[128] Ministry of Oceans and Fisheries, "About MOF," https://www.mof.go.kr/en/page.do?menuIdx=1469.

[129] Young Kil Park, op. cit., 5.

[130] "Co-operation in Arctic Science-Challenges And Joint Actions," *The 2nd Arctic Science Ministerial*, October 26, 2018, 108.

[131] Jean de Pomereu, "Korea's Polar Ambitions," *Sciences Poles*, September 30, 2010, http://www.sciencepoles.org/interview/koreas-polar-ambitions.

[132] "Co-operation in Arctic Science," op. cit., 108.

[133] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[134] Republic of Korea, "National Report by the Republic of Korea: Enhanced Black Carbon and Methane Emissions Reductions," *Arctic Council*, 2017, https://oaarchive.arctic-council.org/bitstream/handle/11374/2441/EGBCM2_2017_National-Report-Observer-States-Republic-of-Korea.pdf?sequence=6&isAllowed=y.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Ministry of Trade, Industry and Energy (MOTIE)	The MOTIE is involved with Arctic resource development, investment, and energy supply.[135] The MOTIE was the nation's signatory to an MoU with Greenland on joint geological surveys, resource development, and scientific exchange.[136] In addition, the MOTIE and Natural Resources Canada also share an MoU on Cooperation in Innovation and Energy Technologies.[137]
Ministry of Foreign Affairs (MOFA)	The MOFA contributes to South Korea's Arctic diplomacy with foreign states and intergovernmental organizations. The ministry represents South Korea in Arctic regional forums and facilitated the nation obtaining its observer status in the Arctic Council.[138] In 2020, the MOFA further established the "Arctic Club in Korea,"[139] an informal forum that aims to enhance Arctic collaboration between South Korea and Arctic states.
Korea Meteorological Administration (KMA)	KMA funded several independent Arctic climate research projects.[140] The ministry monitors changing Arctic temperatures and air masses[141] to pinpoint their effects on South Korea's meteorology.

[135] Jakobson and Lee, op. cit., 30.

[136] Brendan O'Donnell et al., eds., *Arctic Summer College Yearbook: An Interdisciplinary Look into Arctic Sustainable Development* (Cham: Springer, 2017), 78.

[137] Government of Canada, "Memorandum of Understanding Between Canada and the Republic of Korea on Cooperation in Innovation and Energy Technologies," March 2, 2016, https://www.canada.ca/en/natural-resources-canada/news/2016/03/memorandum-of-understanding-between-canada-and-the-republic-of-korea-on-cooperation-in-innovation-and-energy-technologies.html.

[138] Jakobson and Lee, op. cit., 30.

[139] Ministry of Foreign Affairs, "Ministry of Foreign Affairs Forms Arctic Club in Korea with Embassies in ROK," January 22, 2020, https://www.mofa.go.kr/eng/brd/m_5676/view.do?seq=320942&srchFr=&srchTo=&srchWord=&srchTp=&multi_itm_seq=0&itm_seq_1=0&itm_seq_2=0&company_cd=&company_nm=.

[140] Hyun Min Sung et al., "Climate Change Projection in the Twenty-First Century Simulated by NIMS-KMA CMIP6 Model Based on New GHGs Concentration Pathways," *Asia-Pacific Journal of Atmospheric Sciences* 34, no.8 (April 2021).

[141] Yonhap, "Cold wave alerts issued for most of S. Korea," *The Korea Herald*, October 16, 2021, http://www.koreaherald.com/view.php?ud=20211016000060.

KEY RESEARCH INSTITUTIONS FOR ARCTIC AFFAIRS

South Korea's research institutions play critical roles in shaping the nation's Arctic relations, particularly the Korean Polar Research Institute and the Korea Maritime Institute, which drive its Arctic research co-operation and facilitate its Arctic diplomacy. In addition, the Korea Research Institute of Ships and Ocean Engineering is South Korea's leading institution for Arctic shipping and maritime technology development. All three institutions are closely aligned with South Korea's central government, with intergovernmental organizations such as the Arctic Council, and with the nation's leading academic institutions.

Research Institutions	Responsibility and Engagement in Arctic Affairs
Korea Maritime Institute (KMI)	KMI is a policy research institute that the South Korean government sponsors through the Office of Government Policy Coordination.[142] KMI facilitates the state's policy development in the maritime and fisheries sectors.[143] KMI is mainly engaged with UArctic, the Arctic Council,[144] and the North Pacific Arctic Conference (NPAC).[145] Since 2015, KMI has co-hosted the Korea Arctic Academy with UArctic.[146] This academic exchange project facilitates Arctic education for students from Korea and Arctic countries. KMI actively partakes in the Arctic Council's PAME working group and expert group meetings.[147] In particular, KMI is one of the co-leads on "Strengthening observer engagement with PAME's shipping-related activities" and was also involved in the "Arctic Indigenous Marine Use Mapping" project.[148] Finally, since 2011, KMI has been hosting the NPAC with the East-West Center.[149]

[142] Jakobson and Lee, op. cit., 31.

[143] Ibid.

[144] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[145] Republic of Korea, "Observer Reports 2016," op. cit.

[146] Ibid.

[147] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[148] Ibid.

[149] Republic of Korea, "Observer Reports 2016," op. cit.

Research Institutions	Responsibility and Engagement in Arctic Affairs
Korea Polar Research Institute (KOPRI)	KOPRI is mainly in charge of South Korea's Arctic scientific research related to climate, atmosphere, oceanology, geology, and ecology.[150] As the institution is closely affiliated with the Ministry of Education, Science and Technology (the preceding agency of the MSIP), KOPRI doesn't cover any Arctic strategic or security issues.[151] The institute has one Arctic polar research base called the Dasan station in Svalbard, Norway.[152] In addition, South Korea's Arctic expeditions and research icebreaker, the *Araon*, falls under the responsibility of KOPRI.[153] Since its establishment in 1978,[154] KOPRI has closely collaborated with numerous domestic and foreign institutions to advance South Korea's Arctic agenda; some of these institutions include the Arctic Council, UArctic, and the International Arctic Science Committee (IASC). In particular, for the Arctic Council, KOPRI has actively participated in the Arctic Monitoring and Assessment Programme working group meetings and workshops.[155] Since joining UArctic in 2016, KOPRI has also facilitated the delivery of the Arctic Science Fellowship program.[156] KOPRI has developed a close partnership with the IASC since its participation in 2002 and has served as the Chair of the Pacific Arctic Group, a subset of the IASC.[157]

[150] Krasnozhenova et al., op. cit., 2.

[151] Jakobson and Lee, op. cit., 31.

[152] Krasnozhenova et al., op. cit., 2.

[153] Travis Larson, "Greener operations for the Korea Polar Research Institute's icebreaking research vessel," June 10, 2021, *Wärtsilä*, https://www.wartsila.com/insights/article/greener-operations-for-the-korea-polar-research-institute-s-icebreaking-research-vessel.

[154] KOPRI, "History of KOPRI," https://eng.kopri.re.kr/eng/html/intro/0103.html.

[155] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[156] UArctic, "Apply for KOPRI Arctic Science Fellowship Program 2019," January 21, 2019, https://www.uarctic.org/news/2019/1/apply-for-kopri-arctic-science-fellowship-program-2019/.

[157] Republic of Korea, "Observer Reports 2016," op. cit.

Research Institutions	Responsibility and Engagement in Arctic Affairs
Korea Research Institute of Ships and Ocean Engineering (KRISO)	KRISO is a government-funded research institute that specializes in shipbuilding and maritime engineering.[158] KRISO is an affiliate of the Korea Institute of Ocean Science and Technology.[159] Akin to KMI and KOPRI, KRISO also actively contributes to the Arctic Council's EPPR working group.[160] In particular, KRISO aims to partake in the Arctic Council's project on "New low-sulfur fuels, fate and behaviour in cold water conditions."[161] In addition, KRISO also houses the Regional Activity Center to support the UN Environment Programme's Northwest Pacific Action Plan,[162] specifically to prevent and respond to Arctic oil spills.
Korea Institute of Geoscience and Mineral Resources (KIGAM)	KIGAM is a state-funded geoscience research organization.[163] In 2014, the institution collaborated with the Geological Survey of Canada to discuss the exploration of oil and gas resources in the Arctic.[164] KIGAM also facilitated the 2019 Arctic Partnership Week in Busan.[165]
Korea Hydrographic and Oceanographic Agency (KHOA)	KHOA is a research body under the MOF.[166] KHOA facilitates South Korea's Arctic hydrographic knowledge and maritime research.[167]
Busan Development Institute (BDI)	BDI plays a critical role in paradiplomacy. The institute focuses on maritime projects that would facilitate Busan becoming a super port city[168] – a major hub for Arctic logistics, information, and tourism in Asia.

[158] KRISO, "Overview," https://www.kriso.re.kr/menu.es?mid=a20102000000.

[159] Ibid.

[160] Republic of Korea, "Observer Reports 2019-2021," op. cit.

[161] Ibid.

[162] Republic of Korea, "Observer Reports 2016," op. cit.

[163] KIGAM, "About KIGAM," https://www.kigam.re.kr/menu.es?mid=a20501000000.

[164] KIGAM "KIGAM, with have a meeting with GSC for the joint exploration of the Arctic Circle," September 23, 2014, https://www.kigam.re.kr/board.es?mid=a20401000000&bid=0032&act=view&list_no=44197&tag=&nPage=10.

[165] UArctic, "UArctic Students participate in Korean Arctic Partnership Week, Busan," December 6, 2016, https://www.uarctic.org/news/2016/12/uarctic-students-participate-in-korean-arctic-partnership-week-busan/.

[166] Jakobson and Lee, op. cit., 31.

[167] Ibid.

[168] Mac Net, "Busan Development Institute," http://www.macnetkorea.com/sub/eng_sub.aspx?s_code=0503750000.

Research Institutions	Responsibility and Engagement in Arctic Affairs
National Institute of Ecology (NIE)	NIE is a subsidiary research institution of the MOE.[169] NIE adds value to South Korea's Arctic ecology research. NIE is closely engaged with the Arctic Council's CAFF working group.[170] In particular, NIE assists the working group in conducting research on the breeding patterns, migratory routes, and conservation of Arctic migratory birds.[171]
National Institute of Environmental Research (NIER)	NIER is an affiliated research institution under the MOE[172] and carries out research related to the environment, climate, and air quality. NIER took part in meetings and contributed research to the Arctic Council's Expert Group on Black Carbon and Methane.[173]

KEY ACADEMIC INSTITUTIONS FOR ARCTIC AFFAIRS

In contrast to Japan, South Korean universities do not directly influence the country's Arctic policy. In general, South Korea's academic institutions lack adequate funding, human capital, and knowledge to affect the country's Arctic policy. Three South Korean universities do, however, have committed Arctic research programs – each with a different specialization – that are worth highlighting in a survey of the country's Arctic actors.

Academic Institutions	Arctic Engagement
Youngsan University Institute	The Institute of Arctic Logistics in Youngsan University specializes in conducting research on the Arctic shipping route and maritime logistics.[174] The university facilitated the Korean Arctic Partnership Week in Busan in 2021, with an emphasis on the theme of Arctic shipping infrastructure.[175]

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[169] Keun Namboong et al., eds., *Public Administration and Policy in Korea* (New York: Routledge, 2018), 238.

[170] Republic of Korea, "Observer Reports 2019-2021," op. cit.

171 CAFF, "AMBI Steering Group," https://www.caff.is/seabirds-cbird/576-caff-webb/caff-is/strategies/arctic-migratory-birds-initiative-ambi.

[172] Namboong et al., op. cit., 238.

[173] Republic of Korea, "Observer Reports 2016," op. cit.

[174] Institute of Arctic Logistics, "Introduction," http://arctic.ysu.ac.kr/ial/sub/introduction.php.

[175] Sungwon Hong, "Seminar Info- Arctic Shipping Infrastructure: Key Issues and Prospects," *The 10th International Arctic Shipping Seminar*, http://arcticshippingseminar.kr/en/sub/information.php.

Academic Institutions	Arctic Engagement
Pai Chai University	Pai Chai University's Korea-Siberia Center conducts research related to Siberia's economy, culture, and ecological environment.[176] The Center also plays a critical role in bridging the Arctic ties between Korea and Russia.[177]
Hankuk University of Foreign Studies	Hankuk University of Foreign Studies is a private university.[178] Staff from the university have published research and facilitated conferences relevant to Arctic economic development, diplomatic relations (e.g., Korea-Russia bilateral relations),[179] and geopolitical issues.[180]

KEY COMMERCIAL ACTORS FOR ARCTIC AFFAIRS

Unlike other non-Arctic states, South Korea's conglomerates (chaebols) have extraordinary influence over the state's economy and politics. As of 2021, South Korea's lucrative shipbuilding and maritime technology development are dominated by the country's "big three" mega-conglomerates: Hyundai, Samsung, and Daewoo.[181] These powerful commercial actors have established Arctic commercial ties on LNG development, shipping, and maritime technology development with Arctic state countries, including Norway, the United States, and Russia.

Commercial Actors	Arctic Engagement
Hyundai Glovis Co. Ltd	Hyundai Glovis is a South Korean logistics company specializing in Arctic shipping. Hyundai Glovis carried out the nation's first cargo shipping via the NSR in 2013.[182] In the same year, Swedish tanker company Stena Bulk also collaborated with Hyundai Glovis to explore the potential of Arctic sea routes.[183]

[176] Irkutsk State University, "Russia and Korea: a View from Siberia," October 26, 2020, http://old.isu.ru/en/news/newsitem.html?action=show&id=8565.

[177] Pai Chai University, "Research Institutes," http://www.pcu.ac.kr/english/sub03/sub0307.html.

[178] UniRank, "Hankuk University of Foreign Studies," https://www.4icu.org/reviews/3014.htm.

[179] Institute of Russian Studies, "Conferences," http://www.rus.or.kr/en/scholarship/conference_world_his.asp.

[180] Corell et al., op. cit., xiv.

[181] Jung-hwan Hwang, "Korea's big 3 shipbuilders aim to hike newbuilding prices," *The Korea Economic Daily*, August 2, 2021, https://www.kedglobal.com/newsView/ked202108020003.

[182] Kim and Stenport, op. cit., 20.

[183] Rob Almeida, "Stena Bulk and Hyundai Glovis to Collaborate in Arctic Shipping," *gCaptain*, September 12, 2013, https://gcaptain.com/stena-bulk-hyundai-glovis-collaborate/.

Commercial Actors	Arctic Engagement
Korean Gas Corporation (KOGAS)	KOGAS is a state-run natural gas supplier and a critical global LNG importer.[184] KOGAS has close Arctic engagement with Russia and Canada on resource development. In 2011, KOGAS executives attempted to commercialize Canada's Arctic gas reserves by building a gas-processing facility in the Northwest Territories.[185] In the same year, KOGAS tried to engage in West Cutbank and Horn River's mining fuel development in BC.[186] In 2018, KOGAS also expressed interest in participating in Russia's Novatek Arctic LNG 2 project.[187]
Hyundai Heavy Industries (HHI)	HHI is the largest shipbuilding company in the world.[188] HHI has close Arctic engagement with Norway. In particular, the company won a $1.6B deal in 2010 to construct Arctic vessels for the Goliat Field in the Barents Sea.[189] This contract holds significance as Goliat is Norway's first offshore oil development project in the Arctic region.[190]
Samsung Heavy Industries (SHI)	SHI is one of the "big three" shipbuilders in South Korea. SHI specializes in the construction of icebreakers, shuttle tankers, and LNG carriers.[191] SHI recently secured a $2.6B contract to assist the Russian Zvezda Shipyard construct LNG carriers for Russia's Arctic LNG 2 project.[192] Based on the contract, Russia ordered seven icebreaking shuttle tankers and six icebreaking LNG carriers from SHI.[193]

[184] Jessica Jaganathan, "UPDATE 1-South Korea's KOGAS asks for LNG cargo delays as demand tanks – sources," *Reuters*, April 8, 2020, https://www.reuters.com/article/southkorea-lng-imports-idUSL4N2BW2N1.

[185] Mia Bennett, "South Korea's growing role in Arctic economic development," *Cryopolitics*, April 20, 2011, https://www.cryopolitics.com/2011/04/20/south-koreas-growing-role-in-arctic-economic-development/.

[186] Young Kil Park, op. cit., 3.

[187] Bne IntelliNews, "Novatek Closes Arctic LNG-2 Deal with Chinese and Japanese Investors," *The Moscow Times*, July 23, 2019, https://www.themoscowtimes.com/2019/07/23/novatek-closes-arctic-lng-2-deal-with-chinese-and-japanese-investors-a66531.

[188] "Hyundai Heavy Industries," *The Journal of Commerce Online*, https://www.joc.com/maritime-news/ships-shipbuilding/hyundai-heavy-industries.

[189] "Hyundai Heavy picked for $1.16 billion Goliat vessel," *Business Recorder*, February 9, 2010, https://www.brecorder.com/news/3729052/hyundai-heavy-picked-for-116-billion-goliat-vessel-201002091018785.

[190] "First Subsea completes work on Norway's first Barents Sea FPSO," *Offshore Energy*, August 11, 2015, https://www.offshore-energy.biz/first-subsea-completes-work-on-norways-first-barents-sea-fpso/.

[191] Samsung Heavy Industries, "Overview," March 19, 2021, https://www.samsungshi.com/eng/company/info_overview.aspx.

[192] Gwang-Sup Song and Soo-min Lee, "Samsung Heavy eyes another $2.6 bn mega-order in Russia's Arctic LNG2 project," *Pulse*, September 24, 2021, https://m.pulsenews.co.kr/view.php?year=2021&no=881464.

[193] Ibid.

Commercial Actors	Arctic Engagement
Daewoo Shipbuilding & Marine Engineering (DSME)	DSME is one of the "big three" shipbuilders in South Korea. DSME was a pioneer in designing an Arc7 ice-class gas carrier for LNG transport in the NSR.[194] Like SHI, DSME also has close Arctic engagement with Russia, particularly with Sovcomflot, the state's largest shipping company. In 2013, Sovcomflot and DSME signed an MoU to enhance shipbuilding capacities and infrastructure in the southern part of Primorsky Krai, Russia.[195] In 2016, the two companies further enhanced their co-operation through the joint construction of the Zvezda Shipyard.[196]

China

China's Arctic Priorities

China stands apart from other non-Arctic states due to its self-proclaimed identification as a "near-Arctic state" and its disproportionate allocation of national resources to Arctic exploration, exploitation, research, and development.[197] Having identified the development of a Polar Silk Road as a foreign policy priority in a 2018 white paper on the Arctic, China's Arctic priorities are scientific research, Arctic governance, economic development, and the development of a polar shipping route.[198] Notably, China has mobilized national resources to achieve engagement on each of its priority areas to good effect. Indeed, Beijing is now arguably one of the Arctic's most influential actors and is well position to expand its influence even further in the short to medium term.[199]

China has leveraged its interest in and support of science research in the Arctic to participate in and to establish new communities of interest in which it plays a central role. As early as 1996, for instance, China joined the International Arctic Science Committee – an Arctic

[194] Krasnozhenova et al., op. cit., 4.

[195] "Russians and DSME sign yard MOU," *Offshore Engineering*, November 15, 2013, https://www.oedigital.com/news/457235-russians-and-dsme-sign-yard-mou.

[196] "Construction of Zvezda Shipbuilding Complex," *Far Eastern Shipbuilding and Shiprepair Center,* http://dcss.ru/en/projects/construction-of-zvezda-shipbuilding-complex/.

[197] Corell et al., op. cit., 245.

[198] Ibid., 146.

[199] Lassi Heininen et al., *Arctic Policies and Strategies – Analysis, Synthesis, and Trends* (Austria: International Institute for Applied System Analysis, 2020): 219.

Council-related non-government agency – and as a result established diplomatic ties with all eight Arctic states before becoming an official non-Arctic member of the Council in 2013.[200] Similarly, in 2004 and 2005, China established the Arctic Yellow River Station in Ny-Ålesund, Spitsbergen, Norway, and initiated the State Oceanic Administration-led Pacific Arctic Group within the Arctic Science Summit Week to enhance scientific collaboration in the Indo-Pacific region.[201] Beijing has also used its icebreaker, the *Xue Long*, to foster research collaboration in the Arctic and to strengthen its own research architecture in the region. Since 1984, China has sent the icebreaker (the world's largest) on more than 20 Arctic expeditions, many of which were joint operations.[202]

China has leveraged its scientific research ties to further advance its role in establishing and maintaining Arctic governance. Indeed, Beijing has prioritized the maintenance and development of Arctic governance in its overall policy approach to the region. To this end, China primarily works to enforce the Arctic region's existing governance institutions in line with the Charter of the United Nations, the Spitsbergen Treaty, the Paris Agreement, and the United Nations Convention on the Law of the Sea (UNCLOS). In addition to consolidating these existing international agreements, China also aims to project its presence through leading climate science-related projects in the Arctic.

In parallel, Beijing is working to expand China's economic footprint in the Arctic, particularly with respect to the region's research development. Chinese state-owned shipping, mining, and energy companies have funded infrastructure construction and resource development projects in various Arctic states, while Chinese companies have both made and attempted to make investments in Canadian, Alaskan, and Norwegian oil and gas sectors. China is particularly involved in economic co-operation with Russia and Denmark, having invested heavily in Russia's Arctic LNG 2 and Northern Greenland's Citronen Zinc-Lead projects.[203]

As with both Japan and South Korea, however, China's Arctic "Holy Grail" is unquestionably the development of an all-season Arctic shipping route – one that could significantly reduce transport times between China and Europe while reducing China's reliance on Indo-Pacific sea lanes of communication for its trade and energy needs. To meet this strategic objective, China is particularly focused on the commercialization and development of Russia's NSR,

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[200] Linda Jakobson and Jingchao Peng, "China's Arctic Aspirations," *Stockholm International Peace Research Institute* no.34 (November 2012): 10.

[201] Heininen et al., op. cit., 223; Jakobson and Peng, op. cit., 10.

[202] Myron H. Nordquist and Ronánn Long, *Marine Biodiversity of Areas Beyond National Jurisdiction* (Leiden: Brill, 2021): 314.

[203] Corell et al., op. cit., 248; Patrik Stig Andersson et al., "Chinese Mining in Greenland: Arctic Access or Access to Minerals?" *The Arctic Yearbook*, October 15, 2018, https://arcticyearbook.com/images/yearbook/2018/China-and-the-Arctic/7_AY2018_Andersson.pdf.

through which China can link its northern ports to Europe, thereby minimizing transit time, lowering shipping costs, and neutralizing non-traditional security threats, such as piracy.[204] Indeed, while all-season use of the NSR remains uneconomical at the time of writing, the Chinese state-owned offshore shipping company COSCO has periodically used the route since 2013.[205] To ensure COSCO's ability to transit throughout the NSR, Beijing routinely cites the UNCLOS provisions around freedom of navigation in coastal states' exclusive economic zones – a reading of international maritime law that contradicts its own stated policies in the South China Sea.

China's Multidirectional Approach to Arctic Engagement

While China is clearly an ambitious Arctic actor, it remains relatively circumspect in its approach to Arctic relations, seeking partnership for engagement, for instance, rather than undertaking unilateral action within the region. Within its bilateral relations, Russia is arguably China's most important partner, although Beijing has also established extensive relations with the Nordic states and trilateral relations with South Korea and Japan.

It Takes a Village: A general view of the port of Sabetta on the Kara Sea shore line on the Yamal Peninsula in the Arctic Circle in a photograph taken on April 16, 2015. The Yamal LNG project at the nearby Yuzhno-Tambeyskoye gas field is a joint Russia, France, China venture. | Photo: Kirill Kudryavtsev/AFP via Getty Images

China engages with Russia across multidisciplinary fields, including infrastructure development, energy projects, NSR shipping, tourism, and scientific research. Highlights in Sino-Russo Arctic co-operation relations include the 2013 Yamal LNG project, the 2018 Polar Silk Road project, and the 2019 Arctic LNG 2 project.[206] Beijing and Moscow have also launched an Arctic research program between the Chinese Pilot National Laboratory for Marine Science and Technology and the Shirshov Institute of Oceanology of the Russian Academy of Sciences,

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[204] Corell et al., op. cit., 12.

[205] Jakobson and Peng, op. cit., 7; Corell et al., op. cit., 23.

[206] Yun Sun, "The Intricacy of China's Arctic Policy," *Stimson*, August 27, 2018, 4, http://stimson.org/wp-content/files/file-attachments/Stimson%20-%20The%20Intricacy%20of%20China's%20Arctic%20Policy%20-%20Yun%20Sun.pdf; Corell et al., op. cit., 248.

two of China's and Russia's most prestigious maritime research institutions.[207] With China's increasing reliance on Russia to ensure its access to the NSR, and with the two states' shared view of the United States as an aggressor state, China and Russia's Arctic ties will likely strengthen in the foreseeable future and could potentially serve as an important counter-point to Trans-Atlantic dominance in the Arctic.

In addition to Russia, China has also deepened its collaboration with the Nordic countries, particularly on joint Arctic resource development and scientific research. China works closely with Finland, for example, on scientific co-operation in Arctic marine industry and geology research, and on construction of China's icebreaker, the *Xue Long 2*.[208] In further demonstration of Sino-Finnish ties, Beijing and Helsinki established a joint research centre for Arctic space observation in Sodankylä, Lapland, in 2018.[209] China has similarly developed a substantive resource development collaboration with Greenland to explore mining, metals, and minerals.[210] And in 2018, China opened the joint Aurora Observatory with Iceland, furthering a bilateral relationship with Reykjavík that is heavily research-based.[211]

Within Asia, as noted above, China's Arctic diplomacy rests primarily on trilateralism with South Korea and Japan, within which Beijing has taken the lead to facilitate the Pacific Arctic Group and the Arctic Science Summit Week.[212] In a similar proactive manner, China also hosted the Third Trilateral High-Level Dialogue on the Arctic in Shanghai on June 8, 2018.[213] Within this broader trilateral framework, Beijing prioritizes its bilateral ties with South Korea – going so far as to sign the distinctly bilateral MoU on Polar Science and Technology Cooperation in 2008.[214] Despite their shared interests in Arctic economic, resource, and governance development, China remains fundamentally wary of Japan as an Arctic partner, understanding that Tokyo's security alliance with the United States makes it biased against Chinese interests in the region.[215]

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[207] Nordquist and Long, op. cit., 325.

[208] Malte Humpert, "China reveals details of a newly designed heavy icebreaker," *Arctic Today*, December 17, 2019, https://www.arctictoday.com/china-reveals-details-of-a-newly-designed-heavy-icebreaker/.

[209] Nordquist and Long, op. cit., 324.

[210] Sun, op. cit., 11.

[211] Heininen et al., op. cit., 221; Nordquist and Long, op. cit., 324.

[212] Jakobson and Peng, op. cit., 10.

[213] Corell et al., op. cit., 355.

[214] Reinhard Biedermann, "The Polar Silk Road: China's Multilevel Arctic Strategy to Globalize the Far North," *Contemporary Chinese Political Economy and Strategic Relations: An International Journal* 6, no.2 (September 2020): 603.

[215] Gabriel Dominguez and Kosuke Takahashi, "Chinese, Russian Navies Conclude First Joint Patrols in Western Pacific," *Janes*, October 27, 2021, https://www.janes.com/defence-news/news-detail/chinese-russian-navies-conclude-first-joint-patrols-in-western-pacific.

In addition to its bilateral ties, China works with intergovernmental organizations and forums, including the International Arctic Science Committee, the International Maritime Organization, UArctic, and the Arctic Council, to address issues within the region's commons, such as climate change and ecology preservation. China is particularly involved with the Arctic Council, contributing to its working groups, task forces, and expert groups. Specifically, Chinese Arctic experts have contributed to working groups and programs such as the Arctic Contaminants Action Program, Arctic Monitoring and Assessment Programme, CAFF, EPPR, PAME, SDWG, and the SOA-based Marine Mechanism.[216]

China's Arctic Actors

KEY GOVERNMENTAL ACTORS FOR ARCTIC AFFAIRS

China has a large, complicated, and decentralized bureaucratic ecosystem for its Arctic affairs. Indeed, while the State Council provides funding for China's polar activities, at present more than 15 governmental agencies and China's People's Liberation Army work independently and collaboratively to fulfil the country's centralized foreign policy agenda.[217]

Governmental Actors	Responsibility and Engagement in Arctic Affairs
The State Oceanic Administration (SOA)	The SOA is a second-tier agency that reports directly to the Ministry of Land and Resources.[218] SOA used to be the primary governmental agency that led China's Arctic affairs. However, the administration was eliminated in 2018 and was later integrated into the portfolio of the Ministry of Natural Resources.[219] The SOA heads the Chinese Advisory Committee for Polar Research, which consists of experts from 13 Chinese ministries to co-ordinate on Arctic affairs.[220] SOA previously covered China's maritime activities, which consisted of shaping the nation's ocean-related policy and contributing to the formation of international polar maritime regulations.[221] On the side, SOA also funded polar research projects related to Arctic climate, geology, minerology, and maritime ecology. [222]

[216] The People's Republic of China, "Observer Report 2020," *Arctic Council*, June 2021, https://oaarchive.arctic-council.org/bitstream/handle/11374/2717/SAOXIS2_Arctic-Council-Observer-REPORT-2019-2021_CHINA.pdf?sequence=1&isAllowed=y.

[217] Ibid., 1.

[218] Jakobson and Lee, op. cit., 5.

[219] Sun, op. cit., 6.

[220] Jakobson and Peng, op. cit., 3.

[221] Jakobson and Lee, op. cit., 5.

[222] "Co-operation in Arctic Science," op. cit., 92.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Chinese Arctic and Antarctic Administration (CAAA)	CAAA is a Director-General level agency under the SOA.[223] The Administration is in charge of forming the nation's polar policy and strategic blueprint.[224] At the same time, it is also responsible for managing the state's key polar affairs and Arctic expeditions.[225] Currently, the CAAA is the most involved and authoritative Chinese agency in charge of Arctic affairs. Despite upholding a wide range of Arctic responsibilities, CAAA only employs approximately 40 staff members.[226] The administration consists of six divisions: (1) The General Affairs Division; (2) The Policy Planning Division; (3) The Expedition Affairs Division; (4) The Science and Technology Development Division; (5) The International Affairs Division; and (6) The Human Resources Division.[227] In particular, the International Affairs Division is in charge of facilitating China's bilateral and multilateral co-operation on Arctic affairs.[228]
China Maritime Surveillance (CMS)	CMS serves as SOA's maritime law enforcement agency.[229] CMS's responsibilities include conducting maritime patrol around disputed waters surrounding China.[230]
National Development and Reform Commission (NDRC)	NDRC focuses on the economic aspects of China's Arctic affairs. The commission has contributed to shaping the nation's Arctic policy related to shipping, resource development, and tourism.[231]
The Ministry of Transport (MOT)	MOT is responsible for enhancing China's policy and capacity related to Arctic shipping routes, maritime communication, and polar commercial trades.[232] The ministry also regulates China's domestic and international shipping industry, while administering the nation's shipping routes and ports. [233]

[223] Sun, op. cit., 5.

[224] Ibid.

[225] Ibid.

[226] Jakobson and Peng, op. cit., 3.

[227] Sun, op. cit., 5-6.

[228] Ibid., 6.

[229] Jakobson and Peng, op. cit., 3.

[230] Ibid.

[231] Sun, op. cit., 9.

[232] Ibid., 10.

[233] Jakobson and Lee, op. cit., 6.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
The Ministry of Science and Technology (MOST)	MOST is a second-tier State Council agency[234] that facilitates China's Arctic agenda using science diplomacy. MOST focuses on enhancing the nation's Arctic science, research, and technology infrastructure.[235] The ministry specifically provides financial funds for Arctic research related to Arctic satellites, climate change, a maritime ice-atmospheric study, and a polar data-sharing system. [236]
The Ministry of Environmental Protection (MEP)	MEP enhances China's Arctic collaboration with foreign countries in the fields of climate change and environmental protection.[237] In 2017, MEP specifically drafted the "Belt and Road Ecological and Environmental Cooperation Plan" to highlight the eco-friendly aspects of China's Maritime Belt and Road Initiative.[238]
The Ministry of Foreign Affairs (MFA)	MFA focuses on the diplomatic and political aspect of the nation's Arctic matters. MFA advocates for China's Arctic interests in bilateral, multilateral, and intergovernmental platforms.[239] The ministry's Department of Treaty and Law also prepares the nation's official statements on the Arctic and co-ordinates China's representatives at Arctic Council ministerial meetings.[240]
Ministry of Industry and Information Technology (MIIT)	MIIT is involved in polar telecommunications and satellite projects.[241] In 2017, MIIT engaged with Arctic stakeholders from Russia, Finland, Norway, and Japan to construct a fibre-optic cable link project across the Arctic Circle.[242]

[234] Jakobson and Peng, op. cit., 4.

[235] Sun, op. cit., 8.

[236] "Co-operation in Arctic Science," op. cit., 92.

[237] Jakobson and Peng, op. cit., 4.

[238] Ministry of Ecology and Environment of the People's Republic of China, *The Belt and Road Ecological and Environmental Cooperation Plan*, June 28, 2017.

[239] Sun, op. cit., 9.

[240] Jakobson and Peng, op. cit., 4.

[241] Sun, op. cit., 8.

[242] Zhenqi Xie, "China's 10,000-km fiber cable to reach the warming Arctic," *CGTV*, December 14, 2017, https://news.cgtn.com/news/7949444d32637a6333566d54/index.html.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Chinese Meteorological Administration (CMA)	CMA monitors Arctic climate and meteorological changes.[243] In 2021, the administration funded the development of FengYun-3, China's latest polar-orbiting meteorological satellite.[244]
State Bureau of Mapping and Surveying	The State Bureau of Mapping and Surveying focuses on polar mapping.[245] In 2019, the Bureau facilitated the state's BeiDou satellite navigation system, which advanced China's shipping navigation capacity for both commercial and military purposes.[246]
People's Liberation Army (PLA)	PLA addresses geo-security threats in the polar shipping routes.[247]
Ministry of Finance (MOF)	The MOF is in charge of the budgetary and administration aspects of polar issues. As a ministry-level entity, the National Development and Reform Commission specifically approves funding for construction of the state's Arctic icebreakers and facilities.[248]
Ministry of Education (MOE)	The MOE funds and promotes inter-university research on Arctic issues related to ecology, oceanography, geology, glaciology, climatology, engineering technology, and socio-politics.[249]
Ministry of Agriculture (MOA)	MOA promotes China's presence in Arctic fishing affairs.[250]

[243] "Atmospher Sci & Global Chg Research Highlights," *Pacific Northwest National Laboratory*, October 2013, https://www.pnnl.gov/science/highlights/highlight.asp?id=1498.

[244] "FY-3 (FengYun-3) 2nd Generation Polar Orbiting Meteorological Satellite Series," *Sharing Earth Observation Resources*, https://directory.eoportal.org/web/eoportal/satellite-missions/content/-/article/fy-3.

[245] Sun, op. cit., 9.

[246] Anne-Marie Brady, China as a Rising Polar Power: What it Means for Canada, *True North in Canadian Public Policy*, (December 2019): 5.

[247] Sun, op. cit., 9.

[248] Jakobson and Lee, op. cit., 6.

[249] "Co-operation in Arctic Science," op. cit., 92.

[250] Sun, op. cit., 10.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Ministry of Commerce (MOC)	MOC focuses on fostering China's commercial partnership in the Arctic. The ministry facilitated the state's recent Arctic collaboration with the Russian Ministry of Economic Development on the joint development of shipping routes, resources, tourism, and infrastructure in the High North.[251]

KEY RESEARCH INSTITUTIONS FOR ARCTIC AFFAIRS

China's primary Arctic research institutions are affiliated with and fund-dependent on different Chinese ministries. They are, as a result, less open to research sharing and collaboration than their non-Arctic Asian states' counterparts. Opportunity for Track 1.5 or Track 2 engagement with China's Arctic research institutions is currently limited. Indeed, much of China's non-academic research collaboration takes place at the Track 1, or official government level.

Research Institutions	Responsibility and Engagement in Arctic Affairs
Polar Research Institute of China (PRIC)	PRIC serves as China's principal research institution and consists of over 120 employees.[252] The institution is responsible for conducting the state's scientific research and polar expeditions.[253] In addition, PRIC also manages China's Yellow River Station in the Arctic and functions as an information centre for the state's research in the High North.[254] Furthermore, the country's polar research vessel, *Xue Long*, falls under the responsibility of PRIC.[255]

[251] Ibid., 10.

[252] Jakobson and Peng, op. cit., 5.

[253] Sun, op. cit., 7.

[254] Ibid.

[255] Lawson Brigham, "China's Polar Ships and Future Operations," *The Arctic Yearbook*, 2018, https://arcticyearbook.com/arctic-yearbook/2018/2018-commentaries/294-china-s-polar-ships-and-future-operations.

Research Institutions	Responsibility and Engagement in Arctic Affairs
Shanghai Institute of International Studies (SIIS)	SIIS has actively published numerous Arctic-focused research on Chinese Arctic and maritime policies. In 2011, the institute also established the Center for Maritime and Polar Studies.[256] The institute promotes China's academic Arctic engagement with different Arctic states. It also has an active presence in multilateral forums, such as the Arctic Circle Forum.[257] The vice-president of SIIS, Yang Jian, specializes in Arctic governance and China's regional strategy in polar affairs.[258]
The China Institute for Marine Affairs (CIMA)	CIMA functions as an internal research centre of SOA.[259] The institute specializes in the legal aspects of China's maritime policy legislation and economic interests in the Arctic.[260]
The Chinese Academy of Science (CAS)	CAS is China's leading academic research institution that specializes in topics such as remote sensing satellites, atmospheric science, and ice coverage forecasting.[261] In particular, the Institute of Aerophysics, the Institute of Geographic Sciences and Natural Resources, and the Institute of Oceanology have conducted research relevant to the Arctic environment and climate.[262]
China-Nordic Arctic Research Center (CNARC)	CNARC was established in 2013 under the joint effort of four Chinese and six Nordic institutions.[263] CNARC's primary aim is to facilitate Arctic engagement between China and the Nordic states. It has conducted Arctic research ranging from resource development, shipping, economic co-operation, and Arctic governance.[264] An annual Arctic symposium is further conducted by CNARC to enhance the collaboration between China and the Nordic states.[265]

[256] China-Nordic Arctic Research Center, "Shanghai Institutes for International Studies," https://www.cnarc.info/members/18-shanghai-institutes-for-international-studies.

[257] UArctic, "Arctic Circle Forum in China in May 2019," January 14, 2019, https://www.uarctic.org/news/2019/1/arctic-circle-forum-in-china-in-may-2019/.

[258] Arctic Frontiers, "Yang Jian," https://www.arcticfrontiers.com/speaker/yang-jian/.

[259] Jakobson and Peng, op. cit., 5.

[260] Ibid.

[261] Sun, op. cit., 8.

[262] Jakobson and Peng, op. cit., 6.

[263] Corell et al., op. cit., 254.

[264] Nordquist and Long, op. cit., 326.

[265] China-Nordic Arctic Research Center, "Symposia," https://www.cnarc.info/symposia.

KEY ACADEMIC INSTITUTIONS FOR ARCTIC AFFAIRS

As with China's Arctic research institutions, the country's academic institutions rely heavily on government funding and are, accordingly, less open to international collaboration than their Asian or Trans-Atlantic counterparts. That said, a few Chinese universities – particularly those located in China's coastal or port cities, such as Dalian and Heilongjiang – do engage globally on Arctic research, albeit selectively. Notably, Shanghai-based universities such as Fudan University, Tongji University, and Shanghai University of Political Science and Law have become China's leading institutions on international Arctic research engagement in recent years.

Academic Institutions	Arctic Engagement
Ocean University of China (OUC)	OUC focuses on research related to Arctic oceanography and fisheries.[266] In 2010, the university's school of Law and Political Science further founded the Research Institute of Polar Law and Politics.[267] To enhance the institution's Arctic research, the university also hosted the nation's leading Arctic experts, including Liu Huirong, and Guo Peiqing.[268]
Dalian Maritime University	Dalian Maritime University conducted research related to Arctic shipping and logistics.[269] The university's Shipping Development Academy also established the Arctic Shipping Affairs Research Center in 2010.[270]
Tongji University (The International Polar and Maritime Studies Center)	Various academics from Tongji University are engaged in the Arctic Council's working groups, including EPPR, PAME, and SDWG.[271]

KEY COMMERCIAL ACTORS FOR ARCTIC AFFAIRS

China's state-owned enterprises and state-affiliated companies are central actors in the country's Arctic affairs, particularly with respect to the Polar Silk Road's development. COSCO, for instance, plays a critical role in China's Arctic LNG transport and shipbuilding and ensures the state's navigation security and logistical capacity in Arctic shipping. The China National

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[266] Jakobson and Peng, op. cit., 6.

[267] Ibid.

[268] Ibid.

[269] Ibid.

[270] Ibid.

[271] The People's Republic of China, op. cit.

Petroleum Corporation and the China National Offshore Oil Corporation also work to secure Chinese interests related to natural resource exploration and energy security in the Arctic, often working with Russian firms in the process.

Commercial Actors	Arctic Engagement
Hunchun Chuangli Haiyun Logistics Company	In 2008, Hunchun Chuangli Haiyun Logistics Company leased North Korea's Rajin Port for 10 years.[272] At the time, Rajin Port was deemed as a potential Arctic hub, while the lease also granted China access to the Sea of Japan for the first time since 1938.[273] In 2011, the company's parent company, Dalian Chuangli Group, extended the lease for Rajin Port for 50 years.[274] This leasing agreement is considered to be one of China's most significant Arctic shipping development.
China National Petroleum Corporation (CNPC)	CNPC is the country's first state-owned resource company to enter the Arctic energy equity market.[275] In the past decade, CNPC fostered close Arctic energy co-operation with Russia. In 2010, CNPC secured agreements with Russia's Sovcomflot Group on the transportation of hydrocarbons.[276] In 2013, CNPC further purchased a 20 percent stock in Russia's Novatek Yamal LNG project.[277] Currently, CNPC is also involved in Russia's latest Arctic LNG 2 project.[278]
China Ocean Shipping Company (COSCO)	COSCO is the nation's leading shipping company and has been actively running transit voyages in the NSR.[279] To enhance its Arctic shipping capacity, the company purchased three ice-class, multi-purpose cargo ships in 2018.[280] In the same year, COSCO completed eight transit voyages through the NSR.[281]

[272] Jakobson and Peng, op. cit., 7-8.

[273] Ibid.

[274] Ibid.

[275] Sun, op. cit., 10.

[276] Jakobson and Peng, op. cit., 9.

[277] Sun, op. cit., 10.

[278] Malte Humpert, "China Acquires 20 Percent Stake in Novatek's Latest Arctic LNG Project," *High North News*, April 29, 2019, https://www.highnorthnews.com/en/china-acquires-20-percent-stake-novateks-latest-arctic-lng-project.

[279] Corell et al., op. cit., 248.

[280] Sun, op. cit., 13.

[281] Corell et al., op. cit., 248.

Commercial Actors	Arctic Engagement
China National Oil and Gas Exploration and Development Company Limited (CNOCD)	CNOCD is a subsidiary of CNPC.[282] The company also has an interest in Russia's Arctic LNG 2 project.[283]
China National Offshore Oil Corporation (CNOOC)	CNOOC acquired a 10 percent participation interest in Russia's Arctic LNG 2 project.[284] The company also previously secured a US$1.5B deal for the Yamal LNG project.[285] The company's oilfield service subsidiary, China Oilfield Services Limited, has conducted drilling, geophysical survey, and marine support projects in the Arctic.[286]
China Poly Group Corporation	China Poly Group is a state-owned company[287] that facilitates infrastructure development projects that enhance Arctic connectivity. In particular, the company signed a railway construction project with Russia's Interregional JSC Belkomur to link Central Russia to Arkhangelsk, in the Arctic.[288] The company also invested in Russia's Murmansk, a transportation project within the Arctic Circle.[289]
China Petroleum & Chemical Corporation (Sinopec)	Sinopec partakes in Arctic LNG development projects. The company had previously tried to secure an Arctic LNG deal with an Alaskan company under Trump's administration.[290] The company also participated in Russia's Yamal LNG project.[291]
Jiangxi Zhongrun Mining	Jingxi Zhongrun Mining focuses on mining exploration for gold, copper, and metals in southern Greenland and northwestern Svalbard, Norway.[292]

[282] Ibid.

[283] Ibid.

[284] Ibid., 247.

[285] Sun, op. cit., 11.

[286] Ibid.

[287] Corell et al., op. cit., 247.

[288] Ibid.

[289] Ibid.

[290] Sun, op. cit., 11.

[291] Ibid.

[292] Ibid.

Commercial Actors	Arctic Engagement
Guangzhou Shipyard International	China's Guangzhou Shipyard International built *Audax* and *Pugnax*, two polar-class, heavy lifting deck carriers for the Yamal LNG Project in 2016.[293]
Jiangnan Shipyard	The company was contracted by the Chinese government to build the nation's second polar research vessel, *Xue Long 2*, in 2019.[294]

Singapore

Singapore's Arctic Priorities

Since gaining its observer status in 2013, Singapore has been a proactive contributor to the Arctic Council through dialogue, in workshops, and in international forums, despite not having a fully articulated Arctic policy as of 2022. Aware that its legitimacy as an Arctic actor rests on its contributions to shared regional challenges – not on its geographic proximity and/or material capacity – Singapore has specifically worked through the Council to address climate change, to promote Arctic governance, and to pursue opportunities for sustainable development.[295]

First among Singapore's Arctic priorities is climate change, as the state is particularly vulnerable to rising sea levels resulting from Arctic melting.[296] Indeed, while the state lacks a comprehensive Arctic plan, Singapore does view glacial melting as a risk input to its domestic flood planning – one that the state's leadership considered when investing $100B in flood prevention in 2020.[297] From Singapore's perspective, then, working to mitigate climate change in the Arctic is both a critical means to deepen its role in Arctic affairs and a necessary

[293] Ibid., 13.

[294] Ibid.

[295] The Straits Times, "Full speech: Five core principles of Singapore's foreign policy," July 17, 2017, https://www.straitstimes.com/singapore/five-core-principles-of-singapores-foreign-policy.

[296] Ian Storey, "The Arctic Novice: Singapore and the High North," *Asia Policy* 18, (July 2014): 66.

[297] Desmond Ng, "Why Singapore is heating up twice as fast as the rest of the world," *CNA*, January 13, 2019, https://www.channelnewsasia.com/cnainsider/singapore-hot-weather-urban-heat-effect-temperature-humidity-906231; Robin Hicks, "How will low-lying Singapore's built environment survive rising seas?," *Eco-business*, September 30, 2019, https://www.eco-business.com/news/how-will-low-lying-singapores-built-environment-survive-rising-seas/.

proactive measure to ensure the country's long-term climate security, particularly with respect to rising sea levels.

As a maritime-dependent nation, Singapore also views Arctic governance, maritime law, and maritime security as central to its national interests, understanding that any legal or regulatory developments within the region could reverberate back to Asia. Singapore's leadership is particularly interested in understanding how Arctic states like Canada, Russia, and China apply UNCLOS to the Arctic's maritime domain as any deviation to its application could have far-reaching effects for the state's security in the South China Sea. Similarly, Singapore is determined to maintain involvement in the NSR's development as an all-season route through the Arctic between East Asia and Europe. This would have a significant impact on the state's economic viability and political status as one of the most – if not the most – important port states in the Indo-Pacific.[298] Indeed, Singaporean firms look at the NSR's development as a commercial opportunity for shipbuilding, ship reporting, oil rig construction, renewable energy development, and offshore engineering, as well as a potential challenge to the country's maritime port industry.[299]

Missile Defence: A serviceman stands near a Russian Bastion mobile coastal defence missile system on the island of Alexandra Land, part of the Franz Josef Land archipelago in the Arctic Circle, on May 17, 2021. | Photo: Maxime Popov/AFP via Getty Images

Singapore's Multidirectional Approach to Arctic Engagement

While Singapore enjoys stable bilateral relations with all Arctic countries, its ties with Russia are noteworthy for their mutual benefit and their breadth and depth. Whereas Moscow needs Singapore's expertise in maritime technology, drilling platform construction, and offshore operations, Singapore requires Russia's help to leverage its maritime technologies' production and to track NSR developments closely. Diplomatically, Singapore remains one of the few

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[298] Julian Turner, "Destination Singapore: behind the rise of the world's top shipping centre," *Ship-Technology*, October 24, 2019, https://www.ship-technology.com/features/why-is-singapore-port-so-successful/; Keppel, "Keppel FELS Completes Two Jack Up Rigs for Transocean," *Offshore Energy*, February 4, 2013, https://www.offshore-energy.biz/keppel-fels-completes-two-jack-up-rigs-for-transocean/.

[299] Ibid., 69.

developed nations that has not imposed sanctions on Russia and the two states' Ministries of Foreign Affairs maintain regular communication to co-ordinate their Arctic collaboration.[300]

In addition, Singapore maintains close Arctic partnership with Norway on education, research, and development, with the National University of Singapore and the University of Tromsø having signed a 2017 MoU on co-hosting Arctic seminars.[301] Diplomatically, Singapore's Minister of State for Foreign Affairs joined the 13th Arctic Frontiers Conference in Tromsø, Norway, in 2019, and in 2020 the two states agreed to establish more than 30 agreements at the inter-university and research institution levels to enable closer research and dialogue on maritime, climate, technological, and sustainable development issues in the Arctic.[302]

Multilaterally, Singapore works with the Arctic Council's working groups on CAFF, PAME, and EPPR on implementation, monitoring, and enforcement.[303] For example, Singapore's National Parks Board closely monitors the issue of Arctic migratory birds for CAFF, helps mitigate oil spills for PAME, and co-ordinates Arctic search and rescue services for the EPPR.[304] Singapore also works closely with the International Maritime Organization on maritime law, international maritime policy, and facilitating maritime co-operation in the Arctic.[305]

Singapore's Arctic Actors

KEY GOVERNMENTAL ACTORS FOR ARCTIC AFFAIRS

Singapore's Ministry of Foreign Affairs, the Maritime and Port Authority, and the National Parks Board are the country's primary agencies for Arctic affairs. Working closely together, the three ministries effectively manage Singapore's Arctic diplomacy, economic outreach, and conservation efforts, respectively.

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[300] Singapore Ministry of Foreign Affairs, "Special Envoy for Arctic Affairs Sam Tan's Participation in the Russia-Singapore Arctic Dialogue," December 17, 2021, https://www.mfa.gov.sg/Newsroom/Press-Statements-Transcripts-and-Photos/2021/12/20211217-Russia-Singapore-Arctic-Dialogue.

[301] National University of Singapore, "NU-UIT Joint Seminar and MoU Ceremony," October 2, 2017, https://esi.nus.edu.sg/esi-highlights/news-item/2017/10/02/nus-uit-joint-seminar-and-mou-ceremony.

[302] Singapore Ministry of Foreign Affairs, "MFA Press Statement: Visit by Minister of State, Ministry of Foreign Affairs and Ministry of Social and Family Development, Sam Tan to Tromso, Norway, for the 13th Arctic Frontiers Conference," January 2, 2019, https://www.mfa.gov.sg/Newsroom/Press-Statements-Transcripts-and-Photos/2019/01/22012019_MOS-Visit-to-13th-Arctic-Frontiers-Conference; Royal Norwegian Embassy in Singapore, "What happens in the Arctic does not stay in the Arctic," January 28, 2020, https://www.norway.no/en/singapore/norway-singapore/news-events/news2/what-happens-in-the-arctic-does-not-stay-in-the-arctic/.

[303] Republic of Singapore, "Observer Report 2019-2021," *Arctic Council*, June 2021, https://oaarchive.arctic-council.org/bitstream/handle/11374/2711/SAOXI2_Arctic-Council-Observer-REPORT-2019-2021_SINGAPORE.pdf?sequence=1&isAllowed=y.

[304] Ibid.

[305] Stewart Watters and Aki Tonami, "Singapore: An Emerging Arctic Actor," *Arctic Yearbook*, 2012, https://arcticyearbook.com/images/yearbook/2012/Scholarly_Papers/5.Tonami_and_Watters_Singapore.pdf.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Ministry of Foreign Affairs (MFA)	MFA is a crucial driver for Singapore's Arctic affairs and oversees the nation's Arctic partnerships. In 2012, MFA appointed a special envoy for Arctic affairs and subsequently facilitated Singapore securing observer status in the Arctic Council.[306] Singapore's active presence in international events, including the Arctic Frontiers and Arctic Circle Assemblies, are also co-ordinated by the MFA.[307]
Agency for Science and Technology and Research (A*STAR)	A*STAR falls under the responsibility of the Ministry of Trade and Industry of Singapore.[308] A*STAR collaborates with universities and Keppel Corporation to develop offshore and marine equipment for ConocoPhillips.[309]
Maritime and Port Authority of Singapore (MPA)	MPA regulates and develops strategies to ensure Singapore's position as a global maritime knowledge hub.[310] MPA focuses primarily on the development of international maritime law while monitoring the Arctic ocean and shipping route. MPA has continuously contributed to the Arctic Council's PAME and EPPR working groups.[311] MPA also attended the 3rd Arctic Shipping Best Practices Information Forum in June 2019.[312]
The National Parks Board (NParks)	NParks is regulated by the Ministry of National Development.[313] NParks is responsible for engaging in the biodiversity aspects of Arctic issues. NParks monitors the Arctic migratory birds issue, as Singapore is a key transit point for birds flying from the Arctic to Australia.[314]

[306] Ibid., 105.

[307] Ministry of Trade and Industry Singapore, "MTI Family," https://www.mti.gov.sg/About-Us/MTI-Family.

[308] Watters and Tonami, op. cit., 109.

[309] Ibid., 109.

[310] Ibid., 108.

[311] Republic of Singapore, op. cit.

[312] Ibid.

[313] National Parks, "Mission and History," January 4, 2022, https://www.nparks.gov.sg/about-us/mission-and-history.

[314] Audrey Tan, "Some migratory birds stopping over in Singapore travelled across the Himalayas, study finds," *The Straits Times*, December 11, 2020, https://www.straitstimes.com/singapore/some-migratory-birds-stopping-over-in-singapore-travelled-across-the-himalayas-study-finds.

Governmental Actors	Responsibility and Engagement in Arctic Affairs
Ministry of Sustainability and the Environment (MSE)	MSE works to project Singapore's push for a green economy and sustainable development in the Arctic. MSE contributes to the Arctic Council's PAME and SDWG working groups.[315] The ministry also oversees the Centre for Climate Research Singapore (CCRS). Dr. Erland Källén, the director of CCRS, has published multiple papers assessing the Arctic climate and the mechanisms for enhanced Arctic warming. Currently, CCRS aims to contribute to Arctic scientific discourse by pinpointing the relation between Arctic sea-level change and its implications on Southeast Asian countries.[316]

KEY ACADEMIC INSTITUTIONS FOR ARCTIC AFFAIRS

Singapore is also home to a number of world-class academic institutes with committed Arctic research and study programs, all of which are deeply integrated into regional and global academic and research networks dealing with Arctic affairs. Principal among these institutions are the National University of Singapore and Nanyang Technical University, both of which facilitate Arctic discussions between students, academics, researchers, government officials, and business professionals within Singapore and abroad.[317]

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[315] Republic of Singapore, op. cit.

[316] Denise Tan, "Southeast Asia will be hardest hit by melting ice; governments urged to speed up change," *Eco-Business*, July 22, 2019, https://www.eco-business.com/news/southeast-asia-will-be-hardest-hit-by-melting-ice-governments-urged-to-speed-up-change/.

[317] UArctic, "Postgraduate scholarships in Singapore for Arctic indigenous students," May 22, 2015, https://www.uarctic.org/news/2015/5/postgraduate-scholarships-in-singapore-for-arctic-indigenous-students/.

Academic Institutions	Arctic Engagement
National University of Singapore (NUS): Energy Studies Institute, Centre for International Law, Centre for Maritime Studies, Tropical Marine Science Institute, Centre for Offshore Research and Engineering, Keppel-NUS Corporate Laboratory, Department of Geography	Different NUS departments cover a wide range of Arctic research, including shipping governance, Arctic international law, Arctic remote energy development, and climate change. In particular, its Energy Studies Institute and the Centre of International Law specialize in Arctic energy and law, respectively. The Energy Studies Institute, in particular, has a strong affiliation with the Ministry of Trade and Industry and the Ministry of Foreign Affairs.[318] Between 2019 and 2021, the institute conducted a workshop on "Sustainable Energy Development in the Arctic: Collaboration on the Arctic Renewable Energy Atlas (AREA)."[319] The institute also facilitated a youth seminar to promote more Arctic awareness.[320]
Nanyang Technological University (NTU): Asian School of the Environment	NTU faculty researchers attended Arctic Council's PAME and SDWG's plenary meetings in 2020.[321]

KEY COMMERCIAL ACTORS FOR ARCTIC AFFAIRS

Major Singaporean Arctic commercial participants are either state-owned or have close ties with the government. Consequently, Singapore's Arctic commercial engagement revolves around the marine industry, which has strong credentials in shipbuilding, repair, and offshore engineering.

[318] National University of Singapore, "Management Board" https://esi.nus.edu.sg/about-us/management-board.

[319] Republic of Singapore, op. cit.

[320] Ibid.

[321] Ibid.

Commercial Actors	Arctic Engagement
Keppel Offshore and Marine (Keppel O&M)	Keppel O&M is a private company that has a strong affiliation with the state.[322] It is an engineering company specialized in designing offshore and marine equipment.[323] Keppel Singmarine, which was integrated as a part of Keppel O&M, has previously constructed seven ice-class vessels, including two icebreakers for Lukoil, a Russian energy company in the mid-2000s.[324] Keppel Singmarine also had previous commercial deals with major Arctic oil projects for its ice-capable jack-up rigs.[325] The company is currently collaborating with NUS to enhance Singapore's Arctic drilling capacity.[326]
Sembcorp Marine	Sembcorp Marine is a private engineering company that has close ties to state institutions. The company specializes in the construction of rigs, floaters, offshore platforms, and specialized vessels.[327] In 2018, the company's subsidiary LMG Marine secured its first polar expedition cruise ship design contract with Brodosplit Shipyard of Croatia.[328]
GIC Private Limited (GIC)	GIC is a state-owned investment firm.[329] GIC recently invested $240M into the Arctic Green Energy Corporation's expansion plans, to ramp up its capability in geothermal energy.[330]

[322] Watters and Tonami, op. cit., 109.

[323] Ibid.

[324] Storey, op. cit., 69.

[325] Ibid.

[326] Keppel Offshore and Marine, "Record delivery of 21 rigs," *Offshore Marine*, (December 2013): 20.

[327] Sembcorp Marine, "Key Capabilities," https://www.sembmarine.com/key-capabilities/rigs-floaters.

[328] Sembcorp Marine, "Sembcorp Marine Subsidiary LMG Marin Scores First Polar Expedition Cruise Ship Design Contract," June 12, 2018, https://www.sembmarine.com/stock-exchange-announcements/sembcorp-marine-subsidiary-lmg-marin-scores-first-polar-expedition-cruise-ship-design-contract.

[329] International Forum of Sovereign Wealth Funds, "GIC Private Limited," https://www.ifswf.org/member-profiles/government-singapore-investment-corporation.

[330] Reuters, "Singapore's GIC invests $240 mln in Arctic Green Energy," July 26, 2021, https://www.reuters.com/business/sustainable-business/singapores-gic-invests-240-mln-arctic-green-energy-2021-07-26/.

Developing an Arctic Approach to Strengthen Canada's Indo-Pacific Relations

PART III

There are multiple areas where Canada can deepen its engagement with China, Japan, South Korea, and Singapore to advance its foreign policy priorities in the Arctic and to integrate itself more fully into Asia's regional multilateral architecture. The tables beginning on page 71 of the Conclusion and Policy Recommendations section of this report provide a blueprint for Canadian engagement with China, Japan, South Korea, and Singapore across different issue areas and between different state, state-affiliated, and non-state actors. Concurrently, the supplementary tables identify which Canadian actors are best situated to represent Canadian interests across the matrix of Asian activities and actors.

Realizing Arctic Partnerships

While Canada would necessarily have to increase the resources it allocates to its Arctic foreign policy to realize the full potential of the bilateral and multilateral engagement opportunities outlined above, there is little question that the country's regional strategic posture would benefit as a result. Indeed, as Canada's policy priorities expand in the Arctic, Ottawa will likely find that partnership with the Asian Arctic states is critical to achieving its objectives, whether defined in socio-economic development or security terms. Further, as the region's geopolitics become more fraught with great power competition between China and the United States, or Russia and the European Arctic states (particularly in a post-Ukraine strategic environment), Canada will also find it beneficial to increase its presence in Asian strategic dialogues and working groups on the Arctic, if only to ensure its foreign policy efforts include both Trans-Atlantic and Trans-Pacific components. Indeed, the need for greater Canadian engagement with the Asian states in the Arctic will necessarily grow in tandem with those same states' growing regional influence, which is outpacing their European and North American counterparts.

In addition, closer co-ordination with China, Japan, South Korea, and Singapore on Arctic issues carries with it the added strategic value of deepening Canadian involvement in Indo-Pacific affairs. Indeed, as outlined above, a necessary corollary to co-operation with the Asian Arctic states is greater Canadian enmeshment in Indo-Pacific-based dialogue mechanisms and working groups, both at the bilateral and multilateral levels. Canadian co-operation with Asian states on Arctic affairs would, therefore, give it far more direct access to the region's predominant economic and security actors than it could otherwise achieve through a standalone Indo-Pacific strategy, particularly one that treats Canada's Arctic affairs in isolation from its Indo-Pacific relations.

From this perspective, Canadian policy-makers and strategic planners would benefit from the development of a "two oceans" strategy integrating Canada's Arctic relations with its approach to the Asia Pacific, or Indo-Pacific. Canada's integration of the Arctic region into its Indo-Pacific

policy, in particular, would result in the following strategic advancements and/or advantages in the Arctic.

First, Canada could strengthen global Arctic governance by supporting the Asian states' activities and interests in the region and co-operating with them on issues of strategic importance for Canada. At the multilateral level, Canada could achieve this by supporting greater Asian state involvement with the Arctic Council and by ensuring greater representation of Asian viewpoints on matters touching Arctic governance. At the bilateral level, Canada could expand its direct ties with China, Japan, South Korea, and Singapore on matters of shared strategic interest, such as environmental protection and resource development, and work with each country to ensure their activities align with regional norms around transparency, inclusivity, and sustainability. In each instance, Canada could work with the Asian states to ensure their activities are in line with the region's existing normative and institutional governance frameworks.

Second, Canada could work with the Asian states to strengthen regional stability, particularly in light of developments around the Russian invasion of Ukraine. At present, Arctic security is disproportionately focused on Trans-Atlantic institutions like NORAD and NATO, meaning the Arctic is poised for greater instability as Western allies and partners co-operate to isolate and pressure Moscow over Russian aggression in Europe. Closer co-ordination with China, Japan, South Korea, and Singapore on Arctic defence dialogue, particularly on dialogue around crisis and conflict prevention, would contribute to a more inclusive security architecture in the region – one made all the more effective as all the Asian states share the strategic aim of regional stability. Security dialogue with China, in particular, could contribute to regional stability as Beijing arguably has the greatest ability to influence Russia's foreign and security policy and could help lead efforts toward Arctic stability.

Third, Canada could co-operate with the Arctic states to realize more fully the Arctic region's economic potential around shipping and trade, in particular. As much of the Arctic's economic potential lies in the trade routes around Russia's northern territorial waters and exclusive economic zones, Canada, as well as the United States and European Arctic states, will need the support of China, Japan, South Korea, and Singapore to ensure the region remains open to trade. As with matters of defence, these Asian actors are arguably better positioned to ensure Russia remains open to Arctic access and engagement and that it remains in Moscow's economic interests that the region remain stable.

Strengthening Asian Ties

As Canada deepens its co-operation with China, Japan, South Korea, and Singapore in the Arctic, it should leverage its ties to advance its own strategic agenda in the Indo-Pacific.

Indeed, where Canada can provide these Asian states a degree of legitimacy in the Arctic, it should insist on reciprocity of access and influence in the Indo-Pacific. More specifically, Canada should employ this reciprocal engagement strategy to decrease its strategic vulnerability with China – linking its support for Chinese activity in the Arctic to Beijing's foreign policy behaviour toward Canada – and to increase its strategic value within Northeast and Southeast Asia. While such an increase in influence will naturally flow from Canada's involvement in dialogue around Arctic standards and regulations – many of which have implications for Asia's regional order – Ottawa should not shy away from making direct linkages between the Asian states' Arctic priorities and its Indo-Pacific goals. In so doing, Canadian policy-makers better position Canada in Asia to be an active, influential actor – one capable of managing interregional issues to advance its region-specific aims.

First, Canada should seek to integrate itself into Northeast Asian trilateral dialogue mechanisms, building on its multilateral engagement with China, Japan, and South Korea in the Arctic to work with all three states on matters related to economic integration and crisis management. While Northeast Asian trilateralism remains underdeveloped and subject to regional and global geopolitical developments, Canada should seek out specific issue areas where Beijing, Seoul, and Tokyo do engage regularly, such as environmental protection and sustainable development, and regional dialogue mechanisms, such as the Greater Tumen Initiative, to project its regional influence. Just as China, Japan, and South Korea see the Arctic as a global region in which they have interests, so, too, should Canada insist its participation in Northeast Asia is an expression of its global foreign and economic policy.

Second, Canada should make its support for Singapore's Arctic activities and involvement conditional on its support for Canadian involvement in Southeast Asian institutions, particularly the ASEAN Defence Ministers' Meeting Plus and the East Asia Summit, that Ottawa has expressed interest in joining. While Singapore, alone, cannot guarantee Canadian membership, it can positively influence other ASEAN member states to support Canadian involvement. Further, Canada should leverage its support for Singapore in the Arctic to raise awareness within the country of Canadian foreign and security priorities in the region. Canada could accomplish this through Track 1.5 and Track 2 dialogues such as the Council for Security Cooperation in the Indo-Pacific, where it specifically ties its engagement with Asian states in the Arctic to its defence priorities in Asia.

Third, Canada should directly link discussion of Indo-Pacific governance, economic development, strategic co-operation, and competition to its relations with and support for China, Japan, South Korea, and Singapore in the Arctic. In forums such as the ASEAN Regional Forum, for example, Canada should consistently and clearly reference issues such as maritime security; cybersecurity; data security; global commons management; and illegal, unregulated,

and unreported fishing as both Asian and Arctic issues in need of regional and trans-regional standards and regulations, consistent with the international rule of law. In linking Asian and Arctic affairs, Canada can better demonstrate its value as a global strategic actor to a set of regional states naturally cynical of the country's strategic resolve.

Fourth, and lastly, Canada should leverage its support for and co-operation with China in the Arctic to insulate itself from Chinese coercion and to demonstrate its value as a strategic partner for Beijing. Ottawa should further make its ongoing support conditional on other aspects of its bilateral relations, such as trade, science, and technology and people-to-people ties, and it should communicate such conditionality clearly to Beijing from the outset. An approach of this type is likely to succeed as China's interests in the Arctic are growing exponentially and Canada's geographic proximity provides it with the potential to spoil Chinese regional aims. Indeed, Canada's Arctic status gives it a particularly effective negotiating tool in Canada-China relations – one that gains in strategic value the more Ottawa demonstrates to Beijing its willingness to engage on its own national security terms, regardless of the current state of US-China relations.

While certainly a good place to start, it would be foolhardy of Canadian policy-makers to see the above opportunities for engagement and strategic outcomes of such engagement as an exhaustive list. If policy-makers should draw one lesson from this brief, it is the fact that Canadian interests in the Arctic have changed, and will continue to change over time, often in response to new national priorities but just as often in response to the region's changing geopolitical environment.

To this end, the best Canadian policy-makers can do to ensure Canada's long-term engagement in the Arctic is to pursue a diplomatic and commercial track predicated on bilateral, multilateral, and multi-regional engagement. Whereas Canadian policy-makers have correctly relied on this approach in the past, they have done so with a singular focus on North America and Europe. While this geographic and geostrategic direction made sense for much of the 20th century, it is no longer sufficient to secure Canadian national interests. While it is premature to suggest Asian states will dominate the next century of Arctic affairs, their growing influence over the region's institutions, resources, and governance structures in proportion to their overall growth in global status is all but certain.

Conclusion and Policy Recommendations

Arctic affairs, being closely tied to Canadian identity and sovereignty, have remained a top national priority for Canada under the transition of different governmental administrations. Yet the nation's emphasis on security, territory, and population-oriented Arctic strategy policies continues to reflect an exclusionary foreign policy approach. In particular, Canada's existing *Arctic and Northern Policy Framework* and defence policy only cover the nation's Arctic engagement with its traditional Arctic state allies and intergovernmental organizations. The benefits, opportunities, and threats brought on by Asian non-Arctic newcomers have been reduced to security and geopolitical risks posed by China, through a narrow Arctic sovereignty lens.

In an era of increasing competition between great powers and global political instability, Canada's Arctic approach of enhancing collaboration with its traditional Arctic allies is not enough. Instead, Canada must develop foresight-based strategies that can create new, constructive international engagement, project national interests, and leverage Canada's global leadership role in the High North. To do so, Canada must deviate from a "conflict or co-operation" binary toward a focus on how the nation can best work with all actors to strengthen its capacity to ensure peace, stability, and development in the High North.

As evidenced in Part II of this report, Asian non-Arctic states, including Japan, China, Singapore, and South Korea, have long established a complex web of networks, infrastructure, and human capital in the Arctic. The following recommendations pinpoint how Canada can best re-insert itself in this network of Arctic "newcomers," while upholding its national interests.

Japan

Ongoing & Upcoming Japanese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
INTER-STATE AND NATIONAL LEVEL ARCTIC ENGAGEMENT		

Arctic Challenge for Sustainability II Project (ArCS II): 2021-2025
 	
The ArCS II is a national Arctic flagship project monitored by three institutions: the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), the Hokkaidō University, and the National Institute of Polar Research (NIPR). ArCS II promotes advanced and interdisciplinary research in the circumpolar regions, specifically related to environmental change, climate prediction, social changes, and Arctic governance.
 	
ArCS II focuses on strengthening Japan's Arctic research capacity through building an international human network. International research exchanges, overseas fellowship programs, and calls for complementary research projects are facilitated by the ArCS II project. Some of ArCS II's notable research accomplishments include:
 	
• NIPR and JAMSTEC have fostered close Arctic collaboration with research centres in different Arctic states:[331]
  • **Norway:** Ny-Ålesund NIPR Observatory, UNIS University Centre in Svalbard;
  • **Finland:** Pallas-Sodankylä Global Atmosphere Watch (GAW) Station;
  • **Russia:** Ice Base Cape Baranova, Spasskaya Pad Scientific Forest Station;
	Polar Knowledge Canada (POLAR)
	
	POLAR is Canada's leading federal organization responsible for advancing Canada's research capacity, presence, and international engagement in the circumpolar regions.
	
	POLAR manages the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, and organized the pan-northern science and technology program. In addition, POLAR also funds projects, awards, grants, and scholarships to support Canadian scholars, universities, and private institutions to engage in Arctic dialogues and research.
	
	Independent researchers, academic institutions, and private institutions receive annual funding through POLAR, usually through its Northern Science Technology and Polar Knowledge Application programs. Between 2017-2019, POLAR funded the Arctic project a total of $8,680,188. [1] Thus, in comparison to Japan's industry-academic-government lead ArCS II project – which provides five-year-long Arctic research support in interdisciplinary fields – Canadian-based industries and academic institutions lack the same degree of support, flexibility, and funding to conduct relevant Arctic research.
	
	Link: https://www.canada.ca/en/polar-knowledge.html
		• Polar Knowledge Canada should enhance industry-academic-government collaboration on Arctic affairs. This includes facilitating platforms and meeting opportunities for all three parties to partake in Arctic dialogues.
		
		• Canadian think tanks and academic institutions should partake in ArCS II's research programs to leverage Canada's research capacity in the Arctic.
		
		• POLAR should offer funding to support national programs that are working to strengthen capacity and to facilitate international exchange, co-funding, and collaboration in the High North.

[331] "Arctic Challenge for Sustainability II: Towards a New Horizon of Arctic Research," Arctic Challenge for Sustainability, 14, https://www.nipr.ac.jp/arcs2/e/wordpress/wp-content/themes/arcs2/assets/pdf/ArCS2_E_web_2021R2.pdf.

Ongoing & Upcoming Japanese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
• **United States:** University of Alaska Fairbanks, Poker Flat Research Range (PFRR) super site; • **Canada:** Canadian High Arctic Research Station (CHARS), Centre d'études Nordiques; and • **Denmark/Greenland:** Greenland Institute of Natural Resources (GINR), Qaanaaq-Siorapaluk Research Base. • Hokkaidō University organized a series of Arctic workshops (e.g., UArctic's Multilevel Governance and Interregional Cooperation Online Workshop) that promote dialogue between international Arctic experts and academics. In 2018, Hokkaidō University signed an MoU on Academic Exchange with AAU Arctic and the Aalborg University Denmark to enhance Arctic research exchange between the two states.[332] https://www.nipr.ac.jp/arcs2/e/		
ARCTIC ACADEMIC AND RESEARCH ENGAGEMENT		
Arctic Data Archive System (ADS) The ADS is administered by the NIPR and the Polar Environment Data Science Center. This open source offers observational and model simulation datasets for Arctic and Antarctica research. The archive collects and offers meteorological, snow, permafrost, hydrological, glacier, vegetation, sea ice, paleoclimate, text, and marine observation data on the Arctic. Link: https://ads.nipr.ac.jp/	**Polar Data Catalogue (PDC)** The PDC is a Canadian open-access archive that offers polar data and metadata. Similar to Japan's ADS, the archive offers data related to climate, sea ice and permafrost, wildlife and vegetation, and social and health indicators for Inuit peoples in the High North. The site is managed mainly by the University of Waterloo.	• PDC should enhance existing metadata interoperability and sharing protocols with Japanese data centres. • Possible expansion of metadata sharing should strengthen tracking of projects and research licensing in northern communities. • Canadian scientists should contact NIPR (ads-info@nipr.ac.jp) and register their Arctic data to enhance the existing Arctic monitoring data network.

[332] Aalborg University, "Memorandum of Understanding- Hokkaido University," April 16, 2018, https://www.arctic.aau.dk/news/news/memorandum-of-understanding---hokkaido-university.cid355469.

Ongoing & Upcoming Japanese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
	PDC shares Arctic data with the NIPR, the US's National Snow and Ice Data Center, and other foreign governmental research centres to facilitate public access to more comprehensive Arctic metadata records.[333] Link: https://www.polardata.ca/	• Akin to Japan, the Government of Canada should fund more Arctic research exchange programs, to establish links between Canada, the Arctic states, and the Asian non-Arctic states. • As evidenced by the Kakehashi Project, Canada and Japan already have a history of robust academic and cultural exchange. The Government of Canada should enhance the existing academic ties and implement more Arctic-specific exchange opportunities for students in Canada's northern communities and Japan's Hokkaidō Prefecture. • Canadian research and academic institutions should implement more annual Arctic science and governance forums and symposiums to enhance Canada's Arctic influence, research output, and public outreach. • Both event organizers should make recordings of the events accessible on digital platforms, in consideration of the travel restrictions caused by the COVID-19 pandemic. • The Government of Canada should offer funds to cover the travel costs for Canadian academics, research institutions, and Arctic scientists to attend the forum in Tokyo.
Re-Inventing Japan Project The Ministry of Education, Culture, Sports, Science and Technology (MEXT) funds Hokkaidō University's Re-Inventing Japan Project. This project promotes Arctic research collaboration with Far East universities in Russia, through inter-university exchange projects. The East Russia-Japan Expert Education Program and Human Resource Development Platform for Japan-Russia Economic Cooperation and Personnel Exchange fall under this project.	**North2North Student Exchange Program** North2North Student Exchange is organized by the University of the Arctic. Students typically from Arctic states are offered a grant to undertake 3 to 10 months of undergraduate and graduate level studies at another UArctic institution. The exchange program offers courses that can specifically enrich students' understanding of the Circumpolar North. Although Canada is an Arctic nation, there is a lack of long-term Arctic-specific academic or research exchange programs between Canada and other states. The only relevant programming was the Canada-Iceland Arctic Research Program, which ran in 2018.	
Symposium on Polar Science The NIPR organizes an annual symposium to ensure international co-operation and dialogue on polar science.	**2022 Arctic Arts Summit** The Canada Council for the Arts and the Government of Yukon will co-host the third Arctic Art Summit in Yukon from June 27 to 29, 2022. The Summit aims to facilitate arts and cultural dialogues between the eight Arctic states and the Arctic Indigenous populations.	

[333] Dana L. Church et al, "The Polar Data Catalogue: A Vehicle for Collaboration, Northern Community Partnerships, & Policy-Making," *The Arctic Yearbook 2016*, 202, https://ccin.ca/home/sites/default/files/publication/PDC%20-%20A%20Vehicle%20for%20Collaboration.pdf.

Ongoing & Upcoming Japanese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
International Conference on Arctic Engineering and Science The conference will take place in Tokyo, Japan from February 25 to 26, 2023. Most recent innovations, trends, challenges, and solutions identified in the fields of Arctic engineering and science will be covered in this meeting.	**21st Annual Arctic Energy and Resource Symposium** The annual symposium explores issues of sustainable resources and infrastructure development in the High North. The Symposium will take place in Calgary, Alberta from March 30 to 31, 2022.	
Arctic Circle Japan Forum The Sasakawa Peace Foundation is helping the Arctic Council to organize the upcoming Tokyo Forum in 2023. A wide range of Arctic issues in fields including geopolitics, economics, oceans, climate, and technology will be covered in this forum.		
ARCTIC RESOURCES, COMMERCIAL, AND INFRASTRUCTURE ENGAGEMENT		
Arctic Subsea Fibre Cable Japan's ARTERIA Networks Corporation signed an MoU to co-develop a submarine fibre-optic cable with Finland's Cinia Ltd.[334] The 14,000-kilometre subsea cable aims to connect Europe with East Asia via the Northwest Passage.	A landing in the Canadian Arctic is expected to be developed for the same Arctic fibre-optic cable project.[335] True North Global Networks – a North American company – is currently under negotiation with the Government of Canada, local governments, and Indigenous organizations to develop the landing. The project is expected to strengthen Nunavut's connectivity to the south and eliminate local residents' dependence on unreliable satellite.	• The governments of Canada, Denmark, the United States, and Japan should initiate ongoing meetings with Indigenous and territorial partners. These project-specific dialogues should facilitate standardized protocols being made to manage the construction of the fibre cable, in consideration of the project's potential commercial, environmental, and social impacts.

[334] Cinia Press Release, "Cinia and ARTERIA Sign MOU For Far North Fiber," February 16, 2022, https://subtelforum.com/cinia-and-arteria-sign-mou-for-far-north-fiber/.

[335] True North Global Networks, "Far North Digital/True North Global Networks Sign MoU with Cinia for Pan-Arctic Fibre Cable," December 21, 2021, https://www.newswire.ca/news-releases/far-north-digital-true-north-global-networks-sign-mou-with-cinia-for-pan-arctic-fibre-cable-872306791.html.

Ongoing & Upcoming Japanese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
Arctic LNG 2 Project Although this is a Russian-led LNG project, the Japan Bank for International Cooperation, and the Japan Oil, Gas, and Metals National Corporation are involved in funding the project.	On December 20, 2016, the Government of Canada has imposed a five-year moratorium on offshore drilling in Arctic waters.	• The Government of Japan recognizes securing a stable supply of natural gas to Japan as one of its most crucial policy priorities. As Canada's High North has the capacity to operate LNG projects, both the Government of Canada and the territorial government should consider Japanese companies as a potential source of funding.

GENERAL RECOMMENDATION

Canada should enhance more research and scientific ties with Japan in the fields of sustainable resource exploration and utilization of marine resources in the Arctic. In comparison to the other Asian non-Arctic states, Japan already has a well-developed network of academic and research institutions focusing on Arctic affairs. While Canada aims to create a conservation economy in the Arctic, it is also the Japanese government's goal to ensure environmental security in the region. Thus, Canada should promote more research roundtables, Arctic fellowships, academic conferences, and inter-university exchange projects with Japanese academic and research institutions to enhance the Arctic research capacities of both states.

In addition, Canada should strengthen its existing Arctic security collaboration efforts with Japan. Evident in Canada and Japan's recently expanded security co-operation in the Indo-Pacific region, a like-minded military collaboration between the two NATO allies can be further extended to the circumpolar regions. Canada and Japan are both keen on strengthening the process of international rule-making in the Arctic. The two states should ensure greater military interoperability and data sharing to combat issues including illegal, unregulated, and unreported fishing, Russian remilitarization, and increased Chinese maritime presence in the High North.

China

Ongoing & Upcoming Chinese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
INTER-STATE AND NATIONAL LEVEL ARCTIC ENGAGEMENT		
UN Biodiversity Conference (COP-15) Phase two of COP-15 is scheduled to take place from April 25 to May 8, 2022, in Kunming, China. This conference will be China's first major UN meeting since the nation last hosted the World Conferences on Women, in 1995.[336] Although the conference does not cover any Arctic-specific topics, interrelated climate issues including ecological destruction, habitat protection, and land conservation will be covered. It is also important to note that, in comparison to other non-Arctic states, China commonly establishes its Arctic collaboration efforts and dialogue through high-level talks. In particular, Chinese top-level bureaucrats (e.g., the vice-president, premier, foreign minister, etc.) have visited Arctic states other than the United States and Russia 33 times over the past two decades. Thus, the UN Biodiversity Conference will be a critical meeting for Canada to re-establish Arctic engagement with China.		• The Government of Canada should use this conference as a platform to co-operate with China on climate issues. • As both countries recognize the need to transition to a clean-growth economy, the two states should engage in high-level talks to pinpoint tangible steps to combat climate change. • As both the Canadian and Chinese governments have attached great importance to the conservation of migratory birds and their habitat, the two states should enhance relevant dialogue and research sharing through the Arctic Council's Arctic Migratory Birds Initiative. • A made-in-Canada Arctic fleet is more prone to delays and higher costs. Especially as Arctic states such as Russia already own heavy icebreakers, Canada should consider China as an alternative offshore channel to procure its icebreaker.
Migratory Birds Sanctuaries along the Coast of the Yellow Sea The sanctuary protects and manages Arctic birds migrating along the East Asian-Australasian Flyway. The sanctuary is also a part of UNESCO's World Heritage List.	**Qaqsauqtuuq Migratory Bird Sanctuary (MBS)** Established by the Environment and Climate Change Canada's Wildlife Service in 1957, MBS is a critical stopover for Arctic nesting shorebirds, during their southbound migration.[337]	

[336] Bloomberg News, "China Gets a Chance to Showcase Global Climate Leadership," October 9, 2021, https://www.bloomberg.com/news/articles/2021-10-09/global-biodiversity-summit-puts-china-in-spotlight.

[337] Environment and Climate Change Canada, 2020 *Qaqsauqtuuq Migratory Bird Sanctuary Management Plan*, 43.

Ongoing & Upcoming Chinese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
Construction of a Nuclear-Powered Icebreaker China's Ministry of Transport has announced its plans to build the country's first nuclear-powered icebreaker, as a part of the nation's Polar Silk Road project. The icebreaker is estimated to be completed in 2025.	**Liberal Government's Heavy Icebreaker Plan** The Liberal government is projecting to spend $7.25B to build two icebreakers,[338] to strengthen the Canadian Coast Guard's Arctic operations capacity. The two icebreakers are estimated to be completed by 2031. The vessels are expected to be constructed by domestic shipyards.	
ARCTIC ACADEMIC AND RESEARCH ENGAGEMENT		
China-Nordic Arctic Cooperation Symposium This annual Symposium is organized by the China and Nordic Arctic Research Center to facilitate Arctic social science research exchange between Chinese and Nordic universities, research institutes, think tanks, and organizations.	Although Canada actively engages in Arctic co-operation through multilateral channels, such as the International Maritime Organization and the Arctic Council, the country has not previously organized any bilateral-specific Arctic forums with either Arctic states or Asian non-Arctic states.	• Arctic affairs should be an area of co-operation for both China and Canada. While Canada can strengthen solidarity with traditional allies (e.g., the United States) on geo-security matters, it should still retain a degree of autonomy to cement diplomatic ties with China in the fields of Arctic environment and research collaboration.
China-Russia Arctic Forum The inter-state Arctic forum is co-hosted by the Ocean University of China and St. Petersburg State University. Founded in 2012, the forum offers a platform to enhance academic dialogue, research co-operation, commercial investment, and policy discussions between China and Russia.		

[338] Murray Brewster, "Budget officer estimates Liberals' heavy icebreaker plan will cost $7.25B," *CBC*, December 16, 2021, https://www.cbc.ca/news/politics/heavy-ice-breakers-pbo-cost-1.6287985.

Ongoing & Upcoming Chinese Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
ARCTIC RESOURCES, COMMERCIAL, AND INFRASTRUCTURE ENGAGEMENT		
Polar Silk Road As a part of the country's Belt and Road Initiative, China projects to develop a maritime trade route that can interconnect the Arctic, Pacific, and Atlantic oceans. The Polar Silk Road is expected to start from Dalian, China, and end in Rotterdam, Netherlands, while linking various other countries in Asia and Europe.	**Northwest Passage** Canada's Northwest Passage possesses the potential of becoming an Arctic shipping route in the near future. Yet there remains scrutiny on different countries' attitudes toward Canada's claim to sovereignty over the Northwest Passage.	• As shown in Part II, both China and Canada have a legally strategic interest in respecting international law, such as UNCLOS. The two states should continue to engage via intergovernmental organizations such as the Arctic Council and multilateral Arctic forums to enhance rules-based international order in Arctic waters. • At the national level, the Government of Canada should improve its maritime monitoring and navigating capacity to encourage compliance. This includes investing more in enhancing the nation's existing hydrographic surveying software, icebreaking services, ice-reporting co-ordination, and other infrastructure support. • The Government of Canada should continue to promote more federally funded infrastructure projects in the High North. One of the primary goals for these Canadian-funded projects should be to improve the co-ordination and co-development capacity with Northern governments and Indigenous land-claim organizations. • As for Canada's long-term strategic plan to close the northern infrastructure gaps, the Government of Canada should establish comprehensive regulations with residents of the circumpolar regions to ensure a more secure and sustainable North. Once robust Arctic-specific investment protocol guidelines are established, Canada should open the door to more foreign investments to ensure the development of transportation, energy, infrastructure, and telecommunications in the High North.
Other Chinese Resource and Infrastructure Investment in the Arctic Chinese state-owned companies have invested heavily in energy, infrastructure, and trans-oceanic trade routes development projects. The following consist of some of China's ongoing and past investment attempts in the Arctic Circle. • **Russia:** Chinese Zhejiang Energy acquired a 10% stake in Russian Novatek's Arctic LNG 2 project (ongoing); • **United States:** In 2017, Alaska's governor Bill Walker attempted to cement a $43B LNG pipeline development deal with Sinopec (scrapped); • **Finland:** The Kouvola-Xi'an freight train railroad was established in 2017, facilitating trade between China and other Nordic countries (completed); • **Iceland:** In 2013, China National Offshore Oil Cooperation and Eykon, an Iceland-based energy company, signed an agreement on joint-oil exploration project in the Arctic (scrapped in 2018); and • **Greenland:** CCP actors attempted to develop numerous airports and a former US military base (scrapped).	**Deepwater Port in Qikiqtarjuaq, Nunavut** Transport Canada funded $40M to develop a port in Qikiqtarjuaq, which will prompt the development of Nunavut's offshore fishing industry. The port is located along the main route of the Northwest Passage, which also strengthens the nation's maritime trade network. The port is expected to be complete around September 2022.	

GENERAL RECOMMENDATION

Canada should re-establish Arctic dialogue with China by developing northern infrastructure, shipping, mining, and fisheries. Although Canada should remain vigilant of the security and safety threats carried by Chinese investments, Chinese capital has been a critical source of funding that has prompted the key LNG projects in Nordic states and Russia to flourish. Rather than projecting the ongoing Sino-Canadian tension to the circumpolar regions, Canada should instead establish robust regional and federal regulatory bodies and laws to protect the nation's interests. Especially as the High North was framed as a "low-tension" region in both states' Arctic policies, re-establishing Arctic dialogue between the two countries could potentially minimize current diplomatic tensions.

Singapore

Ongoing & Upcoming Singaporean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
INTER-STATE AND NATIONAL LEVEL ARCTIC ENGAGEMENT		
High-Level Dialogue Between Singapore and Arctic States Singapore has shown a strong preference to engage directly with Arctic states via both bilateral and multilateral engagements. In particular, Singapore's Special Envoy for Arctic affairs, Sam Tan, has actively participated in high-level bilateral talks with bureaucrats from Arctic nations. Bilaterally, Mr. Tan engaged with Russia via the Russia-Singapore Dialogue in 2021. In the same year, Mr. Tan also delivered a keynote speech at the Norway-Singapore Arctic Hybrid Conference in Singapore.	**US-Canada Arctic Dialogue** Canada held several high-level Arctic dialogues with the United States in the past. The most recent one was a half-day dialogue on December 16, 2021. In particular, the US's Assistant Secretary of State for Western Hemisphere Affairs and Canada's Assistant Deputy Minister for Europe, Arctic, Middle East, and Maghreb at Global Affairs Canada jointly covered the two states' Arctic agendas concerning geo-security, climate change, international co-operation, and sustainable economic development issues in the High North.	• Canada and Singapore's bilateral Arctic dialogues mainly occurred in 2013, when Singapore first obtained its observer status in the Arctic Council. The Government of Canada should promote and resume bilateral exchanges on Arctic affairs with Singapore's senior bureaucrats through hosting Canada-led Arctic conferences, symposiums, and meetings.

Ongoing & Upcoming Singaporean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
ARCTIC ACADEMIC AND RESEARCH ENGAGEMENT		
Arctic Research Researchers at the Energy Studies Institute, National University of Singapore, have organized innovative educational programs, seminars, and workshops to educate Singaporean youth on energy security in the Arctic. These grassroots mobilization events aim to bridge sustainable energy solutions between the circumpolar regions and Asian coastal states. In sum, Singaporean academic and research institutions are particularly interested in Arctic research related to maritime affairs and sustainable resource development.	Canada currently lacks Arctic-specific education programs that mobilize and educate Canadian youth on energy security and sustainable development in the High North.	• The Government of Canada should consider establishing a joint Arctic research centre with Singapore to further enhance the two states' scientific and academic co-operation in Arctic energy, shipping, and sustainable resource development.
ARCTIC RESOURCES, COMMERCIAL, AND INFRASTRUCTURE ENGAGEMENT		
Arctic Maritime Affairs Singapore is keen to secure its prime position in the current global shipping network and is closely monitoring the development of the Arctic shipping routes. The country also possesses considerable expertise in shipbuilding and offshore rig construction.	**Deepwater Port in Qikiqtarjuaq, Nunavut** Transport Canada funded $40M to develop a port in Qikiqtarjuaq, which will prompt the development of Nunavut's offshore fishing industry. The port is located along the main route of the Northwest Passage, which also strengthens the nation's maritime trade network. The port is expected to be complete around September 2022.	• The Government of Canada should enhance scientific and economic co-operation with Singapore on Arctic affairs, specifically in fields such as port development and vessel construction.

GENERAL RECOMMENDATION

Canada should explore ways to build on the Canada-Singapore Infrastructure MoU to enhance the development of cutting-edge maritime and low-carbon energy technologies for the Arctic regions. Akin to Canada's Arctic priorities, the Singapore Green Plan 2030 demonstrates the nation's support for the sustainable development of the Arctic. In addition, Singapore has also built strong credentials in constructing sustainable energy storage, carbon capture, and abatement technologies. Canada should collaborate with Singapore on relevant sustainable infrastructure initiatives to enhance resource productivity in the High North and the circumpolar communities' resilience to climate change.

South Korea

Ongoing & Upcoming Korean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
INTER-STATE AND NATIONAL LEVEL ARCTIC ENGAGEMENT		
Polar Activities Promotion Act South Korea enacted the Polar Activities Promotion Act in 2021. The Act facilitates South Korea's engagement with international Arctic actors to promote activities that enhance sustainability in the Arctic.		
ARCTIC ACADEMIC AND RESEARCH ENGAGEMENT		
International Symposium on Polar Science Since 1988, the Korea Polar Research Institute (KOPRI) has been organizing an annual symposium to encourage scientists around the globe to share their research relevant to the Arctic.	**Polar Continental Shelf Program (PCSP)** PCSP is a federally funded program that provides Arctic research logistic and planning support. The program is mainly accessible to Canadian academic, research, and federal institutions conducting scientific research in Canada's North. Link: https://www.nrcan.gc.ca/science-and-data/science-and-research/arctic-science/polar-continental-shelf-program/10003	• The Government of Canada should offer travel funds and research grants to support Canadian Arctic researchers and scientists' presence in international Arctic events. South Korea's International Symposium on Polar Science and its annual Arctic Partnership Week are two great platforms to disseminate Canadian Arctic experts' research results. • Canadian think tanks should implement Arctic-specific funds, fellowship, and research programs that are accessible to early-career international researchers, to facilitate Arctic research dialogue between Canadian and foreign researchers. • The Government of Canada should fund nationwide Arctic-specific workshops, research projects, and exchange programs dedicated to educating the young generation, to ensure greater youth mobilization on Arctic affairs.
Asian Polar Science Fellowship Program Organized by KOPRI, the fellowship program invites early-career researchers from Arctic states to partake in the Field Research Program or the Institute Visiting Program in South Korea. Selected candidates are funded to conduct Arctic-relevant research in co-operation with KOPRI scientists. Link: https://www.kopri.re.kr/eng/html/comm/04030401.html		

Ongoing & Upcoming Korean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
Asian Polar Science Fellowship Program Organized by KOPRI, the fellowship program invites early-career researchers from Arctic states to partake in the Field Research Program or the Institute Visiting Program in South Korea. Selected candidates are funded to conduct Arctic-relevant research in co-operation with KOPRI scientists. Link: https://www.kopri.re.kr/eng/html/comm/04030401.html		• To cultivate more public awareness and human capacity related to Arctic affairs, Canadian educational institutions should offer Arctic-relevant online courses that are either free of charge or transferrable as high school or university credits. • A made-in-Canada Arctic fleet is more prone to delays and higher costs. Especially as Arctic states such as Russia already own heavy icebreakers, Canada should consider South Korea as an alternative offshore channel to procure its icebreaker.
Arctic Youth Research Group (21C Dasan Junior) This research program provides opportunities for Korean elementary and high school students to gain lab and field work experience in Arctic stations in foreign countries. Link: https://www.kopri.re.kr/eng/html/comm/04030101.html		
North Pacific Arctic Conference Organized by the East-West Center and the Korea Maritime Institute (KMI), the conference invites early-career researchers, policy-makers, and practitioners to discuss contemporary issues affecting the Arctic.		

Ongoing & Upcoming Korean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
Korea Arctic Academy Online Course The online program is organized by UArctic and the KMI. A wide selection of months-long courses is offered to international audiences to spread awareness and enhance knowledge related to Arctic policy, science, society, and industry. Link: https://koreapolarportal.or.kr/kaa/kaaIntroduce.do	**ArcticNet** Established by the Centres of Excellence of Canada, ArcticNet funds, supports, and brings together both Canadian and international Arctic experts and research teams to conduct climate, environmental, and social-economic research in the High North. ArcticNet further organizes the Annual Scientific Meeting to foster a strong Arctic research network. It's North by North program further facilitates northern research led by communities in the circumpolar regions. In addition, the website also contains a free webinar training series to spread awareness and knowledge on Arctic affairs. Link: https://arcticnet.ulaval.ca/about-us/	
New Korean Resource Exploration Vessel South Korean shipbuilder Hanjin Heavy Industries and Construction Co. will build a new seismic research vessel (Tamhae III) for the Korea Institute of Geoscience and Mineral Resources.[339] The new research vessel will be equipped with advanced gas and oil exploration equipment using 3-D and 4-D technology. The vessel is expected to be completed by 2024.	**Liberal Government's Heavy Icebreaker Plan** The Liberal government is projecting to spend $7.25B to build two icebreakers,[340] to strengthen the Canadian Coast Guard's Arctic operations capacity. The two icebreakers are estimated to be completed by 2031. The two vessels are expected to be constructed by domestic shipyards.	

[339] http://www.koreaherald.com/view.php?ud=20210128000418

[340] https://www.cbc.ca/news/politics/heavy-ice-breakers-pbo-cost-1.6287985

Ongoing & Upcoming Korean Arctic Engagement	Relevant Canadian Arctic Engagement	Recommendations
Arctic Resources, Commercial, and Infrastructure Engagement		
Arctic LNG 2 Project South Korean shipbuilder Daewoo Shipbuilding & Marine Engineering is constructing six LNG carriers for the Russian LNG project.[341] The construction is estimated to be completed by the end of 2023.	A lack of capacity in Canadian shipyards has made it difficult for Canada to construct cost-efficient Arctic research and patrol vessels on time.	• Akin to how Norway maintains its position as a global shipping power while being a major importer of South Korea-made vessels, Canada should consider buying existing shipping designs and parts from pioneer ship building suppliers like South Korea's "big three" shipbuilders (KSOE, Daewoo, and Samsung) to reduce costs and time.

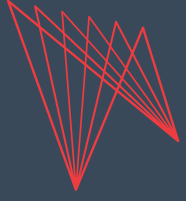
GENERAL RECOMMENDATION

Canada should enhance its Arctic bilateral ties with South Korea in research, shipping, and maritime affairs. South Korean think tanks and academic institutions have developed well-organized exchange programs, online courses, fellowships, and research symposiums dedicated to enhancing Arctic awareness for people from diverse backgrounds. Canada should aim to increase the scope of its Arctic co-operation with South Korea on higher education, primarily by expanding the two states' joint Arctic research projects and academic exchange programs. In addition, Canada should embrace South Korea's expertise in shipbuilding by considering South Korea as a potential reliable and low-cost producer for its Arctic ship-related products. In particular, South Korea's "big three" shipbuilding companies are undertaking joint research with Norway on autonomous navigation ships, the automation of oil prospecting ships, and the use of eco-friendly paint for ships. Building on the signed 2016 Agreement for Science, Technology, and Innovation Cooperation between Canada and South Korea, the Government of Canada should implement relevant joint research projects on shipping with South Korea to enhance Canada's maritime navigation and research capacity in the High North.

[341] https://www.russia-briefing.com/news/south-korea-s-daewoo-win-us-374-million-russian-arctic-ocean-transshipment-tenders-for-northern-sea-passage-icebreaking-barges.html/

The Four Asian States' Shared Arctic Engagement

Shared Arctic Engagement Between Japan, China, Singapore, and South Korea	General Recommendations
Arctic Council • Working groups, task forces, and expert groups	• Canada should continue to engage with all four Asian non-Arctic states through these multilateral platforms to ensure co-operative and rules-based governance of the Arctic.
Arctic Frontiers	
Arctic Circle Assembly and Forum	
International Arctic Science Committee	
International Maritime Organization	
Shared Arctic Engagement Between Japan, China, and South Korea	
University of the Arctic	
Asian Forum for Polar Sciences	
Northern Sustainable Development Forum	
Trilateral High-Level Dialogue on the Arctic	



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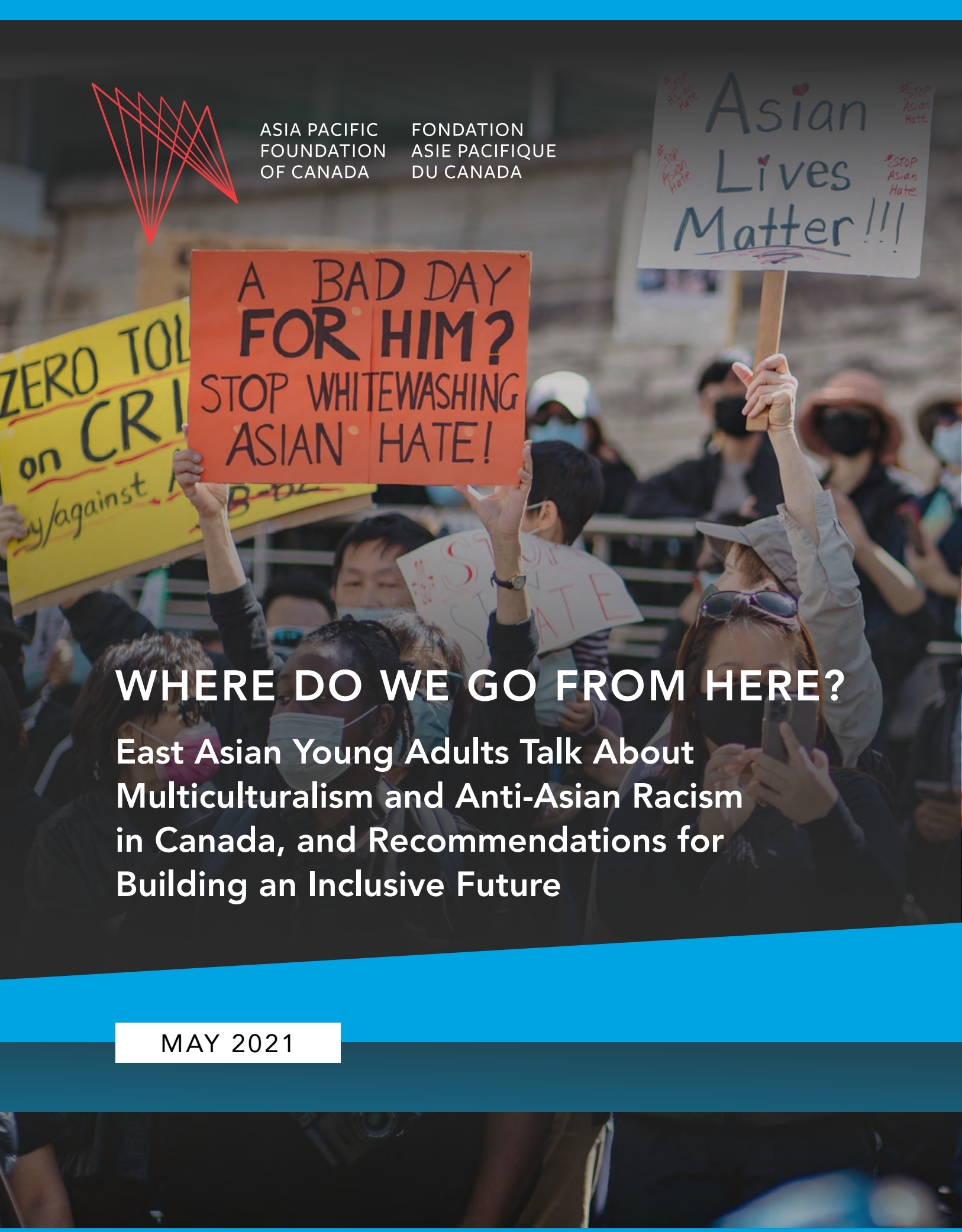

ASIA PACIFIC FOUNDATION OF CANADA
FONDATION ASIE PACIFIQUE DU CANADA

WHERE DO WE GO FROM HERE?

East Asian Young Adults Talk About Multiculturalism and Anti-Asian Racism in Canada, and Recommendations for Building an Inclusive Future

MAY 2021

ABOUT THE ASIA PACIFIC FOUNDATION OF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada. APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas: trade and investment, surveys and polling, regional security, digital technologies, domestic networks, sustainable development, and Asia Competency

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, and a regular Asia Watch newsletter that together support these thematic areas.

APF Canada also works with business, government, and academic stakeholders to provide custom research, data, briefings and Asia Competency training for Canadian organizations. Consulting services are available by request. We would be pleased to work with you to meet your research and business intelligence needs.

Contact us at info@asiapacific.ca or visit us online at www.asiapacific.ca.

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INTRODUCTION: CONTEXT AND RATIONALE FOR THE STUDY

The coronavirus pandemic has exposed and exacerbated deep flaws and fissures, not only in many countries' public health systems, but also in their social welfare systems, their politics, and their societies. Canada is no exception. Among the "shadow pandemics" with which Canadians are having to reckon is the alarming increase in violence and hostility by Canadians against fellow Canadians, specifically, people of Asian descent. Asian international students and workers residing in Canada have also been among the victims. According to a new report titled *A Year of Racist Attacks* by several Canadian advocacy groups, there have been 1,150 cases of racist attacks across Canada since March 2020. The bulk of the incident reports came from Ontario and British Columbia, and over 84 per cent of those reports have been made by people who identify as East Asians.

In the summer of 2020, the Asia Pacific Foundation of Canada (APF Canada) convened a series of focus groups with East Asian-identifying youth in hopes of better understanding how they were processing and experiencing this escalation of anti-Asian aggression. These focus groups comprised young adults (aged 20-28), including Canadian citizens, permanent residents, and temporary residents. In its 36-year history, APF Canada has advocated for greater engagement and understanding between Canada and Asia, whether between different levels of governments, business partners, Indigenous groups, researchers, or NGOs and civil society organizations. We have also strived to be a source of information and objective analysis about events happening in the Asia Pacific region and recommendations on how Canada can and should respond.

METHODOLOGY

The Focus Group method was considered the most appropriate as it provides first, an opportunity to generate a rich understanding of the young adults' perspectives about anti-Asian racism, and second, helps explore shared views and opinions (and divergences) on the topic. Efforts were made to seek out participants who were Canadians, permanent residents, and temporary residents (international workers or students) in Canada and self-identified their ethnicity as East Asian. Researchers used convenience and snowball sampling methods to seek out participants. Respondents were initially asked to fill out a pre-focus group survey on relevant issues. Each participant was also asked for a pseudonym of their choice, which was then used during the focus groups to help maintain their privacy and confidentiality. The focus groups were held virtually through a secure platform, which also allowed participants to join from all over Canada. Each focus group lasted approximately 90 minutes. At the end of the focus groups, participants were given gift cards as a token of appreciation for their time and efforts. The focus groups were recorded with prior consent and the researchers transcribed, analyzed, and independently coded the interviews.

Total participants:
23

Moderators:
2 (1 citizen, 1 permanent resident)

Participants' Age range:
20 to 28 years.

Gender Identity:
Female = 15; Male = 7;
Non-binary = 1

An important part of our commitment to this mandate is educating and engaging young people. Through our programs, we aim to reach youth from a wide variety of backgrounds, while also taking note that these programs may have special salience for some youth of Asian descent. As such, we wanted to hear directly from them on how we and other organizations might do more to effectively address the hate, bias, discrimination, and stereotyping of Asians and Canadians of Asian descent. We are incorporating some of these insights and ideas into our existing projects, but also welcome the opportunity to share them with others who are wanting to do the same. Some of the main takeaways from these focus groups include the following:

1. Anti-Asian hate, hostility, bias, and discrimination are neither new phenomena nor are they isolated incidents. Most of our participants had experienced this kind of treatment first-hand, in different forms and at various points in their lives.
2. Harmful stereotypes about Asia, Asians, and Canadians of Asian descent are pervasive and persistent. Moreover, some of the participants said that they were confronted with these stereotypes when interacting with people they knew – their peers, their classmates, and even their friends.
3. While many participants felt that the sources of anti-Asian bias and prejudice were widespread, they singled out two areas that could be mobilized to address the issue: education about Asia and the experiences of Canadians of Asian descent, and better representation of Asians and Asian diaspora populations in the media and popular culture.

Resident of:
British Columbia = 19; Ontario = 2; Alberta = 1; Quebec = 1

Status in Canada:
Canadians = 15; Permanent Resident = 3; Temporary residents = 5

Focus Groups Dates:
June 24 to July 16, 2020

Focus Group sizes:
4 to 6 members per group

Number of Focus Groups:
5

Duration:
90 minutes (approx.)

Note: Only one group had no temporary residents. Remaining four groups had a mix of citizens, PRs, and temporary residents.

Positionality – In qualitative research it is pertinent to identify the researchers' positionality and recognize that they may have inherent biases that can influence the interpretation of the findings. This work involved four team members – two lead researchers and two junior researchers/ moderators. One of the lead researcher identified as Caucasian American, and the other as South Asian. The two moderators both identified as East Asian. The four members were all females and three identified as immigrants, with one of the moderators identifying as a Canadian. One of the lead researchers has 10 years of experience in advocating for and building Asia competency among Canadians, particularly youth. The second lead researcher has experience in conducting public opinion studies using various research methods, and is an experienced researcher on diversity issues. All efforts have been made to maintain objectivity, however, the researchers' experience, knowledge, and biases can affect the way the data is interpreted.

Notes About the Report

In this report, we use the term *Canadians of Asian descent* (rather than Asian Canadians) as an identity group, keeping in mind the larger context of identity and underscoring that Canadians of Asian heritage are first and foremost Canadians.

The geopolitical context of COVID-19 shaped this study's participant selection. The pandemic has been publicly attributed to communities of East Asian descent, and Chinese people specifically, since its first outbreak in early 2020. Because of such associations with the virus, participant selection was purposefully restricted to people of East Asian descent. The effects of anti-Asian racism are not limited to East Asians, however, and further research is needed to capture the experiences of Southeast and South Asian youth populations as well.

The type of change needed to address these critical issues in a fundamental and transformative way will require a serious and long-term commitment by a wide range of stakeholders. APF Canada expresses its respect for the many individuals and organizations that have long been active in this work, and is profoundly grateful for the opportunity to learn from them. By sharing this report, we hope that it can contribute to these ongoing efforts.

Finally, the lead researchers, as well as the entire APF Canada team, wish to express their sincere gratitude to the 23 young adults who participated in this study. We did not take lightly what it was we were asking of them – sharing their personal experiences and feelings about something that has left deep emotional scars for many people of Asian descent. Our commitment to them was, and remains, to forward strategies to 'do better,' whether that is through how we carry out our own work, or by using our voice to advocate for the difficult but necessary changes that this current period of Canadian history has exposed.

CRITIQUING CANADIAN MULTICULTURALISM

We began both the focus group discussions and the pre-focus group survey with a question about the young adults' perceptions of Canadian values (see Box 1). This question was meant to provide a general starting point for easing into a more focused conversation about their experiences as Canadians of Asian descent and Asians living in Canada. In the survey, participants were asked to reflect on their perceptions of shared Canadian values and asked to rank 13 factors identified as important Canadian values through various polls (see Nanos and Environics). Fifty per cent of the participants ranked "ethnic and cultural diversity" as the top Canadian value.

This result was not unexpected. In 2018, the Environics Institute published a report titled "Canada's World," based on a survey of Canadians' views on global issues. When asked about Canada's biggest contribution to the world, the most frequent response (25%) was that it was a country that welcomed people from all over the world and could serve as a multicultural role model for others. The percentage of people who held this view had more than tripled since the last time this survey was conducted, in 2008. These feelings were especially pronounced among people aged 18-24. APF Canada's 2020 National Opinion Poll found strong agreement with this self-image: nearly three-quarters (74%) of respondents felt that "Canadians are very inclusive."

On one level, these survey results seem to indicate resounding support for genuine cultural and racial diversity. Indeed, our focus group participants, specifically, those who had grown up in Canada, were familiar with the emergence of multiculturalism as a value stand during Pierre Trudeau's government, and that this

Box 1: East Asian Young Adults' Perception of Shared Canadian Values (rank-ordered)

1. Ethnic and cultural diversity
2. Human rights
3. Democracy
4. Gender equality
5. Inclusion
6. Respect for rule of law
7. Environmental rights
8. Respect for minorities
9. Sustainable development
10. Economic security
11. Respect for Indigenous cultures
12. Innovation
13. Leadership

Q: Among the following, what factors do you identify as shared Canadian values? Please rank them according to your beliefs

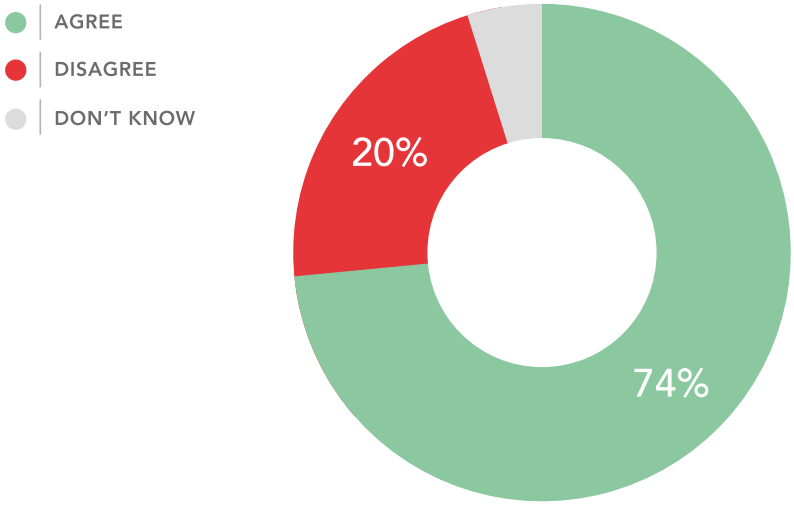
had culminated in the Canadian Multiculturalism Act (1985), which recognizes and promotes multiculturalism as a reflection of Canada's racially and culturally diverse society. But when we explore these types of survey results on a deeper level, we find a fair bit of inconsistency in how people interpret abstract concepts like "multiculturalism," "inclusivity," and "tolerance." That is a topic we turn to below.

FIGURE 1

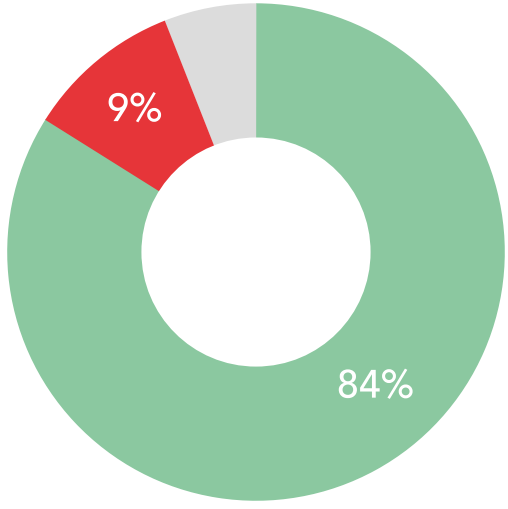
Most Canadians believe that "Canadians are very inclusive"

Question: Do you agree or disagree with the following statements?

Base: (n = 3,519)



But at the same time, they also believe "Anti-Asian racism existed in Canada before COVID-19"



Source:
2020 National Opinion Poll by Asia Pacific Foundation of Canada

The Unevenness of Canadians' Beliefs and Feelings About Diversity

Several of the young adults in our focus groups affirmed their agreement with the multicultural vision of Canadian society. For example, **Kareem**, a 20-year-old citizen, said that Canada "does have a very strong image in terms of diversity and multiculturalism," adding that "we welcome all kinds of people whether they come from any kind of background. And I think that's pretty great about Canada."

Similarly, **Yvette**, also a 20-year-old citizen, noted:

> *"…I feel like it's part of the Canadian spirit that we have a lot of different culture[s], and then we allow different voices and then people here are just so open-minded. I feel so comfortable for sharing my story or sharing my perspective, even though I know some people may have different opinions [than mine]."*

Their appraisals of Canadian multiculturalism were not made in isolation, but rather in comparison with other white-dominant settler colonial societies, such as Australia, New Zealand, and the United States. Observations about race relations in the United States – especially the killing and abuses of Black Americans by police officers – surfaced in several of the discussions. However, participants also used these comparisons to show where Canada was falling short, especially in its treatment of Indigenous peoples. Timothy, a permanent resident in B.C., pointed out that New Zealand had made more progress in respecting Indigenous communities, cultures, and languages. He also mentioned that simply doing better than other countries should not be the yardstick Canadians use to measure their own progress.

Peter, a 20-year-old citizen from B.C., also pointed to the problems inherent in taking a 'victory lap' mentality.

> *"It is dangerous to just buy into this narrative blindly and then have everyone just believe that we are this multicultural society when we really aren't, and obviously, we have our problems… But on the other hand, I still do believe that*

> *Canada is much further advanced than a lot of other countries in terms of race. So it is this double-edged sword, right? It's hard to really pinpoint where exactly we are."*

Peter's observation – that it is "hard to really pinpoint exactly where we are" – was an important piece of subtext for these conversations, namely, uncertainty about Canadians' true commitment to genuine multiculturalism. **Roji** felt that for some people, this commitment was sincere, whereas for others, it may not be something they embrace or engage with on a substantive level.

> *"...a lot of people think that for Canada, multiculturalism and diversity is a value. But I think for a lot of people, it's just a fact or something that exists, but they don't really interact with it..."*
> **– Roji, 21, Canadian citizen, B.C.**

Roji's intuition suggests an unevenness to Canadians' acceptance of cultural and racial differences. For example, a 2019 poll by the Angus Reid Institute showed that 56 per cent of Canadians feel that "minorities should do more to fit in better with mainstream Canadian society" rather than being encouraged to preserve their own customs and languages. When broken down by sex and age group, men and people 55 years and older were considerably more likely to feel this way. But even among people in our participants' peer group – those aged 18 to 34 – 51 per cent of men and 31 per cent of women felt that minorities need to do more to fit into the mainstream.

While we need to exercise caution in reading too much into a single poll result, at a minimum, this suggests ambiguity or a significant lack of consensus in how people define 'the mainstream' in a country that officially embraces multiculturalism as a core part of its identity. In the following section, we highlight how these young adults try to reconcile the ideal with the reality of Canadian multiculturalism in a society in which some people treat their 'Asian-ness' as a subtle or not so subtle disqualifier from the so-called 'mainstream.'

Personal Encounters: Multicultural Ideal vs. Reality

Participants shared moments when the Asian part of their identities began to crystallize in response to personal encounters with Canadian multiculturalism.

IDENTITY

The term "identity" refers to the "characteristics determining who or what a person or thing is." (Oxford)

Social identity, can be defined as "the individual's knowledge that [s] he belongs to certain social groups together with some emotional and value significance to him/[her] of the group membership," as defined by British social psychologist Henri Tajfel (Turner, 1982, p. 18).

Peter, born and brought up in Canada, said he identifies more as Canadian than Chinese. This disconnect from being Chinese is reinforced when he is in China visiting relatives, who comment that they tend to see him as more Canadian than Chinese. Nevertheless, in Canada, he is still seen as having a "hyphenated" identity as Chinese Canadian. Annabelle elaborated on this feeling of disconnect that arose from trying to identify as either exclusively Canadian or Asian. She described growing up feeling like she 'fell into a gap,' wondering, "Why am I not this or why am I not that?" She said it is only recently that she felt a sense of agency in defining who she is.

> *"...it's not something that you should ever feel like you're lacking in either area, because you also straddle a line that is so hard to straddle. And to give yourself that space to be who you are, and be unapologetically, is something that I have only very recently come to understand and be proud of."*
> – **Annabelle, 21, Canadian citizen, Ontario**

Some participants whose parents immigrated to Canada as adults contrasted their own experiences with those of their parents. Some noted a kind of sliding scale of acceptance based on whether a person retains markers that some people might mistake as signs of 'foreign-ness,' such as cultural norms or not being a native speaker of English or French. Nancy, whose mother immigrated to Canada as an adult, made the distinction in how these two groups are perceived.

> *"So, for example, [one group] can speak English without an accent or an identifying accent. You know, they were born here and have lived here most of their lives, versus people of colour who have immigrated more recently, who are notably immigrants, whether it's an accent and maybe it's the cultural norms and that kind of thing."*
> **– Nancy, 22, Canadian citizen, B.C.**

In North American contexts, the latter group is sometimes labelled pejoratively as "Fresh off the Boat," especially when they display "ethnic identifiers" like speaking "accented English" or speaking one's native language with co-ethnics – both big factors in anti-Asian discrimination.[1]

The international students or workers, or those who had come to Canada after they were old enough to have already formed impressions of the country, had somewhat different kinds of encounters with Canadian multiculturalism. For example, 28-year-old **Daxia** said that "as an international student and before I came to Canada, I was really insensitive to race… because when I was in my home country, everyone is from the same ethnic group. So we didn't think too much about race issues." **Yun**, a temporary worker, reflected that her perception of Canada had changed quite a bit since she began learning about Canada' history and socio-political system.

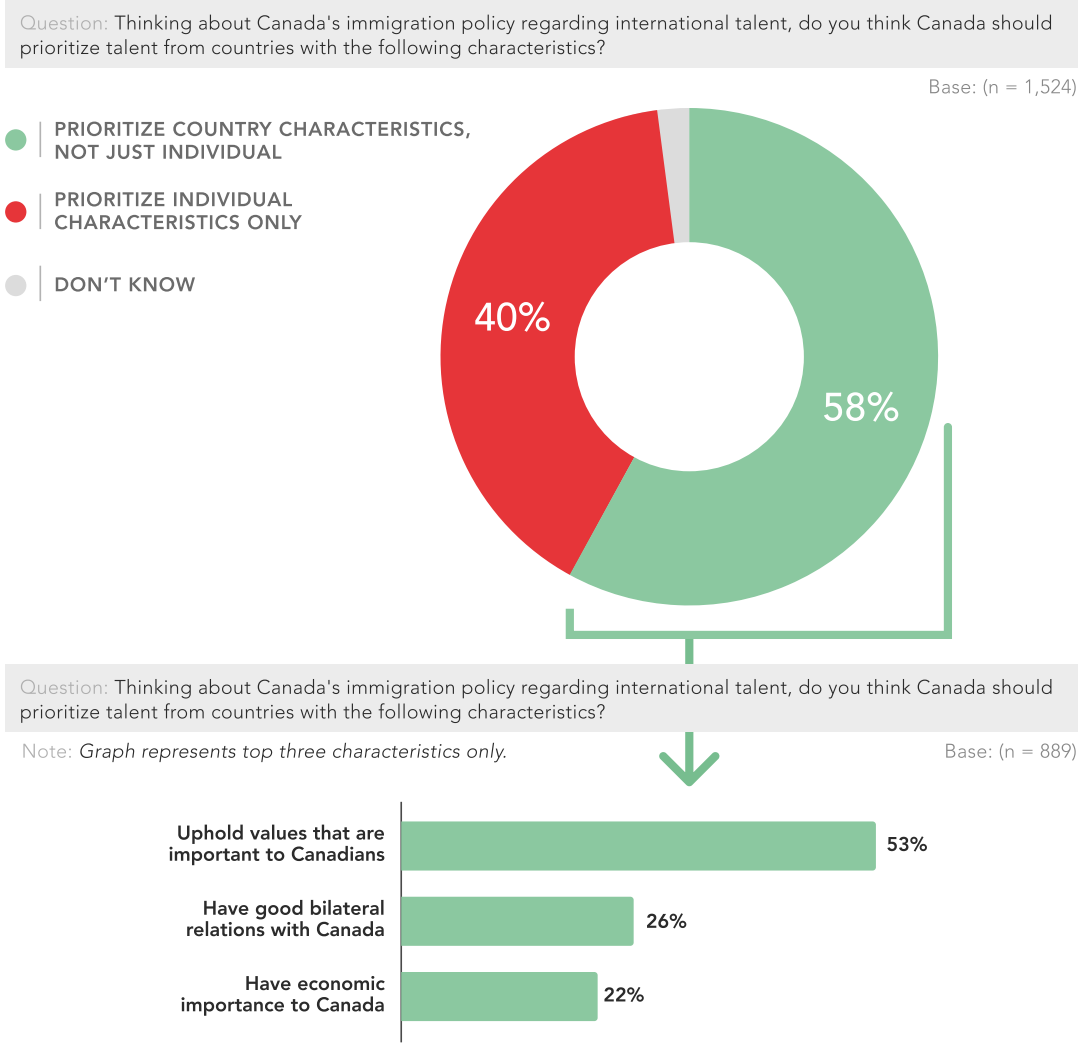
> *"… settler-colonialism is a structure rather than an event, which means it's an ongoing oppressive structure in everyday reality for Indigenous peoples. That's something that I am constantly trying to grapple with myself as well, as a settler invited here. I'm constantly trying to think through the position that I'm currently occupying and the history that happened here and what I can do and what my contribution can be."*
> **– Yun, 28 years old, temporary worker, B.C.**

Yun's reflection incorporates the insight of scholar Patrick Wolfe that settler colonization is not a single event that happened in the past, but is instead a structure that continually evolves through policy and with waves of migration that perpetuate the erasure of Indigenous claims to land and resources.[2]

This insight indicates a high level of learning and complex thinking surrounding race and settler colonialism developed as a student in Canada. With deeper reflection and education about Canada's complicated and difficult racial and settler colonial history, participants present a desire to grapple with their own position and complicity in racial inequalities within official Canadian multiculturalism.

FIGURE 2

Majority of Canadians want their government to prioritize "country characteristics" such as values, good bilateral relations, and the country's economic importance, in immigration policies aimed at international talent



Source:
National Opinion Poll 2019: Canadian Views on Human Capital from Asia, by Asia Pacific Foundation of Canada

Alvin, a 25-year-old citizen in B.C., said before moving to Canada, he imagined it was not only diverse and multicultural, but also a place of mutual respect and understanding of different ethnicities. However, he has since moderated his views: "Most people are really nice, but I don't think people have gathered too much understanding about [the] difference between cultures and people from other countries."

One of the surveys mentioned in the previous section pointed to Canadians' belief that theirs was a society that could serve as a role model for other multicultural societies. In a survey focused on Canada's *contributions to the world*, this could be interpreted as a self-aggrandizing national narrative – a sense that we feel the world has more to learn from us rather than vice-versa. Alvin's point suggests that the reverse may also be true.

Some Canadians might take issue with the characterization of their country as having become more insular and incurious about the world beyond our 'cultural cousins,' like the U.S., U.K., Australia, and Western Europe. Such a characterization may seem especially inapt given that Canada's borders have remained open to immigration from Asia, Africa, Latin America, and the Middle East. Nevertheless, when we try to overlay the ideal of Canadian multiculturalism and a genuine embrace of diversity with the reality, two gaps become apparent.

First, there has been no shortage of observations among leading Canadian thinkers that Canada is not always as attuned to the perspectives and experiences of the rest of the world as we like to think we are. Our counterparts in Asia and elsewhere have made similar observations about the increasingly short-term and transactional nature of our international engagement and commitments – a trend that transcends political party. Some of the most visible examples include our back-to-back failures to earn a spot on the UN Security Council; a foreign policy that has been insufficiently focused and is resourced at rates lower than our peers; and, our under-performance in sending our young people abroad for global experience in countries other than to the 'cultural cousins' noted above. The second gap is a separate but related issue: The beliefs, attitudes, and behaviours related to racial and cultural diversity within Canada. In the next section, we highlight the focus group discussions that shed light on the extent and nature of this gap.

EAST ASIAN YOUNG ADULTS' PERSPECTIVES ON AND EXPERIENCES WITH ANTI-ASIAN RACISM

All five focus groups discussed the surge in anti-Asian racist attacks in response to the coronavirus pandemic. In the pre-focus group survey, there was almost universal agreement (92%) that since the COVID-19 outbreak, people from China or of Chinese (or other Asian) origins had been treated negatively by members of the Canadian public. They also perceived that an individual with East Asian facial features and wearing a mask was likely to be at a higher risk of verbal or physical assault now than in the past. One participant felt that the pandemic marked a shift in racial discrimination against Asians based on physical appearance rather than cultural differences.

Moreover, news and social media stories of Asians being stabbed, pushed, beat-up, and spat on had the participants worried about their own safety. Thirteen participants (54%) said that they themselves had experienced some form of racial abuse or attack, and 15 respondents (63%) said that someone close to them had also experienced some form of racial abuse/attack. John, a 21-year-old citizen in B.C., shared a recent incident he experienced while he was walking his dog:

> *"On my sort of walk back, some guy, he was a white Canadian… he screamed out, 'F*** you, China!' to me. Like, whoa. And I am not ethnically Chinese so he's got it wrong right from the get-go. Regardless, incredibly offensive overt racism at its finest, right?"*
> **– John, 21 years, Canadian citizen, B.C.**

John said that despite his attempts to "shrug it off," the incident lingered in his mind. He reiterated that behaviours like these pre-dated the current pandemic, saying, "I think mass media just has their attention sort of fixated towards these incidents because of COVID-19. I am willing to bet that incidences were happening before COVID-19." In fact, as an elementary school student in Vancouver, John experienced physical and verbal abuse for "being a 'chink.'"

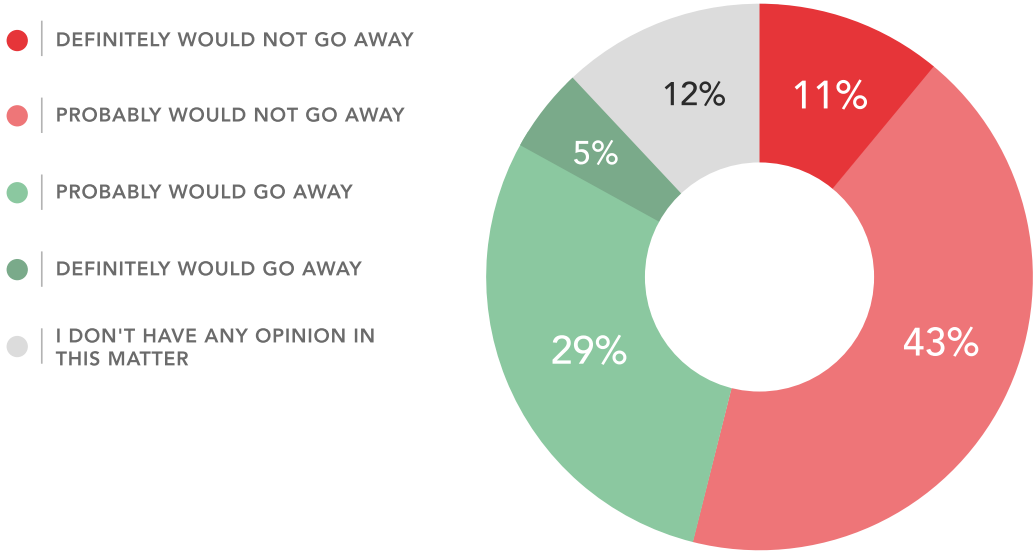
A prominent theme throughout the discussions was participants' belief that anti-Asian hate did not materialize suddenly, but is an escalation of pre-existing prejudices. As **Peach**, a permanent resident from Ontario, observed, "I think COVID definitely exacerbated the problems that are already there." Most of the participants were skeptical (58%) that anti-Asian racism would disappear once the pandemic ended; 38% said they were "not sure." Only one respondent was optimistic that anti-Asian hostility would subside once the COVID-19 threat receded. In fact, much of the focus group discussions centred around the types of microaggressions directed against them and other people of Asian descent.

FIGURE 3

The 2020 National Opinion Poll by APF Canada shows that 54% of Canadians are not very optimistic about anti-Asian hostility dying down in the time to come post COVID-19

Question: Do you feel that the recent surge of anti-Asian sentiment and hostility in Canada will go away once the COVID-19 pandemic ends?

Base: All Respondents (n = 3,519)



Source: *2020 National Opinion Poll by Asia Pacific Foundation of Canada*

Microaggressions

Microaggressions are "brief and commonplace daily verbal, behavioural, and environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory or negative racial slights and insults that potentially have harmful or unpleasant psychological impact on the target person or group."[3] Referring to these incidents as "micro" does not reflect the seriousness of their impact. Indeed, their subtle and sometimes indirect character is what makes them so difficult to address. In one widely cited study, the authors likened racial microaggressions to "carbon monoxide" – dangerous and harmful, even though – or especially because – they are not always readily detectable by everyone.[4]

A comment by **Ehmy**, a 20-year-old Canadian in B.C., shows the tendency to minimize these incidents.

> *"I think… when we are talking about anti-Asian racism, that's kind of beneath the surface and it's more based on microaggressions. It's so hard to capture because we can't necessarily point to specific incidents where people walked away harmed. My ego might get a little bit bruised or it might get a little bit irritated over time, but we can't point to specific things that are worth addressing at the policy sort of level."*

Xavier, a 28-year-old citizen, recounted a recent experience in a computer programming boot camp, in which Xavier was only one of two Asian students. One day, a classmate came to class having shaved off his beard. Xavier recalled:

> *"The Cantonese guy was like, 'Oh hey, you shaved your beard,' and he was like, 'Oh yeah, it's 'cause your cousin from China gave [COVID] to me. It's part of the COVID virus.'… Yes, it's overt racism but, at the same time, it's not overt racism – it's sort of overt racism with a smiley face in a way, right? It's meant as a joke that if you don't laugh with it, you are the enemy. That you can't take a joke."*

In Xavier's example, the offender was explicit in his racial language, albeit in the guise of supposedly making a joke. However, **Sophie** and **Yvette** described aggression that was less explicit and conveyed more through tone, something that creates an additional burden for the recipient struggling to decipher whether the person's behaviour was racially motivated or not.

> **Moderator:** *So I just wanted to get your understanding of what would you define as racism against an East Asian person in Canada?*
>
> **Sophie:** *I think it would depend on the tone that they're saying it. Like, for example, some people might be saying it in a mocking way as in they're trying to make fun of you or make you feel bad… and then other people, it could be just a joking way… But I think the tone is really important…*
>
> **Moderator:** *Mm-hmm.*
>
> **Yvette:** *… some people would just yell out in my face when they first meet me and say , 'Oh, hey, ni hao,' or, 'konnichiwa.' … I don't know if that is racist or not, but it does sound kind of disrespectful in a way. But sometimes, if their tone is more like a mocking or joking way, I would usually laugh back or just make a joke about this…. I just feel the tone is a good way to define it, but sometimes I feel like people don't really know if they are acting rude or racist to other groups."*
>
> (Excerpt from Focus Group 2)

Yvette's dilemma is one that has been well documented elsewhere, specifically, people of Asian descent feeling frustrated that if they respond with anger or confront the person, it "generally [does] no good. It only serve[s] to make the victim appear 'paranoid' or suggest that the responder had some major personal problem."[5] **Nancy**, a 22-year-old citizen in B.C., concurs:

> *"I think that that almost makes it worse because it very well could be racism, but you don't know and it makes it harder to call out because you don't want to be seen as over exaggerating, or seeing racism everywhere where there isn't."*

Although these types of interactions sometimes happen between peers or with other acquaintances, people of Asian descent often hold back from addressing the comments or behaviour, as doing so might result in "denial, defensiveness, and a negative outcome for the relationship."[6] At the same time, they feel bothered by having to "'make excuses' for friends by rationalizing away their biases and by denying their own racial reality."[7]

There are also 'silent' but nonetheless powerful gestures, such as **Peach**'s experience early on in the pandemic, when she and her friends sat down for a meal at a Vancouver restaurant and an older white man sitting next to them got up and moved far away from them. **Yun**, an international worker, pointed out that many Canadians mask their implicit bias behind politeness and good manners. The sometimes 'hidden' nature of race-based feelings can catch some newcomers off-guard. A participant in a 2007 study of international students in the American context described having to come to terms with the "different degrees of racism" she encountered on a daily basis, adding that "there are people who are racists and would still shake your hands, and think you are inferior."[8]

Stereotypes

In all five of the focus groups, the young adult participants discussed the continuing role of stereotypes about Asia and Asians. They noted that while some of these stereotypes may appear to be harmless or even positive, such as the model minority myth, these and other stereotypes can inform larger structural decisions and have detrimental and long-term effects on people's lives.

The stereotype with which most participants were familiar was the "model minority myth." This idea, popularized in the American press during the 1960s, advanced the notion that Asians were especially high-performing academically and professionally, specifically in fields related to math and science. The myth extended to include a wide range of assumptions – for example, that Asians were less likely to engage in criminality or other types of stigmatized behaviours, that they did not experience poverty like other people of colour, and that they did not face racial challenges despite not being part of the racial majority. Nevertheless, while the model minority has been thoroughly discredited, its effects have remained stubbornly pervasive.

> *"…growing up constantly hearing that to be Asian means to excel, to be good at math, and for anyone who doesn't fit that stereotype, that's a lot of pressure. And it's not just external from Canadian society generally. It's also something many of us, I believe, have internalized. And, you know, from our own communities."*
> **– Amy, 24 years, Canadian citizen, B.C.**

In addition, several studies of the model minority myth have shown that its ostensibly favourable aspects are in fact bound up with "subtle, deeper underlying attitudes" that are much more negative, including that Asians are lacking in warmth and are "untrustworthy and foreign," leading others to have feelings of envy and dislike toward them.[9]

Some of the focus group participants mentioned a related and more recent stereotype – that of the 'crazy rich Asian' – which is also based on perceptions of Asians' 'success' and that has

worked its way into the public imagination in Canada. Roji cited the reality TV show *Ultra Rich Asians of Vancouver*, which, although short-lived, contributed to the stereotype that all Vancouver-based Asians are wealthy. The 2018 film *Crazy Rich Asians*, although fictional, also became a point of reference for generalizing about Asians.

> *"When that movie Crazy Rich Asian came up… I was meeting with a friend, that's where I think he said, 'Oh, sorry, you're a UBC student, right?' I was like, 'Oh, yeah, I'm UBC.' And then the second thing he said was, 'Oh, so you definitely are a crazy rich Asian, right?' And I was like, 'No. What?' Because he assumed all international students are super rich and then he assumed because I am Asian looking so I am definitely [an] international student."*
>
> **– Yvette, 22 years, Canadian citizen, B.C.**

Finally, one of the international student participants, 21-year-old **JK**, recounted a particular interaction she witnessed between her landlords, who immigrated from China, and their neighbours. The episode is so illustrative of the types of assumptions that 'mainstream' Canadians make about newcomers from Asia that it is worth relaying in some detail. This episode also demonstrates how negative beliefs about another person's culture and their desire to 'fit in' can be communicated clearly without having to state it explicitly.

The situation **JK** described was one in which her landlords had cut down some branches on a tree they assumed was part of their property. However, their neighbours became upset because they also believed that the tree was part of their own property. One of the neighbours came over to the house where **JK** lives, and she was asked to act as an interpreter, as her landlords were not comfortable speaking in English. The neighbour not only expressed – politely – his displeasure at them having cut the branches, but also talked to them about the Canadian value of respecting nature. The landlords offered their apology for the misunderstanding, but sometime later, the neighbour's wife also came over and gave them essentially the same 'lecture.' At that point, JK said, she found the interaction "kind of irritating because they

don't think that we can – [that] we are able to understand or we think that it is important to understand the laws and the rules here."

Nancy, a B.C.-based citizen who was part of JK's group, added that while newcomers to Canada in all likelihood try their best to be respectful and fit in, there needs to be some allowance for periods of adjustment, or perhaps even more open-mindedness to what it is that makes up Canadian culture.

> *"…expecting all immigrants to immediately assimilate and conform to whatever the dominant Canadian culture is at that time, which is predominantly white and European-influenced. I would say, a more equitable society would be more open to different cultures and have true diversity, not just, you know, diversity of skin tone. So that's something that I would like to see. And I think that in order to get to that point, we really need to sort of drop the hierarchy of this idea that Canadian or European is the ideal, the [top] progressive ideal kind of thing, and that all other cultures, that are mostly cultures of colour, that [they] are somehow inferior and that immigrants need to change."*
>
> **– Nancy, 22 years, Canadian citizen, B.C.**

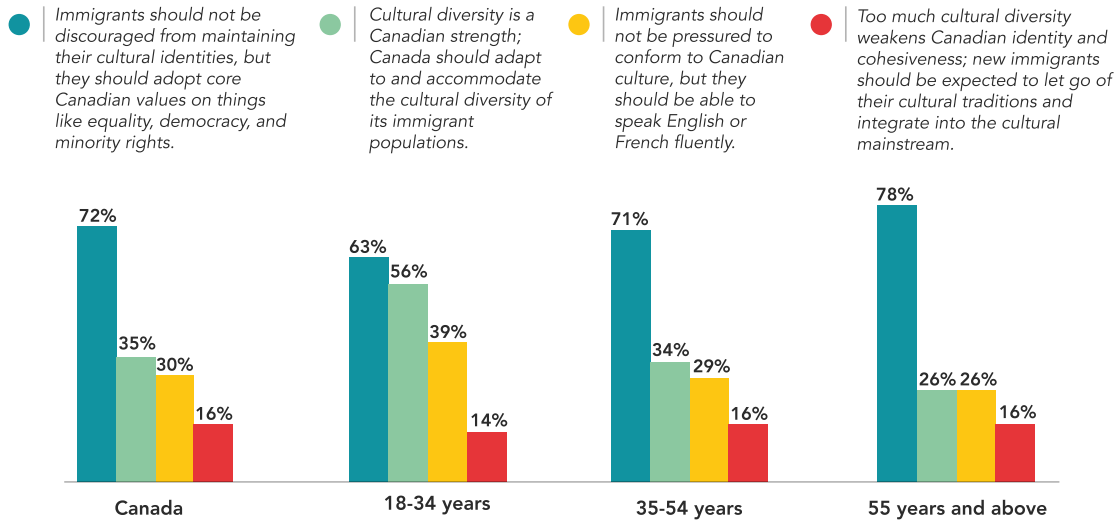
Nancy's desire to "drop the hierarchy" explicitly links the daily indignities of Asian stereotypes and the requirements of assimilation with an implicit racial hierarchy that values "white and European-influenced" culture, or a cultural white supremacy, within Canadian multiculturalism. As Nancy astutely observes, "true diversity" would not be predicated on a cultural ideal into which minorities should assimilate.

FIGURE 4

Canadians generally support immigrants' rights to maintain their cultural identities, but majority of the Canadian youth believe "Cultural diversity is a Canadian strength" compared to older Canadians

Question: The 2016 Census shows that one-fifth of Canadians are foreign-born. In your opinion, what is the appropriate balance between building a common Canadian identity and accommodating differences in culture, language, and values?

Base: 18 - 34 (n=774); 35-54 (n=1,166); 55+ (n=1,473); Canada (n=3,519)



Source: *2020 National Opinion Poll by Asia Pacific Foundation of Canada*

Asian Attitudes Toward Racism

At various points throughout the different focus groups, some participants made broader remarks about attitudes toward racism within Asian cultures and communities in Canada. One set of comments focused on how many Asians and Canadians of Asian descent had internalized the tendency to refrain from reacting or speaking out when they observed or were the targets of racism. Other comments focused on the types of racist attitudes some Asians have toward other people of colour, including other Asians.

Regarding the first example, **Annabelle** and **Skye** observed that Asians sometimes tend to "conform" and "please," as much as possible. **Annabelle** emphasized that this can have the unintended effect of reinforcing racist behaviour as acceptable and perpetuating the norm of systemic racism and microaggressions against Asians. **Peach** shared that often children in Asian

families are taught to be "kind of quiet, or just take it as we go along." While she cautions that this may not hold for all Asian families, she observes that most of her friends try to avoid problems that may cause harm or create problems for others.

The spiral of silence around anti-Asian racism in Canada, whether it is experienced as covert racism, microaggressions, or stereotypes, has suppressed voices and feelings and led to a lack of discussion on how to remedy the social system. **Skye** described watching the 'grin and bear it' approach take a toll on her mother.

> *"... she'd sometimes pass up on work opportunities ... even though she has a lot of knowledge in her subject matter, because she felt that she couldn't, she wouldn't be able to present herself well enough to other people that they take her seriously. Even though she has worked so hard, and when she was in China she did really well for herself. And she has the same brain, she doesn't have anything different. But it's all these things that kind of also whittle away at her confidence as well."*
> **– Skye, 23 years, Canadian citizen, B.C.**

The participants were cognizant that Asians and Canadians of Asian descent are not free of racist attitudes against other racial minority communities, including Black and Indigenous communities. **Isabelle**, a 23-year-old citizen in Montreal, added that there was also some discord between various groups of Asian descent in Canada – South Asians, East Asians, and Southeast Asians. Twenty-year-old **Ehmy**, a B.C.-based citizen, elaborated on this.

> *"I'm sure everyone here, they've heard the term 'jungle Asian,' right? It was like people of Chinese, Japanese, Korean origin would call people like... Philippines, Thai, Taipei origin, 'jungle Asian,' right? Then there's always that whole dimension around skin colour, where lighter-skinned Asians would be racist towards groups that tend to have darker skin..."*
> **– Ehmy, 20, Canadian citizen, B.C.**

Sometimes the lack of tolerance of some people in Asian communities by others in those same communities is based not on skin colour but on a perceived lack of assimilation into 'mainstream' (White) Canadian culture. For example, **Skye** described a time when she and her mother were taking a walk in the park and chatting in English. A passerby, who was also of Asian descent, suddenly addressed Skye's mother, who speaks "accented English," telling her to go back to her country if she could not speak English properly. **Peter**, whose family has been in Canada for nearly 100 years, observed that members of his extended family took pride in having assimilated into Canadian culture and overcoming racial barriers in order to build a successful life here. However, he also expressed dismay that his family, to an extent, "discriminate[d] against other Chinese immigrants who have come later on… blam[ing] them for not being as integrated."

One way of viewing this intra-group prejudice is that it is a type of "defensive othering" – an adaptive response to racial oppression, whereby people who are not part of the dominant racial group try to "distance themselves from the stigma linked to their status" as non-white.[10] By doing so, they perhaps inadvertently contribute to the overall system of racial oppression they and their older relatives have had to navigate.

It should be noted that in some ways, these young adults' reflections on anti-Asian racism were tied up with comparisons with racism against the Black community, which they felt was more evident, visible, and pervasive. When these focus group conversations took place, in summer 2020, some participants reflected that anti-Asian racism would never gain as much visibility as Black Lives Matter, indicating a belief that social advancement and political visibility are finite resources to be competed over by racial minorities. "It [anti-Asian racism] doesn't really raise that many flags for a lot of people because these stereotypes of this model minority, it's not completely harming us," said **Peach**, linking the perception of model minority success with a diminishment of harm against them relative to other communities.

Roji, a 21-year-old citizen in B.C., added:

> *"I've seen a lot of people in my Asian community being advocates and kind of joining the Black Lives Matter movement. Because I think too a lot of Asian Canadians or Asian Americans, it's really hard to target racism against Asians."*

The young adults said it was imperative for Canadians of Asian descent and Asians to step up and denounce racism, not just against Asians but against all people of colour. Sallie noted that movements such as Black Lives Matter have been instrumental in helping people realize that being a "non-racist" is not enough. One needs to be "anti-racist" and actively call out racist attitudes and institutions. Several participants similarly underscored the need for Canadians of Asian descent to try to break out of the tendency to be conformist and start taking a stronger stand against all forms of racial injustice.

Finally, striking a more somber – and indeed, prophetic – note, **Kareem** suggested that if history is any guide, the situation in Canada for people of Asian descent could get worse, especially if the pandemic persists.

> *"…in the past, for example, when the Canadian government deported the Japanese people during the World Wars, I mean, I don't see that as not a possibility if COVID-19 gets worse. In terms of just the general Asian population in Canada."*

His remark about people – including Canadian citizens – of Japanese descent being detained and dispossessed by the Canadian government during the Second World War was met with silent contemplation by the others in his group.

It is evident at this point that Canada needs to do more to achieve a balance as the society grows increasingly multicultural. The young adults shared their own experiences and reflections on two social institutions that can provide a way forward – education and mass media, discussed in detail in the next section.

YOUNG ADULTS' IDEAS FOR BUILDING A MORE INCLUSIVE SOCIETY

The focus groups concluded with participants offering ideas about how we might improve the social and political climate in Canada for people of Asian descent. This part of the conversation was fairly open-ended. Participants were asked to consider actions that could be taken by governments and policy-makers, as well as by non-governmental organizations (including APF Canada). Most of their suggestions coalesced around two areas: Better education about Asia and Canadians of Asian (and other non-white) descent, and diversifying and being more attuned to Canadian media coverage of Asia and Asians' representation in popular culture.

Making Canadian Education More Inclusive

According to APF Canada's 2017 National Opinion Poll, which focused on Canadian youth, two-thirds of respondents under the age of 35 felt their high-school education about Asia was insufficient. Interestingly, even people over the age of 35 shared similar views. Several of the focus group participants who had grown up in Canada also felt that their education not only overlooked Asian histories and cultures, but also did not make much space for learning about the experiences of Asian communities in Canada – something that researchers have referred to as "racial silencing."[11]

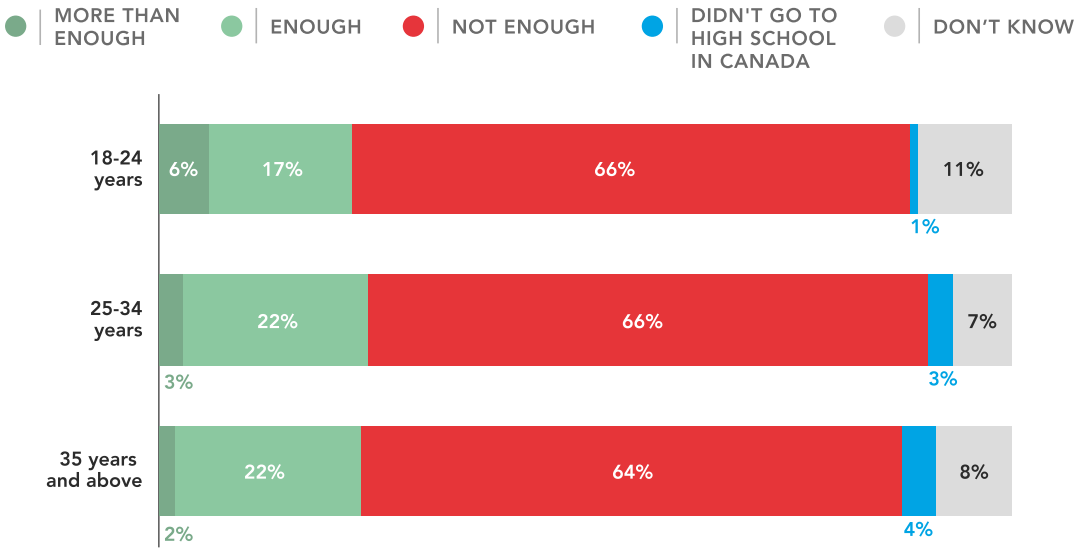
> *"...right now, Canada already lacks in education of Indigenous populations or, Black Canadian history. To be completely honest, I think Asian Canadian history is at the very, very end of that list. So in that sense, I would really like to see more education, for example, Japanese internment in Canada, I would love to see more than one page of that in a textbook, or a course on that..."*
> **– Peach, 21 years, Permanent Resident, Ontario**

FIGURE 5

Canadians of all age-groups feel they had an insufficient exposure to Asia in their high school education

Question: In thinking about your high school education, do you think you had enough or not enough exposure to Asia (e.g., history, culture, geography, languages, politics, etc.)

Base: 18 - 24 (n=459); 25-34 (n=197); 35+ (n=871)



Source: *2017 National Opinion Poll: Canadian Millennial Views on Asia, by Asia Pacific Foundation of Canada*

Peter offered that perhaps Canada's self-image as multicultural has been an obstacle to teaching Canadian history in a way that takes into account the country's treatment of non-white communities.

> *"So I think there's a large racist history that Canada has to deal with. And I think a lot of communities are unaware of that. And I think to some extent it is because of that we have this narrative of multiculturalism. So I think that, you know, that's something that really overshadows this history that we have. And I think by coming to terms with it as part of reconciliation, not only with First Nations, because that's super important, and really enshrined within the history books as super important. But also with people of colour who have generally been neglected within the broader Canadian history."*
>
> **– Peter, 20 years, Canadian citizen, B.C.**

Nancy proposed that education about not only the history, but also about the current experiences of people of Asian descent could be effective in combating stereotypes and misinformation. **Yvette** offered that storytelling could be a powerful educational tool in building a genuinely multicultural society, stressing that such programs needed to start as early as primary school. "It's kind of hard to change people's minds [once] they pass a certain age," she added. Both of these suggestions – using education to challenge stereotypes, and using storytelling to counter dominant narratives – have been identified by researchers as potentially powerful tools in pushing back against prejudice toward racialized groups.[12]

It should be noted there has been some movement in Canada around greater inclusion of Asian stories within primary and secondary school curricula. For example, in 2014, the B.C. government committed to a series of "Legacy Projects" as part of the province's commitment to address historical wrongs against the Chinese community. These projects included an "Education Supplement" – a curriculum module created in consultation with members of the Chinese community. In 2020, the province announced a similar initiative with respect to B.C.'s Punjabi community, one that will also include the creation of educational materials.

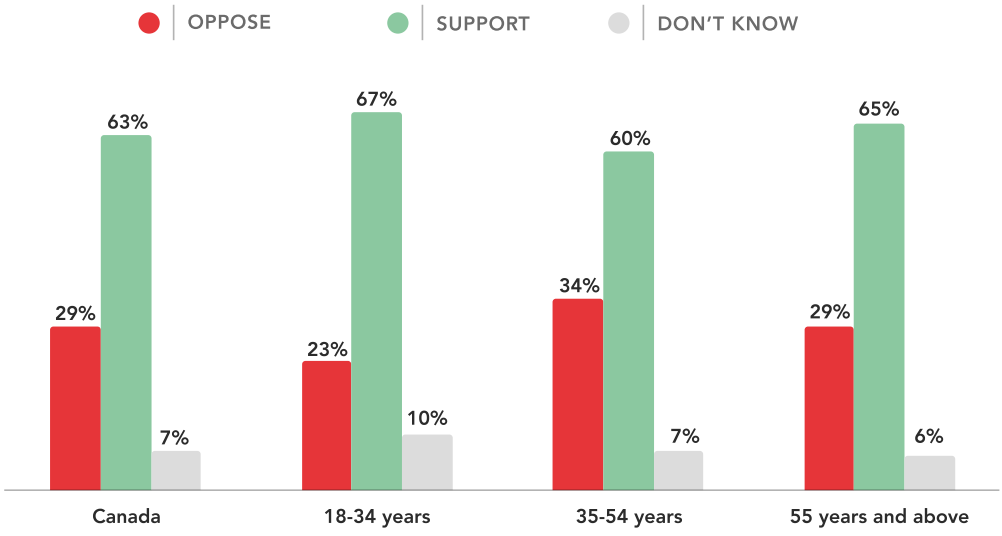
In addition, several government, academic, and community organizations have collaborated around the Landscapes of Injustice project to educate Canadians about the issue mentioned by **Peach** and **Kareem** – the internment and dispossession of people (including many citizens) of Japanese descent. APF Canada has also been piloting, in partnership with the B.C. Ministry of Education, the Asia Pacific Curriculum project, with a focus on working with B.C. teachers to support students in developing a deeper understanding and appreciation of Asian histories, cultures, and societies.

FIGURE 6

Canadian Millennials (18 to 34 years) are more in favour of placing more emphasis on teaching about Asia than older generations

Question: Would you support or oppose your provincial government doing each of the following to build stronger ties with Asia?: Place more emphasis on teaching about Asia in the education system (e.g. history, culture, politics, economics).

Base: 18 - 34 (n=774); 35-54 (n=1,166); 55+ (n=1,473); Canada (n=3,519)



Source: *2020 National Opinion Poll by Asia Pacific Foundation of Canada*

Collectively, these efforts may seem sufficient in addressing this lack of education. What's more, according to ***APF Canada's 2020 National Opinion Poll***, a majority of the population in every province supports an increase in teaching about Asia. This support, moreover, has grown substantially over the past eight years. However, we note two important caveats.

First, teaching about Asia and Asians' role in Canadian history remains under-represented in Canadian education, *despite current immigration patterns and children of Asian descent comprising a growing proportion of our student bodies*. This gap was highlighted in January by a team of teachers from the Toronto District School Board (TDSB), which released a report titled "Addressing anti-Asian racism: A resource for educators." The authors, all of whom are of Asian descent, recounted their own personal experiences with racism. They also noted that nearly half (47%) of the TDSB's student body – the largest in Canada – self-identifies as Asian (2011 Census). However, they astutely point out that such demographic factors alone often do not necessarily catalyze the type of attention and intentionality needed to tackle the problem:

> *"Having a diverse school population alone does not shift fundamental power dynamics that enable racism to exist in society. Students and educators must understand what racism is, and how it looks and feels for racialized people whether your school community is diverse or homogenous (e.g., predominantly white or Asian populations)."*[13]

Second, while expanding and improving upon our teaching about Asia and Canadian communities of Asian descent is a necessary step, it is not sufficient in ushering in a more fundamental level of change. In one study on teaching about Asia in U.S. secondary schools, the researchers pointed out that classroom learning is only one node in a larger ecosystem of how Asia (and Asians) are represented. The larger systems include news, entertainment media, images, formal and informal conversations with friends and family, and so on.[14] The authors point out that many young people get exposed to representations of Asia and Asians in popular culture, which, the authors write, generally does not have as its major concern enhancing understanding of Asian cultures. Rather, they say, the media tend to be a "major source of perpetuating cultural biases and stereotypes of Asians."[15]

In the next section, we turn to various forms of media as tools for perpetuating stereotypes and narratives about people of Asian descent.

Media Diversification and Representation

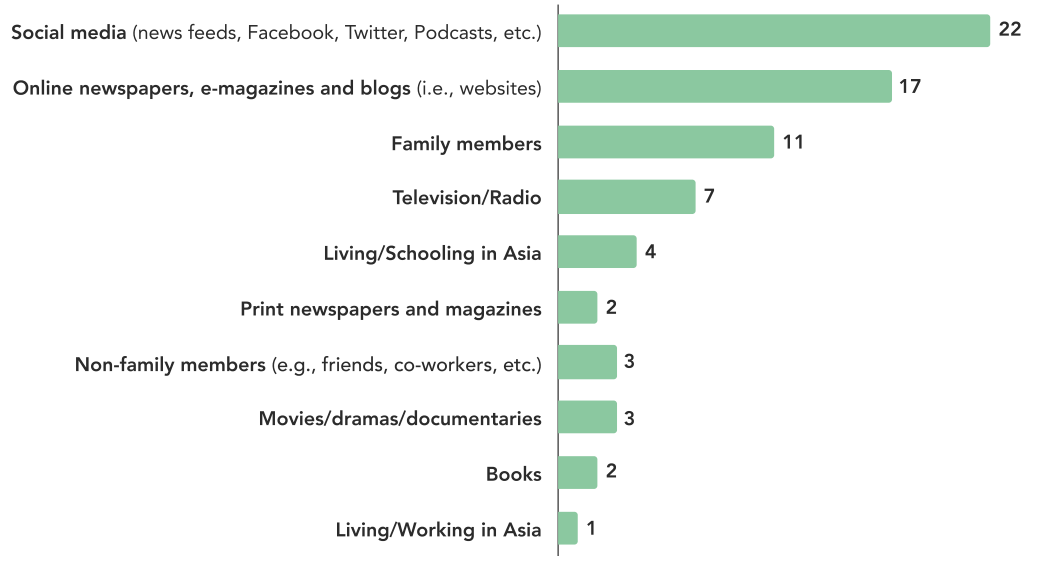
Discussion about media effects on shaping their and others' perceptions of Asia and Canadians/Americans of Asian descent encompassed a wide range of sources of information – online news media, social media, and entertainment and popular culture.

FIGURE 7

Social media, online newspapers, and family members among the top three sources of information about Asia/Asians for most study participants

Question: Please choose your top three sources of information on Asia/Asians from the list below:

Base: All respondents (n=24)



Note: *The figure represents data gathered through the pre-focus group survey. The numbers are not percentages. One respondent was unable to join any of the focus groups but due to the anonymous nature of the survey their response could not be isolated and is therefore included in this figure.*

In the pre-focus group survey, the young adults identified social media, online newspapers/websites, and family members among their top three sources of information on Asia/Asians. This result was largely consistent with a finding in our ***APF Canada 2020 National Opinion Poll***, which showed that among 18- to 34-year-old Canadians of all ethnic and racial backgrounds, social media and online news sources are among their top sources for information about Asia and Asians.

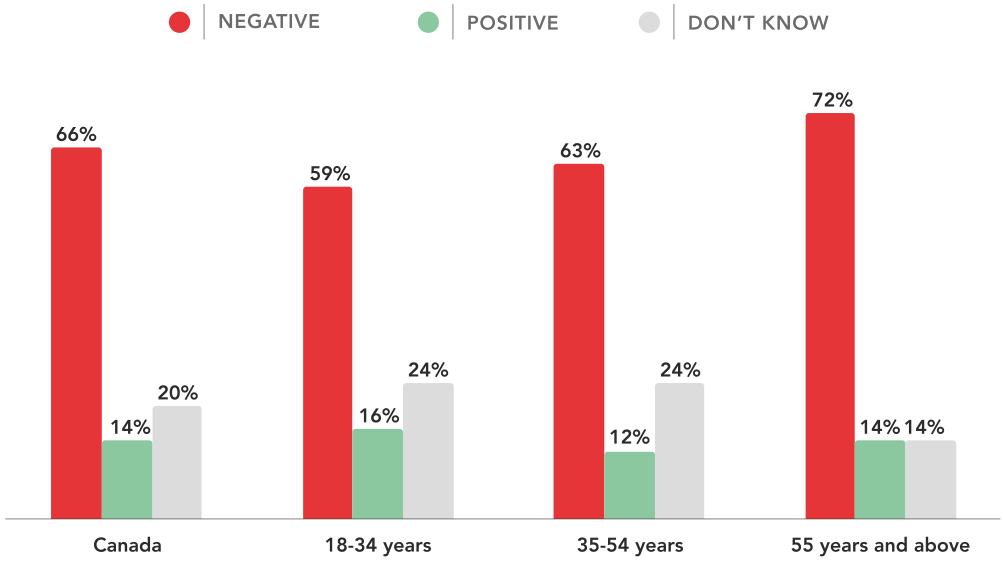
Research on media effects has established the negative impacts of lack of representation and stereotypes in the mass media.[16] These effects become even more pronounced in today's digital climate that has amplified the public's dependency on mass media for information, entertainment, and social connections. Media producers' framing of the narrative can further affect the message's interpretation by the public and thereby impact public perceptions. Studies show that media framing can perpetuate negative stereotypes about minority communities such as impacts of advertising on perceptions of Asian Americans[17] or negative framing of the Muslim community in Chinese news media.[18]

FIGURE 8

*Canadian Youth (18 -34 years) are more likely to find Canadian media has a positive impact on their perception of **China,** compared to the older age groups*

Question: Does the Canadian media have a positive or negative impact on your perception of the following Asian jurisdictions?

Base: 18 - 34 (n=774); 35-54 (n=1,166); 55+ (n=1,473); Canada (n=3,519)



Source: *2020 National Opinion Poll by Asia Pacific Foundation of Canada*

In popular culture and entertainment media, the narrative often fails to adequately reflect the diverse socio-cultural make-up of the society and thereby ceases to be representative. American and Canadian actors of Asian descent have long been fighting for visibility. During the focus groups, the young adults identified that popular culture and media played a big role in their childhood and continue to today. Media framing of culturally diverse characters is also crucial in defining the ethnic and racial groups for the public that has little contact with diverse cultural groups.[19] This step can further aid in deconstructing the monolithic perceptions of Asia for the larger Canadian population.

Furthermore, visibility is only part of the problem. Earlier media depictions of non-white characters suffered from 'whitewashing' and branding culturally diverse characters with racial stereotypes, such as, as the geeky, awkward, broken English speaking, East Asian character who also knows martial arts.[20] Or the South Asian character who is definitely an engineer with broken English, awkward, and with poor fashion sense, as illustrated by the character Raj from the popular sitcom *The Big Bang Theory*. While the issue of whitewashing is less common today, American and Canadian media still have a long way to go in terms of combatting the framing of media messages and ensuring sensitivity to culturally diverse groups of people.

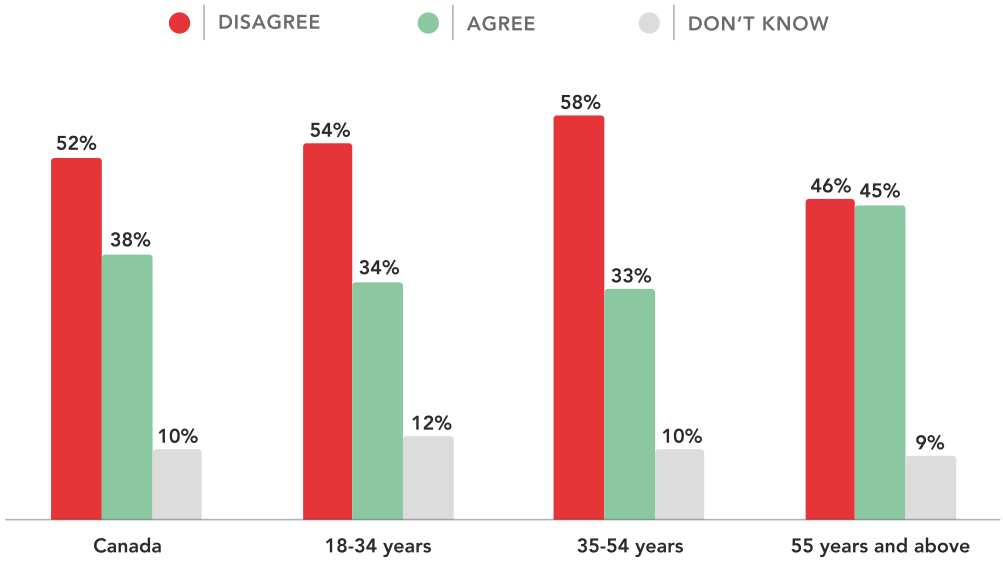
The character of Claudia Kishi in *The Babysitters' Club*, a Netflix production based on Ann M. Martin's book series, is a positive example of an American character of Asian descent who was not based on stereotypes, but rather, was complex and fiercely independent. In a Netflix documentary titled *The Claudia Kishi Club*, a group of creatives who were also of Asian descent shared how the tween character inspired their childhood aspirations and was someone with whom they could identify. One of the focus group participants, **Nancy,** described also being impacted by this character. However, it was also mentioned that Claudia Kishi remains much more the exception than the rule when it comes to Asian faces on the big screen or small screen. Canadian TV shows such as *Kim's Convenience* are helping to break that barrier with a cast primarily of people of Asian descent and a storyline depicting the community and cultures of Canadians with Korean heritage; but this too, is more an exception than the rule.

FIGURE 9

Majority of the Canadian youth don't think Canadian news media provides adequate information on current issues and developments in Asia

Question: Do you agree or disagree with the statement? Canadian news media provides adequate information on current issues and developments in Asia

Base: 18 - 34 (n=774); 35-54 (n=1,166); 55+ (n=1,473); Canada (n=3,519)



Source: *2020 National Opinion Poll by Asia Pacific Foundation of Canada*

Gatekeepers in the Canadian media industry also need to consider supplying a more diverse menu for consumers demanding this content. Diversity in the media sphere through inclusive domestic productions, sensitivity to diverse identity groups and communities, and providing a platform for foreign media can encourage visibility of different ethnicities and cultures, and also help promote more awareness and tolerance of multiculturalism.

Deconstructing Asia as a Monolith

> *"Instead of seeing Asia as one all encompassing category, entity, or whatever, try to understand different Asian cultures in that geographical area and how there's so many more ethnic groups other than say Chinese or Indigenous people in East Asia, for example."* – ***Yun, 28 years, Temporary Worker, B.C.***

As Canada grows increasingly diverse, it is pertinent for Canadians to develop a better understanding of the diversity of ethnic groups that make up the category of 'Asian.' Such efforts and recommendations, however, are not without their challenges. In particular, any efforts to build awareness and address the anti-Asian prejudice at its roots must reach beyond people of Asian descent and work their way into the larger Canadian society.

> *"My critique of the current efforts, you know, this kind of engagement, is that it's not mainstream yet and it's also concentrated in the sense that it seems everybody who's already in that space, like the Asian communities or anybody who has ties to Asia, will naturally have an interest in that. But I think it needs to be expanded to people who know nothing about it. And that's where our efforts maybe need to be redirected because that's where it's harder to reach."*
> **– Isabelle, 23 years, Canadian citizen, Quebec**

Amy and **Nancy** from another focus group raised this same point. In fact, **Amy,** who had attended some of APF Canada's youth-oriented events, noted, "I don't see many white people there almost ever." **Nancy**, while not familiar with APF Canada events, echoes the general sentiment about the importance of reaching a diverse audience through its programming. **Alvin** also felt that many of these efforts to educate and raise awareness often only reach the people who already seek out these ideas. They have not yet reached the mainstream, which is where he suggested we concentrate some of our efforts.

WHERE DO WE GO FROM HERE?

If the past year has taught us anything, it is that "enough is enough." The young adults of Asian heritage in Canada today are not going to be silenced and they are speaking out, as documented in this report. Questions are being raised about the complacency and naïve belief in the Canadian ideal of multiculturalism, as the lived reality paints a very different picture. Studies, including this current one, indicate that racism against people of East Asian heritage in the U.S. and Canada go beyond egregious acts of violence and include a web of social indignities and barriers to opportunities. Such seemingly "innocuous" microaggressions often leave behind an indelible memory and can have social and psychological, if not physical, impacts – such as a climate of fear of speaking out against and silence surrounding racial discrimination. The shared experiences of such discrimination based on race is further complicated by migration status, ethnicity, gender, class, caste, and shared history.

As a society, we need to come together and take a stand against everyday and systemic racism, but there is also a pressing need to educate and build awareness. Incidents such as the Atlanta shooting in March and Indianapolis shooting in April 2021, where collectively at least 10 people of Asian descent lost their lives, marks a disturbing trend in racist attacks in our neighbouring country. But this also underscores the urgency for initiatives to build mass awareness and implement better policies addressing education and media to align the positive *ideal* of multiculturalism with the complicated *reality* in Canada.

Despite the myriad issues, young adults are hopeful and optimistic about the future, provided the Canadian government (both federal and provincial) and its people incorporate concrete changes in at least two of the larger social institutions – education and media. The public, both young and old, depend on these sources for gathering information, which in turn guides their perspectives. And, as mentioned in this report, the two institutions are not exclusive but are often interdependent.

Media literacy is one key piece that can be incorporated into the Canadian school curriculum. Racial stereotypes that are pervasive in the current media demand the need for engaging and educating students to be critical consumers of media products. Students can be engaged through exercises that help them deconstruct media content, recognize bias and stereotypes in the media frame, research their origin, and compare lived reality with media portrayals.[21]

But the buck doesn't stop at the social institutions of education and media. As the young adult participants note, there needs to be broader community, corporate, and political initiatives that provide a space for cross-cultural conversations and build actionable strategies on these insights. Care needs to be exercised that the initiatives are not just one-off, performative acts, but rather build into substantive, practical measures that are continuously applied and evolving. And as the young adults observed, these actions should be developed in consultation with minority communities and give voice to their concerns.

We still have a long way to go towards building a Canadian society that is equitable, respectful, and inclusive, but even as individuals we can take small steps towards this goal. The young adults' suggestions to get the ball rolling are multipronged and locally engaged: Document the histories and stories of different ethnic communities in Canada on a shareable platform; collaborate with local libraries for stories that incorporate authors from diverse communities; and, host or listen to podcasts and events featuring diverse communities discussing key issues across the world. And if looking for something more social, engaging in food or film events that capture diverse cultures and communities can help in building knowledge and networks. But above all, the lead researchers hope that this report also emphasizes the overarching message conveyed by the young adult participants – respect an individual's identity, agency, and space. It is with that first, foundational step that we can work towards a true multicultural reality for Canada.

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RESOURCES TO LEARN MORE ABOUT CANADIANS OF ASIAN DESCENT, ALLYSHIP, AND TRAINING

Government of Canada Resources

- Anti-Racism Engagement Resources
- Building a Foundation for Change: Canada's Anti-Racism Strategy 2019–2022
- Federal Anti-Racism Secretariat

Government of British Columbia Resources

- Anti-Racism
- BC's Office of the Human Rights Commissioner

Organizations working against racism

- Canadian Race Relations Foundation
- Chinese Canadian National Council for Social Justice
  - Stop the Spread – A campaign against racism
- Elimin8hate - Report and record hate crimes [Canada]
- Fight COVID Racism – Report and record hate crimes [Canada]
  - Robust list of Resources on health and mental health, income support, legal support, police alternatives, and more.
- HeartMob by Hollaback – Report online harassment
- Project 1907
- Stop AAPI Hate Reporting Centre [US]

Educational Resources

- Addressing Anti-Asian Racism: A Resource for Educators by the Toronto District School Board, 2021
- A Year of Racist Attacks: Anti-Asian racism across Canada one year into the COVID-19 pandemic by Chinese Canadian National Council Toronto Chapter, 2021
- Anti-Racism for Kids: An Age-by-Age Guide to Fighting Hate, by Parents, 2021
- "Asian-American Professionals Push For Visibility at Work," by Te-Ping Chen, The Wall Street Journal, 2021
- "Corky Lee, Who Photographed Asian-American Life, Dies at 73," by Neil Genzlinger The New York Times, 2021
- Chinese Exclusion Act [US], September 2019
- Colour Code, a podcast by The Globe and Mail
- Guide to Allyship by amélie lamont – An open source guidebook
- "How to intervene in a racist attack," by Akshat Rathi, Quartz, 2016
- Road to Justice – The legal struggle for equal rights of Chinese Canadians
- The Racial Healing Handbook: Practical Activities to Help You Challenge Privilege, Confront Systemic Racism, and Engage in Collective Healing [Handout]
- Treating Yellow Peril: Resources to Address Coronavirus Racism by Professor Jason Oliver Chang, University of Connecticut
- "There's a long, global history to today's anti-Asian bias and violence," by Kim Yi Dionne, Sarah Hayes, and Fulya Felicity Turkmen, The Washington Post (Monkey Cage), 2021
- "What it means to be anti-racist," by Anna North, Vox, 2020
- "Why Diversity Training Doesn't Work – The challenge for Industry and Academia," by Frank Dobbin and Alexandra Kalev, Anthropology Now, 2018

Canadian Museums

- Canadian Museum for Human Rights, Winnipeg, Manitoba
- Chinese Canadian Museum, Vancouver, BC
- Nikkei National Museum & Cultural Centre, Burnaby, BC
- Pacific Canada Heritage Centre – Museum of Migration (PCHC – MoM)
- Royal Ontario Museum, Toronto
- The Virtual Museum of Asian Canadian Cultural Heritage by the Canadian Foundation for Asian Culture (Central Ontario) Inc.

Training Resources

- Anti-Asian Violence Resources
- Anti-Racism Strategies for the Workplace by the University of British Columbia
- Bystander intervention trainings by Asian Americans Advancing Justice
- Bystander intervention trainings by Ihollaback (Also provides, anti-harassment trainings for workplace or street).
- Education and Training by Canadian Race Relations Foundation
- Training & Workshops by the University of Toronto

Documentaries and Film Festivals

- All Our Father's Relations, by Alejandro Yoshizawa, 2016
- Continuous Journey, by Ali Kazimi, 2004
- Lost Years by Kenda Gee and Tom Radford, 2011
- One Big Hapa Family, by Jeff China Stearns, 2010
- Sleeping Tigers: The Asahi Baseball Story, by Jari Osborne, 2003
- Unwanted Soldiers, by Jari Osborne, 1999
- Toronto Reel Asian International Film Festival
- Vancouver Asian Film Festival

Books by Canadians of Asian Descent

- *A Good Wife*, by Samra Zafar
- *A Fine Balance*, by Rohinton Mistry
- *Even this Page is White*, by Vivek Shraya
- *Funny Boy*, by Shyam Selvadurai
- *Familiar Face* by Michael DeForge
- *How to Pronounce Knife*, by Souvankham Thammavongsa
- *How Does A Single Blade Of Grass Thank The Sun?*, by Doretta Lau
- *Kay's Lucky Coin Variety*, by Ann K. Choi
- *Mysterious Dreams of the Dead*, by Terry Watada
- *Obasan*, by Joy Kogawa
- *Older Sister. Not Necessarily Related.*, by Jenny Heijun Wills
- *Polar Vortex*, by Shani Mootoo
- *The Hero's Walk*, by Anita Rau Badami
- *The Headmaster's Wager*, by Vincent Lam
- *The Translation Of Love*, by Lynne Kutsukake
- *Runaway*, by Evelyn Lau
- *We Have Always Been Here*, by Samra Habib

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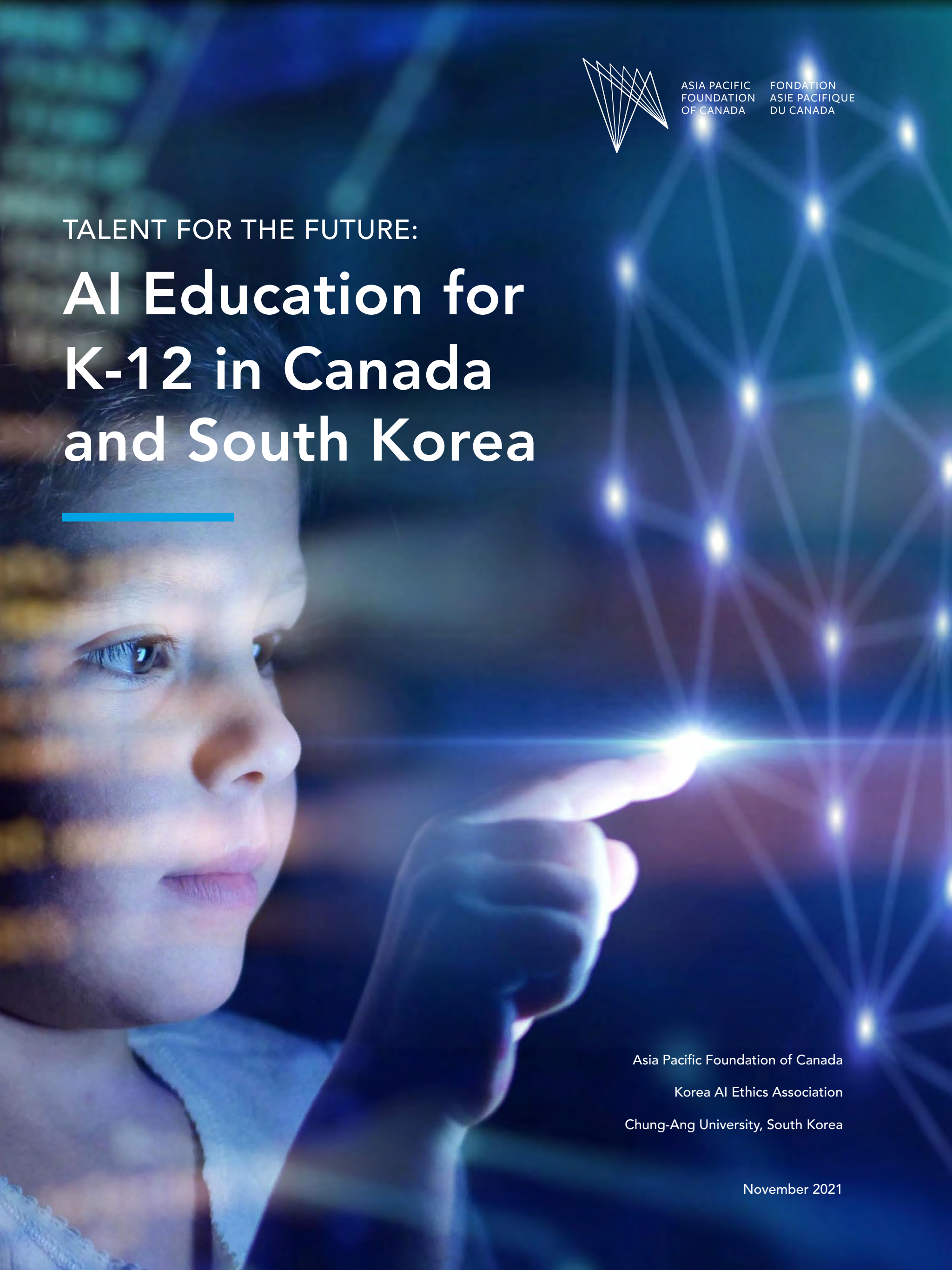

ASIA PACIFIC FOUNDATION OF CANADA
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TALENT FOR THE FUTURE:

AI Education for K-12 in Canada and South Korea

Asia Pacific Foundation of Canada

Korea AI Ethics Association

Chung-Ang University, South Korea

November 2021

CONTENTS

IN PARTNERSHIP WITH:

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EXECUTIVE SUMMARY

The adoption of artificial intelligence (AI) has accelerated during the COVID-19 pandemic, around the world and across different sectors. Now, AI is poised to impact the lives of citizens in all aspects of their lives. The pressing need for educating the next generation of workers and citizens has resulted in countries around the world emphasizing national AI strategies and education planning documents. However, there is a general shortage of information about the implementation of the K-12 education curriculum.

In this context, the Asia Pacific Foundation of Canada, the Korea AI Ethics Association, and Chung-Ang University have collaborated on this report that provides a brief overview of AI education for K-12 students in Canada and South Korea.

The report demonstrates that AI education is still in the nascent stages for both Canada and South Korea. However, South Korea has national-level plans to introduce AI education in a systematic manner, while Canada generally relies on local and civil society initiatives. Such a divergence reflects differences in education and governance systems in the two countries.

More than anything, the two cases demonstrate the importance of creating opportunities for international discussions about K-12 AI education, sharing good practices, and identifying solutions to common challenges. The authors of the report hope to initiate a discussion within Canadian and South Korean stakeholders on the issue through this publication.

The report also highlights the need to provide a forum for international discussions about K-12 AI education between practitioners and policy-makers. Lastly, based on the research and analysis conducted, the report also provides the following takeaways for governments, the private sector, and civil society stakeholders in Canada and South Korea to consider:

1. **Governments must make tangible investments in AI education for K-12 to provide equal opportunities for all students to acquire essential knowledge and skills;**
2. **Private sector and civil society participation should be encouraged, but the government should ensure the quality and consistency of AI education; and**
3. **AI ethics must be front and centre of the curriculum.**

INTRODUCTION

During the last decade, the world has seen remarkable advances in the field of artificial intelligence (AI) and its application throughout society. The adoption of AI has accelerated in the private sector, especially during the COVID-19 pandemic, and the AI global market is projected to reach US$312.4B by 2027.[1] Governments around the world have made AI a priority, launching national strategies to encourage research and development, facilitate regulatory reforms, and increase talent pools. The talent shortage has been consistently highlighted as a key issue in AI policy. Key decision makers in government, academia, and the private sector have responded by launching and increasing support for AI education and research, mostly at the post-secondary level, as they view AI primarily as an investment for economic competitiveness.

At the international level, UNESCO has created an international advisory board to support its member countries in developing: (1) an AI skills framework for schools; (2) an online repository of AI education resources; and (3) workshops to support the integration of AI training into local curriculums.[2] Furthermore, UNESCO facilitated the adoption of the "Beijing Consensus on Artificial Intelligence and Education" in 2019, which emphasizes a human-centred approach to AI in education and provides key policy recommendations.[3]

Beijing Consensus on Artificial Intelligence and Education

Five Areas of Policy Recommendation	Recommendations on Four Crosscutting Issues
AI for education management and delivery;	Promoting equitable and inclusive use of AI in education;
AI to empower teaching and teachers;	Gender-equitable AI and AI for gender equality;
AI for learning and learning assessment;	Ensuring ethical, transparent, and auditable use of education data and algorithms; and
Development of values and skills for life and work in the AI era; and	Monitoring, evaluation, and research.
AI for offering lifelong learning opportunities for all.	

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3 UNESCO, "Beijing Consensus on Artificial Intelligence and Education," unesco.org, May 18, 2019, https://unesdoc.unesco.org/ark:/48223/pf0000368303.

The discussions on AI in basic education broadly diverge into two strands: one on children ***using*** AI and the other on ***teaching*** AI to children. For the purposes of this report, the first strand will not be discussed in depth, but key points in the discourse will be briefly discussed here.

Broadly speaking, there is an understanding that the use of AI for educational purposes has the potential to enhance the learning experience. However, at the same time, there are concerns of potential misuses and ensuing violations of children's rights. There are several initiatives on the topic of children and the use of AI. The Canadian Institute for Advanced Research has sponsored a workshop on AI and the development of children, with a focus on the use of algorithms in online content for children.[4] UNICEF released its *Policy Guidance on AI for Children* in September 2020, with nine key requirements for "child-centred AI."[5] This is a closely watched space but is not covered in depth in this report.

The second strand, ***teaching*** AI, is the main area of focus in this report. In recent years, AI has become increasingly ubiquitous, and key decision makers across the private and public sectors have started to emphasize the importance of skills related to AI. In tandem, experts have started to raise the importance of integrating AI education in the elementary and secondary curriculum. They emphasize not only the importance of developing basic computational thinking and coding skills to further scaffold toward more complex computing skills, but also of instilling basic AI literacy skills for the broader public.

There are several key initiatives in the United States that have drawn attention in the field of AI and education. The Association for the Advancement of Artificial Intelligence (AAAI), one of the top AI academic organizations, and the Computer Science Teachers Association created the AI for K-12 Working Group in 2018 and launched the AI4K12 initiative, which has developed guidelines for new AI curriculums and developed a database of resources for students and educators.[6]

4 Krista Davidson, "AI & Society Workshop Explores the Risks of AI on Children," CIFAR, April 30, 2019, https://cifar.ca/cifarnews/2019/04/30/ai-society-workshop-explores-the-risks-of-ai-on-children/.

5 UNICEF and Ministry of Foreign Affairs, Finland, "Policy Guidance on AI for Children," September 2020, https://www.unicef.org/globalinsight/media/1171/file/UNICEF-Global-Insight-policy-guidance-AI-children-draft-1.0-2020.pdf.

6 David Touretzky et al., "Envisioning AI for K-12: What Should Every Child Know about AI?," Proceedings of the AAAI Conference on Artificial Intelligence 33, no. 01 (July 17, 2019): 9795–99, https://doi.org/10.1609/aaai.v33i01.33019795.

Furthermore, existing programs and organizations that focus on computing science education, such as AP Computer Science or code.org, have integrated AI content into their curriculums.[7]

AAAI's Five Big Ideas in AI
1. Computers perceive the world using sensors;
2. Agents maintain models/representations of the world and use them for reasoning;
3. Computers can learn from data;
4. Making agents interact comfortably with humans is a substantial challenge for AI developers; and
5. AI applications can impact society in both positive and negative ways.

Overall, broadly speaking, AI education for elementary and secondary students is still in its nascent stage, and it is very much decentralized. There are broad guidelines and a plethora of resources, but there is no dominating school of thought for curriculums. In this context, this collaborative research report presents a cross-national comparison of AI education for elementary and secondary students in Canada and South Korea. It depicts different attempts to integrate AI into the basic education curriculums in two very different settings and draws both universal and local lessons for relevant stakeholders. The research report operates with the understanding that AI education is a rapidly evolving field, and it aims to serve as a tentative facilitator of international discussions and collaboration on the matter, as opposed to a definitive, evergreen resource.

Canada and South Korea are deemed to be leaders in the field of AI, and each country presents differing contexts for AI education for elementary and secondary students that enable useful lessons to be drawn. Canada is home to world-class post-secondary AI research institutes and thought leaders, and there are very active civil society organization efforts on coding and AI education. However, there are no federal standards or guidelines on AI education as the education portfolio falls under the responsibilities of the provinces and territories. On the other hand, South Korea has drawn global attention for its ambitious investments in education and R&D, which have placed it on top of the Bloomberg Innovation Index in the past few years. South Korea has announced plans to rapidly integrate AI education into its basic education curriculums to match its lofty goal of becoming a competitive "AI nation."

In each case study, the overview of the key public and private efforts to teach AI in the elementary and secondary curriculums are provided, followed by a brief SWOT analysis for a current snapshot of the state of AI education in Canada and South Korea. This analytical framework also provides insight into education-related policies or initiatives that should be supported long-term, as well as areas that require more support from government. Then, the conclusion section will bring together the analyses from the two case studies and provide policy recommendations for relevant stakeholders. The methodology of this research report consists of desk research and expert interviews.

7 College Board, "AP Computer Science a Course," AP Central, July 10, 2021, https://apcentral.collegeboard.org/courses/ap-computer-science-a/course.

CANADA

Canada has a highly regarded public education system that has generally performed competitively in comparison to its international peers, making it a relatively strong foundation for digital education. In the Programme for International Student Assessment rankings, Canadian students have performed well, higher than the OECD average in the 2018 assessment.[8] A study indicated that 94% of the 15-year-old students had access to a computer at home, and the digital literacy skills of Canadian youth was reported to be generally higher than those of their OECD peers.[9]

Unlike South Korea, Canada does not have a national ministry of education that sets national education policies or curriculums. Instead, education falls under the jurisdiction of Canada's 13 provinces and territories. Provinces and territories have their own ministries of education that establish policies and curriculums that reflect local needs. In addition, locally elected school boards serve as a link between the community and the provincial or territorial governments.[10] In this context, education policy is decentralized across Canada, and efforts to create national standards are mostly conducted by the Council of Ministers of Education, Canada, an intergovernmental body that mostly provides a forum for education policy-makers across Canada and civil society organizations that target specific issues in education policy.[11]

8 Council of Ministers of Education, Canada, "PISA 2018 Canadian Report," CMEC, 2019, https://www.cmec.ca/581/PISA_2018.html.

9 Statistics Canada, "The Daily — Digital Literacy Skills of Canadian Youth Compare Favourably with the OECD Average," www150.statcan.gc.ca, December 14, 2020, https://www150.statcan.gc.ca/n1/daily-quotidien/201214/dq201214a-eng.htm.

10 Canadian School Boards Association (CSBA), "Public Education in Canada," cdnsba.org, 2020, https://www.cdnsba.org/all-about.

11 CMEC, "About Us," cmec.ca, 2021, https://www.cmec.ca/11/About_Us.html.

Public School Initiatives

Since 2017, the federal government has invested a total of C$110M in a program called CanCode, which funds 27 projects by civil society organizations that provide digital skills learning opportunities for students in K-12 and training programs for teachers.[12] However, official curriculum development and delivery falls under the jurisdiction of the provinces and territories. They have developed various curriculums for relevant courses that highlight technical training, as well as creating local frameworks on digital literacy, as the Government of British Columbia has done.[13]

AI has been integrated into courses such as computing science, robotics, and automation throughout Canada, but in a manner that is not standardized. Saskatchewan's 2019 curriculum for Robotics and Automation includes discussions on AI applications in its mandatory Ethics and Laws module, as well as optional AI-specific modules, in which the concept and social implications of AI applications are discussed.[14] Alberta's introductory computer science courses include modules on AI concepts, applications, and ethics, as well as a program specialization in robotics and AI.[15] Modules on AI are also included in advanced university preparatory programs available throughout Canada, such as Advanced Placement or International Baccalaureate.[16] However, these courses are often very specialized and computing science education is not mandatory at the high school level.

Across Canada, public school systems have mandatory career management or civic studies that emphasize the importance of digital literacy, in which AI education could be included at the discretion of instructors. However, at the time this research paper was drafted (March 2021), there were no official government mandates or guidelines to include modules on AI.

Civil Society

Several civil society organizations and private sector actors have been active in filling in the gap in AI education across Canada. The CanCode funding program has been instrumental in this context. One of the key players in this space is Canada Learning Code (CLC), a not-for-profit organization whose goal is to "[bring] accessible computer science to communities across Canada so everyone can create with technology."[17] CLC offers free lesson plans and

12 Innovation, Science and Economic Development, Canada, "MP Hehr Announced New CanCode Investment," canada.ca, July 19, 2019, https://www.canada.ca/en/innovation-science-economic-development/news/2019/07/mp-hehr-announced-new-cancode-investment.html.

13 Ministry of Education, "Digital Literacy – Province of British Columbia," www2.gov.bc.ca, 2015, https://www2.gov.bc.ca/gov/content/education-training/k-12/teach/resources-for-teachers/digital-literacy.

14 Ministry of Education, Saskatchewan, "2019 Saskatchewan Curriculum: Robotics and Automation 10, 20, 30," September 5, 2019, https://bit.ly/3HdxdSz.

15 Government of Alberta, "Program of Study: Computer Science," www.learnalberta.ca, 2021, https://www.learnalberta.ca/ProgramOfStudy.aspx?lang=en&ProgramId=74838#427524.

16 International Baccalaureate Organization, "Find an IB World School," International Baccalaureate®, 2021, https://www.ibo.org/programmes/find-an-ib-school/?SearchFields.Region=iba&SearchFields.Country=CA&SearchFields.State=AB%7CCA&SearchFields.Keywords=computer&SearchFields.Language=&SearchFields.BoardingFacilities=&SearchFields.SchoolGender=.; College Board, "AP Course Audit," apcourseaudit.inflexion.org, 2021, https://apcourseaudit.inflexion.org/ledger/search.php.

17 Canada Learning Code, "Learning for the Digital World: A Pan-Canadian K-12 Computer Science Education Framework," July 31, 2020, https://k12csframework.ca/wp-content/uploads/Learning-for-the-Digital-Future_Framework_Final.pdf.

resources that educators in diverse subject areas – from computing science to social sciences – can integrate into their existing curriculum.

CLC, noting the "inequitable access to high-quality and comprehensive foundational Computer Science education for all students across Canada," published *Learning for the Digital World: A Pan-Canadian K-12 Computer Science Education Framework* in August 2020 in consultation with its advisory group and workshops across the country that engaged over 650 stakeholders.[18]

The framework aims to set a national standard on quality computing science curriculum for K-12 students in Canada, and identifies five focus areas of competency (programming, computing and networks, data, technology and society, and design). Under its data section, the framework highlights "Applications of AI & Machine Learning," which provides specific competencies for each learning stage.[19] Here, the emphasis is not so much on learning the technical elements of AI and machine learning, but rather on identifying AI and assessing ethical issues related to its application.

18 Ibid.

19 Ibid.

Actua's Artificial Intelligence (AI) Education Framework

Created with support from Google.org and CIRA, and informed by research from Google's Applied Digital Skills Team, Google Brain, AI4K12.org, CSTA, Microsoft, AI4ALL, and K-12 educators working with AI.

THEME		DATA	PERCEPTION	REPRESENTATION & REASONING	LEARNING	NATURAL INTERACTION	SOCIETAL IMPACTS
Understanding		Understanding data is foundational to artificial intelligence (AI).	Computers sense and perceive the world around them.	AI creates models to represent other concepts and uses these models for reasoning.	Machine learning happens with data over time.	Interaction between AI and humans mimics communication between people.	AI can impact society in both positive and negative ways.
Investigations		What is data, and how do humans use it? What are types of data used in data science? In what ways is data applied in careers and society?	How do machines use sensors to perceive data? How do machine learning tools classify data? What are the limitations of machine perception?	How is data used in AI models? How can models represent other concepts? How do machine models inform decision making?	How do algorithms demonstrate learning? What are neural networks? How does training data influence machine learning?	What does machine-human interaction look like? How do machines understand natural language? What is aective computing; what is consciousness?	What ethical considerations arise when we use and create AI in society? What biases exist in AI algorithms? How can AI be leveraged to face global challenges?
Curriculum Connections		Math: Qualitative and quantitative data, aggregating and analyzing data Science/Interdisciplinary: Data collection, applications of AI (e.g., STEM careers and research) Social: Decision making and reasoning	Math: Data collection and categorizing data inputs Science: Human senses and environmental stimuli, brain processes during sensing and perception Language: Homophones and speech ambiguity	Math: Mapping, graphing, modeling, effciency Science: Classification systems (e.g., biological) Social: Decision making and reasoning/argument	Math: Sequencing and logic, variables, functions, non-linear graphing Science: Neural processes for learning (e.g., brain structure and function, neural pathways) Social: Understanding bias and critical thinking	Science: Neuroscience (intelligence, consciousness), how living things display intelligence Language: Semantics, communication, language ambiguity Social/Wellness: Non-verbal communication	Math: Detecting bias in data Science/Interdisciplinary: Applications of AI (e.g., STEM careers and research) Social: Decision making, ethics, digital literacy (critical thinking, bias)
PROGRESSION	**Novice/Entry**	Define data; identify data sources or types	Identify sensors; interact with AI agents	Create models; use decision trees	Use a machine learning program; describe learning	Identify verbal and non-verbal communication cues	Identify AI uses and applications in society
	Apprentice	Use data to answer a problem; interpret datasets	Create applications using perception; describe inputs	Design basic decision tree; describe model use	Describe types of machine learning	Compare AI and human performance on tasks	Identify bias potential; describe inclusive AI design
	Practicioner	Describe data analysis; categorical vs numerical data	Describe sensor limitations; use multiple sensors	Design complex decision tree; map effcient paths	Identify bias in data; describe neural network training	Build a chatbot; identify AI	Understand how design impacts function; AI biases
	Expert	Apply data science to solve relevant problems	Use and create complex applications with perception	Describe, use and create search algorithms	Manipulate a neural net/ machine learning algorithm	Identify language ambiguity; debate consciousness	Critically debate social issues and ethics of AI
Applications		Recognition Predictive Analytics Anomaly Detection & Pattern Recognition	Recognition Anomaly Detection & Pattern Recognition	Recognition Predictive Analytics Autonomous vehicles/systems	Conversational Interfaces Predictive Analytics Personalization Anomaly Detection & Pattern Recognition Goal Driven Systems	Conversational Interfaces Personalization Goal Driven Systems	Recognition Conversational Interfaces Predictive Analytics Personalization Autonomous vehicles/systems Anomaly Detection & Pattern Recognition Goal Driven Systems

Source: Actua, "Actua's Artificial Intelligence (AI) Education Handbook," actua.ca, January 2020, https://www.actua.ca/wp-content/uploads/2020/01/Actua-AI_Handbook.pdf.

AI Module from the Canada Learning Code K-12 Computer Science Education Framework

Applications of AI & Machine Learning

Start here	Identify commonly used digital tools that incorporate AI (artificial intelligence) and machine learning and acknowledge how such tools help people accomplish tasks that only humans could previously do.
Emerging learner	Define AI and give real-world examples of how it has been used to extract information from data.
Developing learner	Describe basic algorithms of AI systems and how data and machine learning interact.
Provident learner	Assess how human biases are embedded within technical systems and artificial intelligence.
Going further	Explain how machines learn. Discuss specific ethical challenges with machine learning and AI.
Connections to other areas	**Focus Areas:** Technology and Society (Ethics, Safety and the Law); Programming (Algorithms) **Capacities and Dispositions:** Critical Thinking, Citizenship

Source: Canada Learning Code, "Learning for the Digital World: A Pan-Canadian K-12 Computer Science Education Framework," July 31, 2020, https://k12csframework.ca/wp-content/uploads/Learning-for-the-Digital-Future_Framework_Final.pdf.

Actua is another not-for-profit organization that has contributed to Canada's AI education efforts. It is a charitable organization that delivers science, engineering, and technology educational programs to youth in Canada.[20] Actua developed an AI Education Framework, with data, perception, representation & reasoning, learning, natural interaction, and societal impacts as its six main themes.[21] Like Canada Learning Code's K-12 Computer Science Education Framework, Actua's AI Education Framework focuses on the understanding of the main concepts in AI and its social implications.

20 Actua, "About," actua.ca, 2021, https://www.actua.ca/en/about/.

21 Actua, "Actua's Artificial Intelligence (AI) Education Handbook," actua.ca, January 2020, https://www.actua.ca/wp-content/uploads/2020/01/Actua-AI_Handbook.pdf.

Kids Code Jeunesse (KCJ) is another key player in this space. KCJ is a charitable organization that provides bilingual computing science education to K-12 students across Canada, and it has reached over 10,000 educators and 375,000 youth through its programs thus far.[22] KCJ's new initiative, *#kids2030: Educating Kids on Code, AI & the Global Goals* seeks to educate over 1 million kids and 50,000 educators on AI and ethics, and on the use of technology for achieving the UN's sustainable development goals. Its 10-year road map aims to create education materials on AI ethics and digital citizenship in collaboration with other organizations.[23]

These civil society organizations, supported by government and private sector funding, aim to provide high-quality computing science programs to Canadian youth who may not have access to them in their public-school systems. In addition to workshops and training programs, they provide turnkey resources that educators can easily integrate into their curriculums. It should be noted that in addition to the funding from CanCode or other federal government entities, these organizations collaborate closely with private sector actors such as Amazon (CLC), Google (Actua), and Microsoft (KCJ), which provide not only funding, but also technical expertise.

SWOT Analysis

STRENGTH

- Canada is home to world-class research AI institutes and technology companies, which provide direct and indirect resources for students in the form of educator training, mentorship, and youth programs;
- Civil society organizations, such as those mentioned above, provide affordable resources and opportunities for students and educators, and the generous support of the federal government suggests the expansion of such programs moving forward; and
- The flexibility of school curriculums and general support for development of digital skills and literacy allow educators to easily integrate AI education into their teaching portfolio.

WEAKNESSES

- There is no standardization of computing science or AI curriculum across Canada due to its decentralized educational system. The quality and availability of AI-related programs are not evenly distributed;
- While Canadian students in general have good access to digital infrastructure and educational programming, the digital divide remains a challenge, especially for students in rural and northern areas;
- Education ministries, which make the decisions on curriculums and program deliveries, have been slow to adopt AI into official curriculums and to provide the

22 KCJ, "About," kidscodejeunesse.org, 2021, https://kidscodejeunesse.org/about.

23 KCJ, "#kids2030," kidscodejeunesse.org, 2021, https://kidscodejeunesse.org/kids2030.

resources to make AI education accessible to all, not just to gifted or advanced students specializing in computing science; and

- Educators do not necessarily have the skill set to teach AI, and recruitment of good computing science educators can be challenging due to the competition with the industry.

OPPORTUNITIES

- Highly localized curriculum and the existence of resources such as CLC, Actua, and KCJ mean that entrepreneurial parents, educators, or institutions have access to good resources to provide quality AI education to children;
- Educators across Canada are aware of the importance of AI education, especially after the pandemic, and ministries of education have been upgrading their curriculums to reflect more up-to-date needs; and
- The federal government has been supportive of AI education and training, as evidenced by – among others – the investment of C$110M in the CanCode program and C$750M in the Broadband Fund program, which creates a supportive policy and educational environment.

THREATS

- AI education remains in its infancy, and it will likely remain decentralized across the country and reliant on civil society organization programs, continuing to limit access to quality computing science programs depending on the geographic location;
- Without official mandates to include AI education in the curriculum and resources to support its inclusion from the provincial and territorial governments, educators may remain slow, if not unwilling, to incorporate it into their curriculums; and
- Major technology companies and government agencies are racing to recruit computing science graduates with competitive benefits, and this could exacerbate the shortage of knowledgeable computing science educators in the public school system.

SOUTH KOREA

South Korea has an active and committed government currently acting on plans and promising significant funding to update and roll out a K-12 public school curriculum with AI education coursework. In the 2020 basic plan for AI education, the Ministry of Education (MOE) expressed the intent to transform South Korea into a country that best employs AI. For this purpose, the MOE released the Education Policy Direction and Core Tasks for the Artificial Intelligence Era in November 2020. The document lays out plans to gradually introduce AI subjects in K-12 schools over the next four years. More specifically, the new curriculum includes programming, basic principles of AI, AI utilization, and AI ethics.

In March 2021, no public schools – from elementary through high school – in Korea were teaching AI as an independent subject. However, starting in the 2021 fall semester, two courses, AI basics and AI mathematics, were included as elective subjects in career-pathway programs in high schools nationwide. As for elementary and middle schools, the MOE and local-level education offices (at metropolitan and provincial levels) plan to implement a combined education program, integrating the AI curriculum into the pre-existing software coursework. In addition, the MOE is developing AI-related course materials for distribution and use in K-12 schools. By 2025, the MOE expects that the updated curriculum will be implemented throughout the country, and AI education will be fully adopted in all K-12 schools.[24]

Public School Initiatives

AI EDUCATION IN ELEMENTARY SCHOOLS

The goal of AI education in elementary schools is to instil basic AI literacy by adopting AI convergence education programs and by implementing AI education. According to the plans of the Ministry of Education and each education office, the elementary school curriculum basically focuses on familiarizing students with AI.

In addition, the Ministry of Education announced a plan to have trained 5,000 AI teachers by 2024 by training students majoring in AI in graduate schools of education. Simultaneously, the MOE promised to develop an accredited AI textbook for elementary school.[25]

As examples of specific education methods, teachers can engage learners by using AI chatbots (for answering quizzes after learning the content, such as English or math, with the help of a chatbot) and teach classes using various AI devices such as AI speakers. In addition, students themselves can use AI education platforms for creating and solving problems in class.

24 남윤철, "인공지능시대 교육정책의 방향과 핵심과제," 교육부, 행복한 교육, January 2021, https://happyedu.moe.go.kr/happy/bbs/selectHappyArticleImg.do?bbsId=BBSMSTR_0000000000191&nttId=10119.

25 Cho Ki-sung, "AI education, is it being done properly?" Korea Education Daily, 2020, https://www.hangyo.com/news/article.html?no=90531

The next software education curriculum model (draft)[26]

Primary Category	Secondary Category	Grades 1-2	Grades 3-4	Grades 5-6
AI and convergence	Data science			Understanding of big data Conceptual understanding of AI Implementation of AI II (e.g., machine learning)
	Artificial intelligence		Implementation of AI I (e.g., voice recognition)	

Report of AI education curriculum structure in primary and secondary schools[26]

Category	Grades 1-2	Grades 3-4	Grades 5-6
Understanding of AI	**AI story (smart robot)**	**Strong AI Weak AI**	**AI vs. human Moravec's paradox Turing test**
AI and data	**Various types of data (video, image, sound, text)**	**Number guessing with hints**	**Make aware in a new situation based on the previous data/Make a new situation based on the data**
AI algorithm	**Classifying things Finding commonalities**	**Make certain reactions made by context and conditions**	**Classify things according to the previous data**
Implementation of AI	**Making AI robot (using recycled materials)**	**Machine learning hands-on experience (classification of images and videos)**	**Making AI-driven artifacts (block coding)**
AI and its impact on society in everyday life	**Changes made by AI**	**Commonalities and differences between human and AI**	**The Fourth Industrial Revolution AI ethics**

As an example of a curriculum developed by the Ministry of Education, an AI-based math learning program called "Knock! Knock! Math Explorers" was distributed to students in first and second grade in elementary schools across the country on September 14, 2020. This AI program analyzes the results of a math quiz that students take after learning the topic from math textbooks and the math curriculum, and then recommends learning content suitable for the student. This pilot program is operated at five schools (Seoul, Daegu, Gyeonggi, Chungnam, and Gyeongbuk) and will be gradually distributed to a total of 34 Korean schools in 16 countries around the world.[26]

26 김수현, "초등학교 1∞2학년, AI로 맞춤형 수학학습…고교엔 AI 과목 신설," 연합뉴스, September 13, 2020, https://www.yna.co.kr/view/AKR20200911147700530?input=1195m.

AI Education in Middle Schools

AI education in middle schools focuses on instilling basic AI literacy. According to the Ministry of Education, the goal is to help middle school students to understand the principles of AI and apply them in real life. Currently, 34 class hours are provided through software education, but this number is set to increase. [27]

In the mid-to-long-term development plan for AI-based convergence education (2021-2025), the Seoul Education Office announced that it will bolster AI-based project classes by taking advantage of optional activities, creative activities, and electives approved by the school principal.[28]

Seoul Education Office, AI education development plan for middle schools

Objective

Nurturing innovative talents with future core competencies through AI-based convergence education

Main Targets		Strategies	Specific Plans
Reforming Public Education through AI-based Convergence	1-1	Curriculum centered on future core competencies	• Education for AI-based convergence competencies • Reinforcement of core subjects and work education
	1-2	Support growth of education community	• Self-driven learning environment • Support teacher training and parents' participation
AI-based Targeted Education and Bridging the Education Gap	2-1	AI-based convergence education	• AI-based individuated education • AI ethics and digital literacy education
	2-2	Enhanced educational welfare of the vulnerable	• Literacy education of AI-based system • Tutoring the vulnerable with AI technology
Enlarging Educational Infra-structure through AI Technology	3-1	Constructing AI-based education environment	• AI data implantation into education environment • Construction of AI data-based support platform
	3-2	School safety and innovative work relief	• Accident prevention and diagnosis through AI • AI-based work automation and work relief
	3-3	Expansion of AI-based cooperation and education culture	• AI data implantation into public, government and research governance • Nurturing glocal culture through AI education

Source: 서울특별시 교육청, "AI 기반 융합 혁신미래교육 중장기 발전 계획 발표," 서울교육소식, *February 9, 2021, https://enews.sen.go.kr/news/view.do?bbsSn=170640&step1=3&step2=1.*

In short, AI education in middle schools will focus on fostering two major skills: (1) problem-solving, by understanding the concept of AI and by applying it to software; and (2) the ability to apply completed AI programs to solve practical problems in real life.

27 Kim S., Kim H.Y. (2018) A Computational Thinking Curriculum and Teacher Professional Development in South Korea. In: Khine M. (eds) Computational Thinking in the STEM Disciplines. Springer, Cham. https://doi.org/10.1007/978-3-319-93566-9_9

28 서울특별시 교육청, "AI 기반 융합 혁신미래교육 중장기 발전 계획 발표," 서울교육소식, February 9, 2021, https://enews.sen.go.kr/news/view.do?bbsSn=170640&step1=3&step2=1.

AI Education in High Schools

For AI education in high schools, the MOE proposed providing the opportunity for deep learning by helping students acquire AI principles and integrate them with other subjects. As a first step, the MOE planned to establish the criteria for AI education suitable for each grade level by the second half of 2020. Until 2025, the MOE will continue to bring to light best practices for AI-related subjects and offer them at the discretion of the local education office or school principals.[29] The MOE also decided to expand the operation of two pilot projects: "AI education in exemplary schools" and "regular high schools as a centre for AI convergence education." These schools convert about 15% of all classes into AI-based subjects for three years and provide students with opportunities to receive basic AI education, including in AI, programming, and big data analysis.[30]

The Ministry of Education's plan for operating exemplary high schools for intensive AI education[33]

Regular High Schools as a Centre for AI Convergence Education				AI Education Exemplary Schools		
An information technology course is a mandatory subject for the first year of high school; Second- and third-year students in high school can choose from various AI-related subjects (over 26 credits in the span of three years); and Operation of collaborative courses within the community (over four credits per year).				An information technology course is a mandatory subject in middle and high schools; Clubs related to AI are allowed in elementary, middle, and high schools; and Efforts are made to raise awareness of AI education in the community.		
2020	**2021**	**2022**	**2023~**	**2020**	**2021**	**2022**
34 schools	51 schools	68 schools	Further increase	247 schools	500 schools	Further increase

Furthermore, when revising the curriculum in 2022, the MOE plans to consider the education content, including programming, AI basic principles, AI use, and AI ethics, to ensure that AI education programs are implemented in schools by 2025. Before the curriculum is revised, the MOE plans to prioritize the development of supplementary teaching materials and use career education and after-school programs to help students build diverse AI-related experience. Starting in the second semester of 2021, AI basics and AI mathematics will be taught as electives for high school students' career education. In addition, the existing 12 career programs related to AI will be expanded to 15.[31]

Meanwhile, support for AI education in vocational high schools will also increase. Through funding, the MOE is encouraging vocational high schools to revise their curriculums to incorporate content related to new industries, such as AI, information protection, and smart factories. By 2024, the Seoul Education Office plans to transform 10 vocational high schools in Seoul to specialized high schools that intensively teach either AI or big data. In 2020, the

29 교육부, "인공지능시대 교육정책방향과 핵심과제," Korea.kr, 대한민국 정책브리핑, December 4, 2020, https://www.korea.kr/archive/expDocView.do?docId=39237.

30 Ibid.

31 교육부, "인공지능시대 교육정책방향과 핵심과제," Korea.kr, 대한민국 정책브리핑, December 4, 2020, https://www.korea.kr/archive/expDocView.do?docId=39237.

Seoul Education Office selected four specialized high schools in Seoul for AI and big data. In addition, AI literacy classes will be taught to all first-year students in specialized high schools in Seoul starting in 2021.[32]

Nonetheless, what Korea needs the most to expand its AI education as planned is to train teachers who can provide AI education. In addition to training 5,000 AI specialist by 2025, the requirements for teacher licences will be revised to include the completion of AI courses at the National University of Education. In addition, the Colleges of Education also plan to offer software and AI majors as teaching subjects and major-related mandatory subjects, to train 800 to 1,000 specialized teachers over five years, and to dispatch one in each elementary school and middle school. The new teacher training process will also adopt practical training involving AI-related content; in the meantime, teaching subjects and prerequisite courses will also include AI and information technology education.[33]

Civil Society

Among many AI education programs available for the general public, K-MOOC (Korean massive open online courses) is jointly operated by the Ministry of Education and the National Lifelong Education Promotion Agency. Initially, university lectures were created as online content and offered for free, but along with growing demand for AI education, K-MOOC now offers 55 courses related to AI.[34]

32 서울특별시 교육청, "AI 기반 융합 혁신미래교육 중장기 발전 계획 발표," 서울교육소식, February 9, 2021, https://enews.sen.go.kr/news/view.do?bbsSn=170640&step1=3&step2=1.

33 이하은, "인공지능 인재 양성 청사진 발표, 신규사업 신설 등 '교육계 전방위 변화,'" 한국대학신문, November 20, 2020, http://news.unn.net/news/articleView.html?idxno=500031.

34 Korean Massive Open Online Courses, National Institute for Lifelong Education, South Korea, "K-MOOC Courses" www.kmooc.kr, 2020, http://www.kmooc.kr/courses.

Bundled big data and AI courses in K-MOOC by the Korean Ministry of Education

Basics of AI Technology
Artificial Intelligence is a branch of computer science that studies information processing models that can mimic human intelligence and cognitive functions. As a fundamental problem of artificial intelligence, the course deals with theories and fundamental computational problems related to empirical search, reasoning, learning, and knowledge expression methods.

Data Mining
Data mining is a theory and technique for finding useful patterns in large amounts of data, and has been applied in various fields such as web search and recommendation systems. In this course, students learn basic concepts and related theories of data mining.

Basics of AI Technology
Machine learning is a discipline that extracts information from data or learns patterns, and is the most core field for artificial intelligence technology. First, the course deals with general optimization and online problems based on basic linear algebra concepts.

Big Data and Machine Learning Software
Big data and machine learning software are software that analyzes various data and creates predictive models. In this course, you will learn various big data analysis methods (batch processing, stream processing, interactive query, graph processing, etc.) and how to perform real data analysis using the concepts you have learned.

Source: Korean Massive Open Online Courses, National Institute for Lifelong Education, South Korea, "Courses," www.kmooc.kr, 2020, http://www.kmooc.kr/courses.

As for local governments, the Seoul Metropolitan Government recruited students for the first semester of a software specialists' training program, Seoul Software Academy Cluster (SSAC), in November 2020. SSAC consists of seven courses in five fields: web, app, AI, big data, and internet of things/robot. It provides free education to 120 citizens of Seoul for three or six months, depending on the curriculum. The three-month course is a small-scale course that allows people to directly learn from a developer in the field and to focus on solving real-world problems. The six-month course enables students to become actual developers and find a job in a related field. [35]

AI education for the general public in Korea focuses on vocational training to create jobs and find employment in jobs that use AI technology. For this reason, most AI education projects funded by the Ministry of Education or the Ministry of Science and ICT also offer employment-related programs.

Compared to public school education, the programs offered to the general public often differ in the teaching content, depending on the main entity or the institution that is in charge, because continuing education for the general public is not a part of the regular curriculum.

35 Seoul Industry Promotion Agency, "2021년도 싹(SSAC) SW교육 파트너 모집 공고 (2021.08.23까지) 〉 SBA-서울산업진흥원," www.sba.seoul.kr, July 30, 2021, https://www.sba.seoul.kr/kr/sbcu01s1?bseq=5037846.

SWOT Analysis

STRENGTHS

- The country has the most advanced IT infrastructure and distribution rate in the world. South Korea's internet penetration rate per household has been number one in the world for many years. Korea was also the first country to commercialize 5G. According to a survey done by the Pew Research Center, Korea has the highest smartphone ownership in the world, at 94%; and
- Koreans also have IT utilization skills in daily life and a deep appreciation of education. South Korea is thus expected to quickly catch up with the AI education levels of other advanced AI countries when AI education is fully implemented.

WEAKNESSES

- Korea had a late start compared to other countries in regard to its AI agenda, which can be seen as the biggest weakness of AI education in Korea. Although AI technology is rapidly being adopted in all industries in Korea and the demand for experts such as AI developers is soaring, the supply is not keeping up with the demand;
- There is a labour shortage, for example of teachers who specialize in AI; and
- AI teaching materials, such as textbooks, are still needed to distribute in schools.

OPPORTUNITIES

- The Korean government has a strong interest in promoting and investing in the AI industry. In line with the policy direction of the government, the demand for AI specialists is expected to continue to rise;
- Investment in AI education is actively being made and Korean companies, aware of the government policies, are concentrating on R&D and commercializing the AI industry; and
- Government, industry and civil society have emphasized the need and importance of AI education. Recent domestic experiences with AI ethics issues have increased the public's awareness of AI technology and the technology's social and ethical impacts.

THREATS

- The current AI education in Korea focuses on teaching AI technology. Teaching AI ethics related to dysfunction and impact of AI is vital for proper AI development and safe use. Therefore, it is necessary to expand the AI ethics education courses and curriculum, which are currently only partially covered; and
- It is necessary to establish more systemic, comprehensive, mid- to long-term plans reflecting the national goals for AI education, unlike the current AI education policy being implemented by each education office.

CONCLUSION

The review of Canada's and South Korea's AI programs and curriculums demonstrates a divergence in the introduction of AI education for K-12 students in both countries, which reflects the different education systems and governance structures. Canada's education system is decentralized, and there is no national AI curriculum. Instead, enterprising schools and civil society organizations have filled that niche – such as the work done by Canada Learning Code or Kids Code Jeunesse. On the other hand, South Korea has a national ministry of education, and it has rolled out a concrete, multi-year plan to introduce a national curriculum. It is also supporting AI education by training additional teachers and creating teaching materials.

Since both approaches are in the early stages, it is premature to make an assessment of the two. However, a point researchers wish to highlight is the need for policy-makers, educators, experts, and other stakeholders to engage in consistent dialogue at the domestic and international level on the topic of AI education. This is not only to keep track of developments in AI curriculums at the K-12 level, but to also exchange best practices, successful programs, and potential pitfalls.

At the moment, both Canada and South Korea have world-class and robust talent pipelines in AI. In the last two years, Canada has scored in the top 10 in two global AI talent surveys conducted by the OECD and private companies.[36] Meanwhile, South Korea experienced a significant increase (133 percent) in AI researchers between 2019 and 2020 alone.[37] Canada and Korea have succeeded in their AI talent efforts in part due to heavy investment in higher education initiatives to foster and attract AI expertise. However, developing AI education for K-12 students has the potential of further sustaining and increasing domestic AI talent pools, complementing existing strengths in higher education.

36 Simon Hudson and Yoan Mantha, "Global AI Talent Report 2020," jfgagne.ai, 2020, https://jfgagne.ai/global-ai-talent-report-2020/#anchor-6; Government of Canada and CIFAR, "Canada's Leadership in AI – Talent, Ecosystems, and Responsible AI," oecd.ai, May 4, 2021, https://oecd.ai/en/wonk/canada-national-ai-strategy-2021.

37 Simon Hudson and Yoan Mantha, "Global AI Talent Report 2020," jfgagne.ai, 2020, https://jfgagne.ai/global-ai-talent-report-2020/#anchor-6.

As AI research and development continues and more AI applications become widespread around the globe, policy-makers in Ottawa and Seoul need to make concerted efforts to support the K-12 AI education resources currently available and aid in the development of new ones to future-proof domestic workforces for generations to come.

In addition to highlighting novel K-12 education in Canada and South Korea and kickstarting much-needed conversations and exchanges among international policy-makers, experts, and stakeholders, there are additional salient points that emerge from the overview of the two report's studies.

First, governments must make tangible investments in AI education for K-12 to provide equal opportunities for all students to acquire essential knowledge and skills. In both Canada and South Korea, the lack of resources and teachers capable of teaching AI has been highlighted as a major barrier. South Korea has rolled out a national plan to train the trainer, but there will be discrepancies in opportunities depending on the region. In Canada, the lack of a national strategy and the decentralized nature of the education system do not guarantee the delivery of high-quality AI education across the country. In this context, it is important for governments at the territorial and provincial level to make tangible investments – and a good place to begin would be teacher training and resources for AI education. However, at the federal level, the government still has an important role to play, mainly in supporting provincial and territorial AI education initiatives. It can also provide national-level guidelines as a starting point for subnational jurisdictions to strive for.

Second, private sector and civil society participation should be encouraged, but the government should ensure the quality and consistency of AI education. In Canada, the private sector and civil society have filled in for the government, providing much-needed support for AI education. On the other hand, the South Korean government and its local boards of education have been the drivers on this front with limited private sector or civil society input. The two models could balance each other better. The private sector provides more opportunities for experiential learning that is directly applicable for future employment, and civil society brings in valuable normative perspectives. Greater collaboration with the private sector to provide hands-on opportunities for students and curriculum development will be beneficial in South Korea. On the other hand, government-led initiatives on AI education, like those in South Korea, create greater ripple effects and stronger co-ordination between different stakeholders, which ultimately provides greater quality and consistency across the country. The main takeaway here is that anything on AI should be a multi-stakeholder effort, and education should reflect this as well.

Finally, AI ethics must be front and centre of the curriculum. It is important for AI curriculums to not focus solely on technical or skill-building aspects; this limits the target audience for AI education initiatives to students specializing in computing science. In the curriculums of both countries, AI ethics should be integrated into different fields in addition to math and computing science (English, social studies, etc.) to ensure that learning about technology occurs in a wider array of contexts and that students develop sufficient digital literacy to engage with AI-driven technology as they transition into adulthood.

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ABOUT

APF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas.

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, Digital Media, and a regular Asia Watch newsletter that together support these thematic areas.

APF Canada also works with business, government, and academic stakeholders to provide custom research, data, briefings, and Asia Competency training for Canadian organizations. Consulting services are available by request. We would be pleased to work with you to meet your research and business intelligence needs.

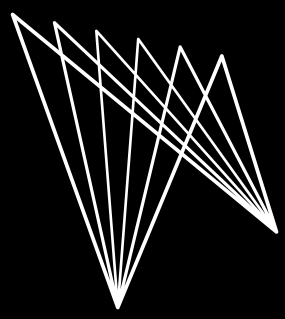
KOREA ARTIFICIAL INTELLIGENCE ETHICS ASSOCIATION (KAIEA)

The KAIEA has been established as a non-profit organization that supports and implements AI to be used safely and ethically for the world and humanity.

KAIEA is the only AI ethics-oriented organization in Korea and is actively engaged in research, development, education, and dissemination of AI ethics with co-operation of the government, corporations, universities, and citizens.

CHUNG-ANG UNIVERSITY'S HUMANITIES RESEARCH INSTITUTE

Chung-Ang University's Humanities Research Institute has been conducting the HK+ project since November 2017 to develop scholarship on "artificial intelligence humanities" with support from the National Research Foundation of Korea. The HK+ artificial intelligence humanities project aims to produce future-oriented, academic, and interdisciplinary research outcomes on the foundation of humanities-based reflections on rapidly changing artificial intelligence technology and industries.



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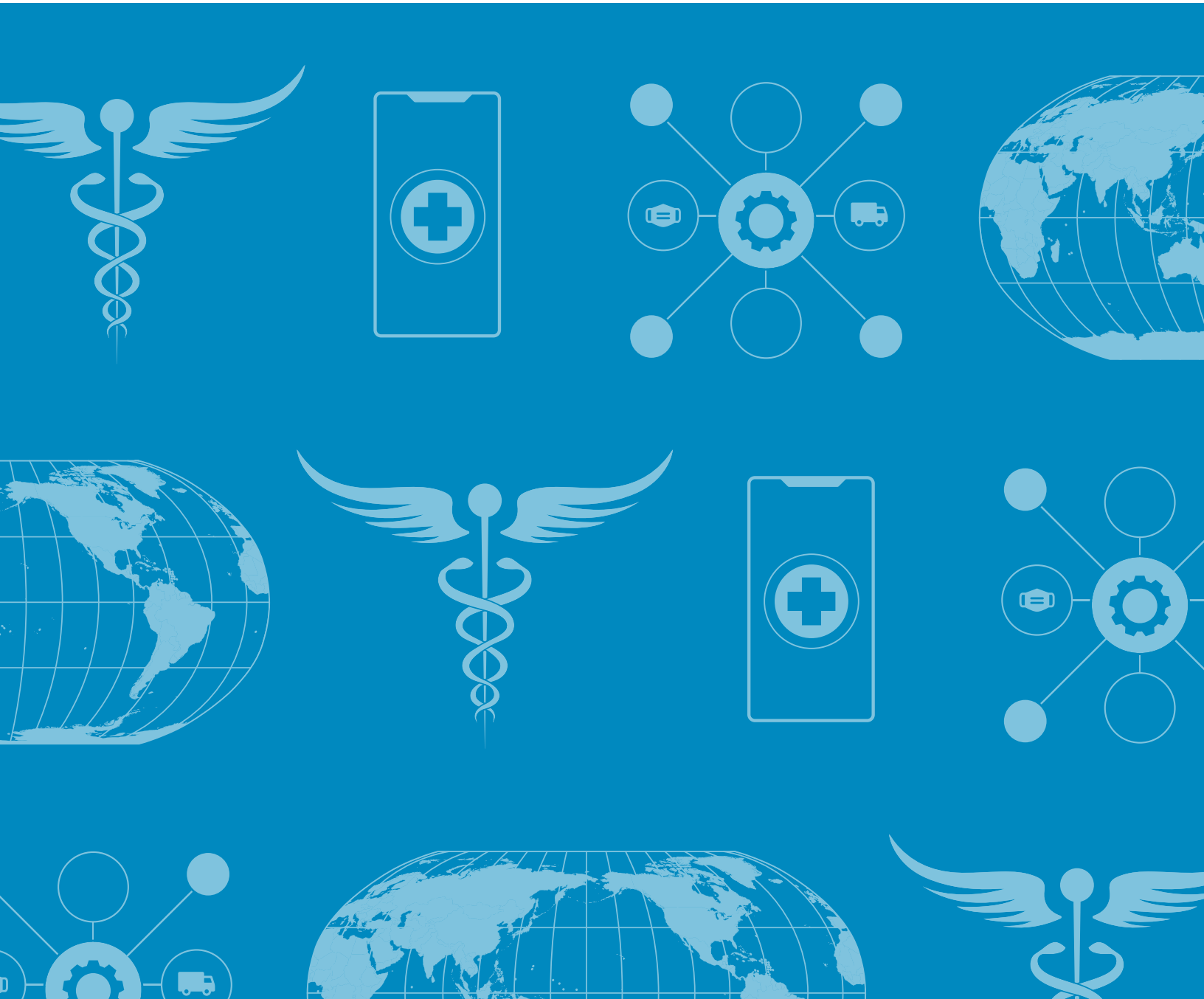
Summary Report

TRANSLATING ASIA PACIFIC COVID-19 EXPERIENCES FOR CANADA:

Building Resilient and Comprehensive Responses to Future Pandemics



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01

INTRODUCTION

The COVID-19 pandemic has proven to be an exacting test for public health systems, economies, and societies worldwide. In Canada, the pandemic has claimed over 25,000 lives since it started, especially among the elderly. At the same time, Canada's economy has experienced a historic slump, with GDP contracting by 4.5% in 2020 compared to 2019. While the economy has recovered to a degree, it has yet to attain its pre-pandemic value, and lingering negative effects of continued disease transmission and economic shutdowns continue to disproportionally impact certain communities, such as visible minorities, Indigenous groups, low-wage workers, and youth.[1] The pandemic has also strained the international systems of trade and diplomacy that Canada relies on and participates in, adding to economic stress and trade competition, especially for goods critical to the pandemic response. To better prepare for similar health crises in the future, it is crucial that Canada evaluate its own COVID-19 challenges and shortcomings and that it learn from the experience, knowledge, and preparation in pandemic responses from other countries.

The Asia Pacific Foundation of Canada has examined the diverse COVID-19 experiences of multiple economies in the Asia Pacific region with the objective of drawing key lessons for Canada. In comparison to North America and Europe, several Asia Pacific economies – despite their geographical proximity to the pandemic's epicentre in Wuhan, China – experienced relatively lower rates of transmission and death, particularly in the early phase of the pandemic, which caught many western states by surprise.

Several economies in the Asian region have a more recent history of responding to emerging infectious diseases with high economic and social impacts, most significantly severe acute respiratory syndrome (SARS) in 2002-2003 and Middle East respiratory syndrome (MERS) in 2015. Regional economies taken as examples for this project either already possessed practical knowledge in the management of infectious disease outbreaks and their social and economic fallouts, or quickly pivoted, formulating cross-sectoral policies and measures that better responded to the specific characteristics of COVID-19.

This report summarizes the research, analysis, and key findings of four policy reports dissecting the experience of Asia Pacific economies as they responded to COVID-19. These four reports examine the following areas:

- Public health and pandemic response;
- Digital innovation for pandemic response;
- Cross-border trade flows; and
- International engagement in global health.

These analyses provide policy recommendations for the Public Health Agency of Canada (PHAC) and bring forth valuable structural recommendations to help the federal government reform Canada's pandemic preparedness and build comprehensive response strategies for the future. For further information, analyses, and detailed case studies, please consult the full reports.

The first section of this summary report examines public health responses to COVID-19 across seven Asia Pacific economies. Researchers examine pandemic preparedness, institutions, public health policies, and legislation either in place prior to COVID-19 or that was rapidly developed and modified at its onset. It identifies and provides in-depth analysis of the factors in pandemic response that allowed Australia, Japan, New Zealand, Singapore, South Korea, Taiwan, and Vietnam to bring COVID-19 under control and prevent heavy death tolls. The report puts forth recommendations to build whole-of-society pandemic responses based on scientific expertise and lessons from past experiences.

Section 2 explores the development and rollout of digital technologies deployed in pandemic response and health care. This section also identifies and examines the enabling policy, legal, institutional, and societal factors facilitating the development and adoption of such digital tools for public health. It ends with takeaways for the government of Canada on the need to *reform*, at a national level, key structural policies such as data sharing, responsive and open technology development, digital literacy within government

agencies and the public, and evaluation of public-private partnerships for future digital health innovations.

Section 3 provides an overview of the impact the pandemic has had on global value chains (GVCs) and the trade of medical products, such as personal protective equipment (PPE) and vaccines, between Canada and the Asia Pacific region. It examines five major problems faced by Asia Pacific and Canadian multinational corporations (MNCs). The case studies include the disruption of GVCs due to export restrictions, transportation delays, and poor labour practices. Also covered are government or private sector programs facilitating reshoring and collaboration among MNCs and small and medium-sized enterprises (SMEs). This section closes with recommendations on how Canada can better prepare for and mitigate supply chain disruptions on key goods during a future health crisis.

Section 4 examines pandemic responses from prominent international organizations that pivoted their programs, research, and funding to address the challenges of COVID-19. Researchers focused on international, regional, and subnational organizations active in Asia Pacific economies that fulfilled diverse roles complementing global and national response efforts. This report proposes a new ecosystem approach to demonstrate how organizations at multiple levels have worked together throughout the pandemic, and how Canada can maximize its engagement with these organizations to build diverse and resilient ties with the region.

02

PUBLIC HEALTH RESPONSES TO COVID-19 IN THE ASIA PACIFIC REGION

While Canada was relatively well prepared for a potential pandemic and fared better than other high-income countries in North America and Europe, its experience during COVID-19 has still resulted in significant loss of life and economic damage. In comparison, economies in the Asia Pacific region, geographically closer to the pandemic's epicentre in Wuhan, China, experienced relatively lower transmission and death rates, particularly in the early phase of the pandemic.

As Canada and others continue to quell subsequent waves of COVID-19 and find a "new normal" for the future, it is critical for it to gather lessons from national and international experiences with COVID-19 in preparation for the next pandemic. Canada has the opportunity to learn not only from its own domestic battle with COVID-19, but from effective and agile responses from partners across the Pacific. Canada can harness these key lessons for its own health policy and institutional changes in preparation for the next health crisis and novel pathogens, a process that will take time and long-term investment, as seen in the cases from the Asia Pacific.

This report, *First Responders: How the Asia Pacific Region Managed the Public Health Response to COVID-19 and What Canada Can Learn From Them*, examines the pandemic preparedness and public health policies of seven Asia Pacific countries. It provides an in-depth analysis of the factors that allowed Australia, Japan, New Zealand, Singapore, South Korea, Taiwan, and Vietnam to bring COVID-19 under control, mitigating disease burdens, death

tolls, and consequent economic damage within their borders. These seven countries were selected based on two key criteria:

1. Overall low cumulative case numbers and mortality through multiple early waves of transmission; and

2. Co-ordinated pandemic preparedness and response across a diversity of governance and political models, and health-care infrastructure.

The research, analysis, and policy recommendations for Canada focus on seven categories relevant to pandemic planning and public health: (1) governance structure, expertise, and experience; (2) pandemic preparedness; (3) public health and pandemic response; (4) border measures; (5) case-based interventions; (6) population-based interventions; and (7) communication strategies. A summary of key findings and recommendations for each category is presented below.

Governance Structure, Expertise, and Experience

Analysis of the COVID-19 response in the seven Asia Pacific case study countries reveals that their public health institutions and pandemic response planning were largely shaped by previous experience with outbreaks, most significantly SARS in 2002-2003 and MERS in 2015. Common themes for reform included improved inter-governmental and inter-ministry co-ordination, improved definition of roles and authority, elevating the role of experts, and the protection of vulnerable populations. The consequent changes to health governance structure and public health institutions paved the way for the successful responses to COVID-19.

After the SARS (2003) and MERS (2015) outbreaks, Asia Pacific governments like South Korea and Taiwan created new disease control institutions, enhanced their powers through law, and created clear-cut protocols for inter-agency and whole-of-government co-ordination in the event of an infectious disease outbreak. Governments established new agencies like the Korea Disease Control and Prevention Agency (KDCA) and Taiwan's National Health Command Center (NHCC), legally backed by the Infectious Diseases Prevention and Control Act and the Communicable Disease Control Act, respectively.[2] Later on, South Korea and Taiwan reformed their infectious disease legislation to designate the KDCA and NHCC as command centres with clear authority to implement necessary health measures; deploy required medical personnel at the municipal, state, or countrywide level; and co-ordinate among all levels of government and multiple ministries.[3]

Although spared from previous infectious disease outbreaks, Australia has been proactive in establishing mechanisms for co-ordination and co-operation among levels of government in key areas, especially public health after the onset of COVID-19. Lacking a central public health agency analogous to PHAC in Canada or the CDC in the United States, Australia exemplified a co-operative model of pandemic responsiveness. The Australia Health Protection Principal Committee (AHPPC), chaired by the chief medical officer and consisting of the chief health officers of the states and territories, is the principal decision-making committee for public health emergency management and disease control in Australia.[4] The practical effect of agencies like the AHPPC and KDCA is a cohesive national response that is able to balance power among levels of government, and ultimately is more effective than Canada's fragmented approach.

Pandemic Preparedness

Responses to COVID-19 in Asia Pacific countries heavily benefited from the emphasis on infectious disease control, the pre-eminent role of public health scientists and experts in guiding measures, and rigorous practical testing of existing pandemic plans. Several governments in the region, including Singapore, Taiwan, and South Korea, supported the increase in the number of infectious disease experts and epidemiological staff working at national, provincial, and municipal levels.[5]

Governments also committed to increased funding for infectious disease preparedness, including electronic information systems for health care. In South Korea alone, these policy mandates for medical talent and institutional capacity led to a doubling of the number of epidemic intelligence service officers and a 182% rise in the budget for contagious diseases and quarantine systems over five years.[6] The retention of such expertise and key staff built over time within public health agencies further contributed to rapid pandemic responses. Experts on the forefront of health measure implementations and in decision-making positions also meant that responses were scientifically guided.

Additionally, Asia Pacific economies have made a habit of conducting rigorous practical exercises to evaluate and update pandemic plans. Taiwan updates its Emergency Infectious Disease Response Handbook annually and holds quarterly training sessions and drills for relevant staff.[7] Likewise, the KDCA in South Korea facilitates infectious outbreak simulations with local governments, central government departments, and the private sector. Fortuitously, the KDCA conducted such a drill in December 2019, before its first reported COVID-19 case, further making South Korea's response a well-oiled machine.[8]

Most successful responses in Asia Pacific countries followed an elimination approach, pursuing containment strategies for COVID-19 with the purpose of reducing community transmission to nearly zero.[9] Unlike in Canada, pandemic planning in jurisdictions like Taiwan, while based on pandemic influenza, was designed to more readily adapt to the unique characteristics of novel viruses and incorporated knowledge gathered from prior experience with coronaviruses (SARS and MERS). Australia and New Zealand, despite initially planning for a mitigation strategy, recognized the limitations of this approach as applied to COVID-19 and pivoted to elimination, a decision that resulted in these two countries successfully controlling transmission.[10] Going forward, it is critical that Canada formulates future pandemic plans expansive enough to cover a range of pathogens and characteristics beyond influenza and flexible enough to readily adapt when the available evidence suggests that elimination is the most viable option.

Public Health and the Pandemic Response

Early warning systems that monitor for external threats are an important first component of an effective pandemic response. This type of surveillance played a key role in pandemic responses in the Asia Pacific. For instance, Taiwan and South Korea both conduct real-time, event-based surveillance, identifying public health events and flagging them for risk assessment.[11] Canada's own surveillance system, the Global Public Health Intelligence Network (GPHIN), is a partner of the Global Outbreak Alert and Response Network and has been lauded in the past. However, due to shifting priorities within PHAC, it was operating at diminished capacity before the outbreak of COVID-19. Given the speed with which viruses can transmit, particularly in the era of modern travel, advance notification of emerging infectious diseases (EIDs) provides valuable time to prepare and initiate a response.

Several Asia Pacific economies conducted their own risk-assessments informed by both previous experience with EIDs, proximity to the outbreak epicentre, and severe reactions from other governments to the novel virus. Regional governments like Taiwan and South Korea based their risk-assessment frameworks on WHO and European standards.[12] They also included information coming from beyond their borders, so they became appropriately concerned when China acted quickly to lock down Wuhan and began speed-building hospitals.[13] Hence, Seoul and Taipei kickstarted their responses independently, relying on their own intelligence and standards of risk, while others, like Canada, awaited advice from the WHO.

Throughout the early stages of the pandemic, Asia Pacific economies were highly responsive and quick to adapt their measures based on changing information. For instance, Taiwan updated its case definition to include patients with pneumonia of unknown cause regardless of travel history by mid-February 2020.[14] South Korea also rapidly increased national alert levels – from blue on January 3 to red (the highest level) by February 23 – enabling the activation of extensive testing and contact tracing efforts.[15] Thus, South Korean officials identified and isolated community transmission clusters in a timely manner that prevented rampant domestic spread. Compared to Canada's delayed and overly cautious response, countries with the most stringent responses in the first months of the pandemic had the best opportunity to control spread without resorting to excessively harsh measures, before widespread community transmission occurred, potentially overwhelming contact tracing and testing systems.

Border Measures

While a contentious policy internationally, Asia Pacific countries and territories did employ well-timed border measures judiciously, inspecting inbound flights and passengers as well as banning certain flight origins based on assessed risk.[16] Such policies were only adopted in the early stages or during severe waves, contributing to delaying and mitigating community transmission.[17] Hence, these territories added time to scale up the implementation of domestic measures and production of crucial testing capacity. Places that rapidly instituted strict border control measures, including mandatory quarantine, also recorded the lowest per-capita mortality rates. Countries and territories in the Asia Pacific region also understood that border measures – and their overall response – were only effective as long as the magnitude of community transmission was properly evaluated through comprehensive testing and border screening, and curbed through complementary restrictions to domestic travel and consistent national-level quarantine measures.

Quarantine protocols in the Asia Pacific region were also more stringent than Canada's. Singapore, Taiwan, Hong Kong, and South Korea took advantage of technology to monitor and enforce home-based quarantines.[18] This varied from simple phone calls or text messages by health officials to electronic fencing through GPS-enabled smartphone applications or personal devices like wristbands to verify a quarantining person's location.[19] The travel deterrent posed by quarantine requirements also curbed the population's international and domestic movement, giving less opportunity for COVID-19 to spread. Hence, it is important for Canada to include and support comprehensive measures – from border restrictions to extensive contact tracing and quarantining – in its pandemic planning, particularly for the early response phase.

Case-Based Interventions

The ability to test a broad range of individuals – and thus to proactively identify cases before they become clusters of community transmission – relies on a high testing capacity at an early stage. Although their methods differed, the Asia Pacific countries and territories that most successfully controlled COVID-19 demonstrated a rapid expansion of capacity and consistent standards for testing that enabled authorities to cast a wider net and to proactively identify cases before they became clusters. In Canada, barriers to increasing testing capacity varied by region and included shortages of test kits, reagents, and lab personnel.[20] Active preparation in the years after SARS and MERS allowed several Asia Pacific jurisdictions to develop surge capacity in test production.

Similarly, aggressive contact tracing, aided by existing pools of already-trained personnel and novel technologies, was a major factor contributing to successful pandemic control in Asia Pacific economies. A successful contact tracing strategy must be fast and thorough; however, it is affected by levels of co-operation and recall bias and is also highly labour-intensive. Japan used a backward contact tracing strategy that sought to identify the source of the infection, thereby enabling the identification of clusters of transmission that emanated from that source.[21] Backward contact tracing was also adopted by South Korea and Australia as the pandemic progressed.[22] South Korea also used digital technology in its contact tracing efforts through the KDCA's Epidemiological Investigation Support System, which collects and analyzes a range of data, including from GPS devices, credit cards, and CCTV, in its contact tracing efforts.[23]

Population-Based Interventions

Asia Pacific responses to COVID-19 benefited immensely from early implementation of social distancing and mobility restrictions. For instance, South Korea began urging social distancing as early as February, and modelling suggests that strong social distancing measures played a key role in South Korea's ability to contain transmission without instituting a lockdown.[24] Nonetheless, timely and judicious use of targeted and short-term lockdowns were effective in curbing subsequent waves of transmission in Australia and New Zealand throughout 2020.[25]

A comparative analysis suggests that the early adoption of mask wearing is one of the factors associated with controlling transmission and lowering death rates due to COVID-19. South Korea, Taiwan, Singapore, and Vietnam were among the first to mandate mask wearing within the first three months of 2020.[26] In South Korea, the public started

wearing masks before official enforcement came into effect in October 2020.[27] Although Canada did not have a culture of mask wearing prior to COVID-19, once masks became the subject of public health orders across the country, the Canadian public demonstrated a high level of compliance. A Statistics Canada survey showed that 84% of respondents reported wearing masks or other PPE in July 2020.[28] COVID-19 has been a learning experience for Canadians as well, raising the possibility that they will voluntarily adopt mask use in response to the next emerging infectious disease.

Communication Strategies

Many economies in the Asia Pacific region, as well as Canadian provinces such as BC, made health officials the forefront of communication campaigns to build trust and credibility and promote public buy-in. They also maintained consistent and clear messaging, further bolstering public adherence and support for health measures among citizens. In addition, appeals based on emotions, narratives, and shared values in New Zealand, Taiwan, and Singapore proved successful in building trust, especially when tailored to existing social and political circumstances.[29]

Governments in the region have also been proactive in diffusing multilingual messages and information through novel and creative methods. In Vietnam, the government sent regular updates via SMS and released the NCOVI app in March 2020 for the dissemination of information and health recommendations.[30] Singapore and Vietnam also used a broad range of media, including print and social media and messaging applications like WhatsApp, Twitter, TikTok, and Facebook on a daily basis to inform and advise diverse audiences speaking different languages and of varying ages.[31]

Policy Recommendations

Although the responses of the Asia Pacific region have been highly cohesive compared to that of Canada, a feature that undoubtedly contributed to their effectiveness, analysis shows that a central system of government is not a prerequisite for a cohesive national response, as demonstrated by Australia. The report recognizes the challenges of a federated health-care system that led to a fragmented response in Canada and suggests strategies to close such gaps at the federal and provincial levels and leverage the role of PHAC as a national public health agency.

Moving forward, Canada faces the challenge of building and reforming its pandemic preparedness and response policies for the inevitable emergency of new pathogens in the future. Policy recommendations (included in the full report) for the area of public health and pandemic preparedness are organized along the following key themes:

1. **Effective pandemic responses are strengthened by structural and institutional preparations following a whole-of society approach, with many policies informed by and shaped through previous experience.**

   Public health institutions and pandemic response planning were largely informed and shaped by previous experience with outbreaks, most significantly SARS in 2002-2003 and MERS in 2015. Common themes for reform included improved inter-governmental and inter-ministry co-ordination, improved definition of roles and authority, elevating the role of experts, and the protection of vulnerable populations. The consequent changes to health governance structure and public health institutions paved the way for the successful response to COVID-19 in economies like Taiwan and South Korea.

   In Canada, it is not possible to wholly replicate the more centralized models of government co-ordination in pandemic response seen in South Korea or Taiwan since provinces and territories oversee their own health-care systems and policies. However, the key takeaway from these examples in Asia is the need to strengthen Canada's co-operation between federal and provincial/territorial governments. Formulating a more cohesive national response should be included in future pandemic plans, with PHAC as a key co-ordinating agency.

2. **Responses need to be guided by scientific expertise using what limited data is available while remaining agile enough to adapt quickly as new data and evidence come to light.**

   Responses to COVID-19 in Asia Pacific countries benefited from the heavy emphasis on infectious disease control, the pre-eminent role of public health scientists and experts in guiding pandemic response measures, and rigorous practical testing of existing pandemic plans.

   Responses were complemented by quick decision-making, flexibility and rapid adaptation of response measures based on changing information. Asia Pacific economies were quick to act based on their own early warning systems and risk assessments, influenced by past experience with emerging pathogens such as SARS and MERS. Economies without this prior experience also benefitted from taking decisive action in their pandemic responses as they learned more about the novel

virus and how other governments were responding. Canada needs to formulate comprehensive and flexible pandemic plans that can be adapted to different pathogens, and be prepared to more readily shift between mitigation and elimination strategies, as more information about the pathogen in question becomes available.

3. **Timely decision-making and implementation of response protocols, either already established or new, vastly impacts the effectiveness of a response.**

   What is notable about the analysis is that the most effective features of the pandemic response were not novel practices but rather swift and decisive action guided by an appropriate level of risk awareness. Canada did not go into COVID-19 unprepared; what was lacking was a sense of urgency and the willingness to take early and decisive action. Countries without the advantage of previous experiences, notably Vietnam, Australia, and New Zealand, had relatively underprepared health-care systems for a pandemic. As a result, they relied on more stringent measures, including strict border restrictions and institutionalized quarantine. These measures, implemented in a timely manner, helped to curb community transmission and avoid the need for frequent, lengthy, and economically damaging lockdowns.

03

DIGITAL INNOVATIONS IN PANDEMIC RESPONSES

The pandemic accelerated the development and adoption of digital technology around the world, particularly for digital health tools to combat COVID-19. Governments in China, Taiwan, and South Korea, for example, have deployed different digital systems and applications to accelerate and increase the efficiency of their pandemic response. Such uses of technology have been reported to contribute significantly to their overall success in limiting the outbreak.

The North American coverage and analysis of technology deployment against COVID-19 in Asia have largely focused on invasive uses of data-driven electronic systems and mobile applications that could potentially undermine civil rights. This type of discussion has also drawn the attention to the different political, social, and/or cultural contexts unique to Asia used to underscore the inapplicability of similar digital tools for pandemic response in current Canadian settings.

While the critiques above are partially legitimate, these types of analysis reduce a wide array of factors to the question of whether Asians care about privacy or not. This limited framework fails to recognize the potential technology holds to improve Canada's pandemic preparedness and response strategies in the future, especially as the adoption of digital technologies in a range of sectors beyond health continues.

This report, *Digital Innovation for Pandemic Response in Asia: Lessons for Canada*, seeks to provide both an overview of the digital tools employed for pandemic responses in Asia and a more nuanced understanding of the institutional and social context factors that enabled the relatively successful deployment of digital technology for public health during COVID-19. It examines several examples of deployed data-driven technologies implemented in multiple Asian economies to facilitate: (1) contact tracing; (2) health surveillance and quarantine monitoring; (3) medical supply distribution; and (4) telehealth. Then, it examines the foundational factors that enabled and facilitated the rollout of technologies for pandemic response, ending with policy recommendations.

Contact Tracing

Multiple economies across the Asia Pacific region have invested in and deployed different forms of digital contact tracing, relying on technology to reduce the human effort and time involved in the notoriously labour-intensive process. For instance, Singapore, Brunei, Indonesia, and Malaysia have all introduced contact-tracing apps similar to the COVID Alert app in Canada, taking advantage of GPS and Bluetooth functionalities in mobile phones.[32]

In South Korea, Taiwan, and Vietnam, the governments created data-sharing mechanisms to facilitate rapid contact tracing. For example, Taiwan's TRACE, its contact tracing platform, is connected to different government databases that facilitate data collection from multiple government sources and real-time monitoring.[33] South Korea's Epidemiological Investigation Support System collects data from different government ministries and agencies and all the mobile service providers to conduct contact tracing.[34] China has leveraged the omnipresent mobile "super apps" like WeChat and Alipay, connecting them to the National Integrated Government Service Platform for contact tracing and transmission surveillance.[35]

Health Surveillance and Quarantine Monitoring

Multiple governments in Asia also rolled out digital solutions for monitoring and surveillance of confirmed COVID-19 cases, inbound travellers, and suspected carriers, a key part of their quarantine and self-isolation measures. Brunei and Hong Kong provided wearables (i.e., wristbands) for those undergoing mandatory quarantine to confirm their locations.[36] China integrated health data from the health-care system with a real-time monitoring system to develop a health code system with epidemiology maps. In turn,

these maps can be used by local governments for monitoring COVID-19 transmission in the population.[37] Similarly, South Korea's Smart Quarantine System pools data from a variety of government sources and telecommunication companies. This allows South Korea to efficiently identify, contact, and quarantine high-risk inbound travellers.[38]

Medical Supply Distribution

Several economies in Asia developed and rolled out innovative tools to facilitate the even and effective allocation and distribution of medical supplies such as PPE and vaccines. For instance, Taiwan implemented a mask rationing program based on its pre-existing National Health Insurance (NHI) database. Individuals could purchase 9 masks every 14 days, with the limit verified through the person's NHI card. Taiwan also leveraged crowdsourced information for the NHI mobile app, enabling users to make online purchases, particularly for masks, and reservations for convenient store pickup.[39] Singapore also took a technological and centralized approach to distributing more common medical supplies like masks, using a website to organize pickup schedules.[40] In South Korea, collaboration between the government and tech companies, such as Naver and Kakao, combatted vaccine wastage by allowing users to track the availabilities of vaccines as cancellations or no-shows emerged using an online map feature.[41]

Telehealth

COVID-19 also led to a rapid adoption of various telehealth services and mobile apps throughout 2020. While private services, these applications served important roles as both screening tools for COVID-19 and as remote doctor consultation platforms. Indonesia's Check COVID-19 app, Japan's LINE Healthcare, and China's Ping An Good Doctor are examples of either private sector-led or public-private partnered digital initiatives that have helped screen suspected COVID-19 patients remotely.[42] Other telehealth applications, like Ali Health and We Doctor in China,[43] GrabHealth in Indonesia,[44] Doctor Anywhere in Singapore, and VieVie and Jio Health in Vietnam,[45] are digital solutions offering remote doctor consultations, medication ordering, and even automated delivery options to patients seeking help for common and chronic illnesses. Facilitating medical services like virtual screening and doctor consultations eased the demand on and inflows into already strained hospitals during the pandemic.

Technological Foundations: Institutional Factors and Social Contexts

The rollout of these technologies in Asia was made possible and facilitated by certain institutional and societal factors in place prior to the pandemic. Some Asian governments, based on their experiences with SARS and MERS earlier in the century, have established or reformed government institutions, laws, electronic systems, and procedures to swiftly respond to a pandemic. Infectious disease laws created new public health institutions in multiple jurisdictions. Examples of these include the Centre for Health Protection in Hong Kong, the National Centre for Infectious Diseases in Singapore, the KDCA in South Korea, and the Central Epidemic Command Center in Taiwan. These public health agencies played crucial co-ordinating and advising roles over the pandemic and were key information repositories guiding response measures.

Additionally, the laws granted governments in Asia, especially the recently established public health agencies, certain key rights that aided in the rollout of digital tools in pandemic response. First, these laws allowed public health agencies to access and manage a wealth of personal and health data from government and private sources to assist them in determining health measures to curb transmission of an infectious disease. Second, in collaboration with government, these agencies were also allowed to establish their own electronic systems to better perform their law-mandated duties in the event of a health crisis.

Aspects present in the diverse social contexts in Asia also aided in the deployment and relative acceptance, even high adoption, of digital tools against COVID-19. It is important to recognize that citizens in Asia are equally or more concerned about online privacy in comparison to North American and European counterparts.[46] In fact, the use of invasive forms of digital technology in response to COVID-19 has raised questions and backlashes in the region. Additionally, countries in Asia have more challenges related to lower levels of public trust in government compared to Canada.[47]

In this context, governments in Asia have endeavoured to foster trust in their public health measures, including the use of data-driven digital tools and systems, throughout the pandemic. They have also needed to be responsive to privacy and data-use concerns from their citizens to demonstrate that they are trustworthy stewards of personal data, employing the data for health purposes, to keep the public informed, and to hasten a return to a new normal.[48]

Another important point to consider is the familiarity of the Asian public with digital public service and tools. In 2020, Asia as a region scored ahead of Canada on the United

Nations E-Government Development Index, in particular global leaders in e-government adoptions such as South Korea, Singapore, and Japan.[49] This shows that populations across Asia, particularly in leading countries, have higher levels of familiarity with digitally accessing public services, creating a more welcoming environment for pandemic digital tools like contact-tracing apps.

Close collaboration between governments and key tech players to develop and roll out COVID-19 digital tools, either as stand-alone mobile apps or additional functions within an app, contributed to the public's comfort and ability to engage with such technologies. This was especially true when these private sector applications facilitated key public services aiding in pandemic responses. For example, South Korea partnered up with domestic tech leaders Kakao and Naver to facilitate vaccine distribution through free, in-app vaccine availability mapping and bookings.

Also, the platform effects of these ubiquitous services must be taken into consideration. For instance, WeChat and Alipay are so ubiquitous in China that it is almost impossible to conduct day-to-day tasks without them. Apps such as Grab, Gojek, or Kakao enjoy similar statuses in their respective economies. These mobile applications provided an existing and widespread foundation for convenient dissemination of digital pandemic response tools.

Further, attitudes about technology may have influenced the public support or, at least, toleration of digital tools used in response to COVID-19 in Asia. According to a poll by Oxford, there is a sharp discrepancy in global risk perception of AI decision-making by region, with respondents in Asia generally having a positive attitude toward AI in comparison to North American and European respondents.[50] Another study done by Edelman in 2021 showed that respondents in several Asian economies – including India, Indonesia, and South Korea – still maintained high levels of trust toward their technology sectors, while this trust had declined across North America and Europe.[51] As a result, local populations in the region were likely more amenable to the use of digital tools throughout the pandemic.

Policy Recommendations

For Canada, it is not the lack of ideas or access to technology that makes the deployment of these solutions challenging in a domestic context; after all, Canadian software developers are perfectly capable of developing the same apps or systems. Instead, this research demonstrates that what has made the rollout of these digital solutions possible in Asia, but not in Canada, are institutional factors and social attitudes. Analysis of these enabling

factors leads to relevant lessons for Canada beyond highlighting interesting technology solutions.

The report provides the following recommendations and key takeaways for Canada, including legal and institutional frameworks allowing for comprehensive and secure data governance, mechanisms to build trust in technology and digital literacy among the public, and re-defining collaboration between public and private sectors.

1. **Reform data governance frameworks – in both the short and long term.**

   The ability of governments in Asia to share personal data between different ministries and levels of government was a key factor contributing to the success of digital technologies in controlling COVID-19's transmission. While the more intrusive forms of data collection and usage would not align with Canada's social values, Canadian policy-makers have been consistently informed about the need to develop a more coherent model of data governance at the national level, not just for the pandemic response, but also for modernized public administration, health care, and economic competitiveness.

2. **Build channels for public participation – and eventually, public ownership.**

   The effectiveness of programs deploying digital technologies as pandemic response relies significantly on community buy-in to drive high levels of uptake among the public. Digital solutions should be developed in a way that actively channels public input, be it in the form of surveys/questionnaires, requests for comment, information gathering, or real-time feedback. Given methods to engage in the technology deployment process, the public can develop a better understanding of the mechanisms and rationales behind these tools and platforms, while at the same time developing a stronger sense of ownership.

3. **Re-think the public-private partnership.**

   The case studies from Asia highlight the need for the government of Canada to re-think the model of public-private partnerships in the development of digital solutions. In Asia, the collaboration between public health agencies and major tech companies such as WeChat, Alipay, Kakao, Naver, or Gojek has enabled the rollout of digital solutions in various areas of the COVID-19 response. However, these responses were made possible because of a different type of relationship between the public and private sectors; governments have a more hierarchical relationship with the firms, and the tech companies are often seen as "national champions" that have a stake in the well-being of the citizens.

4. **Strengthen public understanding – and eventually, trust – in technology.**

   The public engagement with digital solutions introduced by governments in Canada and Asia has underscored the importance of strengthening the public understanding of these new tools. Educating the public on how their data is collected and used and how they can properly address misuse of their data could enhance trust in future rollouts of digital solutions. Asian governments have shown responsiveness to public queries and criticisms of their technology during the pandemic, enhancing trust (or at least, acceptability) of the digital solutions.

04

SUPPLY CHAIN DISRUPTIONS DURING THE COVID-19 PANDEMIC

The rapid spread of COVID-19 in early 2020 caused a sudden increase in global demand for medical goods that could limit the spread of the virus or reduce its deadliness. The overwhelming demand for these products put stress on global value chains (GVCs), which encompass the full range of activities involved in bringing a product to market. It caused universal shortages of medical goods and PPE. Companies found themselves ill-equipped to meet the increased demand due to low stockpiles of the required goods, the difficulties involved in quickly scaling up production, and the complexity of co-ordinating the safe delivery of goods to those in need.

Supply chains were particularly affected by the pandemic as they typically rely on a "just-in-time" model of production, meaning that goods arrive right before they are placed on the shelves or are included in the manufacturing process. The last-minute nature of this system meant that companies were left with insufficient inventory when the demand for medical goods increased.

Goods produced in Canada, such as automobiles, often rely on intermediary goods from Asia that then have "value" added to them through modifications made in Canada. These value-added exports highlight the interconnectedness of Canadian goods and GVCs in Asia. For example, a recent Statistics Canada report that analyzed 2016, 2017, and 2018 trade data found that almost 50% of Canada's domestic production inputs rely on some Chinese content.[52] These Canadian goods that rely on inputs from Asian GVCs are often

adversely affected when a sudden external shock, such as an increase in global demand, leads to supply chain failures.

In March 2020 the Institute for Supply Management conducted a survey of 600 firms in the United States and found that 75% of the companies had experienced supply chain disruptions as a result of COVID-19.[53] Canada also experienced its share of supply chain failures due to protectionism and logistical strains during the course of the pandemic.

Asia Pacific countries are some of the leading manufacturers of medical goods and PPE due to their large manufacturing capabilities and were among the first to experience large-scale supply chain disruptions caused by the pandemic. Firms based in Asia Pacific countries faced the same difficulties that plagued companies and MNCs around the world, but they have more experience combatting widespread respiratory viruses due to the 2002-2003 SARS outbreak in Asia and the 2015 MERS outbreak in South Korea. This experience provided many Asian countries with the tools necessary to mitigate supply chain tensions during the COVID-19 pandemic.

This report, *Supply Chain Disruptions During the COVID-19 Pandemic: Lessons for Canada*, explores five major problems that contributed to the breakdown of supply chains during the COVID-19 pandemic and offers recommendations for how to better handle these issues in the future:

1. The increase in demand for certain goods, which caused a manufacturing shortage. Throughout the pandemic, there was an overwhelming demand for any COVID-19-related product. Companies could not produce these goods fast enough to meet the demand, which subsequently caused supply chain issues;

2. Goods that cannot be domestically produced, through reshoring or refocusing operations, and for which there are only a few supply chains readily available, and the problems that followed in relying on specific companies for production;

3. Temporary export restrictions that were put in place by some countries that were able to produce these goods domestically;

4. The overreliance on certain economies for COVID-19-related goods, which in some cases resulted in the decision to reshore production; and

5. The logistical challenges companies faced in transporting vaccines. Once vaccines had been manufactured, the next challenge for multinational corporations was determining the best way to distribute and transport them. There were challenges in temperature requirements, transportation methods, and deliveries to remote communities.

Policy Recommendations

To overcome these intertwined challenges, the report proposes the establishment of a supply chain task force to promote transparency, research, and funding of initiatives that will increase Canada's understanding of GVCs; increase public-private discussion and collaboration; identify critical goods; and cultivate a diversified stockpiling strategy. These measures could ensure that Canada is better prepared to weather any future global crises that have a significant impact on supply chains.

The purpose of the task force will not only be to respond to crises, but also to prepare preventive mechanisms that can identify potential disruptions and provide a framework that can be used to respond to these issues. The task force will provide support to the government and private companies in the form of technical assistance or consulting services and funding to support the implementation of any programs deemed necessary to prepare for future supply chain shocks.

This specialized task force will do the following:

1. **Increase access to supply chain data.**

   At the beginning of the pandemic, companies that had invested in creating supply chain maps for their operations were better prepared and informed when tackling production challenges. The mapping process can be very expensive and difficult to maintain. Hence, the supply chain task force can provide a valuable service by identifying critical goods that need to be easily accessible during a crisis and their key suppliers. Then, it could provide subsidies or other incentives to encourage companies to map their own supply chains to ensure that this type of information is readily available in a crisis.

2. **Improve assessment of reshoring decisions.**

   The government of Canada can also use the supply chain task force to address reshoring decisions. In concert with businesses, producers, health-care experts, trade specialists, and economists, the task force can assess the feasibility of reshoring or near-shoring critical and vulnerable supply chains. Once the imperative for reshoring is determined, a security mandate from the federal government would be necessary to enforce this process.

3. **Ensure due diligence to avoid supporting unsafe labour practices.**

   Manufacturers of goods that cannot be domestically produced through reshoring and refocusing will occasionally employ unsafe labour practices that lead to delays,

including disease outbreaks in production facilities and human rights violations. Therefore, the supply chain task force can be useful as a monitoring body, ensuring that companies are doing their due diligence in regard to labour conditions and practices. This can be done by facilitating a company's own investigations on labour conditions or by prompting companies providing critical goods to conduct such reviews.

4. **Support collaboration between stakeholders.**

   One of the key takeaways from the COVID-19 pandemic is that responses were not organized quickly enough and did not always involve the right actors. To address this issue, the proposed task force could facilitate the timely communication and consultation among the relevant stakeholders – from trade ministers to local businesspeople – to address supply chain problems during a crisis.

5. **Foster an information-sharing innovation ecosystem in Canada.**

   As part of the supply chain task force's mandate to promote discussion, it can also foster an innovation ecosystem in Canada and encourage large corporations to connect with SMEs. Intentionally creating linkages between universities, civil society, and industry, as well as fostering knowledge sharing between firms, can be achieved through a systems of innovation approach. This will not only build resilience during massive global supply shocks and demand surges, but it will also allow companies to increase their productivity.

6. **Diversify Canada's stockpiling strategy.**

   Canada already has a stockpiling protocol in the form of the National Emergency Strategic Stockpile (NESS), but this is only one form of stockpiling. The NESS relies on the management of a public stock of critical goods by a public authority, which can be unwieldy and entails the risk of products expiring. Other forms of stockpiling include requiring producers to maintain pre-defined stocks of critical products and/or intermediate goods, like active pharmaceutical ingredients. This can be achieved via fiat, preferential sourcing (granting companies that comply with stockpiling requirements coveted procurement contracts with the government), or financial incentives like subsidies or tax breaks. A feasibility study should be conducted to compare the just-in-time inventory model that has become ubiquitous in global value chains with a "just-in-case" model where inventory exceeds demand in the event of a demand surge.

05

COVID-19, CANADA–ASIA PACIFIC RELATIONS, AND INTERNATIONAL ORGANIZATIONS

Even as global institutions struggled to address the pandemic, many international organizations in the Asia Pacific demonstrated a variety of rapid and proactive responses across the fields of health, economics, trade, investment, political co-operation, and regional integration, that were often more effective than those of global international institutions. This may indicate that what is occurring is not actually a decline in international co-operation but rather a shift away from global institutions. Canada is only involved in a few of these institutions in the Asia Pacific, and there is a great deal of room for expansion in terms of collaboration and exchange of information and ideas.

This report, *COVID-19, Canada–Asia Pacific Relations, and International Organizations*, proposes a new ecosystem approach to explain how international organizations function together and how Canada can use this principle to pursue resilient and long-term engagement strategies in the Asia Pacific, with international organizations of diverse sizes, scales, and scopes.

COVID-19 evoked an apparent decline in the allegiance of many nations to the principles of multilateral institutions such as the WHO. However, the challenges that these institutions faced in responding to COVID-19 did not emerge out of nowhere; rather, there has been a steady movement away from multinational institutions in recent years, accompanied by an increased rivalry between China and the United States.[54] This has fostered a trend toward smaller groupings aligned around a more regional or interest-based focus, as

exemplified by the largely economically focused BRICS (Brazil, Russia, India, China, and South Africa) and MIKTA (Mexico, Indonesia, Korea, Turkey, and Australia) formations to the Quadrilateral Security Dialogue between the United States, Australia, India, and Japan.[55]

The issues around which these various organizations are aligned have largely been focused on security, economics, trade, and development. COVID-19 re-oriented the focus of many international organizations to include pandemic and health-related programs and responses. The pandemic has clearly shown that these disciplines are in fact closely related to public health and that moving forward, international organizations, regardless of their primary focus, should continue to include a health lens in their work.

The disproportionate impact of the COVID-19 pandemic along lines of race, socioeconomic status, age, Indigeneity, gender, and other axes of difference, in Canada and beyond, also revealed the shortcomings of viewing policy using a narrow lens and the impact that public health has on other areas of policy. This process has been facilitated by a reduced focus on binding formal agreements and policy initiatives as scholars and policy-makers have increasingly pointed toward the role international organizations play in "policy transfer" or "policy learning."[56] This shift has been marked by a rise in the influence of epistemic communities and subnational networks, particularly with respect to the field of global health.[57] The response to COVID-19 demonstrated the outsized role now played by these networks. An ecosystem approach to international organizations seeks to understand and identify the roles that various organizations play in a given area of co-operation and takes into account a multitude of interactions and opportunities for engagement at various levels and scales.

The report covers a range of international institutions large and small, encompassing political, financial, and security concerns, including the WHO, the Association of Southeast Asian Nations (ASEAN), the Asia-Pacific Economic Cooperation (APEC), the Asian Development Bank, and the Quadrilateral Security Dialogue. Although the WHO, already focused on public health, seemed less prepared to adapt to the pandemic environment, the response of many other organizations to COVID-19 demonstrates the real-world application of the ecosystem concept.

These institutions collaborated with other international organizations to co-ordinate pandemic responses, advise policy actions, and adapt from their original mandates to prioritize alleviating pandemic-related issues. The research revealed an overwhelming emphasis on staying interconnected through co-operating, collaborating, and co-ordinating response actions on subnational and international levels. Disaster response

and connections forged in previous natural hazard environments emerged as a theme characterizing the activities of several of the international organizations in this report, as in the case of the Asian Development Bank.

The research revealed that Canada had only a minimal presence in the activities of many of these organizations. This may be indicative of the lack of an overarching strategy in Canada–Asia Pacific relations that predates the pandemic. Further, Canada has limited itself to engaging with traditional global international organizations that have acted slowly or been criticized for general inactivity such as the UN, G7, G20, WHO, and the WTO. In addition, Canada's engagement on global health matters in the Asia Pacific was mostly led by Global Affairs Canada (GAC), without involvement from PHAC.

When and how key international organizations in the Asia Pacific reacted to the COVID-19 crisis highlighted several potential opportunities for Canada to take a more active role within the region in the future. There is a great deal of opportunity for Canada to further engage around public health, but an ecosystem approach should drive this engagement in the Asia Pacific.

Policy Recommendations

In consideration of the proposed ecosystem approach, the report makes the following recommendations for Asia Pacific engagement with respect to both the ongoing COVID-19 pandemic and future pandemic planning:

1. **Recognize and advocate for interconnectedness of health, trade, and economic resilience and support more sustained Canadian engagement in the Asia Pacific.**

   Canada will benefit from supporting deeper, more sustained engagement in the Asia Pacific via an ecosystem approach that highlights the importance of maintaining relationships, trust, and good faith with regional and international partners. It is also necessary for Canada to re-evaluate its representation on regional organizations, strengthening and expanding its existing participation beyond traditional organizations like ASEAN, Pacific Islands Forum, or Pacific Community.

   Building more robust relationships with regional organizations does not diminish the importance of helping to strengthen the WHO (e.g., funding, advocating for reform) so it is less beholden to program specific funding, geopolitical influence struggles, and is more institutionally nimble in times of crisis.

At the same time, Canada needs to broaden its methods of obtaining global health information beyond solely relying on the WHO's Secretariat in Geneva. Canada can benefit from direct engagement with WHO regional offices, regional organizations, disease surveillance networks, epidemiology networks, and expert networks (Track 2, etc.).

In times of crisis, Canada needs to ensure the continued and consistent engagement across regions globally and the inclusion of experience and knowledge from the Asia Pacific at different levels. This can be done through mechanisms like an ad-hoc crisis engagement committee and a storehouse of readily available information on which Canadian government actors are working with international organizations in the field of health in the Asia Pacific. In times of crisis, not having an accurate picture of who is doing what and where makes it difficult to quickly access information, act, and formulate evidence-driven policy-making. This would add to the ability of PHAC and an ad-hoc crisis engagement committee to act in times of crisis.

2. **Enhance ministerial communication, co-operation in international health programming, and engagement.**

   Maximizing the benefits of an ecosystem approach may also require building more channels for communication and co-operation between GAC and PHAC. Greater representation of PHAC on GAC global health engagement programs is critical for Canada to stay interconnected through an ecosystem in times of health crisis. PHAC's lack of presence in GAC global health engagement programs is a missed opportunity for PHAC to contribute its resources, knowledge, and expertise in disease outbreaks and management, and to develop interpersonal relationships with public health officials and scientists in the region that can be called on as a complementary source of emerging outbreak information in addition to GPHIN.

   Within the ecosystem approach, international engagement is necessary to co-ordinate and collaborate with other international organizations to ensure concerns are addressed and to build on information sharing. Thus, it is crucial that Canada add an international engagement component to its pandemic planning, particularly with a focus on international organizations in the Asia Pacific. To strengthen regional relationships, Canada should continue to expand international assistance for pandemic readiness and infectious disease surveillance. Increased presence opens higher possibilities of pathways for collaborations and co-ordination of response plans with countries in the Asia Pacific during times of health crises.

3. **Amplify opportunities for Canadian leadership with locally driven initiatives.**

   The pandemic has repeatedly highlighted that a weak point of public health and health-care policy is equality of care. Local and marginalized communities such as refugees, minorities, migrant workers, women, and Indigenous groups have disproportionately experienced the negative impacts of COVID-19. These trends were especially noticeable throughout the Asia Pacific, where Canada can play a larger role in helping diminish such inequities. Canada can contribute by funding subnational efforts on global health and equity, engaging consistently with epidemiological groups and networks, and providing the necessary tools to engage with local governments and key civil society organizations.

06

CONCLUSION

This project examined and analyzed the diverse COVID-19 experiences of Asia Pacific economies and drew valuable insights and lessons to improve Canada's own future pandemic response. It is important that policy-makers in Canada go beyond the headlines discussing the success of certain responses in the Asia Pacific that have attracted global attention, and endeavour to study what factors contributed to making these responses so effective and noteworthy in the first place.

Similar to how economies in the Asia Pacific learned, reformed, and evolved from the repeated experiences of SARS and MERS, Canada must take the COVID-19 pandemic as a resonating call to action to better prepare for the next inevitable instance when a novel pathogen goes viral. In addition to learning from its own setbacks and miscalculations, Canada can and should learn from the responses in the Asia Pacific jurisdictions that handled the pandemic better, including those examined and analyzed for this project.

Since COVID-19's impact expands beyond the realm of health, pandemic preparation and planning must adopt a comprehensive, multipronged approach to counteract the fallout of future health crises on interconnected components like the economy, trade, and Canada's regional and global engagement. As demonstrated through the research and analysis in the four policy reports covered here, future pandemic preparation and plans must emphasize cohesive, scientifically guided, national-level responses supported by policies that define clear roles, authorities, and co-ordination mechanisms across all government actors.

Reforms only to public health institutions and policies that leverage decisive action based on scientific expertise, while welcome and important, will not be enough. There also needs to be a fundamental shift in how Canada approaches structural policies key to updating and facilitating pandemic planning, such as data governance, technology development, and public-private co-operation. Similar changes need to occur in Canada's traditional approach to international organizations, to move toward a more agile and diversified ecosystem approach in the Asia Pacific. This more structural transformation will create the requisite foundation for whole-of-government and whole-of-society responses to pandemics. As seen by the examples from the Asia Pacific, it is not possible to carry out system changes overnight; they are a long-term effort and an investment of years. In Canada's case, there is no better time than the present to start.

ABOUT APF CANADA

ASIA PACIFIC FOUNDATION OF CANADA

FONDATION ASIE PACIFIQUE DU CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas:

Business Asia:
Trade and Investment

Digital Asia:
Digital Technologies

Sustainable Asia:
Sustainable Development

Perspectives Asia:
Surveys and Polling

Engaging Asia:
Domestic Networks

Education:
Asia Competency

Strategic Asia:
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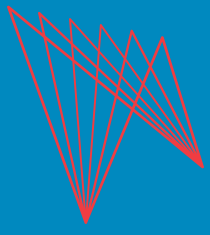

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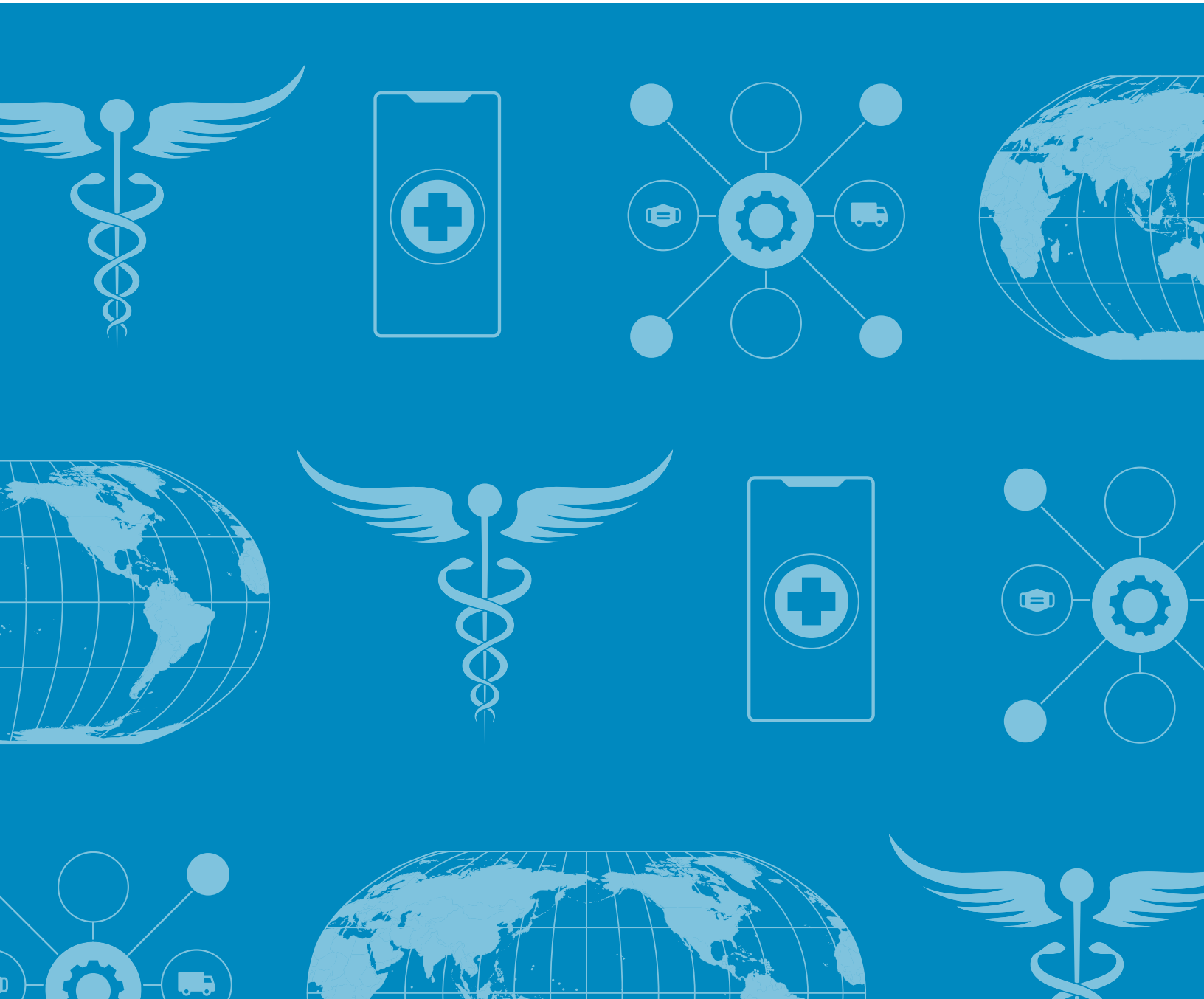
VOL.5

MARS 2022

Rapport de synthèse

TRANSPOSER LES EXPÉRIENCES DE L'ASIE PACIFIQUE SUR LA COVID-19 POUR LE CANADA :

Définir des réponses résilientes et globales pour les futures pandémies



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01

INTRODUCTION

La pandémie de COVID-19 a constitué un test exigeant pour les systèmes de santé publique, les économies et les sociétés du monde entier. Au Canada, la pandémie a fait plus de 25 000 victimes depuis son début, surtout parmi les personnes âgées. Parallèlement, l'économie canadienne a connu un effondrement historique, le PIB se contractant de 4,5 % en 2020 par rapport à 2019. Même si l'économie s'est rétablie dans une certaine mesure, elle n'en est pas encore revenue à sa valeur d'avant la pandémie, et les effets négatifs persistants de la transmission continue de la maladie et des fermetures pour raisons économiques continuent d'avoir un impact disproportionné sur certaines communautés, comme les minorités visibles, les groupes autochtones, les travailleurs à bas salaire et les jeunes.[1] La pandémie a également mis à rude épreuve les systèmes internationaux de commerce et de diplomatie sur lesquels le Canada compte et auxquels il participe, ajoutant au stress économique et à la concurrence commerciale, en particulier pour les biens essentiels à la réponse à la pandémie. Pour mieux se préparer à des crises de santé semblables à l'avenir, il est crucial que le Canada évalue ses propres défis et défaillances relativement à la COVID-19 et qu'il tire parti de l'expérience, des connaissances et de la préparation des autres pays en matière d'intervention en cas de pandémie.

La Fondation Asie Pacifique du Canada a examiné les diverses expériences de plusieurs économies de la région Asie Pacifique au sujet de la COVID-19, dans le but d'en tirer les leçons clés pour le Canada. En comparaison avec l'Amérique du Nord et l'Europe, plusieurs

économies de la région de l'Asie Pacifique — malgré leur proximité géographique avec l'épicentre de la pandémie à Wuhan, en Chine — ont connu des taux de transmission et de décès relativement plus faibles, en particulier dans la phase initiale de la pandémie, qui a pris de nombreux États occidentaux par surprise.

Plusieurs économies de la région asiatique ont réagi plus récemment à des maladies infectieuses émergentes ayant un fort impact économique et social, notamment le syndrome respiratoire aigu sévère (SRAS) en 2002-2003 et le syndrome respiratoire du Moyen-Orient (SRMO) en 2015. Les économies régionales prises comme exemples dans le cadre de ce projet possédaient déjà des connaissances pratiques en matière de gestion des épidémies de maladies infectieuses et de leurs retombées sociales et économiques, ou se sont rapidement réorientées, formulant des politiques et des mesures intersectorielles qui répondent mieux aux caractéristiques spécifiques de la COVID-19.

Ce rapport résume la recherche, l'analyse et les principales conclusions de quatre rapports d'analyse de politiques disséquant l'expérience des économies de la région de l'Asie Pacifique dans leur réponse à la COVID-19. Ces quatre rapports examinent les domaines suivants :

- la santé publique et la réponse à la pandémie;
- les innovations numériques adoptées pour répondre à la pandémie;
- les flux commerciaux transfrontaliers;
- l'engagement international en matière de santé mondiale.

Ces analyses formulent des recommandations stratégiques pour l'Agence de la santé publique du Canada (ASPC) et présentent des recommandations structurelles précieuses pour aider le gouvernement fédéral à modifier la préparation du Canada à une pandémie et à élaborer des stratégies d'intervention complètes pour l'avenir. Pour avoir de plus amples renseignements et prendre connaissance des analyses et des études de cas détaillées, veuillez consulter la version intégrale des rapports.

La première section de ce rapport de synthèse examine les réponses des autorités de santé publique à la COVID-19 dans sept économies de l'Asie Pacifique. Les chercheurs se penchent sur la préparation à la pandémie, les institutions et les politiques sur la santé publique, ainsi que la législation mise en place avant la COVID-19 ou qui a été rapidement développée et modifiée dès son apparition. Ils déterminent et analysent en profondeur les facteurs de la réponse à la pandémie qui ont permis à l'Australie, au Japon, à la Nouvelle-Zélande, à Singapour, à la Corée du Sud, à Taïwan et au Vietnam de maîtriser la COVID-19

et d'éviter de lourdes pertes humaines. Le rapport formule des recommandations pour mettre en place des réponses contre la pandémie à l'échelle d'une société, reposant sur l'expertise scientifique et des leçons tirées des expériences passées.

La section 2 explore le développement et le déploiement des technologies numériques utilisées dans la réponse à la pandémie et les soins de santé. Cette section dégage et examine également les facteurs politiques, juridiques, institutionnels et sociétaux qui facilitent le développement et l'adoption de ces outils numériques pour la santé publique. Elle se termine par des conclusions pour le gouvernement du Canada sur la nécessité de *procéder à une réforme*, au niveau national, des politiques structurelles clés comme le partage des données, le développement de technologies adaptables et ouvertes, la culture numérique au sein des organismes gouvernementaux et du public, et l'évaluation des partenariats public-privé pour les futures innovations en matière de santé numérique.

La section 3 donne un aperçu de l'impact de la pandémie sur les chaînes de valeur mondiales (CVM) et le commerce des produits médicaux, comme l'équipement de protection individuelle (EPI) et les vaccins, entre le Canada et la région de l'Asie Pacifique. Elle examine cinq problèmes majeurs qui se posent aux sociétés multinationales (SM) canadiennes et de la région de l'Asie Pacifique. Les études de cas portent notamment sur la perturbation des CMV en raison des restrictions visant l'exportation, des retards de transport et des pratiques de travail médiocres. Elle traite également des programmes gouvernementaux ou du secteur privé facilitant la délocalisation et la collaboration entre les SM et les petites et moyennes entreprises (PME). Cette section se termine par des recommandations sur la façon dont le Canada peut mieux se préparer aux perturbations de la chaîne d'approvisionnement de biens clés lors d'une future crise sanitaire, et atténuer ces perturbations.

La section 4 examine les réponses à la pandémie de la part d'organisations internationales de premier plan qui ont réorienté leurs programmes, leurs recherches et leur financement pour relever les défis de la COVID-19. Les chercheurs se sont concentrés sur les organisations internationales, régionales et infranationales actives dans les économies de la région de l'Asie Pacifique, qui ont joué divers rôles en complément aux initiatives mondiales nationales. Ce rapport propose une nouvelle approche écosystémique pour montrer comment les organisations de plusieurs niveaux ont travaillé ensemble tout au long de la pandémie, et comment le Canada peut maximiser son engagement avec ces organisations pour établir des liens diversifiés et résilients avec la région.

02

RÉPONSES DES AUTORITÉS DE SANTÉ PUBLIQUE DE LA RÉGION DE L'ASIE PACIFIQUE, AU SUJET DE LA COVID-19

Même si le Canada était relativement bien préparé à une éventuelle pandémie et qu'il s'en soit mieux tiré que d'autres pays à revenu élevé d'Amérique du Nord et d'Europe, son expérience durant la COVID-19 a tout de même entraîné des pertes de vie et des dommages économiques importants. En comparaison, les économies de la région de l'Asie Pacifique, géographiquement plus proches de l'épicentre de la pandémie situé à Wuhan, en Chine, ont connu des taux de transmission et de mortalité relativement plus faibles, en particulier au cours de la phase initiale de la pandémie.

Alors que le Canada et d'autres pays continuent de réduire les vagues subséquentes de COVID-19 et de trouver une « nouvelle normalité » pour l'avenir, il est essentiel qu'il tire des leçons des expériences nationales et internationales par rapport à la COVID-19, en vue de la prochaine pandémie. Le Canada a la possibilité de tirer des leçons, non seulement de sa propre bataille contre la COVID-19 au pays, mais aussi des réponses efficaces et souples de ses partenaires du Pacifique. Le Canada peut exploiter ces leçons clés pour définir ses propres politiques de santé et changements institutionnels, en préparation pour la prochaine crise de santé et les nouveaux pathogènes, un processus qui prendra du temps et un investissement à long terme, comme on le voit dans les cas de l'Asie Pacifique à l'étude.

Intitulé *Premiers répondants : Comment la région de l'Asie Pacifique a géré la réponse à la COVID-19 des organismes de santé publique et les leçons que le Canada peut en tirer*, ce rapport

se penche sur l'état de préparation à une pandémie et les politiques de santé publique de sept pays de la région de l'Asie Pacifique. Il fait une analyse approfondie des facteurs qui ont permis à l'Australie, au Japon, à la Nouvelle-Zélande, à Singapour, à la Corée du Sud, à Taïwan et au Vietnam de maîtriser la COVID-19, en atténuant le fardeau des maladies, le nombre de décès et les dommages économiques qui en découlent à l'intérieur de leurs frontières. Ces sept pays ont été sélectionnés selon deux critères clés :

1. un cumul de cas et une mortalité généralement faibles, en raison de multiples vagues précoces de transmission; et

2. un état de préparation et une réponse coordonnés à la pandémie, à l'aide d'un éventail de modèles de gouvernance et de modèles politiques, et d'infrastructures de soins de santé.

La recherche, l'analyse et les recommandations stratégiques à l'intention du Canada portent sur sept catégories pertinentes pour la planification et la santé publique en cas de pandémie : (1) la structure de gouvernance, l'expertise et l'expérience; (2) l'état de préparation à la pandémie; (3) la santé publique et la réponse en cas de pandémie; (4) les mesures frontalières; (5) les interventions axées sur les cas; (6) les interventions axées sur la population; et (7) les stratégies de communication. Un résumé des principales conclusions et recommandations pour chaque catégorie est présenté ci-dessous.

Structure de gouvernance, expertise et expérience

L'analyse de la réponse à la COVID-19 dans les sept pays de la région de l'Asie Pacifique étudiés révèle que les institutions de santé publique et la planification de la réponse à la pandémie ont été largement définies par l'expérience antérieure d'autres épidémies, notamment le SRAS en 2002-2003 et le SRMO en 2015. Les thèmes communs de ces réformes comprenaient une meilleure coordination intergouvernementale et interministérielle, une meilleure définition des rôles et de l'autorité, l'augmentation du rôle des experts et la protection des populations vulnérables. Les changements consécutifs apportés à la structure de gouvernance de la santé et aux institutions de santé publique ont ouvert la voie aux réponses efficaces par rapport à la COVID-19.

Après les épidémies du SRAS (2003) et du SRMO (2015), les gouvernements de la région de l'Asie Pacifique, comme ceux de la Corée du Sud et de Taïwan, ont créé de nouvelles institutions de contrôle des maladies, ont renforcé leurs pouvoirs en adoptant des lois et ont établi des protocoles précis pour la coordination interagences et pangouvernementale en cas d'épidémie de maladie infectieuse. Les gouvernements ont créé de nouvelles

agences comme la Korea Disease Control and Prevention Agency (KDCA) et le National Health Command Center (NHCC) de Taïwan, soutenus par une loi sur la prévention et le contrôle des maladies infectieuses et une loi sur le contrôle des maladies transmissibles, respectivement[2]. Par la suite, la Corée du Sud et Taïwan ont apporté des réformes à leur législation sur les maladies infectieuses pour désigner la KDCA et le NHCC en tant que centres de commandement dotés du pouvoir explicite de mettre en œuvre les mesures sanitaires nécessaires; de déployer le personnel médical requis au niveau de la municipalité, de l'État ou du pays; et d'assurer la coordination entre tous les niveaux de gouvernement et plusieurs ministères[3].

Même si elle a été épargnée par les précédentes épidémies de maladies infectieuses, l'Australie a activement établi des mécanismes de coordination et de coopération entre les niveaux de gouvernement dans des domaines cruciaux, notamment la santé publique, après l'apparition de la COVID-19. En l'absence d'un organisme central de santé publique analogue à l'ASPC au Canada ou au CDC aux États-Unis, l'Australie a donné l'exemple d'un modèle coopératif de réaction à une pandémie. L'Australia Health Protection Principal Committee (AHPPC), présidé par le médecin chef et composé des responsables de la santé des États et des territoires, est le principal comité décisionnel pour la gestion des urgences de santé publique et le contrôle des maladies en Australie[4]. L'effet pratique d'organismes comme l'AHPPC et la KDCA est une réponse nationale cohésive qui est capable d'équilibrer le pouvoir entre les niveaux de gouvernement et qui, en fin de compte, est plus efficace que l'approche fragmentaire du Canada.

État de préparation à la pandémie

Les réponses à la COVID-19 dans les pays de l'Asie Pacifique ont largement bénéficié de l'importance accordée au contrôle des maladies infectieuses, du rôle prééminent des scientifiques et des experts en santé publique dans la définition des mesures, et des tests pratiques rigoureux des plans de lutte contre la pandémie existants. Plusieurs gouvernements de la région, dont Singapour, Taïwan et la Corée du Sud, ont soutenu l'augmentation du nombre d'experts en maladies infectieuses et du personnel épidémiologique travaillant aux niveaux national, provincial et municipal[5].

Les gouvernements se sont également engagés à augmenter le financement de la préparation aux maladies infectieuses, y compris les systèmes d'information électroniques pour les soins de santé. Rien qu'en Corée du Sud, ces mandats politiques concernant les talents médicaux et la capacité institutionnelle ont entraîné un doublement du nombre d'agents du service de renseignement sur les épidémies et à une augmentation de 182 %

du budget consacré aux maladies contagieuses et aux systèmes de quarantaine en cinq ans[6]. Le maintien de cette expertise et du personnel clé constitué au fil du temps au sein des agences de santé publique a contribué à la rapidité des réponses aux pandémies. La présence d'experts à l'avant-scène de la mise en œuvre des mesures de santé et à des postes de décision a également permis d'orienter les réponses de manière scientifique.

De plus, les économies de la région de l'Asie Pacifique ont pris l'habitude de mener des exercices pratiques rigoureux pour évaluer et mettre à jour les plans de lutte contre les pandémies. Tous les ans, Taïwan met à jour son manuel d'intervention d'urgence en cas de maladie infectieuse et organise des séances de formation et des exercices trimestriels pour le personnel concerné[7]. De même, la KDCA en Corée du Sud organise des simulations d'épidémies infectieuses avec les administrations locales, les services du gouvernement central et le secteur privé. Fortuitement, la KDCA a réalisé un tel exercice en décembre 2019, avant son premier cas de COVID-19 signalé, augmentant encore le caractère de « machine bien huilée » de la réponse contre les pandémies de la Corée du Sud[8].

La plupart des réponses réussies dans les pays de l'Asie Pacifique ont suivi une approche d'élimination, poursuivant des stratégies de confinement pour la COVID-19 dans le but de réduire la transmission communautaire à presque zéro[9]. Contrairement à ce qui s'est passé au Canada, la planification de la pandémie dans des pays comme Taïwan, même si elle reposait sur la grippe pandémique, a été conçue pour s'adapter plus facilement aux caractéristiques uniques des nouveaux virus et intégrait les connaissances acquises lors d'expériences antérieures avec des coronavirus (SRAS et SRMO). Même si elles avaient initialement prévu une stratégie d'atténuation, l'Australie et la Nouvelle-Zélande ont reconnu les limites de cette approche pour la COVID-19 et ont opté pour l'élimination, une décision qui a permis à ces deux pays de contrôler la transmission[10]. À l'avenir, il est essentiel que le Canada formule des plans de lutte contre les pandémies suffisamment étendus pour couvrir un éventail d'agents pathogènes et de caractéristiques autres que la grippe et suffisamment souples pour s'adapter facilement lorsque les données disponibles indiquent que l'élimination est l'option la plus viable.

Santé publique et réponse en cas de pandémie

Les systèmes d'alerte précoce qui surveillent les menaces extérieures sont un premier élément important d'une réponse efficace contre une pandémie. En Asie Pacifique, ce type de surveillance a joué un rôle clé dans les réponses à la pandémie. Par exemple, Taïwan et la Corée du Sud mènent tous deux une surveillance en temps réel des événements, qui repère les événements de santé publique et les signale pour qu'on en évalue les risques[11].

Le système de surveillance du Canada, le Réseau mondial d'information en santé publique (RMISP), est un partenaire du Réseau mondial d'alerte et d'action en cas d'épidémie. Dans le passé, il avait récolté des compliments. Toutefois, en raison de priorités changeantes au sein de l'ASPC, il fonctionnait à une capacité réduite avant l'éclosion de la COVID-19. Étant donné la vitesse à laquelle les virus peuvent se transmettre, en particulier à l'ère des voyages modernes, la notification préalable des maladies infectieuses émergentes (MIE) permet de disposer d'un temps précieux pour se préparer et mettre sur pied une réponse.

Plusieurs économies de la région de l'Asie Pacifique ont procédé à leur propre évaluation des risques en se fondant sur leur expérience antérieure des MIE, sur leur proximité de l'épicentre de l'épidémie et sur les graves réactions d'autres gouvernements par rapport à ce nouveau virus. Des gouvernements régionaux comme Taïwan et la Corée du Sud ont fondé leurs cadres d'évaluation des risques sur les normes de l'OMS et de pays d'Europe[12]. Ils ont également tenu compte des informations provenant de l'extérieur de leurs frontières, de sorte qu'ils se sont inquiétés à juste titre lorsque la Chine a agi rapidement pour isoler Wuhan et a commencé à construire des hôpitaux en mode accéléré[13]. Séoul et Taipei ont donc commencé à réagir de manière indépendante, en s'appuyant sur leurs propres renseignements et normes de risque, tandis que d'autres, comme le Canada, attendaient les conseils de l'OMS.

Tout au long des premières phases de la pandémie, les économies de l'Asie Pacifique ont été très réactives et ont rapidement adapté leurs mesures en fonction de l'évolution des informations. Par exemple, Taïwan a mis à jour sa définition de cas pour inclure les patients atteints de pneumonie de cause inconnue, indépendamment de leurs antécédents de voyage, dès la mi-février 2020[14]. La Corée du Sud a également augmenté rapidement les niveaux d'alerte nationaux — du bleu le 3 janvier au rouge (le niveau le plus élevé) le 23 février —, permettant ainsi l'activation de vastes efforts de dépistage et de recherche des contacts[15]. Ainsi, les autorités sud-coréennes ont identifié et isolé les grappes de transmission communautaires en temps opportun, ce qui a permis d'éviter une propagation rampante au niveau national. Comparativement à la réaction tardive et excessivement prudente du Canada, les pays qui ont adopté les mesures les plus rigoureuses au cours des premiers mois de la pandémie ont bénéficié de la meilleure possibilité de contrôler la propagation sans recourir à des mesures excessivement strictes, avant qu'une transmission communautaire généralisée ne se produise, ce qui aurait pu accabler les systèmes de recherche des contacts et de dépistage.

Mesures frontalières

Même s'il s'agissait d'une politique controversée au niveau international, les pays et territoires de l'Asie Pacifique ont utilisé des mesures frontalières judicieuses et établies en temps opportun, en inspectant les vols et les passagers à l'arrivée et en interdisant les vols de certaines origines, en fonction du risque évalué[16]. Ces politiques n'ont été adoptées qu'aux premiers stades ou pendant les vagues graves, contribuant à retarder et à atténuer la transmission communautaire[17]. Ainsi, ces territoires ont eu le temps d'intensifier la mise en œuvre des mesures nationales et la production de capacités de dépistage essentielles. Les endroits qui ont rapidement instauré des mesures strictes de contrôle aux frontières, y compris la quarantaine obligatoire, ont également signalé les taux de mortalité par habitant les plus bas. Les pays et territoires de la région de l'Asie Pacifique ont également compris que les mesures aux frontières — et leur réponse globale — n'étaient efficaces que si l'ampleur de la transmission communautaire était correctement évaluée au moyen de tests complets et d'un dépistage aux frontières, et jugulée par des restrictions complémentaires des voyages intérieurs et des mesures de quarantaine cohérentes au niveau national.

Les protocoles de quarantaine de la région de l'Asie Pacifique étaient également plus stricts que ceux du Canada. Singapour, Taïwan, Hong Kong et la Corée du Sud ont tiré parti de la technologie pour surveiller et faire respecter les quarantaines à domicile[18]. Il s'agissait de simples appels téléphoniques ou de messages textes de la part d'agents de santé ou, encore, de barrières électroniques au moyen d'applications GPS pour téléphones intelligents ou de dispositifs personnels comme des bracelets permettant de vérifier l'emplacement d'une personne en quarantaine[19]. L'effet dissuasif de la quarantaine sur les déplacements de la population a également limité les mouvements internationaux et nationaux, ce qui a réduit les possibilités de propagation de la COVID-19. Pour le Canada, il est donc important d'inclure et de soutenir des mesures globales — allant des restrictions aux frontières à la recherche étendue des contacts et à la mise en quarantaine — dans sa planification de la pandémie, en particulier pour la phase de réponse précoce.

Interventions axées sur les cas

La capacité de tester un large éventail d'individus — et donc de dépister les cas de manière proactive avant qu'ils ne deviennent des grappes de transmission communautaire — repose sur une capacité de test élevée à un stade précoce. Même si leurs méthodes étaient différentes, les pays et territoires de l'Asie Pacifique qui ont le mieux réussi à contrôler la COVID-19 avaient adopté une expansion rapide de leur capacité et des normes cohérentes pour les tests, ce qui a permis aux autorités de jeter un filet plus large et de repérer les cas de

manière proactive les cas avant qu'ils ne deviennent des grappes. Au Canada, les obstacles à l'augmentation de la capacité de dépistage variaient d'une région à l'autre et comprenaient des pénuries de trousses de dépistage, de réactifs et de personnel de laboratoire[20]. Une préparation active dans les années qui ont suivi le SRAS et le SRMO a permis à plusieurs administrations de l'Asie Pacifique de développer une capacité d'intensification de la production de tests.

De même, la recherche agressive des contacts, facilitée par les groupes existants de personnel déjà formé et les nouvelles technologies, a été un facteur majeur contribuant au contrôle réussi de la pandémie dans les économies de l'Asie Pacifique. Pour être efficace, une stratégie de recherche des contacts doit être rapide et exhaustive; cependant, elle est affectée par les niveaux de coopération et le biais de rappel. Elle est également très exigeante en main-d'œuvre. Le Japon a utilisé une stratégie de recherche des contacts à rebours qui visait à repérer la source de l'infection, permettant ainsi de trouver les grappes de transmission qui émanaient de cette source[21]. La Corée du Sud et l'Australie ont également adopté cette stratégie à mesure que la pandémie progressait[22]. La Corée du Sud a également utilisé la technologie numérique dans ses efforts de recherche des contacts à l'aide du système de soutien aux enquêtes épidémiologiques de la KDCA, qui recueille et analyse toute une série de données, notamment celles provenant de dispositifs GPS, de cartes de crédit et de caméras de surveillance en circuit fermé, dans le cadre de ses efforts de recherche des contacts[23].

Interventions axées sur la population

Les réponses de l'Asie Pacifique à la COVID-19 ont immensément bénéficié de la mise en œuvre précoce de la distanciation sociale et des restrictions de mobilité. Par exemple, la Corée du Sud a commencé à préconiser la distanciation sociale dès février, et la modélisation suggère que de solides mesures de distanciation sociale ont joué un rôle clé dans la capacité de la Corée du Sud à contenir la transmission sans instaurer de confinement[24]. Néanmoins, l'utilisation judicieuse et en temps opportun de mesures de confinement ciblées et à court terme a permis d'endiguer les vagues ultérieures de transmission en Australie et en Nouvelle-Zélande, tout au long de 2020[25].

Une analyse comparative suggère que l'adoption précoce du port du masque est l'un des facteurs associés au contrôle de la transmission et à la baisse des taux de mortalité attribuables à la COVID-19. La Corée du Sud, Taïwan, Singapour et le Vietnam ont été parmi les premiers à exiger le port du masque dans les trois premiers mois de 2020[26]. En Corée du Sud, le public a commencé à porter des masques avant l'entrée en vigueur de

l'obligation officielle en octobre 2020[27]. Même si le Canada n'avait pas de culture du port du masque avant la COVID-19, lorsque les masques ont fait l'objet d'ordonnances de santé publique dans tout le pays, le public canadien a fait preuve d'un haut niveau de conformité. En juillet 2020, un sondage de Statistique Canada a montré que 84 % des répondants ont déclaré porter des masques ou un autre type d'EPI[28]. La COVID-19 a également constitué une expérience d'apprentissage pour les Canadiens, ce qui soulève la possibilité qu'ils adoptent volontairement le port du masque en réponse à la prochaine maladie infectieuse émergente.

Stratégies de communication

De nombreuses économies de la région de l'Asie Pacifique, ainsi que des provinces canadiennes comme la Colombie-Britannique, ont placé les responsables de la santé au premier plan des campagnes de communication, afin d'instaurer la confiance et la crédibilité et de favoriser l'adhésion du public. Ils ont également maintenu des messages cohérents et clairs, ce qui a renforcé l'adhésion du public et le soutien des citoyens par rapport aux mesures de santé. De plus, les appels fondés sur les émotions, les récits et les valeurs partagées diffusés en Nouvelle-Zélande, à Taïwan et à Singapour se sont avérés efficaces pour instaurer la confiance, surtout lorsqu'ils étaient adaptés aux circonstances sociales et politiques existantes[29].

Les gouvernements de la région ont également activement diffusé des messages et des informations multilingues, à l'aide de méthodes novatrices et créatives. Au Vietnam, le gouvernement a envoyé des mises à jour régulières par messages textes et a lancé l'application NCOVI en mars 2020, pour diffuser des informations et des recommandations sanitaires[30]. Le Vietnam et Singapour ont également fait un usage quotidien d'un vaste éventail de médias, y compris la presse écrite, les médias sociaux et les applications de messagerie comme WhatsApp, Twitter, TikTok et Facebook, pour informer et conseiller divers publics parlant différentes langues et d'âges variés[31].

Recommandations stratégiques

Même si les réponses de la région de l'Asie Pacifique ont été très cohésives par rapport à celles du Canada, et cette caractéristique a sans doute contribué à leur efficacité, l'analyse montre qu'un système de gouvernement central n'est pas une condition préalable à une réponse nationale cohésive, comme l'a démontré l'Australie. Le rapport reconnaît les défis d'un système de soins de santé fédéré qui a mené à une réponse fragmentée au Canada et

suggère des stratégies pour combler ces lacunes aux niveaux fédéral et provincial, ainsi que tirer parti du rôle de l'ASPC en tant qu'agence nationale de santé publique.

Pour l'avenir, le Canada doit relever le défi d'élaborer et de réformer ses politiques de préparation et d'intervention en cas de pandémie pour faire face à l'urgence inévitable de nouveaux agents pathogènes faisant leur apparition à l'avenir. Les recommandations stratégiques (incluses dans le rapport complet) pour le domaine de la santé publique et de la préparation à la pandémie sont organisées selon les thèmes clés suivants :

1. **Les réponses efficaces aux pandémies sont renforcées par des préparations structurelles et institutionnelles suivant une approche s'appliquant à l'échelle de la société, avec de nombreuses politiques informées et définies par l'expérience antérieure.**

   Les institutions de santé publique et la planification de la réponse à la pandémie ont été largement informées et définies par l'expérience antérieure des épidémies, notamment le SRAS en 2002-2003 et le SRMO en 2015. Les thèmes communs de ces réformes comprenaient une meilleure coordination intergouvernementale et interministérielle, une meilleure définition des rôles et de l'autorité, l'augmentation du rôle des experts et la protection des populations vulnérables. Dans des économies comme Taïwan et la Corée du Sud, les changements consécutifs apportés à la structure de gouvernance de la santé et aux institutions de santé publique ont ouvert la voie aux réponses efficaces contre la COVID-19.

   Au Canada, il n'est pas possible de reproduire entièrement les modèles plus centralisés de coordination gouvernementale de l'intervention en cas de pandémie observés en Corée du Sud ou à Taïwan, puisque les provinces et les territoires supervisent leurs propres systèmes et politiques de soins de santé. Toutefois, la principale leçon à tirer de ces exemples en Asie est la nécessité de renforcer la coopération entre les gouvernements fédéral, provinciaux et territoriaux du Canada. La formulation d'une réponse nationale plus cohérente devrait faire partie des futurs plans de lutte contre les pandémies; l'ASPC y jouerait le rôle d'un organisme de coordination crucial.

2. **Les réponses doivent être guidées par l'expertise scientifique à l'aide des données limitées disponibles, et être suffisamment souples pour s'adapter rapidement aux nouvelles données et preuves qui apparaissent.**

   Les réponses à la COVID-19 dans les pays de l'Asie Pacifique ont largement bénéficié de la grande importance accordée au contrôle des maladies infectieuses, du rôle prééminent des scientifiques et des experts en santé publique dans la définition des mesures, et des tests pratiques rigoureux des plans de lutte contre la pandémie existants.

Les réponses ont été complétées par une prise de décision rapide, une flexibilité et une adaptation rapide des mesures de réponse, en fonction de l'évolution des informations. Les économies de la région de l'Asie Pacifique ont réagi rapidement en s'appuyant sur leurs propres systèmes d'alerte précoce et d'évaluation des risques, influencés par l'expérience acquise avec des agents pathogènes émergents comme le SRAS et le SRMO. Les économies qui n'avaient pas cette expérience préalable ont également bénéficié d'une action décisive dans leurs réponses contre la pandémie, à mesure qu'elles en apprenaient davantage sur le nouveau virus et sur la façon dont les autres gouvernements y réagissaient. Le Canada doit formuler des plans de lutte contre les pandémies complets et souples qui peuvent être adaptés à différents agents pathogènes. Il doit être prêt à passer plus facilement des stratégies d'atténuation aux stratégies d'élimination, à mesure que l'on dispose de plus d'informations sur l'agent pathogène en question.

3. **La prise de décision et la mise en œuvre en temps utile des protocoles de réponse, qu'ils soient déjà établis ou nouveaux, ont un impact considérable sur l'efficacité d'une réponse.**

   Ce qui est remarquable dans cette analyse, c'est que les caractéristiques les plus efficaces de la réponse contre la pandémie n'étaient pas des pratiques nouvelles, mais plutôt une action rapide et décisive guidée par un niveau approprié de sensibilisation aux risques. Le Canada n'était pas sans être préparé à la COVID-19. Ce qui a fait défaut, c'est un sentiment d'urgence et la volonté de prendre des mesures rapides et décisives. Les pays qui ne bénéficiaient pas d'expériences antérieures, notamment le Vietnam, l'Australie et la Nouvelle-Zélande, avaient des systèmes de soins de santé relativement mal préparés à une pandémie. Par conséquent, ils se sont appuyés sur des mesures plus rigoureuses, notamment des restrictions strictes aux frontières et une quarantaine institutionnalisée. Ces mesures, mises en œuvre en temps opportun, ont permis de freiner la transmission communautaire et d'éviter la nécessité de recourir à des mesures de confinement fréquentes, longues et économiquement préjudiciables.

03

INNOVATIONS NUMÉRIQUES DANS LES RÉPONSES CONTRE LA PANDÉMIE

La pandémie a accéléré le développement et l'adoption de la technologie numérique dans le monde entier, notamment pour les outils de santé numérique destinés à lutter contre la COVID-19. Les gouvernements de la Chine, de Taïwan et de la Corée du Sud, par exemple, ont déployé différents systèmes et applications numériques pour accélérer et accroître l'efficacité de leur réponse contre pandémie. Selon les rapports, ces utilisations de la technologie ont contribué de manière significative à leur succès global dans la limitation de l'épidémie.

La couverture et l'analyse nord-américaines du déploiement de la technologie contre la COVID-19 en Asie ont largement porté sur les utilisations invasives de systèmes électroniques et d'applications mobiles axés sur les données et susceptibles de porter atteinte aux droits civils. Ce type de discussion a également attiré l'attention sur les différents contextes politiques, sociaux et/ou culturels propres à l'Asie utilisés pour souligner l'inapplicabilité d'outils numériques similaires pour la réponse à la pandémie dans les milieux canadiens actuels.

Même si les critiques formulées ci-dessus sont partiellement légitimes, ces types d'analyse réduisent un large éventail de facteurs à la question de savoir si les Asiatiques se soucient ou non de la vie privée. Ce cadre limité ne reconnaît pas le potentiel que détient la technologie pour améliorer les stratégies canadiennes en matière de préparation et d'intervention en cas de futures pandémies, d'autant plus que l'adoption des technologies numériques dans un éventail de secteurs autres que la santé se poursuit.

Intitulé *Innovations numériques à l'égard de la réponse à la pandémie en Asie: Leçons pour le Canada*, ce rapport vise à fournir à la fois un aperçu des outils numériques utilisés pour les réponses contre la pandémie en Asie et une compréhension plus nuancée des facteurs du contexte institutionnel et social qui ont permis le déploiement relativement réussi de la technologie numérique pour la santé publique pendant la COVID-19. Il examine plusieurs exemples de technologies axées sur les données mises en œuvre dans plusieurs économies asiatiques pour faciliter : (1) la recherche des contacts; (2) la surveillance sanitaire et le suivi des quarantaines; (3) la distribution de fournitures médicales; et (4) la télésanté. Ensuite, il examine les facteurs fondamentaux qui ont permis et facilité le déploiement des technologies pour la réponse contre la pandémie et se termine par des recommandations stratégiques.

Recherche des contacts

De nombreuses économies de la région de l'Asie Pacifique ont investi et déployé différentes formes de recherche numérique des contacts, en s'appuyant sur la technologie pour réduire l'effort humain et le temps nécessaire à ce processus notoirement laborieux. Par exemple, Singapour, Brunéi, l'Indonésie et la Malaisie ont tous lancé des applications de recherche des contacts semblables à l'application Alerte COVID au Canada, en tirant parti des fonctionnalités GPS et Bluetooth des téléphones mobiles[32].

En Corée du Sud, à Taïwan et au Vietnam, les gouvernements ont créé des mécanismes de partage des données pour faciliter la recherche rapide des contacts. Par exemple, TRACE, la plateforme de recherche des contacts de Taïwan, est connectée à différentes bases de données gouvernementales qui facilitent la collecte de données provenant de plusieurs sources gouvernementales et le suivi en temps réel[33]. Pour effectuer la recherche des contacts, le système de soutien aux enquêtes épidémiologiques de la Corée du Sud recueille des données auprès de différents ministères et organismes gouvernementaux et de tous les fournisseurs de services mobiles[34]. La Chine a exploité les « super applications » mobiles omniprésentes comme WeChat et Alipay, en les connectant à la plateforme nationale de services gouvernementaux intégrés pour la recherche des contacts et la surveillance de la transmission[35].

Surveillance sanitaire et suivi des quarantaines

De multiples gouvernements en Asie ont également déployé des solutions numériques pour le suivi et la surveillance des cas confirmés de COVID-19, des voyageurs entrants et des

porteurs d'agents pathogènes, un élément clé de leurs mesures de quarantaine et d'auto-isolement. Brunéi et Hong Kong ont fourni aux personnes soumises à une quarantaine obligatoire des bracelets permettant de confirmer leur localisation[36]. Pour mettre au point un système de codage sanitaire avec des cartes épidémiologiques, la Chine a intégré les données sanitaires du système de soins de santé à un système de surveillance en temps réel. À leur tour, ces cartes peuvent être utilisées par les gouvernements locaux pour surveiller la transmission de la COVID-19 au sein de la population[37]. De même, le système de quarantaine intelligent de la Corée du Sud fait une mise en commun des données provenant de diverses sources gouvernementales et de sociétés de télécommunication. Cela permet à la Corée du Sud d'identifier, de contacter et de mettre en quarantaine les voyageurs entrants à haut risque, avec efficacité[38].

Distribution des fournitures médicales

Plusieurs économies asiatiques ont élaboré et mis en place des outils innovants pour faciliter l'attribution et la distribution uniformes et efficaces de fournitures médicales, comme l'EPI et les vaccins. Par exemple, Taïwan a mis en place un programme de rationnement des masques déterminé à partir de la base de données préexistante de l'assurance maladie nationale (AMN). Les personnes pouvaient acheter 9 masques tous les 14 jours, la limite étant vérifiée par leur carte d'AMN. Taïwan a également exploité les informations participatives pour l'application mobile de l'AMN, qui permet aux utilisateurs de faire des achats en ligne, notamment pour les masques, et des réservations pour le ramassage pratique en magasin[39]. Singapour a également adopté une approche technologique et centralisée pour distribuer des fournitures médicales plus courantes comme les masques, en utilisant un site Web pour organiser les horaires de ramassage[40]. En Corée du Sud, la collaboration entre le gouvernement et des sociétés de technologie, Naver et Kakao, a permis de lutter contre le gaspillage de vaccins en permettant aux utilisateurs de suivre la disponibilité des vaccins au fur et à mesure des annulations ou des absences aux rendez-vous, à l'aide d'une carte en ligne[41].

Télésanté

La COVID-19 a également entraîné l'adoption rapide de divers services et d'applications mobiles de télésanté tout au long de l'année 2020. Même s'il s'agit de services privés, ces applications ont joué un rôle important, à la fois comme outils de dépistage de la COVID-19 et comme plateformes de consultation médicale à distance. Les applications

Check COVID-19 de l'Indonésie, LINE Healthcare du Japon et Ping An Good Doctor de la Chine sont des exemples d'initiatives numériques menées par le secteur privé ou en partenariat public-privé qui ont permis de dépister à distance les patients soupçonnés d'être atteints de la COVID-19[42]. D'autres applications de télésanté, comme Ali Health et We Doctor en Chine[43], GrabHealth en Indonésie[44], Doctor Anywhere à Singapour, ainsi que VieVie et Jio Health au Vietnam[45], sont des solutions numériques offrant des consultations médicales à distance, la possibilité de commandes de médicaments et même des options de livraison automatisée aux patients cherchant de l'aide pour des maladies courantes et chroniques. La facilitation de services médicaux comme le dépistage virtuel et les consultations médicales virtuelle a permis de réduire la demande et l'afflux de patients dans des hôpitaux déjà surchargés pendant la pandémie.

Fondements technologiques : Facteurs institutionnels et contextes sociaux

Le déploiement de ces technologies en Asie a été rendu possible et facilité par certains facteurs institutionnels et sociétaux qui étaient en place avant la pandémie. Certains gouvernements asiatiques, forts de leurs expériences avec le SRAS et le SRMO plus tôt dans le siècle, avaient établi ou réformé des institutions gouvernementales, des lois, dles systèmes électroniques et des procédures, pour répondre rapidement lors d'une pandémie. Des lois sur les maladies infectieuses ont créé de nouvelles institutions de santé publique dans de nombreuses administrations. Citons par exemple un centre de protection de la santé à Hong Kong, un centre national des maladies infectieuses à Singapour, la KDCA en Corée du Sud et un centre de commandement centralisé des épidémies à Taïwan. Ces agences de santé publique ont joué un rôle crucial de coordination et de conseil pendant la pandémie et ont été les principaux dépositaires d'informations guidant les mesures de réponse.

De plus, les lois ont accordé à des gouvernements en Asie, en particulier aux agences de santé publique récemment créées, certains droits essentiels qui ont facilité le déploiement des outils numériques pour la réponse à la pandémie. Premièrement, ces lois ont permis aux agences de santé publique d'accéder à une multitude de données personnelles et sanitaires provenant de sources gouvernementales et privées, et de les gérer, afin de les aider à déterminer les mesures sanitaires à prendre pour freiner la transmission d'une maladie infectieuse. Deuxièmement, en collaboration avec le gouvernement, ces agences ont également été autorisées à mettre en place leurs propres systèmes électroniques, afin de mieux s'acquitter de leurs tâches légalement mandatées en cas de crise sanitaire.

Certains aspects présents dans divers contextes sociaux en Asie ont également contribué au déploiement et à l'acceptation relative, voire à l'adoption élevée, d'outils numériques contre la COVID-19. Il est important de reconnaître que les citoyens de l'Asie se préoccupent tout autant, sinon plus, de la vie privée en ligne que leurs homologues nord-américains et européens[46]. En fait, l'utilisation de formes invasives de technologie numérique en réponse à COVID-19 a soulevé des questions et des réactions négatives dans la région. De plus, les pays d'Asie ont plus de problèmes associés à la baisse de la confiance du public à l'égard du gouvernement que le Canada[47].

Dans ce contexte, les gouvernements d'Asie se sont efforcés de favoriser la confiance dans leurs mesures de santé publique, notamment l'utilisation d'outils et de systèmes numériques axés sur les données, tout au long de la pandémie. Ils ont également dû répondre aux préoccupations de leurs citoyens en matière de protection de la vie privée et d'utilisation des données, afin de prouver qu'ils sont des gestionnaires dignes de confiance des données personnelles, qu'ils utilisent ces données à des fins sanitaires, qu'ils informent le public et qu'ils accélèrent le retour à une nouvelle normalité[48].

Un autre point qu'il est important de considérer est la familiarité du public asiatique avec le service et les outils publics numériques. En 2020, l'Asie a obtenu, en tant que région, un score supérieur à celui du Canada dans l'indice de développement de l'e-gouvernement des Nations unies, en particulier des chefs de file mondiaux de l'adoption de l'administration électronique comme la Corée du Sud, Singapour et le Japon[49]. Cela montre que les populations de l'Asie, en particulier dans les pays avancés, sont plus familières avec l'accès numérique aux services publics, ce qui crée un environnement plus accueillant pour les outils numériques pour lutter contre les pandémies, comme les applications de recherche de contacts.

L'étroite collaboration entre les gouvernements et les principaux acteurs technologiques pour développer et déployer des outils numériques contre la COVID-19, sous forme d'applications mobiles autonomes ou de fonctions supplémentaires au sein d'une application, a contribué à l'aisance du public et à son aptitude à utiliser ces technologies. C'était particulièrement vrai lorsque ces applications du secteur privé facilitaient les services publics cruciaux qui contribuaient aux réponses contre la pandémie. Par exemple, la Corée du Sud a établi un partenariat avec les chefs de file technologiques nationaux Kakao et Naver pour faciliter la distribution de vaccins à l'aide d'une application de cartographie des vaccins et de prises de rendez-vous.

Il faut également prendre en compte les effets des plateformes de ces services omniprésents. Par exemple, WeChat et Alipay sont tellement omniprésentes en Chine qu'il est presque

impossible d'effectuer des tâches quotidiennes sans ces plateformes. Des applications comme Grab, Gojek ou Kakao jouissent d'un statut similaire dans leurs économies respectives. Ces applications mobiles ont fourni une base existante et répandue pour la diffusion pratique d'outils numériques d'intervention en cas de pandémie.

De plus, les attitudes à l'égard de la technologie peuvent avoir influencé le soutien du public ou, du moins, la tolérance des outils numériques utilisés en réponse à la COVID-19 en Asie. Selon un sondage réalisé par Oxford, il existe un écart important dans la perception générale des risques liés à la prise de décisions en matière d'IA (intelligence artificielle) selon la région. Par rapport aux personnes interrogées en Amérique du Nord et en Europe, les personnes sondées en Asie ont généralement une attitude positive à l'égard de l'IA[50]. Une autre étude, réalisée par Edelman en 2021, a montré que les personnes sondées dans plusieurs économies asiatiques — dont l'Inde, l'Indonésie et la Corée du Sud — conservaient un niveau de confiance élevé envers leurs secteurs technologiques, alors que cette confiance avait diminué en Amérique du Nord et en Europe[51]. Par conséquent, les populations locales de la région étaient probablement plus favorables à l'utilisation d'outils numériques tout au long de la pandémie.

Recommandations stratégiques

Pour le Canada, ce n'est pas le manque d'idées ou d'accès à la technologie qui rend le déploiement de ces solutions difficile dans un contexte national. Après tout, les développeurs de logiciels canadiens sont parfaitement capables de développer les mêmes applications ou systèmes. Cette recherche montre plutôt que ce qui a rendu possible le déploiement de ces solutions numériques en Asie, mais pas au Canada, ce sont les facteurs institutionnels et les attitudes sociales. L'analyse de ces facteurs habilitants permet de tirer des leçons pertinentes pour le Canada, qui vont plus loin que la mise en évidence de solutions technologiques intéressantes.

Le rapport présente les recommandations suivantes et les principaux points à retenir pour le Canada, notamment les cadres juridiques et institutionnels permettant une gouvernance des données complète et sécurisée, les mécanismes permettant d'instaurer la confiance du public à l'égard de la technologie et de la culture numérique, et la redéfinition de la collaboration entre les secteurs public et privé.

1. **Réformer les cadres de gouvernance des données, à court et à long terme.**

   La capacité des gouvernements asiatiques à partager les données personnelles entre les différents ministères et niveaux de gouvernement a été un facteur crucial, qui a

contribué au succès des technologies numériques dans le contrôle de la transmission de la COVID-19. Même si les formes les plus intrusives de collecte et d'utilisation des données ne sont pas conformes aux valeurs sociales du Canada, les décideurs canadiens ont été constamment informés de la nécessité de développer un modèle plus cohérent de gouvernance des données au niveau national, non seulement pour la réponse à la pandémie, mais aussi pour la modernisation de l'administration publique, des soins de santé et de la compétitivité économique.

2. **Créer des canaux de participation du public et, à terme, de ralliement public.**

   L'efficacité des programmes déployant des technologies numériques dans le cadre d'une intervention en cas de pandémie repose en grande partie sur leur adoption au sein de la communauté, afin de susciter un niveau élevé d'utilisation de la part du public. Les solutions numériques doivent être développées de manière à canaliser activement la contribution du public, que ce soit sous forme de sondages/questionnaires, de demandes de commentaires, de collecte d'information ou de retour d'information en temps réel. En raison des méthodes pour prendre part au processus de déploiement de la technologie, le public peut mieux comprendre le mécanisme et les raisons qui sous-tendent ces outils et plateformes, tout en développant un sentiment d'appartenance plus fort.

3. **Repenser le partenariat public-privé.**

   Les études de cas réalisées en Asie soulignent la nécessité, pour le gouvernement du Canada, de repenser le modèle de partenariat public-privé dans le développement de solutions numériques. En Asie, la collaboration entre les agences de santé publique et les grandes entreprises technologiques comme WeChat, Alipay, Kakao, Naver ou Gojek a permis le déploiement de solutions numériques dans divers domaines de réponse contre la COVID-19. Toutefois, ces réponses ont été rendues possibles grâce à un type de relation différent entre le secteur public et le secteur privé; les gouvernements ont une relation plus hiérarchique avec les entreprises, et les entreprises technologiques sont souvent considérées comme des « champions nationaux » qui ont un rôle à jouer dans le bien-être des citoyens.

4. **Renforcer la compréhension — et, à terme, la confiance — du public dans la technologie.**

   L'engagement du public envers les solutions numériques introduites par les gouvernements au Canada et en Asie a souligné l'importance de renforcer la compréhension du public par rapport à ces nouveaux outils. Éduquer le public sur la manière dont ses renseignements sont colligés et utilisés et sur la manière dont il

peut réagir correctement à une utilisation abusive de ses renseignements pourrait renforcer la confiance dans les futurs déploiements de solutions numériques. Les gouvernements asiatiques ont fait preuve de réactivité par rapport aux questions et aux critiques du public concernant leur technologie pendant la pandémie, renforçant ainsi la confiance (ou, du moins, l'acceptabilité) des solutions numériques.

04

PERTURBATIONS DE LA CHAÎNE D'APPROVISIONNEMENT PENDANT LA PANDÉMIE DE COVID-19

Au début de l'année 2020, la propagation rapide de la COVID-19 a provoqué une augmentation soudaine de la demande mondiale de produits médicaux susceptibles de limiter la propagation du virus ou de réduire sa mortalité. La demande écrasante pour ces produits a exercé des pressions sur les chaînes de valeur mondiales (CVM), qui englobent l'ensemble des activités liées à la mise sur le marché d'un produit. Elle a provoqué des pénuries universelles de produits médicaux et d'EPI. Les entreprises se sont trouvées mal équipées pour répondre à l'augmentation de la demande, en raison de la faiblesse des stocks de produits nécessaires, des difficultés liées à l'augmentation rapide de la production et de la complexité de la coordination de la livraison en toute sécurité des produits aux personnes dans le besoin.

Les chaînes d'approvisionnement ont été particulièrement touchées par la pandémie, car elles reposent généralement sur un modèle de production « juste à temps », ce qui signifie que les biens arrivent juste avant d'être mis en rayon ou d'être inclus dans le processus de fabrication. La dimension de dernière minute de ce système a fait que les entreprises se sont retrouvées avec des stocks insuffisants lorsque la demande de produits médicaux a augmenté.

Les biens produits au Canada, comme les automobiles, doivent souvent utiliser des biens intermédiaires en provenance d'Asie, auxquels on ajoute ensuite de la « valeur », en leur apportant des modifications au Canada. Ces exportations à valeur ajoutée soulignent

l'interrelation entre les biens canadiens et les CVM en Asie. Par exemple, un récent rapport de Statistique Canada analysant les données commerciales de 2016, 2017 et 2018 a révélé que près de 50 % des intrants de la production intérieure du Canada reposent sur du contenu chinois[52]. Ces biens canadiens qui dépendent des intrants des CVM asiatiques sont souvent affectés négativement lorsqu'un choc externe soudain, comme une augmentation de la demande mondiale, entraîne des défaillances de la chaîne d'approvisionnement.

En mars 2020, l'Institute for Supply Management a mené un sondage auprès de 600 entreprises aux États-Unis et a constaté que 75 % d'entre elles avaient connu des perturbations de la chaîne d'approvisionnement à la suite de la COVID-19[53]. Le Canada a également connu sa part de défaillances des chaînes d'approvisionnement, en raison du protectionnisme et des contraintes logistiques au cours de la pandémie.

Les pays d'Asie Pacifique comptent parmi les principaux fabricants de produits médicaux et d'EPI, en raison de leurs vastes capacités de production. Ils ont été parmi les premiers à subir les perturbations à grande échelle de la chaîne d'approvisionnement causées par la pandémie. Les entreprises établies dans les pays d'Asie Pacifique ont connu les mêmes difficultés que les entreprises et les multinationales du monde entier, mais elles ont plus d'expérience dans la lutte contre les virus respiratoires répandus en raison de l'épidémie de SRAS de 2002-2003 en Asie et de l'épidémie de SRMO de 2015 en Corée du Sud. Cette expérience a fourni à de nombreux pays asiatiques les outils nécessaires pour atténuer les tensions s'exerçant sur la chaîne d'approvisionnement pendant la pandémie de COVID-19.

Ce rapport, intitulé *Perturbations de la chaîne d'approvisionnement pendant la pandémie de COVID-19 : Leçons pour le Canada*, étudie cinq problèmes majeurs qui ont contribué à la rupture des chaînes d'approvisionnement pendant la pandémie de COVID-19 et propose des recommandations pour mieux gérer ces problèmes à l'avenir :

1. L'augmentation de la demande de certains produits, qui a provoqué une pénurie de fabrication. Tout au long de la pandémie, la demande de tout produit lié à la COVID-19 a été massive. Les entreprises ne parvenaient pas à produire ces biens assez rapidement pour répondre à la demande, ce qui a entraîné des problèmes de chaîne d'approvisionnement.

2. Les biens qui ne peuvent pas être produits au niveau national, au moyen de la délocalisation ou de la réorientation des opérations, et pour lesquels il n'y a que quelques chaînes d'approvisionnement facilement disponibles, et les problèmes qui ont suivi en s'appuyant sur des entreprises spécifiques pour la production.

3. Les restrictions d'exportation temporaires mises en place par les pays qui étaient en mesure de produire ces biens au niveau national.

4. La dépendance excessive à l'égard de certaines économies pour les biens liés à la COVID-19, ce qui, dans certains cas, a entraîné la décision de délocaliser la production.

5. Les défis logistiques que les entreprises ont dû relever pour transporter les vaccins. Une fois les vaccins fabriqués, le défi que devaient ensuite relever les multinationales était de déterminer la meilleure façon de les distribuer et de les transporter. Les exigences en matière de température, les méthodes de transport et les livraisons aux communautés éloignées ont posé des problèmes.

Recommandations stratégiques

Pour surmonter ces défis interdépendants, le rapport propose la création d'un groupe de travail sur la chaîne d'approvisionnement chargé de promouvoir la transparence, la recherche et le financement d'initiatives qui permettront au Canada de mieux comprendre les chaînes de valeur mondiales, d'accroître les discussions et la collaboration entre les secteurs public et privé, d'identifier les biens essentiels et d'élaborer une stratégie de stockage diversifiée. Ces mesures pourraient faire en sorte que le Canada soit mieux préparé à surmonter toute crise mondiale future ayant un impact important sur les chaînes d'approvisionnement.

L'objectif du groupe de travail ne sera pas seulement de répondre aux crises, mais aussi de préparer des mécanismes de prévention qui peuvent déterminer les perturbations potentielles et fournir un cadre pouvant être utilisé pour répondre à ces problèmes. Le groupe de travail apportera son soutien au gouvernement et aux entreprises privées sous forme d'assistance technique ou de services de conseil et de financement pour soutenir la mise en œuvre de tout programme jugé nécessaire pour se préparer aux futurs chocs de la chaîne d'approvisionnement.

Voici ce que ce groupe de travail spécialisé réalisera :

1. **Augmenter l'accès aux données sur la chaîne d'approvisionnement.**

   Au début de la pandémie, les entreprises qui avaient investi dans la cartographie de la chaîne d'approvisionnement pour leurs opérations étaient mieux préparées et informées lorsqu'elles devaient s'attaquer aux défis de la production. Le processus de cartographie peut être très coûteux et difficile à maintenir. Le groupe de travail sur la

chaîne d'approvisionnement peut donc fournir un service précieux en déterminant les biens essentiels qui doivent être facilement accessibles pendant une crise et leurs principaux fournisseurs. Ensuite, il pourrait fournir des subventions ou d'autres incitations pour encourager les entreprises à cartographier leurs propres chaînes d'approvisionnement, afin de garantir que ce type d'information soit facilement disponible en cas de crise.

2. **Améliorer l'évaluation des décisions de relocalisation.**

   Le gouvernement du Canada peut également utiliser le groupe de travail sur la chaîne d'approvisionnement pour les décisions de délocalisation. De concert avec les entreprises, les producteurs, les experts en soins de santé, les spécialistes du commerce et les économistes, le groupe de travail peut évaluer la faisabilité de la délocalisation ou de la quasi-délocalisation des chaînes d'approvisionnement essentielles et vulnérables. Après avoir déterminé l'impératif de délocalisation, un mandat de sécurité du gouvernement fédéral sera nécessaire pour faire respecter ce processus.

3. **Assurer une diligence raisonnable pour éviter de soutenir des pratiques de travail dangereuses.**

   Les fabricants des biens qui ne peuvent pas être produits dans le pays grâce à la délocalisation et à la réorientation auront parfois recours à des pratiques de travail dangereuses qui entraîneront des retards, notamment des épidémies dans les installations de production et des manquements aux droits de la personne. Par conséquent, le groupe de travail sur la chaîne d'approvisionnement peut être utile en tant qu'organisme de réglementation, en veillant à ce que les entreprises fassent preuve de diligence raisonnable au sujet des conditions et des pratiques de travail. Cela peut se faire en facilitant les enquêtes menées par une entreprise sur les conditions de travail ou en incitant les entreprises fournissant des biens essentiels à procéder à de tels examens.

4. **Soutenir la collaboration entre les parties prenantes.**

   L'une des principales leçons tirées de la pandémie de COVID-19 est que les réponses n'ont pas été organisées assez rapidement et n'ont pas toujours mis en cause les bons acteurs. Pour remédier à ce problème, le groupe de travail proposé pourrait faciliter la communication et la consultation en temps opportun entre les intervenants concernés — des ministres du commerce aux gens d'affaires locaux —, afin de résoudre les problèmes de la chaîne d'approvisionnement pendant une crise.

5. **Favoriser un écosystème d'innovation pour le partage de l'information au Canada.**

   Dans le cadre de son mandat consistant à promouvoir les discussions, le groupe de travail sur la chaîne d'approvisionnement peut également favoriser un écosystème d'innovation au Canada et encourager les grandes entreprises à établir des liens avec les PME. Il est possible de créer intentionnellement des liens entre les universités, la société civile et l'industrie, ainsi que de favoriser le partage des connaissances entre les entreprises, grâce à une approche axée sur les systèmes d'innovation. Cela permettra non seulement de renforcer la résilience en cas de chocs massifs de l'offre et de hausses de la demande à l'échelle mondiale, mais aussi d'accroître la productivité des entreprises.

6. **Diversifier la stratégie de stockage du Canada.**

   Le Canada dispose déjà d'un protocole de stockage. Du nom de Réserve nationale stratégie d'urgence (RNSU), il ne s'agit toutefois que d'une forme de stockage. La RNSU repose sur la gestion d'un stock public de biens essentiels par une autorité publique, ce qui peut être difficile à gérer et comporte le risque que les produits expirent. D'autres formes de stockage consistent à exiger des producteurs qu'ils maintiennent des stocks prédéfinis de produits cruciaux et/ou de biens intermédiaires, comme les ingrédients pharmaceutiques actifs. Cela peut se faire au moyen d'un décret, d'un approvisionnement préférentiel (en accordant aux entreprises qui se conforment aux exigences de stockage des contrats d'approvisionnement du gouvernement, qui sont convoités), ou d'incitations financières comme des subventions ou des allègements fiscaux. Une étude de faisabilité devrait être menée pour comparer le modèle d'inventaire « juste à temps », devenu omniprésent dans les chaînes de valeur mondiales, avec un modèle « juste au cas où », où les stocks sont supérieurs à la demande en cas d'augmentation de la demande.

05

COVID-19, RELATIONS CANADA–ASIE PACIFIQUE ET ORGANISATIONS INTERNATIONALES

Même si les institutions mondiales ont eu du mal à faire face à la pandémie, de nombreuses organisations internationales de la région de l'Asie Pacifique sont parvenues à adopter un éventail de réponses rapides et proactives dans les domaines de la santé, de l'économie, du commerce, de l'investissement, de la coopération politique et de l'intégration régionale, souvent plus efficaces que celles des institutions internationales mondiales. Cela pourrait indiquer que ce qui se produit n'est pas réellement un déclin de la coopération internationale, mais plutôt un éloignement des institutions mondiales. Le Canada ne participe qu'à quelques-unes de ces institutions dans la région de l'Asie Pacifique, et il peut augmenter sa participation de beaucoup, ainsi que les échanges d'informations et d'idées.

Intitulé COVID-19, relations Canada–Asie Pacifique et organisations internationales,, ce rapport propose une nouvelle approche écosystémique pour expliquer comment les organisations internationales fonctionnent ensemble et comment le Canada peut utiliser ce principe pour suivre des stratégies d'engagement résilientes et à long terme en Asie Pacifique, avec des organisations internationales de tailles, d'échelles et de portées diverses

La COVID-19 a évoqué un déclin apparent de l'allégeance de nombreuses nations aux principes des institutions multilatérales comme l'OMS. Cependant, les défis que ces institutions ont dû relever lorsqu'elles répondaient à la COVID-19 ne sont pas tombés du ciel. Au contraire, il y a eu un mouvement constant d'éloignement des institutions multinationales au cours des dernières années, accompagné d'une rivalité accrue entre

la Chine et les États-Unis[54]. Cette évolution a favorisé l'émergence de regroupements plus petits, alignés sur une approche plus régionale ou axée sur les intérêts, comme en témoignent les formations BRICS (Brésil, Russie, Inde, Chine et Afrique du Sud) et MICTA (Mexique, Indonésie, Corée, Turquie et Australie), largement axées sur l'économie, et le dialogue quadrilatéral sur la sécurité entre les États-Unis, l'Australie, l'Inde et le Japon[55].

Les questions autour desquelles s'alignent ces diverses organisations portent principalement sur la sécurité, l'économie, le commerce et le développement. La COVID-19 a réorienté l'attention de nombreuses organisations internationales vers les programmes et les réponses liés à la pandémie et à la santé. La pandémie a clairement montré que ces disciplines sont en fait étroitement liées à la santé publique et que, à l'avenir, les organisations internationales, quel que soit leur objectif principal, devraient continuer à inclure une optique sanitaire dans leur travail.

L'impact disproportionné de la pandémie de COVID-19 selon la race, le statut socioéconomique, l'âge, l'indigénéité, le sexe/genre et d'autres axes de différence, au Canada et ailleurs, a également révélé les lacunes d'une vision étroite des politiques et l'impact de la santé publique sur d'autres secteurs de la politique. Ce processus a été facilité par la réduction de l'importance accordée aux accords formels contraignants et aux initiatives politiques, car les chercheurs et les décideurs ont de plus en plus mis l'accent sur le rôle des organisations internationales dans le « transfert des politiques » ou « l'apprentissage des politiques ».[56] Cette évolution a été marquée par une augmentation de l'influence des communautés épistémiques et des réseaux infranationaux, notamment dans le domaine de la santé mondiale[57]. La réponse à la COVID-19 a montré le rôle considérable que jouent désormais ces réseaux. Une approche écosystémique des organisations internationales cherche à comprendre et à déterminer les rôles que jouent diverses organisations dans un domaine de coopération donné et tient compte d'une multitude d'interactions et de possibilités d'engagement à divers niveaux et échelles.

Le rapport couvre un éventail d'institutions internationales, grandes et petites, dont les mandats comprennent des préoccupations politiques, financières et sécuritaires, notamment l'OMS, l'Association des nations de l'Asie du Sud-Est (ANASE), la Coopération économique Asie Pacifique (APEC), la Banque asiatique de développement et le Dialogue quadrilatéral sur la sécurité. Même si l'OMS, dont le mandat porte déjà sur la santé publique, a semblé moins préparée à s'adapter à l'environnement pandémique, la réponse de nombreuses autres organisations à l'égard de la COVID-19 montre une utilisation concrète du concept de l'écosystème.

Ces institutions ont collaboré avec d'autres organisations internationales pour coordonner les réponses contre la pandémie, conseiller des mesures politiques et adapter leur mandat initial pour donner la priorité à l'atténuation des problèmes liés à la pandémie. La recherche a révélé une importance colossale accordée aux interrelations, sous le sceau de la coopération, de la collaboration et de la coordination des mesures de réponse aux niveaux infranational et international. L'intervention en cas de catastrophe et les liens forgés dans des environnements de risques naturels antérieurs ont pris la forme d'un thème caractérisant les activités de plusieurs des organisations internationales mentionnées dans ce rapport, dont la Banque asiatique de développement.

La recherche a révélé que le Canada n'avait qu'une présence minimale dans les activités de plusieurs de ces organisations. Cela peut être révélateur de l'absence d'une stratégie globale dans les relations entre le Canada et l'Asie Pacifique précédant la pandémie. De plus, le Canada a limité sa participation aux organisations internationales mondiales traditionnelles qui ont agi lentement ou ont été critiquées pour leur inactivité générale, comme l'ONU, le G7, le G20, l'OMS et l'OMC. De plus, l'engagement du Canada sur les questions de santé mondiale dans la région de l'Asie Pacifique a surtout été dirigé par Affaires mondiales Canada (AMC), sans la participation de l'ASPC.

Le moment et la façon dont les principales organisations internationales de l'Asie Pacifique ont réagi à la crise de la COVID-19 ont mis en évidence plusieurs possibilités, pour le Canada, de jouer un rôle plus actif dans la région à l'avenir. Pour le Canada, il existe de nombreuses possibilités de s'engager davantage en matière de santé publique. Toutefois, pour la région de l'Asie Pacifique, une approche écosystémique devrait guider cet engagement.

Recommandations stratégiques

Compte tenu de l'approche écosystémique proposée, le rapport formule les recommandations suivantes concernant l'engagement dans la région de l'Asie Pacifique en ce qui a trait à la pandémie actuelle de COVID-19 et à la planification des pandémies futures :

1. **Reconnaître et promouvoir l'interrelation entre la santé, le commerce et la résilience économique, ainsi qu'appuyer un engagement canadien plus soutenu dans la région de l'Asie Pacifique.**

   Le Canada gagnera à soutenir un engagement plus profond et plus soutenu en Asie Pacifique, à l'aide d'une approche écosystémique qui souligne l'importance de maintenir les relations, la confiance et la bonne foi avec les partenaires régionaux et

internationaux. Il est également nécessaire que le Canada réévalue sa représentation au sein des organisations régionales, en renforçant et en élargissant sa participation actuelle au-delà des organisations traditionnelles comme l'ANASE, le Forum des îles du Pacifique ou la Communauté du Pacifique.

L'établissement de relations plus solides avec les organisations régionales ne diminue pas l'importance d'aider à renforcer l'OMS (p. ex., pour le financement, pour promouvoir une réforme), afin qu'elle dépende moins du financement de programmes spécifiques, des luttes d'influence géopolitiques et qu'elle soit plus souple sur le plan institutionnel en temps de crise.

En même temps, le Canada doit accroître ses méthodes d'obtention d'informations sur la santé mondiale et ne pas se fier uniquement au Secrétariat de l'OMS à Genève. Le Canada peut bénéficier d'un engagement direct avec les bureaux régionaux de l'OMS, les organisations régionales, les réseaux de surveillance des maladies, les réseaux d'épidémiologie et les réseaux d'experts (dialogue parallèle, etc.).

En temps de crise, le Canada doit assurer un engagement continu et cohérent dans toutes les régions du monde et l'inclusion de l'expérience et des connaissances de l'Asie Pacifique à différents niveaux. Cela peut se faire au moyen de mécanismes comme un comité ad hoc d'engagement en cas de crise et un entrepôt d'informations facilement accessibles sur les acteurs du gouvernement canadien qui travaillent avec des organisations internationales dans le domaine de la santé en Asie Pacifique. En temps de crise, le fait de ne pas savoir précisément qui fait quoi, et où, fait en sorte qu'il est difficile d'accéder rapidement à l'information, d'agir et de formuler des politiques fondées sur des données probantes. Cela renforcerait la capacité de l'ASPC et d'un comité ad hoc d'engagement en cas de crise à agir lorsqu'une crise se présente.

2. **Améliorer la communication ministérielle, la coopération dans les programmes de santé internationale et l'engagement.**

   Pour maximiser les avantages d'une approche écosystémique, il faudra peut-être aussi créer davantage de canaux de communication et de coopération entre AMC et l'ASPC. Une plus grande représentation de l'ASPC au sein des programmes d'engagement en santé mondiale d'AMC est essentielle, pour que le Canada maintienne des relations en période de crise sanitaire, à l'aide d'un écosystème. Le manque de présence de l'ASPC dans les programmes d'engagement en santé mondiale d'AMC constitue une possibilité manquée, pour l'ASPC, de fournir ses ressources, ses connaissances et son expertise en matière d'éclosions et de gestion de maladies, et de cultiver des relations

interpersonnelles avec les responsables de la santé publique et les scientifiques de la région auxquels on peut faire appel comme source complémentaire d'information sur les éclosions émergentes, en plus du RMISP.

Dans le cadre de l'approche écosystémique, un engagement international est nécessaire, afin de coordonner et de collaborer avec d'autres organisations internationales, pour s'assurer que les préoccupations sont prises en compte et pour miser sur le partage de l'information. Il est donc essentiel que le Canada ajoute un volet d'engagement international à sa planification en cas de pandémie, en mettant plus particulièrement l'accent sur les organisations internationales de l'Asie Pacifique. Pour renforcer les relations régionales, le Canada devrait continuer à accroître l'aide internationale en matière de préparation à des pandémies et de surveillance des maladies infectieuses. Une présence accrue mène à de plus grandes possibilités de collaboration et de coordination de plans d'intervention avec les pays de l'Asie Pacifique en période de crise sanitaire.

3. **Accroître les possibilités de leadership canadien au moyen d'initiatives locales.**

   La pandémie a mis en évidence à plusieurs reprises que l'un des points faibles de la politique de santé publique et de soins de santé est l'égalité des soins. Les communautés locales et marginalisées, dont les réfugiés, les minorités, les travailleurs migrants, les femmes et les groupes autochtones, ont subi de manière disproportionnée les effets négatifs de la COVID-19. Ces tendances étaient particulièrement visibles dans la région de l'Asie Pacifique, où le Canada peut jouer un rôle plus important pour aider à réduire ces inégalités. La contribution du Canada peut prendre les formes suivantes : financer les efforts infranationaux en matière de santé mondiale et d'équité, s'engager de façon constante auprès des groupes et des réseaux épidémiologiques, et fournir les outils nécessaires pour s'engager auprès des gouvernements locaux et des principales organisations de la société civile.

06

CONCLUSION

Ce projet a examiné et analysé les diverses expériences des économies de l'Asie Pacifique en matière de COVID-19, afin d'en tirer des leçons et enseignements précieux pour améliorer la réponse du Canada en cas de future pandémie. Il est important que les décideurs du Canada ne se contentent pas d'examiner les manchettes annonçant la réussite de certaines réponses en Asie Pacifique qui ont retenu l'attention mondiale, et qu'ils s'efforcent d'étudier les facteurs qui ont contribué à rendre ces réponses si efficaces et remarquables en premier lieu.

À l'instar des économies de l'Asie Pacifique qui ont appris, ont apporté des réformes et ont évolué à la suite des expériences répétées du SRAS et du SRMO, le Canada doit considérer la pandémie de COVID-19 comme un appel à l'action pour mieux se préparer à la prochaine situation, inévitable, où un nouvel agent pathogène deviendra viral. En plus de tirer des leçons de ses propres revers et erreurs de calcul, le Canada peut et doit tirer des leçons des réponses des administrations de l'Asie Pacifique qui ont mieux géré la pandémie, y compris celles qui ont été examinées et analysées dans le cadre de ce projet.

Comme l'impact de la COVID-19 dépasse le domaine de la santé, la préparation et la planification en cas de pandémie doivent adopter une approche globale et multidimensionnelle pour contrer les retombées de futures crises de santé sur des éléments interreliés comme l'économie, le commerce et l'engagement régional et mondial du Canada. Comme le montrent les recherches et les analyses effectuées dans les quatre

rapports d'analyse de politiques dont il est question ici, la préparation et la planification en cas de pandémie doivent mettre l'accent sur des interventions nationales cohérentes, guidées par des données scientifiques et soutenues par des politiques qui définissent clairement les rôles, les pouvoirs et les mécanismes de coordination de tous les acteurs gouvernementaux.

Bien que bienvenues et importantes, les réformes des institutions et des politiques de santé publique qui favorisent une action décisive fondée sur l'expertise scientifique ne suffiront pas à elles seules. Le Canada doit également apporter un changement fondamental dans sa façon d'aborder les politiques structurelles essentielles pour actualiser et faciliter la planification en cas de pandémie, comme la gouvernance des données, le développement technologique et la coopération public-privé. Des changements similaires doivent se produire dans l'approche traditionnelle du Canada à l'égard des organisations internationales, afin de se rapprocher de l'approche écosystémique plus souple et plus diversifiée de l'Asie Pacifique. Cette transformation plus structurelle créera les bases nécessaires à des réponses pangouvernementales et sociétales aux pandémies. Comme le montrent ces exemples de l'Asie Pacifique, il n'est pas possible d'effectuer des changements systémiques du jour au lendemain; il s'agit d'un effort à long terme et d'un investissement de plusieurs années. Dans le cas du Canada, il n'y a pas de meilleur moment que maintenant pour commencer.

VUE D'ENSEMBLE

ASIA PACIFIC FOUNDATION OF CANADA

FONDATION ASIE PACIFIQUE DU CANADA

La Fondation Asie Pacifique du Canada (« la Fondation ») est une organisation à but non lucratif consacrée aux relations du Canada avec l'Asie. Sa mission consiste à servir de catalyseur et de trait d'union dans les relations entre l'Asie et le Canada. La Fondation a pour rôle de renforcer les liens entre le Canada et l'Asie, en se concentrant particulièrement sur les secteurs relevant de sept thématiques :

le commerce et les investissements

les technologies numériques

le développement durable

les enquêtes et les sondages

les réseaux intérieurs

les compétences sur l'Asie

la sécurité régionale

Notre recherche fournit des renseignements, des aperçus et des points de vue de grande qualité, pertinents et opportuns, sur les relations entre le Canada et l'Asie. Notre travail consiste à fournir des réflexions sur les politiques et des veilles économiques aux parties prenantes dans toute la région Asie-Pacifique, à l'aide de rapports, de notes de synthèse, d'études de cas, des médias numériques de dépêches et d'un bulletin d'information régulier intitulé Asia Watch. Ensemble, ces éléments soutiennent ces secteurs thématiques.

La Fondation travaille également avec des intervenants du monde des affaires, du gouvernement et du milieu universitaire, pour fournir aux organisations canadiennes des recherches personnalisées, des données, des séances d'information et de la formation relative aux compétences sur l'Asie. Des services d'experts-conseils sont disponibles sur demande. Nous serons heureux de travailler avec vous pour répondre à vos besoins en matière de recherche et de veille économique.

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NOTES EN FIN DE TEXTE

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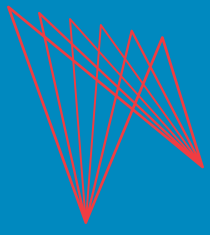

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VOL.1

MARCH 2022

FIRST RESPONDERS:

How the Asia Pacific Region Managed the Public Health Response to COVID-19 and What Canada Can Learn from Them

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EXECUTIVE SUMMARY

Throughout the world, COVID-19 has exposed the strengths and weaknesses of public health and pandemic preparedness. In contrast to developed countries throughout Europe and North America, many Asian countries have been highly successful in managing the pandemic within their borders. For example, the exemplary responses of South Korea, Taiwan, Australia, New Zealand, and other economies of the Asia Pacific region have been characterized by superior levels of co-ordination and agility. The most definitive factor in the response of Asian economies such as Taiwan and South Korea has been the structural and institutional changes wrought by experience with past outbreaks.

In a review released in March 2021, the auditor general of Canada concluded that the Public Health Agency of Canada was not adequately prepared to respond to COVID-19. In Canada, the 2003 SARS outbreak was largely confined to health-care facilities and thus did not provide sufficient preparation or learning opportunities for the government to develop and implement a whole-of-society pandemic response. In the intervening years, the responses that were built up after SARS have languished as focus has shifted elsewhere. Canada now faces an opportunity to learn from the successes and failures of its response to COVID-19 and to incorporate those lessons into future pandemic plans. This should include looking to the Asia Pacific, as this region has shown the most effective response to COVID-19.

In this report, we evaluate the pandemic responses from seven Asia Pacific economies: Australia, Japan, New Zealand, Singapore, South Korea, Taiwan, and Vietnam, across seven broad categories: (1) governance structure, expertise, and experience; (2) pandemic preparedness; (3) public health and the pandemic response; (4) border measures; (5) case-based interventions; (6) population-based interventions; and (7) communication strategies.

We identify factors that enabled the success of the Asia Pacific region and that are relevant to the Canadian context. We then propose recommendations based on the following themes, which emerged from our research:

- Effective pandemic responses require a whole-of society approach;
- Effective pandemic responses are strengthened by structural and institutional preparations, many of which are shaped by past experiences;
- Responses need to be guided by scientific expertise using what limited data is available, and be agile enough to adapt quickly to new evidence; and
- Timing greatly affects the effectiveness of a response.

RÉSUMÉ

Partout dans le monde, la COVID-19 a mis en évidence les forces et les faiblesses des organismes de santé publique et de l'état de préparation aux pandémies. Contrairement aux pays développés de l'Europe et de l'Amérique du Nord, de nombreux pays asiatiques ont très bien réussi à gérer la pandémie au sein de leurs frontières. Par exemple, les réponses exemplaires de la Corée du Sud, de Taïwan, de l'Australie, de la Nouvelle-Zélande et d'autres économies de la région de l'Asie Pacifique ont été caractérisées par des niveaux supérieurs de coordination et d'agilité. Le facteur le plus déterminant dans la réponse des économies asiatiques comme celles de Taïwan et de la Corée du Sud a été les changements structurels et institutionnels apportés en raison de l'expérience des épidémies passées.

Dans une étude publiée en mars 2021, la vérificatrice générale du Canada a conclu que l'Agence de la santé publique du Canada n'était pas suffisamment préparée pour réagir à la COVID-19. Au Canada, l'épidémie de SRAS de 2003 a été largement confinée aux établissements de soins de santé et n'a donc pas fourni au gouvernement une préparation suffisante ou des possibilités d'apprentissage pour élaborer et mettre en œuvre une réponse à une pandémie portant sur l'échelle de la société. Au cours des années qui ont suivi, les mesures mises en place après le SRAS ont langui, car l'attention s'est déplacée ailleurs. Le Canada a maintenant la possibilité de tirer des leçons des succès et des échecs de sa réponse à la COVID-19 et d'intégrer ces leçons aux plans de lutte contre de futures pandémies. Pour ce faire, il devrait notamment se tourner vers l'Asie Pacifique, car c'est dans cette région que la réponse à la COVID-19 a été la plus efficace.

Dans ce rapport, nous évaluons les réponses à la pandémie de sept économies de la région de l'Asie Pacifique — l'Australie, le Japon, la Nouvelle-Zélande, Singapour, la Corée du Sud, Taïwan et le Vietnam —, par rapport à sept catégories générales : (1) la structure de la gouvernance, l'expertise et l'expérience; (2) la santé publique et l'état de préparation à la pandémie; (3) la surveillance des maladies infectieuses et la réponse à leur égard; (4) les mesures aux frontières; (5) le dépistage et la gestion des cas; (6) les interventions non pharmaceutiques; et (7) les stratégies de communication.

Nous déterminons les facteurs qui ont permis à la région de l'Asie Pacifique de remporter du succès et qui sont pertinents pour le contexte canadien. Nous proposons ensuite des recommandations fondées sur les thèmes suivants, qui ont été dégagés par notre recherche :

- Les réponses efficaces en cas de pandémie exigent une approche visant l'ensemble de la société.
- Les réponses efficaces à une pandémie sont renforcées par des préparations structurelles et institutionnelles, dont beaucoup sont définies par les expériences passées.
- Les réponses doivent être guidées par l'expertise scientifique en utilisant les données limitées disponibles, et être suffisamment souples pour s'adapter rapidement aux nouvelles données.
- Le choix du moment influe grandement sur l'efficacité d'une réponse.

01

INTRODUCTION

Although Canada was not unprepared for a pandemic, COVID-19 nonetheless resulted in significant loss of life and had a high economic cost. By the end of 2020, Canada had recorded 584,409 cases of COVID-19, resulting in 15,762 deaths and costing an estimated C$240B, or C$952M per day.[1] Many countries, most notably in the Asia Pacific region, handled the pandemic relatively better, with lower rates of transmission and deaths, fewer overall restrictions on domestic society, and a smaller decline in GDP. In this report we assess and analyze the factors that contributed to the successful pandemic response of multiple Asia Pacific countries and derive recommendations that are applicable in the Canadian context. COVID-19 is not the last health crisis that the world will face. Only by learning from our own experiences – as well as those of others – will Canada be better positioned to respond more effectively when the next pandemic arrives.

This report begins with a brief description of COVID-19 as a novel pathogen, highlighting the unique features that have made it challenging to control. We then examine the pandemic outcomes in the Asia Pacific region. Our analysis later focuses on key features of the pandemic response in select Asia Pacific countries and the lessons that can be derived for future pandemic planning in Canada.

Our findings reveal several themes that are shared between Asia Pacific countries that successfully navigated COVID-19. Previous experience with epidemics informed policy and structural reforms and also heightened the awareness of emerging infectious diseases

among the public. As Canada emerges from the initial shock of COVID-19 and begins to assess how this experience can improve its response to future pandemics, our analysis identifies several lessons from the Asia Pacific region.

02

METHODOLOGY AND SCOPE

Our analysis is restricted to the first year of the pandemic, with particular focus on the first few months. As such, an assessment of vaccination campaigns has not been included. The findings in this report are based on the experiences of seven countries. Specifically, this report provides an in-depth examination and analysis of the responses of Australia, Japan, New Zealand, Singapore, South Korea, Taiwan, and Vietnam. The criteria for their inclusion are as follows:

1. **Overall low cumulative case numbers and mortality:** The selected countries have been able to maintain comparatively low rates of community transmission throughout multiple waves of the pandemic. We did not heavily focus on those countries in South or Southeast Asia, such as India, Thailand, and Cambodia, that performed admirably throughout the first year only to experience devastating surges in the spring of 2021.

2. **Co-ordinated pandemic preparedness and response:** The success of each economy covered in our report resulted from the unique intersectionality of governance models, socioeconomic and cultural factors, and existing public health infrastructures. Hence, our approach focuses more on the policies and institutional features that allowed their effective and co-ordinated pandemic responses, despite the inherent differences between these countries. We analyzed the mechanisms used to establish response networks, from which Canada can draw contextualized lessons.

Our research and analysis relied on a mix of methods, including desk research, expert interviews, and expert roundtables.

We performed a review of policy responses to COVID-19, using a variety of sources including: (1) government websites and reports, white papers, and media briefings; (2) academic publications obtained from health science and medicine literature databases; and (3) databases compiled by international organizations and research groups.

From our desk research, we identified experts from the region and invited them to share their perspectives at two health policy roundtables or by interview. The experts included public health officers, government officials, physicians, and academic researchers. In addition to Canada, these experts represented our case study countries: Australia, Japan, New Zealand, Singapore, South Korea, Taiwan, and Vietnam. We identified areas of discussion and formulated a broad range of questions that were included in briefing materials sent to participants.

Roundtable 1 included seven participants who shared their expertise on pandemic preparedness and response, public health investment, surveillance, population-based interventions, border policies, reopening strategies, and high-risk populations. Roundtable 2 included five experts who were asked questions on case-based interventions such as contact tracing, testing, quarantine, and the application of digital technology to aid these strategies.

Additionally, we consulted several Canadian experts from academic institutions and the public sector on areas including communication, public health, data governance, and border control to help evaluate the applicability of our recommendations.

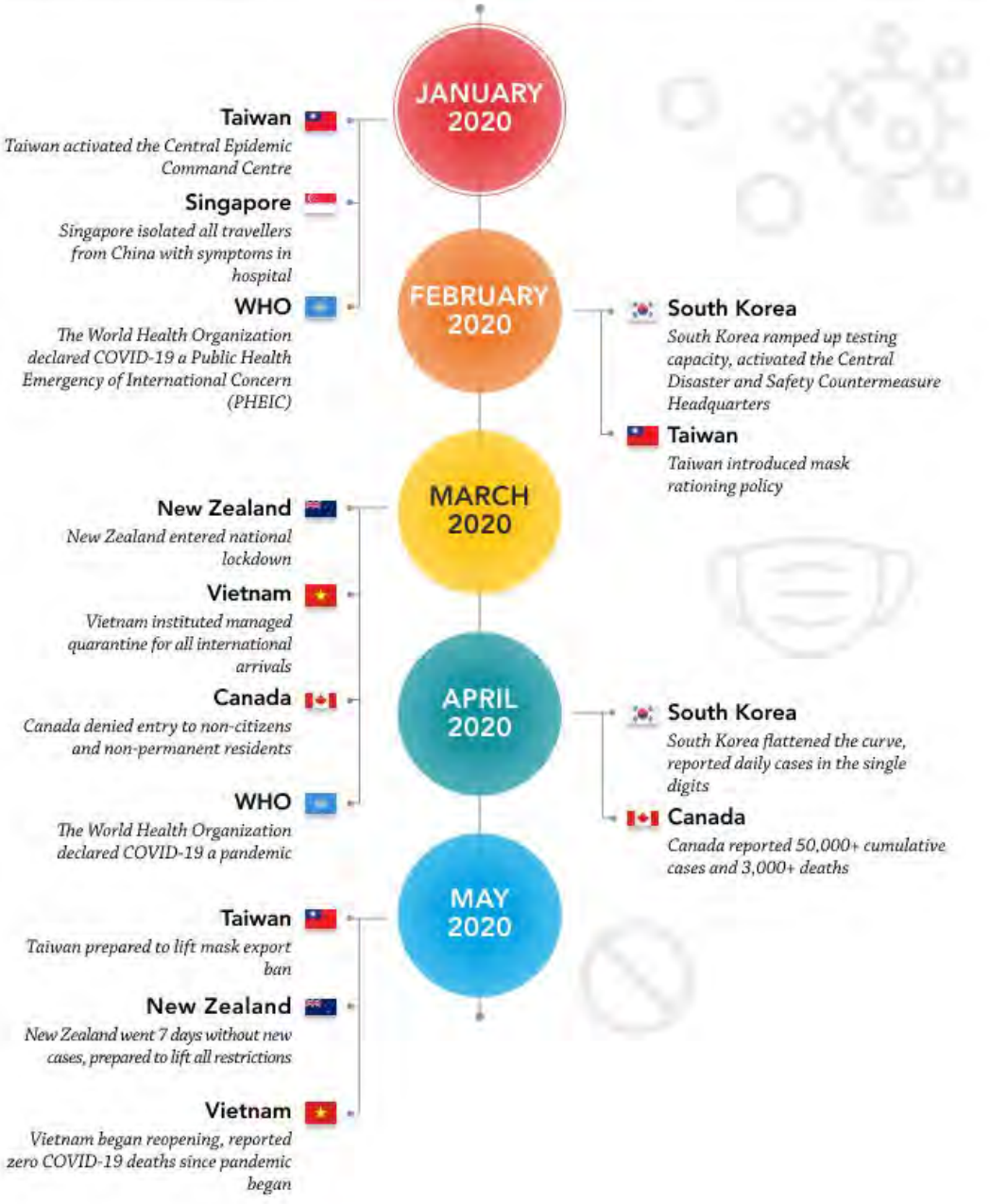
Early Timeline of COVID-19

On December 31, 2019, a cluster of pneumonia of unknown cause was described on the surveillance site ProMED.[2] On the same day, Chinese authorities notified the World Health Organization (WHO) of a cluster of 27 cases of pneumonia of unknown cause in Wuhan City, Hubei Province.[3] On January 9, Chinese researchers identified the causative organism as a novel coronavirus, and on January 10 they released the genetic sequence of the virus.[4] Although there was evidence as early as January 2 that person-to-person transmission was occurring,[5] the WHO did not acknowledge this fact until January 20.[6] Thailand identified the first case outside of China on January 13, followed by Japan on January 15. The WHO declared COVID-19 a Public Health Emergency of International

Concern on January 30. However, the organization did not declare COVID-19 a pandemic until March 12. By then, 125,260 cases had been detected in 117 countries, with 4,613 deaths.[7]

FIGURE 1

Timeline of COVID-19



In Canada, the first case was diagnosed on January 27 in a traveller recently returned from Wuhan. The first case of community transmission was recorded on March 5 in BC. Throughout the spring and early summer of 2020, the highest case counts were recorded in Ontario, Quebec, and Alberta, with fatalities being particularly concentrated among residents of long-term care facilities. By mid-summer, cases had steadily declined throughout the country, leading to a relaxation of restrictions. With the exception of the Atlantic provinces and the territories, cases began to surge throughout the country in the fall and winter of 2020, leading to the anticipated second wave. A third wave, largely driven by the novel and more-transmissible variants, developed throughout the winter/spring of 2021, leading to increased restrictions across most of Canada, including widespread lockdowns.

Transmission Dynamics

SARS-CoV-2, the virus that causes COVID-19, is primarily transmitted via respiratory droplets,[8] although there is increasing evidence that airborne transmission can occur under certain conditions.[9] Studies in Hong Kong and Japan have described clusters of transmission – so-called "superspreader" events – as having been responsible for the majority of new infections, estimating that 20% of cases were responsible for 80% of transmission.[10] The literature on COVID-19 shows that such patterns hold true for transmission globally.

SARS-CoV-2 demonstrates other characteristics that set it apart from the coronaviruses that caused severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), including both asymptomatic and pre-symptomatic transmission and a higher rate of transmission.[11] The rate of asymptomatic infections is difficult to accurately discern and is likely influenced by factors such as population demographics. Reports have highlighted that the asymptomatic rate ranges from 18% to 79% of cases,[12] and studies have reported that viral loads were not substantially different between symptomatic, pre-symptomatic, and asymptomatic individuals.[13]

Given the high global levels of transmission and the natural mutability of viruses, there has always been a substantial risk of genetic variants emerging that are more transmissible or more lethal. Throughout the winter of 2020-2021, novel variants of concern were detected that proved to be more transmissible than the original strain. Notably, the Alpha variant (B.1.1.7) first detected in the United Kingdom is estimated to be between 40% and 80% more transmissible than the original strain, while the Delta variant first detected in India is estimated to be 60% more transmissible than Alpha. These variants also appear to be

more prevalent in younger patients than the original strain, possibly due to lower rates of vaccination among this cohort. In June 2021, the Delta variant was the cause of the majority of new cases recorded in the United Kingdom and Australia, with infection rates highest in younger adults and older teens who had not been vaccinated.[14]

03

THE RELATIVE SUCCESS OF THE ASIA PACIFIC REGION

After China, other countries in Asia were the first to detect COVID-19 within their borders. Due to the proximity to the epicentre in China, there were fears that this region would be among the hardest hit by the pandemic. However, transmission throughout the Asia Pacific was on average much lower than that experienced by countries in North America and Europe. Taiwan, despite extensive connections with mainland China, had recorded only 40 cases by March 2020 and went 253 days without recording a single new case between April and December 2020. Although Singapore had recorded nearly 60,000 cases by March 2021, its response was largely successful in controlling community transmission, as nearly 90% of cases were among migrant workers living in crowded dormitories.

As our analysis reveals, the response to COVID-19 of many countries within the Asia Pacific region, most notably Vietnam, Singapore, and New Zealand, did not conform to prior indicators of success. The United States topped the Global Health Security Index (GHSI) assessment released in 2019 but struggled to mount an effective response to COVID-19, experiencing some of the highest rates of transmission and mortality in the world. Canada also scored high on the GHSI, ranking fifth overall; however, this assessment did not translate into a similarly ranked real world pandemic response. Conversely, the GHSI identified vulnerabilities in New Zealand's pandemic readiness, including an insufficient

FIGURE 2

The cumulative incidence of COVID-19 as of June 6, 2021, in Canada and the Asia Pacific

Source: COVID-19 Data Repository, Center for Systems Science and Engineering, John Hopkins University

number of epidemiologists, inadequacies in the sharing and reporting of surveillance data, and failure to conduct exercises to assess pandemic readiness,[15] all areas that were similarly identified by the 2010 Senate report on H1N1 as needing improvement in Canada.[16] However, New Zealand overcame these challenges to mount one of the most effective responses to COVID-19.

The level of economic development also was not a determining factor in the ability of individual countries to curb the spread of COVID-19. High-income economies such as the United States and the United Kingdom struggled to contain transmission, while Vietnam, Cambodia, and Thailand, which have relatively low rates of per-capita spending in health, all reported low case numbers, recording 25, 50, and 373 cases, respectively, by March 2021.

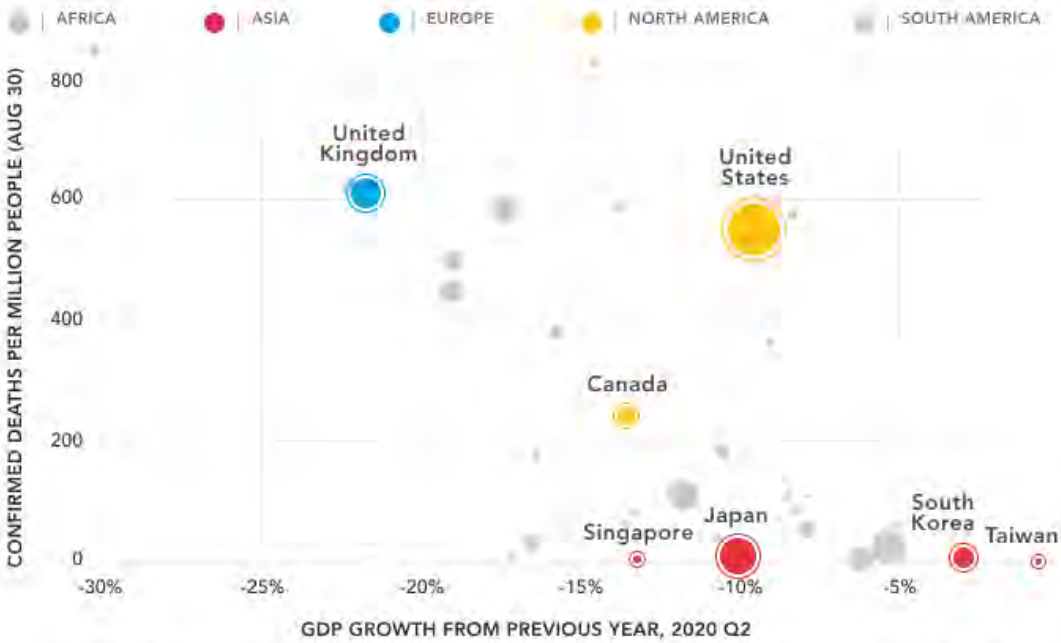
Economic Costs and Benefits of the Pandemic Response

The greater success of jurisdictions within the Asia Pacific region, such as South Korea, Taiwan, Australia, and New Zealand, is also reflected when analyzing the economic damage inflicted by the COVID-19 pandemic. Border closures, lockdowns, and other pandemic responses can cause massive economic damage. Many governments have been reluctant to implement drastic measures in a timely or comprehensive fashion. However, evidence suggests that taking a less-aggressive approach focused primarily on mitigating transmission rather than eliminating it was a more costly strategy in the long term. Despite the costs of the border restrictions imposed by Australia and New Zealand, in 2020 those countries experienced a year-over-year decline in GDP of 2.4% and 3.0%, respectively,

FIGURE 3

The relationship between the number of confirmed deaths and GDP growth from the previous year (2020 Q2) in the U.K., U.S., Canada, Singapore, Japan, South Korea, and Taiwan

The vertical axis shows the number of COVID-19 deaths per million, as of August 30. The horizontal axis shows the percentage decline of GDP relative to the same quarter in 2019. It is adjusted for inflation.

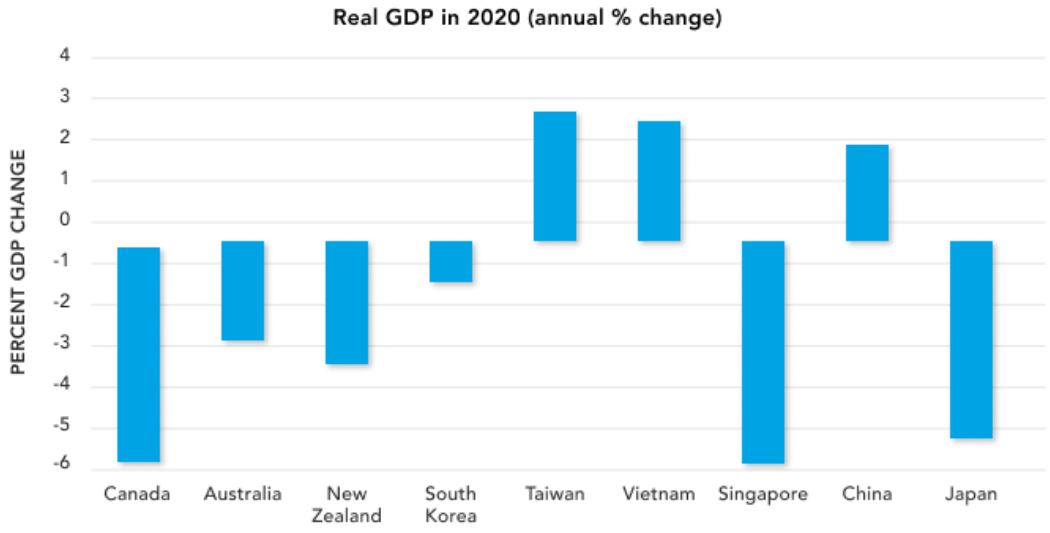


Source: COVID-19 Data Repository, Center for Systems Science and Engineering, John Hopkins University, World Bank — World Development Indicators

compared to Canada's 5.4% decline. South Korea, which pursued an ambitious testing and contact tracing strategy, experienced only a 1% decline in GDP while simultaneously avoiding border closures and mass lockdowns. Meanwhile, the early and decisive actions of Taiwan, including proactive case detection and strictly imposed quarantine, contributed to an actual gain in GDP of 3.1% in 2020. Although other factors may have been at play, this has implications for the cost-benefit analyses of future pandemic responses and supports the ethical and economic benefits of being proactive.

FIGURE 4

Percent GDP change between 2019 and 2020 in Canada, Australia, New Zealand, South Korea, Taiwan, Vietnam, Singapore, China, and Japan. Canada suffered the most economic damage compared to other countries in the Asia Pacific



Source: International Monetary Fund (IMF). 2021. World Economic Outlook: Managing Divergent Recoveries. Washington, DC

ANALYSIS

We investigated seven economies identified as having the most effective pandemic response to determine the factors that contributed to their success through an analysis across seven broad categories: (1) governance structure, expertise, and experience; (2) pandemic preparedness; (3) public health and pandemic response; (4) border measures; (5) case-based interventions; (6) population-based interventions; and (7) communication strategies. While there was no single path to success, we identified commonalities from which we derived lessons applicable to Canada.

Our findings reveal several themes that are shared between Asia Pacific countries that successfully navigated COVID-19. Previous experience with epidemics informed policy and structural reforms and also heightened the awareness of emerging infectious diseases among the public. As Canada emerges from the initial shock of COVID-19 and begins to assess how this experience can improve its response to future pandemics, our analysis identifies several lessons from the Asia Pacific region.

04

GOVERNANCE STRUCTURE, EXPERTISE, AND EXPERIENCE

A successful pandemic response is built on strong institutions and targeted policies. Our analysis of the COVID-19 response of the seven Asia Pacific economies reveals that their public health institutions underwent changes after previous experience with outbreaks, most significantly SARS in 2002-2003 and MERS in 2015. In the aftermath of these events, common reforms included improving inter-governmental and inter-ministry co-ordination, improving the definition of roles and authority among the various actors involved in a pandemic response, elevating the role of experts, and putting an emphasis on the protection of vulnerable populations. The changes brought to health governance structures and public health institutions paved the way for the successful response to COVID-19.

Effect of Governance Structure and Experience on Pandemic Preparedness and Response

COVID-19 is not the first emerging infectious disease that the Asia Pacific region has contended with. In the aftermath of previous outbreaks such as SARS, H1N1, and MERS, many of the most-affected countries have increased their focus on infectious disease outbreaks and pandemic preparedness. In addition to enacting new laws and policies, they assigned clear mandates to new or existing institutions, ensuring transparent protocols

and command structures in the case of a new outbreak. While in some instances the reform process led to a more centralized governance structure for pandemic responses, the key takeaway for Canada is how such reforms and institutions facilitated smooth co-ordination across government ministries and agencies, resulting in a more responsive, agile, and whole-of-government approach to the 2020 pandemic. The strength of effective cross-government co-ordination is exemplified by the centralized response of South Korea and Taiwan as well as by the more decentralized example of Australia.

After SARS, South Korea created the Korea Centers for Disease Control and Prevention (KCDC) in 2003.[17] South Korea learned further lessons from its failed response to MERS in 2015, when a lack of communication and co-operation between different levels of government and a lack of collaboration between agencies were identified as factors explaining the poor response.[18] At the national level, it was determined that the roles and responsibilities of the health authorities were fragmented and lacked clarity.[19] At the time, the KCDC was under the Ministry of Health and lacked independent decision-making authority. In the reforms that followed MERS, the head of the KCDC was subsequently elevated to the level of vice-minister and the KCDC was designated the command centre for infectious disease responses.[20] The Infectious Disease Control and Prevention Act was also revised in 2016 to clarify the responsibilities of the participants involved in pandemic response and to facilitate co-ordination during an outbreak of an infectious disease.[21] The KCDC also amended its organizational structure and revised the Standard Manuals for Crisis Management to improve response co-ordination, which has been credited as a factor in its rapid and agile response to COVID-19.[22] On a practical level, a round-the-clock Emergency Operations Centre was established, as were provincial-led rapid response teams under the authority of the KCDC.[23]

In early March 2020, as the COVID-19 outbreak grew, there was increasing pressure from the public for the pandemic response to be led by public health experts with pandemic experience rather than by the government.[24] In response, on September 12, 2020, the KCDC was elevated to a stand-alone agency and renamed the Korea Disease Control and Prevention Agency (KDCA), and staffing levels were increased.[25] No longer merely a centre under the Ministry of Health and Welfare, the KDCA obtained independence in the administration of its workforce and budget allocations. These changes also gave the KDCA jurisdiction and enforcement authority over six health-related laws, including the newly revised Infectious Disease Control and Prevention Act, the provisions of which cover notification and reporting of infectious diseases, as well as a range of prevention and control measures.[26]

Taiwan had also experienced co-ordination issues between the central and municipal governments during its response to SARS in 2003,[27] as well as problems with surge capacity.[28] The legacy of SARS in Taiwan was the implementation of institutional and legal foundations on which future pandemic plans were built, including changes to the Communicable Disease Control Act in 2004 and the creation of the National Health Command Center (NHCC) to facilitate cross-ministerial information exchange and co-ordination during a pandemic response.[29]

Post-SARS reforms in Taiwan further led to the establishment of the Central Epidemic Command Center (CECC), a sub-unit of the NHCC. The CECC is headed by the minister of health and welfare, and during emergencies it is activated to co-ordinate the outbreak response. The role of the commander of the CECC is to co-ordinate and mobilize resources across multiple ministries, including interior, transportation, foreign affairs, economics, labour, education, and defence.[30] As COVID-19 unfolded, the CECC was effective in improving the government response time and mobilizing resources.[31]

Amendments to the public health laws, including the Communicable Disease Control Act, made after SARS and during COVID-19 have further bolstered the authority of the CECC.[32] Taiwan's Communicable Disease Control Act and the Special Act on COVID-19 Prevention, Relief and Restoration provide the CECC with broad policy-making authority, including over surveillance, border control, and quarantine.[33] The Act further provided the legal authority for the integration of the National Health Insurance and Immigration databases. The CECC also has the authority to enforce any disease prevention measures deemed necessary, including the tracking of cellphone data to monitor adherence to quarantine.

Canada also experienced SARS, the legacy of which was the creation of the Public Health Agency of Canada (PHAC). However, given the decentralized governance structure in Canada, the agency does not have the same level of authority to co-ordinate a pandemic response as does the KDCA in South Korea or the CECC in Taiwan. Although Canada demonstrated initial cohesion between levels of government in the early phases of the pandemic, the presence of a public health body imbued with greater authority could facilitate increased cooperation between the federal and provincial/territorial governments and consistency in the overall response, as demonstrated by the examples of South Korea and Taiwan.

CASE STUDY:

Case Study: Australia's Co-operative Model of Pandemic Response

In an analysis of the factors that facilitate an effective pandemic response, Australia is in many ways the exception to the rule. Spared during both the SARS and MERS outbreaks, and thus not as prepared for COVID-19 as other countries in the Asia Pacific, Australia nonetheless benefited from the past experiences of nearby countries. Lacking a central public health agency analogous to the PHAC or the CDC, Australia exemplified a co-operative model of pandemic responsiveness. The Australia Health Protection Principal Committee (AHPPC), chaired by the chief medical officer and consisting of the chief health officers of the states and territories, is the main decision-making committee for public health emergency management and disease control in Australia.[34]

One of the strengths of Australia's response to COVID-19 was the co-ordination of a unified national response, without depriving states of their autonomy and decision-making powers.[35] Although structured in a decentralized manner that is similar to Canada, in Australia the states and territories and the federal government jointly developed a national COVID-19 plan. To facilitate co-ordination and co-operation between levels of government, a National Cabinet made up of the prime minister, the state premiers, and the territory first ministers was convened on March 15, replacing the Council of Australian Governments (COAG). They met as often as weekly during the pandemic as they negotiated the management of COVID-19.

Thus, despite lacking previous outbreak experience and the resultant legal and institutional reforms seen in many Asian countries, the successful Australian response emphasized co-ordination across various levels of government and acknowledged the authority of experts, similar to what was done in countries such as Taiwan and South Korea.

Australia is also an interesting case to consider, as it is structured similarly to Canada, with responsibilities for health care divided between the federal government and the states/territories, although to a different degree than in Canada. Further, the AHPPC is somewhat analogous to Canada's Pan-Canadian Public Health Network. Some differences between Australia's and Canada's responses to COVID-19 are found in the dynamics between the central and provincial or state-level governments. While in Australia the authority of the Commonwealth has gradually expanded to influence an array of issues that were originally the purview of the states/territories, in Canada the balance of power tips more toward the provinces/territories, with the federal government's role largely defined as that of funder, particularly in matters related to health.[36] Thus, the Canadian body most closely analogous to Australia's National Cabinet is the Council of the Federation. The Council, however, does not include the federal government, and its main objective is to co-ordinate at the provincial level and then negotiate with the federal government.

The practical effect of these differences in the balance of power among the levels of government can be seen in the response to COVID-19. As seen with the Australian approach, a more balanced sharing of power between federal and state governments facilitated a more cohesive national response. The National Cabinet agreed that each government would follow and implement AHPPC advice as necessary, a co-operative agreement that removed any need for the federal government to consider a more heavy-handed approach. In Canada, greater federal power was rejected out of hand by the provinces/territories, as illustrated by Scott Moe, the premier of Saskatchewan and then-chair of the Council of the Federation, informing the federal government on April 14, 2020, that the provinces/territories rejected any consideration that the *Emergencies Act* be invoked. The Canadian government does have an option under section 91 of the Constitution, which confers authority to maintain "peace, order and good governance," to pass legislation related to health and welfare when the failure of one province would affect other provinces.[37] However, it remains uncertain to what extent this power can be exerted without the consent of the provinces, a situation that the 2010 Senate commission on H1N1 recommended the federal government address in order to have a legislative backup plan if the preferred route of a collaborative approach failed.[38]

Given the structural challenges posed by a decentralized federation such as Canada to present a harmonized national response and the inherent obstacles that any future increase in federal authority is likely to encounter, legislation endowing PHAC with greater authority, such as that enacted by South Korea after MERS, may not be the most productive avenue. Rather, strategies aimed at improving co-operation between federal and provincial/territorial governments and formulating a more cohesive national response should be included in future pandemic plans, with PHAC as the key co-ordinating agency.

Structurally, this could be through the establishment of a body modelled after Australia's National Cabinet, as Australia has demonstrated that, to be effective, any co-ordinating body has to have the authority to act. In Canada, such a body may also function most efficiently if activated only temporarily and for the purpose of pandemic response, as is the case with the CECC in Taiwan. Pandemic responsiveness would also benefit from strategies to forge a more collaborative partnership between PHAC and the provinces in the inter-pandemic period. Finally, the establishment of provincial rapid response teams under the co-ordination of PHAC, similar to the model of the rapid response teams in South Korea, could also improve the speed and efficiency of the initial outbreak response in Canada.

RECOMMENDATIONS

- Enhance the role of PHAC at the provincial/territorial level through increased collaboration and co-operation with the provinces and territories;
- Improve co-operation between federal and provincial/territorial governments to facilitate the formation of a cohesive national pandemic response, possibly structured after the National Assembly of Australia; and
- Form a provincial/territorial level pandemic-specific response apparatus under the co-ordination of PHAC to facilitate the rapid response to outbreaks of novel pathogens, in the model of the KDCA-led rapid response teams.

05

PANDEMIC PREPAREDNESS

Focus on Infectious Diseases and the Role of Experts in Pandemic Planning

In recent decades, the public health focus in many western countries, including Canada, has shifted to chronic and non-communicable diseases such as cancer, diabetes, and mental illnesses. This has reduced the level of resources committed to emerging infectious diseases (EIDs). In contrast, extensive experience with EIDs has led many Asian economies, including Singapore,[39] South Korea,[40] and Taiwan, to emphasize infectious disease control and to place experts at the forefront of pandemic preparedness and response.

Following SARS, Singapore committed to a six-fold expansion in the number of infectious disease physicians.[41] After MERS, South Korea legally mandated an increase in the recruitment and training of epidemiological investigators, mandating a minimum of 30 officers in the central government and two in each municipal/provincial government.[42] Practically, they more than doubled the number of epidemic intelligence service officers between 2015 and 2020 and added 360 additional infectious disease response staff at the regional level.[43] As a result, South Korea had more than 400 public and private epidemiologists in place at the start of the epidemic.[44] South Korea also increased the number of regional centers for disease control from one to five and substantially increased their budget for risk management over the past five years.[45] The increased funding has been largely invested in infectious disease preparedness, including new electronic

information systems and enhanced health-care infrastructure.[46] The budget for contagious diseases and quarantine systems in South Korea has risen by 182% over the past five years.[47]

Taiwan has also increased its focus on infectious disease over the last two decades, particularly with respect to pandemic preparedness. During a pandemic, the island emphasizes the role of experts over that of civil servants. Recognizing the limitations of civil society organizations consisting primarily of lay people, the CECC includes an expert advisory panel to offer independent professional opinions and make policy recommendations.[48]

Taiwan, whose pandemic plans include the stipulation that the response system should not be allowed to lag in the absence of a pandemic, also emphasizes the importance of institutional memory, mainly through the long-term retention of key experts and staff. Multiple government officials and public health experts responsible for managing the COVID-19 pandemic had previously been involved in responding to SARS, which informed their response to COVID-19.[49] Dr. Chen Chien-jen, the minister of health during SARS, was the vice-president at the time that COVID-19 erupted.

In the 17 years since SARS, Canada's focus on EIDs has waned, resulting in lower investment levels for infectious disease preparedness compared to that observed in much of Asia. As well, unlike the examples of Taiwan and South Korea, at the time the pandemic started, neither the health minister nor the president of PHAC had a medical or scientific background, and the role of the chief public health official is advisory rather than authoritative. This is not unusual in a consultative democracy, nor is this system incompatible with the elevation of experts, as New Zealand has credited a science-based risk assessment with the early and decisive action taken by their government,[50] and Australia's Council of Australian Governments decided on March 13, 2020, that the advice of the AHPPC would be elevated to the status of COAG advice, effectively conferring a higher level of authority on the AHPPC. Nonetheless, the theme that has emerged throughout Asia is that the countries that have achieved the best pandemic responses have maintained their focus on infectious diseases and have subsequently elevated the authority of experts in their pandemic response.

The Role of Practical Experience in Pandemic Preparedness

Having learned from previous outbreaks the value of practical experience, many Asia Pacific countries became more rigorous about conducting exercises to evaluate and update their pandemic plans. In contrast, Canada had not adequately updated the Canadian Pandemic Preparedness Plans (CPIP) or the Health Portfolio Strategic Emergency Management Plan, nor had these plans been subjected to hands-on testing, as related by the auditor general in the March 2021 review of the COVID-19 response.[51] Among the other issues identified by the auditor was the lack of practical drills and experience. The benefits of such experience can be observed in the level of co-ordination and efficiency demonstrated by Taiwan and South Korea in their response to COVID-19.

Following Taiwan's experience with SARS, the executive branch of the government began undertaking epidemic drills to improve preparation.[52] Taiwan updates its EID response handbook annually and holds quarterly training sessions and drills for health-care workers.[53] Government agencies and hospital systems in Singapore are required to conduct externally evaluated pandemic response simulations,[54] while contact tracing procedures were enhanced and regularly practised.[55] Although Vietnam does not have an established public health response network that regularly undergoes pandemic exercises, it instituted pop-up drills across several regions throughout the pandemic, mostly in anticipation of large-scale community transmission and potential strains on health-care systems.

In South Korea, the KCDC has facilitated outbreak simulations with local governments every year since 2010,[56] while the Emergency Operations Centre co-ordinates regular hands-on drills involving multiple departments of the central government as well as local governments and the private sector.[57] With fortuitous timing, the KCDC had performed an emergency drill in December 2019 based on a scenario of an unidentified disease emerging in China. Having practised the response to the scenario so recently, they were well prepared to deal with the real thing when COVID-19 emerged barely one month later.[58]

RECOMMENDATIONS

- Review and implement measures to afford increased authority to experts (scientists/physicians) in organizational decision making;
- Increase the investment in infectious disease preparedness. This includes an increased emphasis on both the hiring and retention of epidemiologists/public health exerts, to improve both institutional memory and institutional surge capacity in the event of a pandemic; and
- Implement regular drills to test pandemic plans and prepare relevant personnel.

Strategy: Elimination or Mitigation?

A significant difference between the Asia Pacific countries studied here and Canada is in the initial strategy with which they approached the pandemic. Throughout Europe and North America, as well as much of Asia, pandemic plans were largely based on pandemic influenza risk management guidelines issued by the WHO after the 2009 H1N1 pandemic. Based on these guidelines, Canada's plans assumed that the hypothetical virus would spread too rapidly to be contained and that attempts to do so would only incur unnecessary economic damage. Thus, Ottawa's plans were aimed at mitigation, also known as the "flatten the curve" model, whereby measures are gradually increased as the pandemic progresses. In contrast, many Asia Pacific countries, informed by past experience of outbreaks, achieved greater control of COVID-19 by pursuing a containment strategy, which involves the rapid escalation of control measures with the goal of eliminating community transmission.[59]

A mitigation strategy relies heavily on pharmaceutical interventions such as antivirals and vaccines, interventions that did not exist for COVID-19 at the outset of the pandemic.[60] The patterns of pre-symptomatic and asymptomatic transmission displayed by COVID-19 also have strategic implications, heightening the importance of interventions such as social distancing and mask wearing. Taiwan, with its past experience of novel and emerging pathogens, had pandemic plans that were more readily adaptable to the characteristics of novel pathogens. These preparations allowed Taiwan to take early and aggressive action that led to a period of 253 days without a single new case, from April to December 2020, during which the first and second waves peaked in Canada. Australia and New Zealand, despite initially planning for a mitigation strategy, recognized the limitations of this approach as applied to COVID-19 and pivoted to elimination, a decision that resulted in these two countries successfully controlling transmission.[61]

The goals of mitigation strategies are to prevent overwhelming the health-care system and to protect the vulnerable.[62] Canada never experienced the level of health-care strain seen in countries such as Italy during the initial months of COVID-19; however, the virus swept through long-term care facilities with devastating consequences despite the mitigation measures implemented by Ottawa and the provinces. Analysis revealed that levels of transmission in the surrounding communities were the primary factor in determining the risk of outbreaks in Canadian long-term care.

Indigenous people in Canada were also disproportionately affected by COVID-19. In contrast, Indigenous people in Australia and the Māori peoples of New Zealand have not been overly impacted by COVID-19 compared to the general population, thanks to low community transmission in these two countries. By driving case counts down nearly to

zero early on, countries such as New Zealand were better able to protect their vulnerable populations and also prevented the sort of dramatic surges experienced by many countries throughout the fall and winter.

CASE STUDY:

New Zealand's Effective Pivot

Like Canada, New Zealand based its pandemic response plans on a mitigation approach. However, COVID-19 proved to have important distinctions from influenza, including a longer incubation period, which allowed more time for an effective testing and contact tracing strategy that could disrupt transmission chains. The WHO–China joint mission's report on COVID-19 indicated that, based on the characteristics of this novel pathogen, containment of SARS-CoV-2 was possible.[63] These findings were supported by emerging evidence that an intense elimination strategy based solely on non-pharmaceutical interventions, such as the one China employed in Wuhan, could be successful in controlling transmission of COVID-19.[64] Scientific advisors also provided the government with case studies of countries who were among the first to deal with COVID-19, including Singapore, Hong Kong, and Taiwan.[65] Based on this emerging information, and on the advice of senior scientists, New Zealand demonstrated an impressive agility as it swiftly pivoted to an elimination strategy on March 23, 2020. This decision was prompted by its lack of capacity to rapidly scale contact tracing, concerns about its ICU surge capacity, and a desire to protect its vulnerable populations, including the Maori and Pacific Islanders.[66]

The success New Zealand and Taiwan have experienced in their control of COVID-19 demonstrates the importance of a response that is appropriate for the characteristics of the pathogen. As such, agility is an important component of an effective pandemic response. The CPIP emphasizes that a response should focus on existing strategies. Although in the midst of a pandemic it may seem too chaotic to attempt to innovate, pursuing the wrong strategy is more costly still. Thus, future pandemic plans should be expansive enough to be adapted to a range of characteristics and scenarios, and flexible enough to readily adapt when the available evidence suggests that elimination is the most viable option.

A successful elimination approach requires the involvement of experts, adequate public health infrastructure, decisive action on the part of governments, and a social safety net to support the vulnerable.[67] The social safety net that Canada established in response to COVID-19 was rapid and comprehensive. Further, the public initially demonstrated a high level of trust and approval in both provincial and federal governments,[68] although this waned as the pandemic went on, with a Leger poll in early 2021 finding that trust in government and public health authorities had significantly eroded as a result of the pandemic.[69] Greater investment in public health infrastructure with increased focus on infectious disease surveillance and planning, including regular exercises and evaluations, and a more prominent role for the input of experts could ensure that Canada is better prepared to mount an agile and aggressive response to the next pandemic.

RECOMMENDATIONS

- Formulate future pandemic plans that are comprehensive and flexible enough to be adapted for different pathogens and that are able to readily move between mitigation and elimination strategies, with a particular emphasis on eliminating community transmission for the protection of high-risk populations.

Public Health and the Pandemic Response

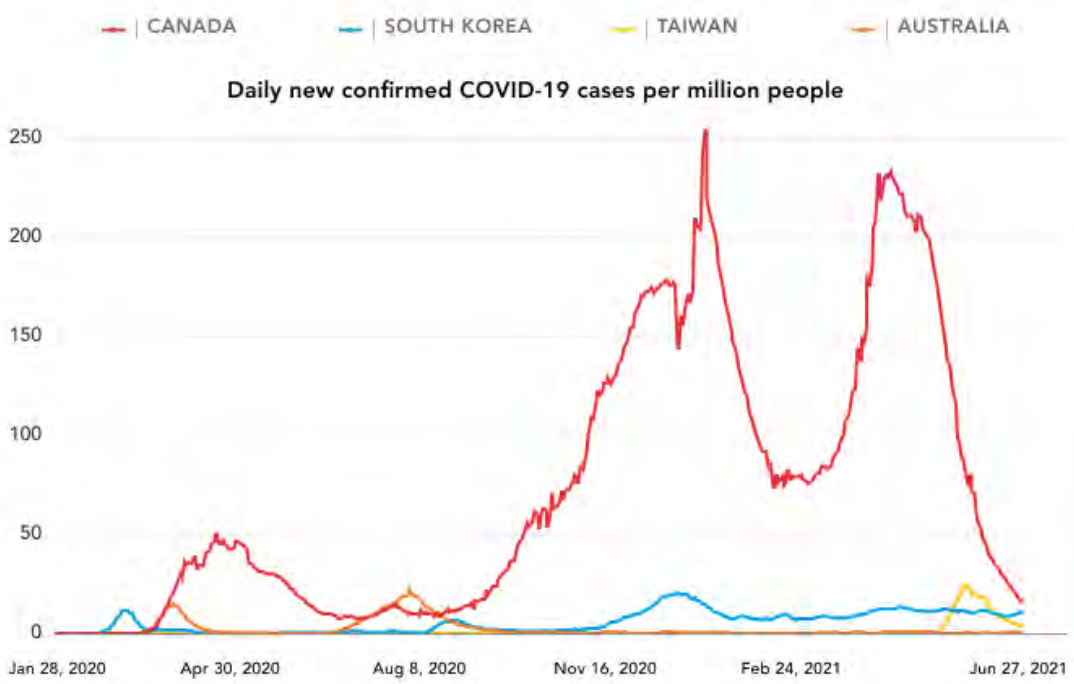
Timing is an essential component of an effective pandemic response. As the example of Taiwan shows, early 2020 represented a brief window of opportunity to prevent the establishment of community transmission. Many countries that missed this opportunity struggled to find a balance between easing restrictions and the resurgence of transmission throughout the remainder of the year,[70] a balance that was understandably complicated by a reluctance to re-impose costly restrictions until cases had risen high enough that they could not be avoided. However, by this time the required measures typically needed to be

both stringent and lengthy to effectively suppress transmission. Many Asian countries, by acting swiftly and decisively, avoided this pattern of surges and heavy public health clampdowns. These early and effective responses relied heavily on the use of early warning systems and risk assessments.

FIGURE 5

Confirmed COVID-19 cases over time

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



Source: https://ourworldindata.org/explorers/coronavirus-data-explorer?zoomToSelection=true&time=2020-03-01..2021-06-27&pickerSort=desc&pickerMetric=new_cases_smoothed_per_million&Metric=Confirmed+cases&Interval=7-day+rolling+average&Relative+to+Population=true&Align+outbreaks=false&country=CAN~KOR~TWN~AUS

Early Warnings

Early warning systems that monitor for external threats are an important first component of an effective pandemic response. Although the Global Outbreak Alert and Response Network (GOARN), in its partnership with the WHO, was conceived for such a purpose, it

should not be considered a replacement for national surveillance strategies. Informed by previous outbreak experience, independent event-based surveillance (EBS) systems and risk assessments were a key feature of the early response of many countries in Asia.

The Taiwan Centers for Disease Control conducts real-time EBS followed by rapid risk assessment. The EBS monitoring system picks up on international and domestic public health events and initiates alerts. Revised after MERS in 2015, sources informing the EBS now include international organizations, government websites, scientific publications, news, media, and internet bulletin boards. Taiwan's EBS for China is applied not only at the national level, but also at the provincial and city levels, due to Taiwan's proximity to China and the large volumes of individuals who travel within and between China and Taiwan[71]. In addition to its own internal intelligence, Taiwan also subscribes to the Canadian-based AI surveillance platform BlueDot, which operates 24 hours a day and draws from over 100,000 data sources in 65 languages, including news outlets; airline ticketing; human, animal, and insect population data; climate data; and global infectious disease alerts[72]. BlueDot issued the first notification about the novel coronavirus when it alerted its clients about a cluster of cases of "unusual pneumonia" in China on December 30, a day before ProMED[73].

Following the inadequate response to MERS in 2015, South Korea revised and enhanced its own EBS system.[74] In 2019, it further bolstered its surveillance capacity by establishing the 24-hour Emergency Operations Centre to facilitate early detection of emergency situations. The Centre collects and analyzes information pertaining to infectious diseases from both domestic and international sources in real time.[75] South Korea also implemented active monitoring of communicable disease situations outside of the country and routine screening at airports and seaports.[76]

Headquartered at PHAC, Canada's own EBS system, the Global Public Health Intelligence Network (GPHIN), is a partner of GOARN and has been lauded in the past for its early detection of emerging pathogens. However, GPHIN was not operating at full capacity before the outbreak of COVID-19. Given the speed with which viruses can transmit, particularly in the era of modern travel, advance notification of emerging infectious diseases provides valuable time to prepare and initiate a response. Further, the unpredictability of when such a threat will emerge reinforces the need for constant vigilance, as demonstrated by the rapid response of multiple countries across the Asia Pacific.

Risk Assessments

Early detection of an EID is only an asset if it is accompanied by an appropriate level of action. As COVID-19 emerged in early 2020, there were stark differences between Canada and several Asia Pacific countries in the determination of risk posed by COVID-19, as well as in the actions taken based on those risk assessments. Crucially, economies such as Taiwan and South Korea acted on the findings of their own risk assessments, while much of North America and Europe, including Canada, relied instead on the early assurances of China and the WHO that COVID-19 posed a low risk. This heightened risk awareness among Asian countries was largely shaped by their close geographic proximity to China as well as by several experiences with EIDs in recent decades.

Risk assessments in Korea are based on the following criteria: impact of the disease, risk of transmission, and risk of importation. Between January 8 and February 23, 2020, the KCDC conducted a total of eight risk assessments. Each was triggered by a new development in the outbreak and each influenced government decision-making.[77] The overall risk was assessed as high by January 20 and very high by February 23. In addition to informing the overall response, communicating the risk assessment to the general population facilitated engagement and awareness on the part of the public.

SARS taught Taiwan the value of early and continuous preparation and to err on the side of caution.[78] Risk assessments are modelled on the WHO and European Centres for Disease Control protocols. Risk of importation, risk of community outbreak, and impact on the country all contribute to the overall assessment. The Taiwan CDC commenced daily risk assessments on each province in China on January 18 and the overall risk was raised to high on January 24.[79] In retrospect, Taiwan's exclusion from the WHO, which has necessitated increased self-reliance, may have facilitated an early and aggressive response to COVID-19.[80] After receiving early reports of a pneumonia of unknown cause in Wuhan, Taiwan sent its own experts to China to investigate. Based on their findings, Taiwan also overruled the WHO's initial recommendations that travel from China not be restricted and that the general public did not need to wear masks.[81] These measures would prove to be instrumental in preventing widespread community transmission from occurring in Taiwan throughout the first year of the pandemic.

Canada conducted five risk assessments between mid-January and mid-March 2020. However, they were snapshots that only considered the risk at that particular moment in time, even though the risk assessments outlined in the CPIP include considerations of future risk. They did not forecast future risk or the likelihood of a pandemic and crucially did not give sufficient weight to the existing external evidence, such as the early

transmission and mortality rates and the fact that the virus aroused sufficient alarm in China to prompt the building of two hospitals in 10 days.[82]

Outside of Asia, many countries largely waited on the word of the WHO before taking substantial action. Canada did not raise the risk from COVID-19 to high until March 16, mainly as a result of the growing number of confirmed cases in the community, which by that date had reached 401. Thus, it was not until there was confirmation of sustained community transmission within Canada that COVID-19 was acknowledged to pose a high risk to the Canadian public. In contrast, countries such as South Korea and Taiwan, operating with the same information available to Canadian authorities, determined the risk to be high before the virus was spreading within their borders. The differences between the countries that took an independent approach to risk assessments and those that relied more heavily on the WHO is evident in both the timing and magnitude of their early responses. It is evident that the more comprehensive risk assessments of countries such as South Korea and Taiwan not only gave those countries more time to prepare, but were also the first of several crucial steps that allowed them to prevent the type of widespread surge of COVID-19 seen in countries throughout North America and Europe.

Timing of the Response

One of the most difficult tenets of responding to a pandemic is that responses are at their most effective precisely when there is the least data to support or guide them. The WHO has come under a great deal of criticism for not acting faster in reporting human-to-human transmission and declaring that COVID-19 constituted a pandemic. Although evidence-driven responses are certainly preferable, COVID-19 has shown that waiting on data to formulate a response is costly, in terms of both lives and money. In response to COVID-19, most of Taiwan's policies were adopted ahead of the possible turning point for which they were intended. This deploy-in-advance strategy, which focuses on being proactive rather than reactive, is fundamental to all CECC-driven policies.[83]

Given the dearth of available information and the importance of timely action, responses to EIDs must be informed by the lessons of previous outbreaks, while at the same time being agile enough to adapt rapidly as new evidence becomes available. Respiratory EIDs do share some characteristics, so response plans have a certain level of interoperability. However, the most effective responses are the ones that are designed for the pathogen in question. Thus, countries that learned from those ahead of them on the transmission curve, as New Zealand learned from China, Taiwan, and Singapore, were best equipped to mount responses that were both timely and evidence-driven.

Decisions on when and how to respond should also be guided by the precautionary principle, which states that actions to address health risks should not be postponed for scientific certainty.[84] This concept has previously been enshrined in the CPIP, which states that a precautionary approach is "particularly applicable in the early stages of a pandemic when evidence-informed decision-making is not possible due to lack of data and the uncertainty of an evolving event. This means taking timely and reasonable preventive action, proportional to the threat and evidence-informed to the extent possible." However, from January to March 2020, COVID-19 cases slipped unnoticed into the country and began to circulate undetected throughout communities while officials deliberated on a response. In contrast, a unifying factor of many of the most effective countries in Asia was an early and decisive response that acted on the available information, as exemplified by South Korea and Taiwan.

Taiwan was among the first to act when unofficial alarms about a new virus emerged. On December 31, 2019, in response to social media reports of a pneumonia of unknown origin in Wuhan, Taiwanese inspectors began boarding direct flights from Wuhan and screening passengers.[85] On January 2, 2020, the Taiwan CDC issued an alert to the health-care community to report patients with respiratory symptoms who had recently travelled to Wuhan.[86] On January 13, Taiwan sent two infectious disease experts to China to gather further information, and their report supported suspicions that the virus was capable of person-to-person transmission.[87] Taiwan activated its Central Epidemic Command Centre on January 20, 2020.[88]

Throughout the early stages of the pandemic, Taiwan was also highly responsive, rapidly adjusting its measures to fit the latest information. On January 27, it integrated the databases of the National Immigration Agency with the National Health Insurance Administration, allowing health-care providers access to patients' 14-day travel histories. On January 21, it designated Wuhan as level 3, instituting mandatory 14-day home quarantine on all passengers arriving from Wuhan. This was expanded to include all of China on January 28, South Korea on February 24, and Italy on February 27, in response to worsening outbreaks in those countries.[89] Stepwise travel restrictions were imposed, first to travellers from Wuhan on January 24, then to Guangdong on February 2, and finally to all of mainland China on February 6. In mid-February, Taiwan modified the case definition to include patients with pneumonia of unknown cause, regardless of travel history. These enhanced surveillance practices led to the detection of four local clusters over the ensuing two weeks.[90]

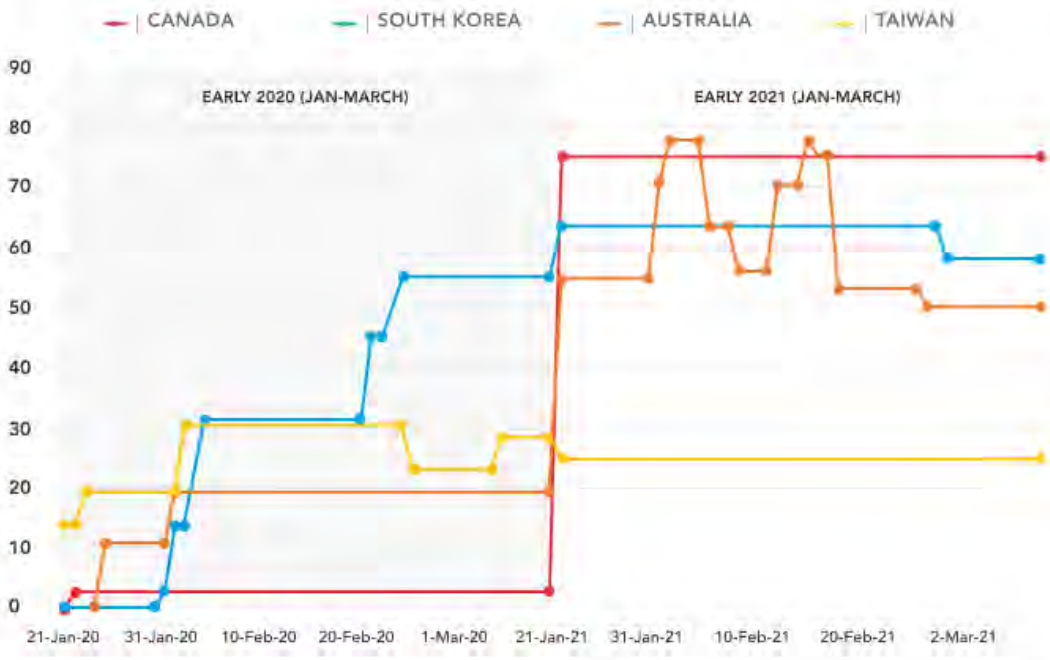
South Korea's response was uniquely impressive, in that they were among the earliest to experience an outbreak of COVID-19 and managed to control it without imposing

widespread lockdowns or border closures.[91] In February, they had the highest number of cases outside of China, peaking at 909 on February 29. Having learned from MERS, during which it failed to adequately raise the national alert level, the COVID-19 alert level was raised to blue on January 3, yellow on January 20, orange on January 28, and to the highest, red, on February 23. This enabled the activation of the Central Disaster and Safety Countermeasure Headquarters, headed by the prime minister, to co-ordinate the response. Through the early initiation of extensive testing and contact tracing efforts, South Korea successfully flattened the curve to single-digit increases in daily cases by mid-April.

Viruses are not static, and by the time a case is detected transmission may have already occurred. Canada's future pandemic responsiveness could benefit from greater emphasis on the importance of "timely and reasonable preventive action," as outlined in the CPIP. The early measures adopted by South Korea and Taiwan further demonstrate the importance of a timely response. Canada eventually adopted measures that exceeded both of those countries in terms of stringency, demonstrating that the best opportunity to control spread without resorting to excessively harsh measures is in the earliest stages, before widespread community transmission occurs and contact tracing and testing systems are overwhelmed.

FIGURE 6

A comparison of the 'stringency' in policy responses between Canada and the Asia Pacific during the first quarters of 2020 and 2021



Source: Oxford COVID-19 Government Response Tracker

The stringency index on the y-axis represents a composite score based on nine response indicators, including travel bans, school closures, and workplace closures.

RECOMMENDATIONS

- Implement enhanced surveillance (e.g., GPHIN) to enable the independent evaluation of the threat posed by emerging infectious diseases;
- Emphasize the importance of an early and proactive response to minimize the damage to both health care and the economy; and
- Commit to conducting future risk assessments that are in line with established practices.

06

BORDER MEASURES TO CURB TRANSMISSION

One of the most contentious aspects of pandemic response commitments is the implementation of border measures. Before COVID-19, there was a lack of data to guide an evidence-based policy. Although the WHO specifically recommended against the implementation of any border restrictions on January 30, 2020, many countries, particularly in the Asia Pacific region, rushed to impose restrictions on travellers.

Taiwan acted swiftly to impose stepwise travel restrictions, starting with Wuhan on January 24 and culminating with a ban on the entry of all foreigners on March 19.[92] However, Taiwan also aggressively enforced mandatory quarantines and did not rely on border restrictions alone to combat the virus.

Vietnam's national airline stopped all flights from China on February 1 and from South Korea on March 5 and ceased all international flights on March 25, 2020.[93] Vietnam also implemented mandatory quarantine for all international arrivals at designated facilities on March 21, one of the first countries to do so.[94]

Australia also closed its borders to flights from China on February 2 before closing them to all international arrivals on March 20. However, this was not fast enough to prevent community transmission that resulted in a surge of domestic cases through to the end of April 2020, revealing the limitations of targeted border restrictions.

As a participating member of the WHO, Canada is committed to meet the obligations of the International Health Regulations (IHR). According to Article 43 of the IHR, the adoption

of restrictive border measures is prohibited if reasonable alternative measures that would sufficiently protect the population exist. In addition, any measures imposed should be based on scientific principles, evidence, and/or guidance from the WHO.[95] Canada's early decision to refrain from restrictions on international travel prior to March 16 was in line with the requirements of the IHR, despite there being no enforcement mechanism for these regulations. In contrast, other signatories, such as Australia, acted much sooner on border measures despite their own IHR commitments.

The effect of border restrictions on the spread of infectious disease has not been well researched, and what studies exist are largely based on modelling, with scarce real-world data. The limited evidence for their effectiveness has largely been based on influenza. A review of 23 studies found that domestic and international travel restrictions could delay viral transmission but not entirely contain it.[96] The impact of restrictions was diminished if implementation was delayed more than six weeks after the onset of the epidemic or until transmission levels were high.[97] It has also been suggested that border closures can be counterproductive, as they can discourage reporting of cases by both individuals and countries and cause widespread economic damage that is disproportionate to the threat posed by the virus itself.[98]

However, as a novel pathogen, COVID-19 has characteristics that do not align with the cautious approach to border measures derived from studies of previous pathogens.[99] Numerous countries, including Vietnam and Australia, enacted early border measures in defiance of their IHR commitments, decisions that received some validation in subsequent studies. Analyses have shown that the severity of the first wave of the COVID-19 pandemic was primarily determined by international travel[100] and that national travel bans reduced cross-border spillovers.[101] COVID-19 modelling suggests that, when implemented early, cross-border travel restrictions may lead to a reduction in the number of community cases.[102] Modelling also predicted that Australia's early decision to close its border to flights from China reduced cases by 79% by March 2[103] and 86% by March 6.[104] The key component of the border measures that demonstrated efficacy is their early implementation, before the details of this novel pathogen were fully known.

Despite the success that island nations such as Australia and New Zealand have achieved through the implementation of strict border controls, it is unlikely that Canada can feasibly employ a comparable strategy, given the extensive land border. However, the examples from the Asia Pacific also suggest that the timing of border restrictions matters and that border restrictions on their own were not sufficient to stop the spread of COVID-19; rather, they functioned as part of a comprehensive set of measures including screening and quarantine.

Border Screening

Similar to border closures, there was minimal evidence for the efficacy of border screening measures prior to COVID-19.[105] Canada does not include temperature screening at airports in its pandemic plans, after spending C$7.6M on such measures failed to detect a single case of SARS, nor would these measures detect asymptomatic cases of COVID-19 or other similar viruses.[106] Despite the lack of supporting evidence to support screening, Asian countries deployed a more robust approach to screening that was able to more rapidly detect, trace, and isolate travellers infected with COVID-19.

CASE STUDY:

South Korea's Screening Innovation

South Korea resisted imposing blanket restrictions on travellers arriving from China, in accordance with the IHR, despite facing domestic pressure to do so. On January 3, South Korea initiated enhanced screening and quarantine for travellers arriving from Wuhan. By mid-March, with cases among travellers increasing, the enhanced screening measures were extended to all incoming travellers. Screening measures included temperature checks and the requirement that travellers download a self-diagnosis app through which they could report their health status both on arrival as well as twice a day for the duration of their 14-day quarantine period.

Symptomatic travellers were tested at the airport, facilitating the detection of the first confirmed case of COVID-19 in South Korea on January 20. As Europe became the new epicentre of transmission, South Korea began testing passengers arriving from Europe on March 22. This was expanded to include all international travellers in April. To test such volumes while avoiding large groups of people congregating, Korea pioneered the use of walk-through testing facilities at the airport. These were set up outdoors to allow for natural ventilation to decrease the risk of transmission. This reduced the level of disinfection required after each individual, facilitating the rapid acquisition of samples. This comprehensive set of measures effectively mitigated the risk of transmission from infected travellers while allowing South Korea to keep its borders open.

On December 31, 2019, Taiwanese health authorities began boarding planes arriving from Wuhan and screening passengers before they disembarked, thereby minimizing the infection risk to other travellers.[107] South Korea also acted quickly, establishing separate gates for travellers from Wuhan on January 3, 2020, in addition to temperature screening and health declarations. To further facilitate the rapid screening of inbound passengers, Taiwan and Singapore were quick to implement a mandatory online health declaration form for incoming travellers. If the declaration did not flag any indicators that the traveller was at risk of COVID-19, the traveller then received a pass (Singapore) or SMS (Taiwan) to facilitate passage through immigration.

Recent analyses suggest that screening measures for COVID-19 have demonstrated a detection rate of between 10% and 53%, depending on the measures employed, and there are suggestions that screening may delay the time to outbreak.[108] Pre-departure and on-arrival testing for travellers has been an important component of border screening measures in many countries in Asia, despite the lack of data to demonstrate the efficacy of such measures. South Korea expanded testing to all incoming passengers in April 2020. Hong Kong similarly began testing of all incoming travellers on April 8, 2020, while Canada only implemented testing of non-exempt passengers arriving at international borders in early 2021. One of the advantages of pre-departure testing is that, compared to other screening measures, it is not excessively labour-intensive.

Quarantine of Travellers

A comprehensive quarantine regimen vastly increased the efficacy of border measures. Studies show that border screening is far more effective when combined with quarantine, with up to 91% of cases detected, depending on the screening methods. Quarantine features prominently in the pandemic response of several countries in the Asia Pacific and is likely a major factor in their success, although the methods vary by country.

Quarantine is only as effective as the degree of adherence. Facility-based quarantine is easier to monitor, usually by paid security or hotel staff. Home-based quarantine, while less inconvenient to travelers, is more challenging to monitor. Future updates to Canada's pandemic plans could benefit from the inclusion of preparations for a mandatory quarantine order at the national level. A 14-day quarantine remained voluntary until the middle of March 2020. Once quarantine was made mandatory, the monitoring of individuals under self-isolation was still limited due to resource challenges and logistical issues.

CASE STUDY:

Taiwan's Digital Monitoring for Quarantine

Having been proactive in the detection of community transmission in the early stages of the pandemic, Taiwan has since relied on quarantine of incoming travellers to prevent the introduction of new cases. Digitally monitored home quarantine for passengers arriving from Wuhan was instituted as early as January 21, 2020, and was later extended to all incoming travellers.

Taiwan's implementation of quarantine was well planned and is detail oriented. As part of airport infection control measures, the country used special government-funded taxis to transport passengers who did not have adequate transportation plans.[109] In contrast with several other countries in Asia, Taiwan permits home quarantine, although optional hotel facilities are provided for individuals who do not have an adequate quarantine plan.

Monitoring and enforcement are the strengths of the home quarantine plan, consisting of electronic location verification, known as the electronic fence, as well as daily calls to check on the traveller's health status. Once travellers have arrived at their destination, they are visited by local civil staff to set the GPS parameters on their smartphones and provide instruction, as well as to deliver a care package that includes food supplies, masks, sanitizers, and coupons for Netflix and Line TV.[110] To facilitate compliance, staff and volunteers provide assistance such as grocery or meal delivery or child-care arrangements. Twice-weekly garbage pickup by local sanitation companies is provided to minimize contamination. As well, a 24-hour hotline is available to provide counselling and information or health-care arrangements.[111] Taiwan's experience demonstrates that stringent measures imposed early result in reduced restrictions overall. As case counts fell, quarantine periods for inbound travellers from low-risk countries were shortened to five or seven days.

Several Asian countries that employed home-based quarantines used technology to facilitate more stringent monitoring. Singapore uses electronic wristbands to monitor a select group of travellers who are permitted to quarantine at home rather than at a facility. The device relies on GPS and Bluetooth technology but does not store personal data or have voice or video recording functions.[112]

South Korea likewise monitors quarantine via its self-quarantine safety protection app. The two-way app allows health authorities to monitor compliance by verifying the device's GPS location. It also allows patients to report their health status. The use of this app is not mandatory, although it has an uptake rate of over 90%. Individuals who opt out or do not have smartphones can undergo monitoring by daily phone confirmation. Hong Kong employs quarantine wristbands consisting of a waterproof strip of paper with a serial number and a QR code to be scanned by an app on a smartphone, which then establishes a digital perimeter. Although the implementation of this protocol has not been flawless, it nonetheless provides a compromise between stringent monitoring and the privacy concerns that have accompanied other digital tools.

Many countries solved the problem of monitoring by using government-run quarantine facilities. Vietnam quarantined all confirmed cases, their direct contacts (F1), and all travellers at a government-run quarantine facility for 14 days, while contacts of F1 individuals (F2) were ordered to isolate at home for 14 days.[113] Australia and New Zealand require that incoming travellers enter a managed isolation facility for 14 days. Singapore has similar requirements, although travellers from a select few countries can instead quarantine at lodgings of their choice.

In addition to ease of monitoring, facility-based quarantine also reduces household transmission, which has been a significant source of new cases, particularly with the more-transmissible variants of concern. A South Korean study reported that 11.8% of household contacts tested positive, compared to only 1.9% of non-household contacts.[114] In the spring of 2021, as the variants of concern became dominant, Alberta reported that 40% of new cases were the result of household transmission and that living with an infectious individual was the single largest risk factor for transmission.[115]

Despite their advantages, quarantine facilities are expensive to run and are not infallible. Several countries have experienced outbreaks associated with breaches of quarantine facilities, including Vietnam and Australia. In Canada, the imposition of a three-day hotel stay on travelers arriving by air attempted to find a middle ground between inconvenience and stringency. However, particularly once the more-transmissible Delta variant became the dominant strain, these measures did not prove stringent enough to be supported

scientifically and the existence of a loophole at the land borders provided travelers with a way to circumvent them.

The timing with which travel-related quarantine measures are implemented is also important. In Canada, the mandatory measures took effect after the predicted wave of sun-seeking travellers had left for winter vacations, thereby penalizing them on their return rather than discouraging their travels in the first place, a move that would likely have slowed the importation of the variants of concern into the country. An added benefit of quarantine, particularly when implemented as stringently as in Australia, is that it can serve as a deterrent to travel, which assists in maintaining travellers at levels that are manageable for the purposes of screening and monitoring quarantine.

Interprovincial Travel Restrictions

Interprovincial travel also contributes to the spread of COVID-19. Some Canadian provinces implemented measures and blocked their borders in accordance with their individual situations, but no countrywide actions were taken, the federal government leaving the decision to individual provinces. This may have acted as a deterrent to Canadian provinces willing to undertake the costs associated with lockdowns, as the success of these sacrifices can be undone if other provinces do not commit to a similar level of pandemic control, a reality that Australia effectively addressed in its response to COVID-19.

In Australia, states can impose their own travel restrictions, including closing their borders, restricting travel into and out of the state, and requiring a quarantine period for people who have travelled between states.[116] In addition to the restrictions on international travel, Queensland (March 24), Western Australia (March 22), South Australia (March 22), and Tasmania (March 19) all restricted entry from other regions of Australia. This allowed states to maintain relaxed restrictions even if small clusters broke out in a single state.

Although prohibitions on interprovincial travel are not legally permitted in Canada, most provinces have at certain times employed some measure of border restrictions during the pandemic. Most notably, the Atlantic provinces imposed a 14-day quarantine requirement on all travellers into the region, a measure that has been credited with their low rate of transmission relative to the rest of the country. The available evidence from COVID-19 indicates that interprovincial travel restrictions can play a valuable role in pandemic control, particularly once international borders have been breached.

Throughout the first year of the pandemic, Canada's border measures were less rigorous than those of many successful Asia Pacific countries, such as Australia, particularly in the timing and enforcement of mandatory quarantine.[117] The countries that rapidly instituted strict border control measures, including mandatory quarantine,[118] also recorded the lowest per-capita mortality rates. While it is understandable that a government wants to impose measures that are as minimally onerous as possible while still being effective, half measures do not typically work when trying to contain a virus such as COVID-19, a principle that the countries that have been most successful in containing the virus have understood. Future measures need to be consistently applied, scientifically guided, and deployed at a time when they can be most effective.

The other main takeaway from our case studies is that border measures are only one component of a comprehensive response. A recent review concluded that border measures alone were unlikely to significantly alter the trajectory of an outbreak without the commensurate adoption of domestic measures such as testing, contact tracing, and social distancing.[119] Analyses have shown that a multi-layered approach of symptom-based and PCR screening combined with quarantine under observation has demonstrated the best results.[120] Although this mirrors the approach eventually adopted by Canada, it attained mixed results here, highlighting that early timing and stringent implementation are the key components for optimal success.

RECOMMENDATIONS

- Include preparations for the rapid institution and scale-up of border measures in pandemic plans;
- Apply border measures as consistently as possible to minimize loopholes that can be exploited, and minimize exemptions;
- Establish more proactive infection control measures at points of entry;
- Include measures for effectively monitoring individuals under quarantine in pandemic plans; and
- Include provisions for restrictions on interprovincial travel in extreme circumstances in pandemic plans.

07

CASE-BASED INTERVENTIONS

Surveillance

One of the most notable differences between Taiwan and Canada was in their respective approaches to case detection and surveillance in the early phases of the outbreak. Taiwan pursued a proactive case detection strategy that enabled them to more accurately track the spread of COVID-19. This approach, which required the early availability of adequate testing capacity, proved to be more effective at preventing community transmission.

There was no federal standard for testing in Canada, as each province set its own criteria. Testing criteria evolved slowly, restricting the accessibility of testing. In many regions, limited capacity meant that it was early May 2020 before testing was available for all who were symptomatic. Prior to this, many people who were only mildly symptomatic were advised to self-isolate at home and never got tested, including in BC, Alberta, Ontario, and Quebec.[121] Although this prioritized limited tests for people who might require medical care, these restrictions negated the chance to contact trace mild cases. As the example of Taiwan demonstrates below, a more comprehensive approach to testing and tracing better facilitates efforts to accurately assess the magnitude of the pandemic.

Taiwan quickly employed its surveillance network to expand testing to patients with respiratory symptoms who had tested negative for influenza, as well as close contacts of infected individuals,[122] or those exposed with a high risk of transmission.[123] Not only

did this strategy allow the identification and isolation of infected individuals before they were able to widely transmit the virus, it also helped in the identification of asymptomatic and pre-symptomatic individuals who may not have been identified by symptom-based testing.

CASE STUDY:

Taiwan's Surveillance Protocols and Infrastructure

A major lesson learned from Taiwan's battle with SARS was the realization that the existing respiratory syndromic surveillance systems based on passive reporting were not effective, largely because front-line doctors struggled to rapidly comply with the system requirements. Therefore, pneumonias of unknown cause were detected too late to prevent transmission of highly contagious EIDs.

To address this, the Taiwan CDC developed an automated hospital syndromic surveillance protocol that can automatically collect data from hospital emergency departments and that functions in real time.[124] Surveillance is further enhanced by the near-real-time availability of patient data on the National Health Insurance database and the ability to rapidly scale up laboratory capacity.

As a result of these changes, Taiwan had well-established surveillance systems in place at the outset of COVID-19 that were rapidly adapted to the novel pathogen. Following the activation of the CECC, there were 27 laboratories capable of processing up to 2,250 molecular diagnostic tests for COVID-19 by February 21, 2020, enabling the activation of enhanced laboratory surveillance procedures that included testing clusters of respiratory infections and patients with influenza-like symptoms for COVID-19.[125]

FIGURE 7

Description of Taiwan's emergency department-based syndromic surveillance system

Source: "Establishing a nationwide emergency department-based syndromic surveillance system for better public health responses in Taiwan." Wu, et al. (2008) BMC Public Health, 8(1).

On February 12, 2020, Taiwan responded to increasing awareness of asymptomatic and pre-symptomatic transmission by implementing a revised screening strategy that identified patients with respiratory symptoms who tested negative for influenza and tested them for COVID-19. Although this strategy only identified one positive case, contact tracing of that patient subsequently identified three infected family members, including the patient's asymptomatically infected brother.[126]

Surveillance was further strengthened by the integration on January 27 of the National Health Insurance Administration and the National Immigration Agency databases. Integrating the databases allowed health-care providers to access a patient's travel history and enabled the generation of real-time alerts based on travel history and clinical symptoms to facilitate case identification.[127] As a result, the median time to detection of imported cases was only two days.[128]

Being proactive has been a recurring theme in the analysis of the COVID-19 response in the Asia Pacific region. This principle holds especially true in surveillance. Without an accurate measure of the extent of an outbreak, it is impossible to establish an appropriate response. Through surveillance strategies refined after previous outbreak experiences, Asian countries effectively tracked and contained transmission of COVID-19, a strategy that would enable Canada to respond more effectively to future outbreaks.

Testing

The ability to test a broad range of individuals – and thus to proactively identify cases before they become clusters of community transmission – relies on a high testing capacity at an early stage. Although their methodologies differed, the Asia Pacific countries that most successfully controlled COVID-19 demonstrated a rapid expansion of testing capacity that enabled authorities to cast a wider net and to proactively identify cases before they became clusters.

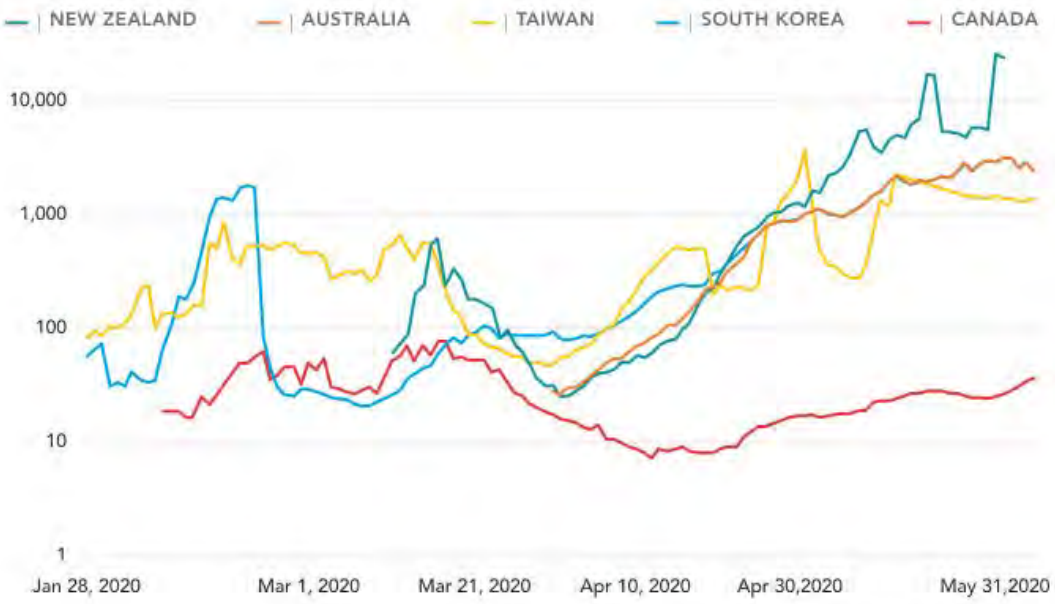
In Canada, barriers to increasing testing capacity varied by region and included shortages of test kits, reagents, and lab personnel. As of March 2021, Vietnam and New Zealand were each performing 1,000 tests for each confirmed case, while Australia was performing 500 tests and Taiwan was performing 200 tests. In comparison, Canada was performing fewer than 30 tests for each confirmed case. The use of expanded testing is supported by modelling studies that have shown that, with respect to surveillance as a means of outbreak control, test sensitivity is secondary to frequency of testing and speed of reporting.[129]

The countries shown in Figure 8 all conducted more tests per confirmed case than Canada did and consistently demonstrated a lower percentage of positive tests. According to the WHO, a test positivity rate below 5% for at least two weeks is one of the metrics that can be used to determine if a country has controlled the pandemic. Canada reached a high of 14% on April 11, 2020, while the highest rate South Korea experienced was 4.9% on March 5, 2020.

FIGURE 8

Tests conducted per new confirmed case of COVID-19, comparing New Zealand, Australia, Taiwan, South Korea, and Canada

Shown is the daily number of tests for each new confirmed case. This is a rolling 7-day average.



Source: "A cross-country database of COVID-19 testing." Hasell, J., Mathieu, E., Beltekian, D. et al. (2020). Sci Data 7, 345.

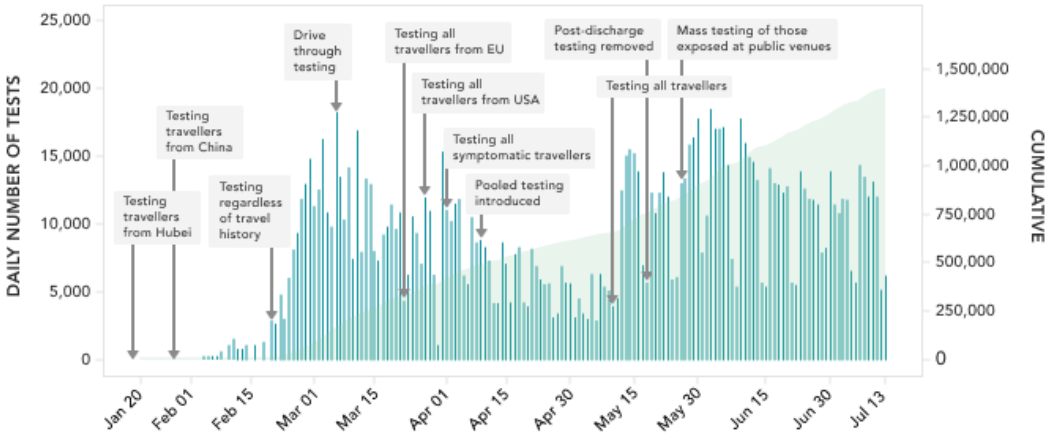
CASE STUDY:

Testing Scaling in South Korea

During the MERS outbreak in 2015, South Korea experienced testing shortages that exacerbated hospital outbreaks. Experts concluded that an improved pandemic response requires an expanded testing strategy not constrained by the narrow restrictions of a case definition.[130] Thus, South Korea's response to COVID-19 was defined by a strategy of test-trace-treat. In addition to testing suspected cases, it also tested the close contacts of infected individuals and individuals in high-risk groups, regardless of symptoms. This rapid and strategic response enabled it to keep community transmission low and thus avoid the implementation of mass testing.

FIGURE 9

South Korea's ramp up of testing during the first half of 2020



Source: "Response to COVID-19 in South Korea and implications for lifting stringent interventions." Dighe et al. (2020). BMC Medicine, 18(1).

The proactive detection of cases that South Korea pursued early in the pandemic was enabled by its rapid scale-up of testing. Testing shortages during MERS were exacerbated by the lack of an emergency use authorization option at that time.[131] To address shortages in diagnostic capacity, an emergency use authorization system was developed between the KCDC and the Ministry of Food and Drug Safety to expedite the authorization of diagnostic tests.[132] Further, the Public-Private Alliance on Infectious Disease Testing was established in 2017,[133] and extensive public-private partnerships were formed with a large number of biotechnology companies in the aftermath of MERS.[134] As a result, during COVID-19 the maximum daily testing capacity rapidly expanded, reaching 18,000 by March 16. This allowed South Korea to modify its testing criteria on February 16 to include anyone with respiratory symptoms, regardless of travel history.[135] By March 30, South Korea had tested more than 400,000 individuals.

South Korea also innovated drive-through testing and the phone-style testing booth as ways to increase efficiency and minimize the risks of transmission.[136] By minimizing disinfection protocols, these methods allowed the collection of up to six samples per hour or 60 samples a day, three times the two samples per hour possible in a typical clinic setting. Further, health-care workers were better protected by the design of the testing booths, and the speed with which they could process patients meant that the risk of transmission between patients in crowded waiting rooms was greatly diminished.

Although slower in expanding testing capacity, with only approximately 15,000 tests performed by the end of March 2020, Vietnam now exemplifies the utility of a mass testing strategy. It developed a COVID-19 RT-PCR test kit through the Military Medical University on March 5, 2020. The kit has been used widely nationally in diagnostic labs since, specifically for mass testing of individuals in areas under targeted lockdowns.[137] This mass testing strategy, facilitated by the use of pooled sampling in which samples were processed in batches of 10, then individually if the pooled results came back positive, was credited with suppressing the second wave of infections that occurred in the coastal city of Danang between July and August 2020.[138]

In May 2021, the city employed the same strategy again to mass-test residents of areas with suspected cases. This approach allowed city officials to identify up to 11,000 people related to a factory outbreak.[139] The Ministry of Health also instituted rapid testing of health-care workers, hospital patients, second-degree contacts, those in hotspots under targeted lockdown, high-risk essential workers, those working in hospitality and exposed to the public, workers at land borders, and factory and manufacturing plant workers on a five- to seven-day rotating basis.[140]

The magnitude of testing within a country is influenced by the extent of transmission. Although Taiwan performed 200 tests per confirmed case, it opted not to employ mass testing because only a small portion of its cases were locally transmitted and only a small number of those could not be traced to the source.[141] South Korea, after suppressing the initial surge early in 2020, has also reduced the amount of testing performed. Although Canada has dramatically improved its testing capacity since the early phase of the pandemic, testing capacity has still been exceeded during the worst of the subsequent

surges. The role of testing in the successful COVID-19 response of many Asian countries demonstrates the importance of including the rapid scale-up of testing in future pandemic plans.

Contact Tracing

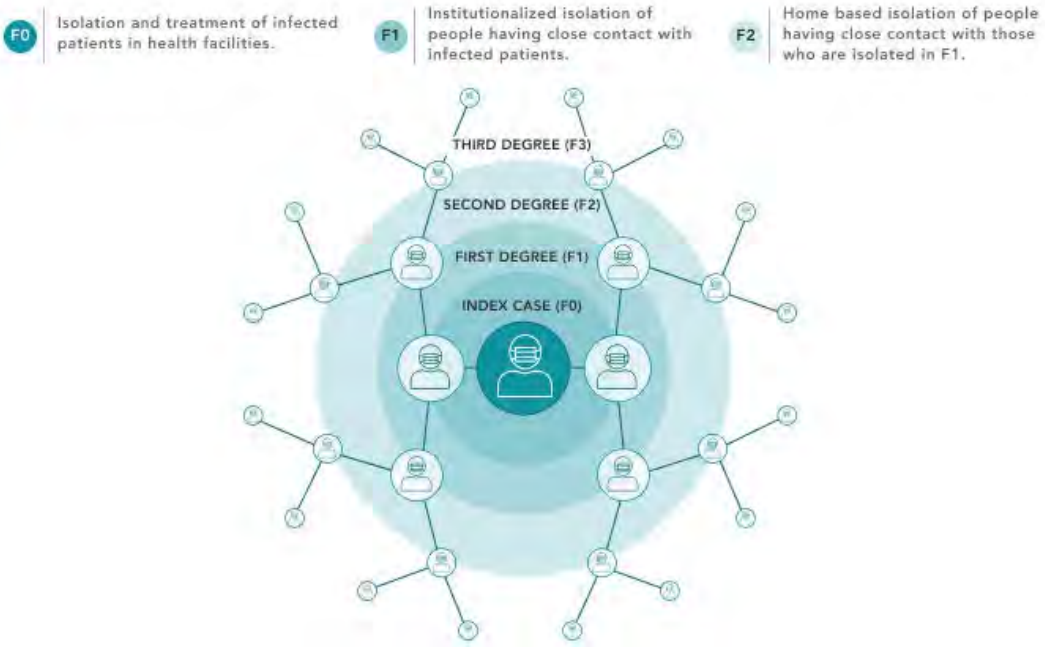
Aggressive and thorough contact tracing was also a major factor in the response of most of the countries that have successfully controlled the pandemic, particularly as the longer incubation of COVID-19 makes interrupting transmission by contact tracing and isolation more effective. The WHO standard for an effective contact tracing program is for 80% of close contacts to be traced and quarantined within three days of a case being confirmed, as it is most effective early, when case numbers are still low. A successful contact tracing strategy must be fast and thorough; however, it is affected by levels of co-operation and recall bias and is also highly labour-intensive. Among the Asian countries that have been the most successful in controlling the pandemic have been examples of less-conventional strategies as well as novel tools that have together improved the speed and reduced the labour requirements of contact tracing.

Japan's contact tracing strategy emerged from the observation that 80% of infected individuals did not transmit to anyone, while among the remaining 20% there were superspreaders who transmitted the virus to numerous others. Given this pattern, Japan used a backward contact tracing strategy that sought to identify the source of the infection, thereby enabling the identification of clusters of transmission that emanated from that source. Backward contact tracing was also adopted by South Korea and Australia as the pandemic progressed[142]. This process is highly labour-intensive, and in Japan it was facilitated by the existence of hundreds of public health centres. Both the centres and the model of contact tracing were already in place due to a lengthy history of tuberculosis in Japan, and they were adapted quite readily to fight COVID-19.

Vietnam employs an extensive strategy that traces to fourth-degree contacts. The index cases (F0) and their close contacts (F1 – first degree) are quarantined in government facilities, including designated hospitals if they require medical care. All direct contacts of confirmed cases, regardless of whether they were symptomatic, were also tested.[143] The second-degree contacts isolate at homes and report their health status to local authorities. Contact tracing was also performed for all passengers of any flight that had a confirmed case of COVID-19.[144] This strategy was facilitated by the existence of an army of 12,000 trained contact tracers at the outset of the pandemic.[145]

FIGURE 10

Vietnam's extensive contact tracing approach that starts with the index patient case up to third-degree contacts



Source: "Proactive response and innovative approaches to SARS-CoV-2 in Vietnam." Chau NVV, Dung NT, Geskus R, et al. 2021. BMJ

Despite their efficacy, the strategies mentioned above are even more labour-intensive than traditional contact tracing methods, which can quickly become overwhelmed to the point of being ineffective. In Canada, early efforts to establish contact tracing at a scale sufficient for the pandemic involved recruiting staff from other positions throughout PHAC and Health Canada and training them as contact tracers. Establishing this process early on as part of future pandemic preparations would improve efficiency and expediency.

During the summer of 2020, several health jurisdictions across the country built up their contact tracers in anticipation of a predicted second wave in the fall. Despite these efforts, once again health authorities became overwhelmed by contact tracing across the country. During the height of the second wave, numerous health authorities throughout Canada, including in Alberta and Toronto, temporarily suspended contact tracing efforts when

their capacity was exceeded and PHAC reported that the source of infection was unknown in up to half of cases.

Speed is essential in an effective contact tracing strategy. A University of Oxford study found that delaying contact tracing by even one day after the onset of symptoms could determine the difference between controlling the virus and allowing it to spread.[146] Capacity limitations within Canada frequently resulted in delayed contact tracing. Between February 3 and 5, Toronto public health reached only 12% of newly confirmed cases within 24 hours of diagnosis.[147] Asian countries who established more rapid and efficient programs used a range of tools and approaches to support their contact tracing efforts.

The use of digital tools to support contact tracing in Singapore, South Korea, and Taiwan was associated with the low per-capita cases and mortality rates observed in those countries.[148] Vietnam implemented an SMS notification system on February 3 and launched an app for contact tracing and symptom reporting on February 8.[149]

South Korea also used digital technology in its contact tracing efforts. On March 26, the KCDC launched the Epidemiological Investigation Support System, which collects and analyzes a range of data, including from GPS devices, credit cards, and CCTV, in its contact tracing efforts.[150] This was facilitated by public disclosure provisions that were added to the Infectious Disease Control and Prevention Act after MERS in 2015. These measures have raised privacy concerns, which the government has attempted to alleviate through the Personal Information Protection Act, a comprehensive data privacy law. The data can only be accessed by KCDC investigators and can only be accessed for the preceding 14 days. As required by law, all personal information will be destroyed once the pandemic is over.[151] These measures have expedited what is typically a laborious process. Using these tools, investigation and tracking of confirmed cases now takes 10 minutes or less, compared with a whole day using manual tracing efforts.

Although there are many obstacles to the use of digital technology to support contact tracing in Canada, the examples from the Asia Pacific region demonstrate the importance of efficient contact tracing to an effective pandemic response. Future pandemic plans should therefore consider ways, digital or otherwise, to make the process faster and more efficient and to more rapidly scale up capacity.

CASE STUDY:

App-Based Contact Tracing in Singapore

Singapore also employs a vigorous contact tracing program. In conjunction with an effective surveillance strategy, it has been estimated that this program detects nearly three times more imported cases compared to the global average.[152] In addition to digital footprint tracking similar to that employed by South Korea, in March 2020 Singapore also launched TraceTogether, a smartphone app that tracks close encounters between people using Bluetooth technology. Initial uptake did not meet the approximately 60% threshold established by researchers at the University of Oxford as being necessary to stop transmission when instituted in conjunction with other measures.[153] Thus, to increase the efficacy of the TraceTogether app, its use was made mandatory in Singapore from December 2020.

Singapore also developed and implemented SafeEntry, a cloud-based visitor registration system that requires individuals to scan QR codes on their smartphones and enter personal information before entering public places such as offices, shopping malls, cinemas, and restaurants. This allows potentially exposed individuals to be alerted if they were in the same location as an active carrier at the same time. To cover as much of its population as possible, especially those without smartphones, the government distributed Bluetooth TraceTogether tokens with QR codes printed on them for use with SafeEntry to key populations, such as the elderly.

Despite the success of these apps in reducing transmission of COVID-19, there have been concerns raised over privacy issues associated with their use. The government has issued assurances that the TraceTogether app does not collect geolocation data nor reveal personal information to other users and that the information collected is only accessible to the Ministry of Health for contact tracing purposes. However, this was shown to be false when it was revealed that the data had been accessed by the police for a criminal investigation, validating the fears of those concerned about privacy breaches and damaging the public's trust. Similar concerns also pose a barrier to the use of this type of app in Canada.

RECOMMENDATIONS

- Establish national guidelines, standards, and benchmarks for testing and contact tracing;
- Plan to rapidly scale up testing to support surveillance activities and proactively detect cases, which could include expanding private/public partnerships and emergency use authorizations;
- Include plans to test specific populations, such as health-care workers (including long-term care facilities staff), cross-border truck drivers, and front-line workers, that may benefit most from regular testing based on evolving data;
- Plan for a rapid scale-up of contact tracing strategies, including the use of technology to increase efficiency; and
- Include adaptations of contact tracing strategies for different pathogens in pandemic plans.

08

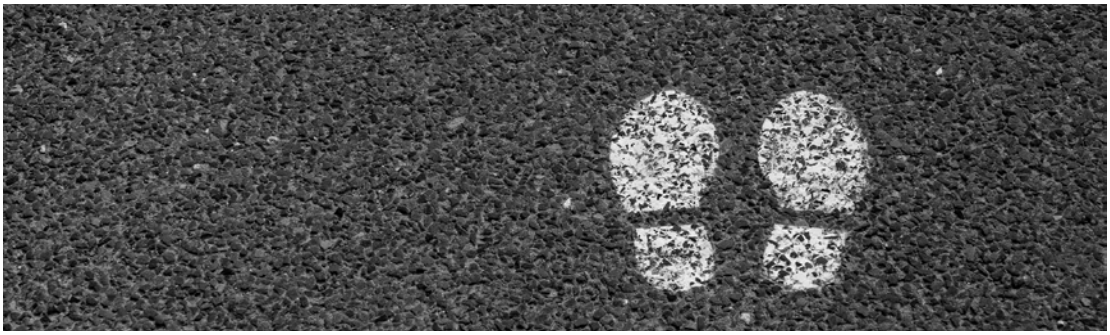
POPULATION-BASED INTERVENTIONS

Case-based interventions such as contact tracing are not sufficient on their own to control a virus such as COVID-19, particularly given the patterns of asymptomatic and pre-symptomatic transmission.[154] The effective deployment of population-based interventions, such as social distancing and masking, in addition to case-based interventions, has been credited with the success of Taiwan's pandemic response.[155] Studies in Europe and Central Asia have shown that the early implementation of population-based interventions in response to COVID-19 was associated with lower mortality and better economic outcomes.[156]

Social Distancing and Mobility Restrictions

Social distancing has been widely used to reduce transmission, although the timing and details have varied by country and even by region. South Korea began urging social distancing as early as February 2020, and modelling suggests that strong social distancing measures played a key role in South Korea's ability to contain transmission without instituting a lockdown.[157] As of June 2021, Vietnam has yet to enter a nationwide lockdown aside from a two-week national social distancing order during the first wave, instead relying on targeted lockdowns of affected areas, coupled with mass and sometimes mandatory testing to manage clusters. In Japan, the COVID-19 task force developed the

"avoid the three Cs: closed spaces, crowded places, and close-contact settings" model of risk mitigation.[158] The purpose of the model was to prevent the emergence of clusters from these settings, which could often escalate to widespread community transmission.



CASE STUDY:

Alternatives to Lockdowns in South Korea

South Korea has not imposed large-scale lockdowns and to date there have been no mobility restrictions at the city or provincial level. Instead, the country relied on mass testing, contact tracing, and quarantine to manage clusters. Such measures are legally supported by the Infectious Disease Control and Prevention Act amended in the aftermath of MERS and again during COVID-19. Following an outbreak in the city of Daegu linked to the Shincheonji church, the government tracked down up to 200,000 members and ordered testing and isolation of all those who were affected.

Authorities enacted Articles 47(1) and 49(2) of the Act to shut down 400 Shincheonji facilities in Gyeonggi province, as well as prohibiting their religious services for two or more weeks.[159] In May 2020, after outbreaks associated with restaurants and nightclubs, the government of the city of Seoul ordered closure of those businesses indefinitely and contact traced attendees. Similarly, health-care facilities with outbreaks such as Daenam Hospital in Cheongdo and Asiad Hospital in Busan were kept under cohort isolation.[160]

Although widely deployed, the efficacy of lockdowns in controlling a pandemic remains somewhat controversial, with some public health experts arguing that lockdowns can do more harm than good. As well, circuit-breaker type closures are likely to be less effective for COVID-19, since multiple generations of transmission can occur as a result of asymptomatic transmission.[161]

Generally, lockdowns are a last resort to be used when less-stringent measures have failed. Many of the countries that immediately deployed robust public health measures, such as South Korea, have successfully managed the pandemic without instituting widespread lockdowns. In New Zealand and Australia, where the initial pandemic plans called for mitigation rather than containment, initial lockdowns were considered necessary to acquire the time needed to deploy an adequate response, with New Zealand locking down on March 26 and gradually lifting restrictions until none remained on June 8, 2020.[162] Australian states and territories assessed their own situation and implemented measures as necessary, with the epicentres such as Victoria remaining under lockdown for as long as four months, from early July to the end of October 2020.[163]

In Canada, the provinces and territories similarly employed lockdown strategies of varying lengths and stringencies in the early months of the pandemic, a necessity given that community transmission was already established. Although most regions relaxed their measures once transmission had been reduced, many re-imposed them when cases rose again throughout the fall/winter of 2020/2021. As evidenced by the examples of Australia and New Zealand, which kept their measures in place until transmission had been reduced to nearly zero, employing a more consistent approach not only reduced the number of cases and deaths, it also proved to be economically less costly overall.

This approach proved beneficial in the long run, as they were able to relax restrictions within their borders and did not experience the subsequent waves that caused much of Europe and North America to keep shutting down every time they reopened. Although there were isolated incidents of transmission that occurred after reopening, short lockdowns of three to five days in a defined Australian or New Zealand region were sufficient to keep the virus contained on these occasions. The effectiveness of this model should guide future pandemic planning in Canada.

Personal Protective Equipment

Personal protective equipment (PPE) is a relatively low-cost yet highly effective method to prevent the transmission of communicable diseases. In Canada, early recommendations

regarding masks were in line with those of the WHO, which advised against mask wearing among the general public, citing a lack of evidence and global supply shortages.

A comparative analysis suggests that the early adoption of mask wearing is one of the factors associated with lower death rates due to COVID-19, as exemplified by South Korea, Taiwan, and Singapore.[164] In the early days of the pandemic, governments in Asia either recommended the use of masks (rather than mandating them) or took action to prevent shortages and price gouging. Public adoption of masks was voluntary and a greater cultural acceptance of mask wearing, largely the result of experience with past outbreaks, meant that many members of the public had already adopted mask use before the WHO changed their guidelines in June of 2020.

Vietnam was among the earliest countries to mandate masks, on March 16, 2020.[165] In South Korea, a mask mandate did not come into effect until October 13, 2020, even though the public had been wearing face coverings for months without the need for enforcement.[166] As well, the demand for masks was very high in Singapore in early February 2020, with the government urging people to only use them when necessary and distributing 5.2 million masks to 1.1 million households by February 19.[167] Japan banned the sale of masks for profit on March 15, and similarly promised to deliver them to households to assuage public anxiety.[168]

Although Canada did not have a culture of mask wearing prior to COVID-19, once they became the subject of public health orders across the country, the Canadian public demonstrated a high level of compliance. A Statistics Canada survey showed that 84% of respondents reported wearing masks or other PPE in July 2020. In June 2020, when an indoor mask mandate was not yet widely implemented, "65% of Canadians reported that they would wear a mask in public places where physical distancing is difficult."[169] As a result, the Canadian public may be more likely to adopt mask wearing early and voluntarily in response to the next emerging infectious disease.

A similar trend was observed in South Korea, where a survey found that citizens reported higher levels of adherence to the prevention protocols recommended by the KCDC during the COVID-19 pandemic than they did during the MERS outbreak five years earlier.[170] The greater acceptance of masks by both governments and the public in several Asian countries clearly contributed to the success of those countries in controlling transmission of COVID-19 compared to Canada, where more skeptical attitudes toward mask wearing prevailed.

RECOMMENDATIONS

- Include more detailed social distancing measures, including plans to sustain measures until transmission is near zero, in future pandemic plans;
- Include the use of masks among healthy individuals in pandemic plans; and
- Promote the use of PPE as a cheap and effective way to prevent communicable disease transmission early to maximize public buy-in.

09

COMMUNICATION: THE ART OF TALKING TO THE PUBLIC ABOUT HEALTH SCIENCE

Effective communication relays important information to the general public to help them make informed decisions and protect their health. In the early stages of the pandemic, several countries in Asia demonstrated strong communication strategies that were clear, consistent, and effective, overcoming the absence of evidence and disparities between levels and regions of government that were hampering communications in many other countries, particularly with respect to issues such as mask wearing.

Public Health Communication Strategies

Many economies in the Asia Pacific region, as well as Canadian provinces such as BC, made health officials the forefront of communication campaigns to build trust and promote public buy-in. Taiwan in particular benefited from having Chen Chien-jen, an epidemiologist by training, as its vice-president at the time the pandemic erupted. Novel, creative, and effective communication strategies significantly contributed to the successful management of COVID-19 in the Asia Pacific.

Since the first case of COVID-19 was diagnosed in Singapore, the government has used a broad range of media, including print, broadcast, websites, and social messaging platforms such as WhatsApp, Twitter, Telegram, and Facebook on a daily basis to inform and advise the population.[171] Singapore also engaged a popular comedian named Uncle Phua in its

public service campaign series. The comedian used Singlish (an English-based language commonly spoken in Singapore) to humorously address the public about issues such as social distancing, hoarding, respecting front-line workers, and vaccination.[172] Singapore also involved public figures during its experience with SARS in 2003.

In Vietnam, the government sent regular updates via SMS and released the NCOVI app in March 2020 for the dissemination of information and health recommendations.[173] The app can also be used to facilitate contact tracing efforts by enabling citizens to provide a daily update of their health status[174]. Like Singapore, Vietnam launched a public service campaign in collaboration with several public figures. One creative output was the rewrite of a famous pop song by two local singers, titled Ghen Co Vy (jealous coronavirus), that delivers a uniting message to combat COVID-19. The song became popular across social media channels like TikTok and had 88 million views on YouTube as of June 2021.[175]

Maintaining Trust and Credibility

Appeals based on emotions, narratives, and shared values will help build trust, especially when tailored to existing social and political circumstances. For example, Taiwan framed social distancing as an act of civic love: "the greater the love, the greater the distance you keep."[176]

Officials at the forefront of communication campaigns must be clear, consistent, and comprehensive in their messaging to be credible. Displays of compassion and vulnerability have proven to be remarkedly effective; for example, New Zealand's Prime Minister Jacinda Ardern held regular briefings through Facebook livestream to directly address citizens' questions, and she took a 20% salary cut along with Cabinet in solidarity with the country's citizens.[177] The director of the KCDC, Jung Eun-kyeong, conducted the daily briefings and served as the face of the pandemic response, a measure that increased public acceptance of various pandemic control measures. Dr. Jung has received praise for her straight talk and calm demeanour that inspires trust.[178]

Demonstrating concern for the public's well-being and best interests through concrete actions will prove to be beneficial in establishing trust early and maintaining long-term buy-in, especially given the ever-changing, unprecedented nature of a pandemic, which requires flexible and adaptable communication.

RECOMMENDATIONS

- Make health officials the forefront of future communication campaigns, rather than politicians;

- Use creative tools for different demographics, such as social media for young people and printed handouts at community centres for families and older people;
- Ensure that messages are available in multiple languages, and effectively deliver them to diverse populations through relationships with communities;
- Engage public figures with great influence;
- Form partnerships with other sectors to help deliver messages (e.g., telecommunication companies for SMS message delivery, emergency alerts on smartphones); and
- Use emotional appeals to craft messages rather than shame or blame, highlight common goals and values, and ensure messages are appropriate to cultural contexts.

10

CONCLUSION

This report analyzed the successful COVID-19 responses of seven economies in the Asia Pacific and highlighted seven broad categories of factors that contributed to their success. Although the responses of the Asia Pacific region have been highly cohesive compared to that of Canada, a feature that undoubtedly contributed to their effectiveness, our analysis shows that a central system of government is not a prerequisite for a cohesive national response, as demonstrated by Australia. This report recognizes the challenges of a staging a national-level pandemic response within the context of a federated health-care system and suggests strategies to close such gaps at the federal and provincial levels, using the role of PHAC as a national public health agency.

Canada now faces the challenges of adapting its policies and institutions to facilitate a better pandemic response in the future. The changes should occur sooner rather than later, as emerging pathogens will undoubtedly appear again. In addition to learning from previous mistakes, Canada can and should learn from the countries that handled the pandemic better, including those highlighted in this report.

From our analysis, we observed that experience was the most valuable teacher in many COVID-19 success stories, most notably South Korea and Taiwan, with robust public health infrastructure and decision-making hierarchies established following SARS and MERS. The prompt activation of these response networks facilitated effective control measures, including large-scale testing and extensive contact tracing. Innovative technological tools

were used in both contact tracing and quarantine monitoring, as seen in Singapore and Taiwan. These structural changes take time to build, and COVID-19 should serve as the momentum for Canada to review the feasibility of institutional shifts to enhance the country's future pandemic response.

Countries without the advantage of previous experience and relatively underprepared health-care systems, such as Vietnam and New Zealand, relied on more stringent measures, including strict border restrictions and institutionalized quarantine. These measures, when implemented in a timely manner, helped to curb community transmission and avoid the need for lengthy, economically damaging lockdowns. Japan followed a cluster-based approach for preventing clustered outbreaks and backward contact tracing for cases arising from clusters. In this way, the country was able to avoid blanketed lockdowns and kept its community spread at a manageable level.

Australia was an interesting case study due to several similarities with Canada in its governance structure. Like New Zealand, Australia did not have a centralized public health response agency. However, the Australian Health Protection Principal Committee, the highest decision-making body made up of health experts from all states and territories, gained significantly more influence over the course of the pandemic and was able to provide expert advice directly to the National Cabinet. Australia's success highlighted the importance of elevating the role of health officials in infectious disease emergencies.

What is notable about our analysis is that the most effective features of the pandemic response were not novel practices but rather swift and decisive action guided by an appropriate level of risk awareness. Canada did not go into COVID-19 unprepared; however, as the countries highlighted in this report demonstrate, just as important as preparations are a sense of urgency and the willingness to take early and decisive action. Future pandemic plans should emphasize a cohesive response that is guided by science, co-operation, and co-ordination between levels of government, and an institutional capacity to benefit from the experiences of other countries. As well, the adaptation of these strategies must align with Canadian values of autonomy, democracy, and freedom.

ABOUT APF CANADA

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APPENDIX

Roundtable Participants

ROUNDTABLE 1:

- Dr. M. Jae Moon – Department of Public Administration, Yonsei University, South Korea;
- Dr. Chang-yup Kim – School of Public Health, Seoul National University, South Korea;
- Dr. Caroline Miller – School of Public Health, University of Adelaide, Australia;
- Dr. Paul Glasziou – Institute for Evidence-Based Healthcare, Bond University, Australia;
- Dr. Amanda Kvalsvig – Department of Public Health, University of Otago, New Zealand;
- Dr. Chang-Chuan Chan – College of Public Health, National Taiwan University, Taiwan; and
- Dr. Irving Yi-Feng Huang – Department of Public Administration, Tamkang University, Taiwan.

ROUNDTABLE 2:

- Dr. Danish Ahmad – Global Health Fellow, University of Canberra, Australia;
- Dr. Reiko Miyahara – National Centre for Global Health, Japan;
- Dr. Li Yang Hsu – School of Public Health, National University of Singapore, Singapore;

- Dr. Hyukmin Lee – Yonsei University College of Medicine, South Korea; and
- Ms. Hyunjin Kang – Seoul National University, South Korea.

List of Interviews

- Professor Kelley Lee - Tier 1 Canada Research Chair in Global Health Governance, Faculty of Health Sciences, Simon Fraser University
- Dr. Heidi Tworek - School of Public Policy and Global Affairs, University of British Columbia
- Dr. Kumanan Wilson – Department of Medicine, University of Ottawa
- Mr. Michael Garner – Fmr Senior Science Advisor, Public Health Agency of Canada
- Katie Greenwood – Director, Straegic Planning and Policy, Public Health Agency of Canada
- Mary Teresa Glynn – Director, COVID-19 Task Force, Canada Border Services

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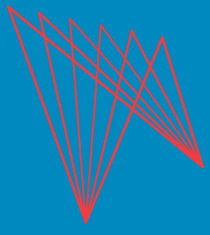

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DIGITAL INNOVATIONS FOR PANDEMIC RESPONSE IN ASIA:

Lessons for Canada

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EXECUTIVE SUMMARY

The pandemic has accelerated the adoption of digital technology around the world. In several Asian economies, the use of data-driven digital tools has enabled successful early responses against COVID-19. The deployment of digital innovations in pandemic response has drawn both praise for their effectiveness and concerns about their intrusiveness and potential violation of civil and political rights. Often, the success of these technologies in Asia has been attributed to the "collectivist" or "communal" attitudes and low prioritization of privacy concerns among the public, or the ability of more *dirigiste* governments to act in a more imposing manner. However, this report aims to provide a more nuanced understanding and analysis of how institutional and social factors have enabled the successful deployment of these technologies in Asia.

This report provides an overview of different use cases from Asia of digital technology in response to COVID-19 under four different categories: contact tracing, monitoring and surveillance, distribution of medical supplies, and telehealth. Researchers also examine the building blocks necessary to support the development, rollout, and public adoption of digital innovations in pandemic response. The research and analysis also show that Asian governments, much like their western counterparts, strive to maintain tenuous public trust in their operations. Canadian and Asian policy-makers share similar challenges and concerns, particularly pertaining to digital technologies. Finally, we seek to provide recommendations for the government of Canada that address key institutional and social factors to enable the use of digital technologies in future pandemic responses.

The report concludes with four recommendations:

1. **Reform data governance frameworks – in both the short and long term.**

   The ability of governments in Asia to share personal data between different ministries and levels of government was a key factor contributing to the success of digital technologies in controlling COVID-19's transmission. While the more intrusive forms of data collection and usage would not align with Canada's social values, Canadian policy-makers have been consistently informed about the need to develop a more coherent model of data governance at the national level, not just for the pandemic response, but for modernized public administration, health care, and economic competitiveness.[1]

2. **Build channels for public participation – and eventually, public ownership.**

   The effectiveness of programs deploying digital technologies as pandemic response relies significantly on community buy-in to drive high levels of uptake among the public. Digital solutions should be developed in a way that actively channels public input, be it in the form of surveys/questionnaires, requests for comment, information gathering, or real-time feedback. Given methods to engage in the technology deployment process, the public can develop a better understanding of the mechanism and rationales behind these tools and platforms, while at the same time developing a stronger sense of ownership.

3. **Re-think the public-private partnership.**

   The case studies from Asia highlight the need for the government of Canada to re-think the model of public-private partnerships in the development of digital solutions. In Asia, the collaboration between public health agencies and major tech companies such as WeChat, Alipay, Kakao, Naver, or Gojek has enabled the rollout of digital solutions in various areas of COVID-19 response. However, these responses were made possible because of a different type of relationship between the public and the private sectors; governments have a more hierarchical relationship with the firms, and the tech companies are often seen as "national champions" that have a stake in the well-being of the citizens.

4. **Strengthen public understanding – and eventually, trust – in technology.**

   The public engagement with digital solutions introduced by governments in Canada and Asia has underscored the importance of strengthening the public understanding of these new tools. Educating the public on how their data is collected and used and how they can properly address misuse of their data could enhance trust in future rollouts of digital solutions. Asian governments have shown responsiveness to public queries and criticisms of their technology during the pandemic, enhancing trust (or at least, acceptability) of the digital solutions.

RÉSUMÉ

La pandémie a accéléré l'adoption de la technologie numérique dans le monde entier. Dans plusieurs économies asiatiques, l'utilisation d'outils numériques axés sur les données a permis de mener à bien des interventions précoces contre la COVID-19. Le déploiement des innovations numériques dans la réponse à la pandémie a suscité à la fois des éloges pour leur efficacité et des inquiétudes quant à leur caractère intrusif et à la violation potentielle des droits civils et politiques. Souvent, le succès des cas d'utilisation en Asie a été attribué aux attitudes « collectivistes » ou « communautaires » et à la faible priorité accordée par le public aux questions de vie privée, ou à la capacité des gouvernements plus *dirigistes* à agir de manière plus imposante. Cependant, ce rapport vise à fournir des connaissances et une analyse plus nuancées de la manière dont les facteurs institutionnels et sociaux ont permis le déploiement réussi de ces technologies en Asie.

Ce rapport offre une vue d'ensemble des différents cas d'utilisation de la technologie numérique en Asie en réponse à la COVID-19 selon quatre catégories différentes : recherche de contacts, suivi et surveillance, distribution de fournitures médicales et télésanté. Les chercheurs examinent également les éléments de base nécessaires pour soutenir le développement, le déploiement et l'adoption, de la part du public, des innovations numériques dans la réponse à la pandémie. La recherche et l'analyse montrent également que les gouvernements asiatiques, tout comme leurs homologues occidentaux, s'efforcent de maintenir une confiance ténue du public dans leurs opérations. Les décideurs canadiens et asiatiques ont en commun des défis et préoccupations similaires, notamment en ce qui concerne les technologies numériques. Enfin, nous cherchons à formuler des recommandations à l'intention du gouvernement du Canada qui portent sur les principaux facteurs institutionnels et sociaux, afin de permettre l'utilisation des technologies numériques dans les futures interventions en cas de pandémie.

Le rapport se termine par quatre recommandations :

1. **Réformer les cadres de gouvernance des données, à court et à long terme.**

   La capacité des gouvernements asiatiques à partager les données personnelles entre les différents ministères et niveaux de gouvernement a été un facteur clé contribuant au succès des technologies numériques dans le contrôle de la transmission de la COVID-19. Bien que les formes les plus intrusives de collecte et d'utilisation des données ne soient pas conformes aux valeurs sociales du Canada, les décideurs

canadiens ont été constamment informés de la nécessité de développer un modèle plus cohérent de gouvernance des données au niveau national, non seulement pour la réponse à la pandémie, mais aussi pour la modernisation de l'administration publique, des soins de santé et de la compétitivité économique[1].

2. **Créer des canaux de participation du public et, à terme, de ralliement public.**

   L'efficacité des programmes déployant des technologies numériques dans le cadre d'une intervention en cas de pandémie repose en grande partie sur leur adoption au sein de la communauté, afin de susciter un niveau élevé d'utilisation de la part du public. Les solutions numériques doivent être développées de manière à canaliser activement la contribution du public, que ce soit sous forme de sondages/questionnaires, de demandes de commentaires, de collecte d'information ou de retour d'information en temps réel. En raison des méthodes pour prendre part au processus de déploiement de la technologie, le public peut mieux comprendre le mécanisme et les raisons qui sous-tendent ces outils et plateformes, tout en développant un sentiment d'appartenance plus fort.

3. **Repenser le partenariat public-privé.**

   Les études de cas en Asie mettent en évidence le bénéfice pour le gouvernement du Canada de repenser le modèle de partenariats public-privé dans le développement de solutions numériques. En Asie, la collaboration entre les agences de santé publique et les grandes entreprises technologiques comme WeChat, Alipay, Kakao, Naver ou Gojek a permis le déploiement de solutions numériques dans divers domaines de réponse à la COVID-19. Toutefois, ces réponses ont été rendues possibles grâce à un type de relation différent entre le secteur public et le secteur privé; les gouvernements ont une relation plus hiérarchique avec les entreprises, et les entreprises technologiques sont souvent considérées comme des « champions nationaux » qui ont un rôle à jouer dans le bien-être des citoyens.

4. **Renforcer la compréhension — et, à terme, la confiance — du public dans la technologie.**

   L'engagement du public envers les solutions numériques introduites par les gouvernements au Canada et en Asie a souligné l'importance de renforcer la compréhension du public par rapport à ces nouveaux outils. Éduquer le public sur la manière dont ses renseignements sont colligés et utilisés et sur la manière dont il peut réagir correctement à une utilisation abusive de ses renseignements pourrait renforcer la confiance dans les futurs déploiements de solutions numériques. Les

gouvernements asiatiques ont fait preuve de réactivité face aux questions et aux critiques du public concernant leur technologie pendant la pandémie, renforçant ainsi la confiance (ou, du moins, l'acceptabilité) des solutions numériques.

01

INTRODUCTION

The use of digital technology against the spread of COVID-19 by several Asian economies has been widely reported, following their successful initial response to the pandemic. Governments in China, Taiwan, and South Korea, for example, have deployed different digital tools to accelerate and increase the efficiency of their pandemic response, and such uses of digital technology have been reported to contribute significantly to their overall success in limiting the outbreak. The North American coverage and analysis of these Asian cases have largely focused on invasive uses of the technology that could potentially undermine civil rights, drawing attention to the different political, social, and/or cultural contexts unique to Asia and underscoring their inapplicability in the current Canadian settings.

While the critiques above are partially legitimate, these types of analysis reduce a wide array of factors that enable such uses of digital technology to the question of whether Asians care about privacy or not. In addition to providing an overview of the digital tools employed for pandemic responses in Asia, this report aims to provide a more nuanced understanding of the factors that have enabled the deployment of digital technology for public health during COVID-19. Dissembling and analyzing these factors into smaller components yields valuable insights for Canada.

In this context, this report presents the different types of digital technology uses in Asia that have contributed to successful responses to the COVID-19 outbreak. It then analyzes

the different institutional factors and social contexts that have enabled the deployment of these digital tools in Asia. This report was prepared with funding from the Public Health Agency of Canada (PHAC) with the aim of providing recommendations for the government of Canada on the effective preparation and use of digital technology in the event of a future health crisis.

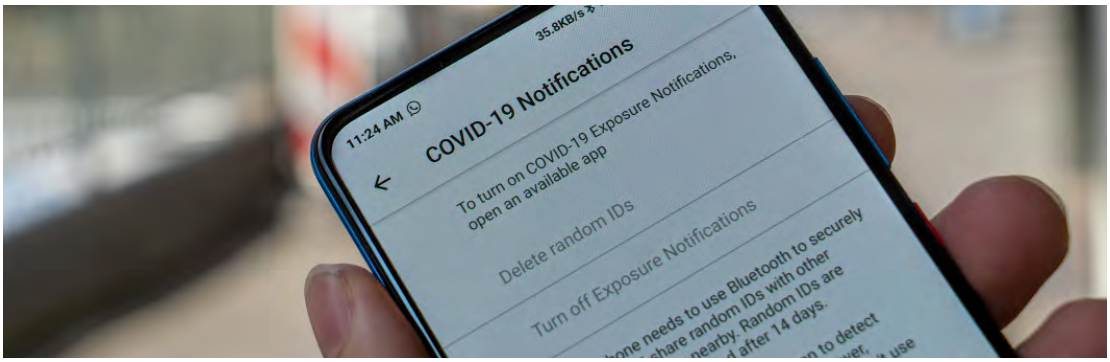
Methodology and Scope

The methodology of this paper is largely quantitative, based on desk research and informational interviews with public health and digital technology experts. Several original language sources in Asia (e.g., Korean, Mandarin, Tagalog) were consulted as part of the research process.

The research report begins with a descriptive summary of four different types of digital technology uses against COVID-19 in Asia. We include examples and descriptions of digital technologies in Brunei, China, Hong Kong, Indonesia, Japan, Malaysia, Singapore, South Korea, Taiwan, and Vietnam. Building on this section, the report then breaks down the factors that have enabled the use of said forms of digital technology in Asia, specifically the institutional factors and social contexts. Finally, the report concludes with four recommendations presented to the government of Canada, drawing lessons from regional cases.

02

USE OF DIGITAL TECHNOLOGY IN COVID-19 RESPONSE



The use of digital technologies accelerated during the pandemic. According to a report by McKinsey and Company, the average share of overall customer interactions that are digital went up from 36% to 58% between December 2019 and July 2020.[2] Digital technologies have been leveraged in a variety of ways to lessen the impact of the COVID-19 pandemic. The following functional applications are considered in this report: 1) contact tracing; 2) surveillance; 3) distribution of medical supplies; and 4) telemedicine.

This section presents summaries of different digital innovations used by selected Asian governments in response to COVID-19, highlighting a few key examples. For more detailed descriptions of digital tools and technology-related response efforts for case study countries, please see Appendix A.

FIGURE 1

Digital technology for pandemic preparedness and response

Contact Tracing

Contact tracing is understood as the process of identifying and tracking "individuals who might have come into contact with an infected person."[3] While most economies around the world, and particularly in Asia, had introduced some kind of digital contact tracing by early 2021, this process is still labour intensive since health authorities need to interview confirmed COVID-19 patients and reach out to close contacts via either phone calls or visits to advise them to self-isolate.

In Canada, analog contact tracing requires significant human effort. For instance, health authorities in Alberta hired more than 2,000 contact tracers from the beginning of the pandemic to January 2021.[4] Further, much of this analog form of contact tracing depends on the information provided by the confirmed COVID-19 patient, which is not always reliable. Contact tracing has been deemed a "failure" in developed economies.[5] The City of Toronto even ended its contact-tracing efforts altogether in October 2020 because it was not deemed effective considering the cost.[6]

In this context, the use of digital technology for contact tracing in Asia has drawn significant attention from the western media and policy researchers. Most economies across the Asia Pacific region quickly deployed different forms of contact tracing, relying on technology to reduce human effort and time. Supported by digital technologies, governments throughout the region have traced infection statuses, movement of people, and potential contacts. This has been enabled by strong government capacity, robust digital infrastructure, and seamless government-business data sharing.[7] In the process, however, these practices have raised concerns, in both Canada and Asian economies, over the disproportionate collection and management of data that could lead to potential violations of civil rights.

Singapore, Brunei, Indonesia, and Malaysia have introduced contact-tracing apps like the COVID Alert app in Canada, powered by Bluetooth in mobile phones. In the cases of South Korea, Taiwan, and Vietnam, the governments created data-sharing mechanisms to facilitate rapid contact tracing. South Korea's Epidemiological Investigation Support System collects data from different government ministries and agencies, 22 credit card companies, and all of the mobile service providers to conduct contact tracing. Taiwan's TRACE, its contact-tracing platform, is connected to different government databases that facilitate data collection and real-time monitoring. China has leveraged the omnipresent mobile "super apps" like WeChat and Alipay, connecting them to the National Integrated Government Service Platform for contact tracing and surveillance.

CASE STUDY 1:

"Super Apps" and Contact Tracing in China: WeChat and Alipay

In China, Beijing overcame the need for high public participation in contact tracing by leveraging two super apps that each had one billion users in China – WeChat and Alipay. Both super apps host a "mini app" where users submit their national ID number, contact information, travel history, and health status to the National Integrated Government Service Platform. Users then receive a QR code to access public places and transportation. This gives the Chinese government an immense amount of real-time data with which it can track the movements of suspected COVID-19 cases in detail, including who they encounter.

Monitoring and Surveillance

Following the identification of COVID-19 carriers and close contacts, the next important step is to make sure that these individuals are isolated to minimize the outbreak. Hence, governments around the world have introduced quarantine and self-isolation measures for inbound travellers or close contacts. In various countries such as Canada, the implementation and enforcement of monitoring and surveillance measures have been mostly limited to non-digital methods, not only for logistical reasons, but also because of potential violations of civil rights. In many countries in Asia, however, governments have rolled out digitally enabled solutions for monitoring and surveillance of confirmed and potential COVID-19 carriers.

Brunei and Hong Kong provided wearables (i.e., wristbands) for those undergoing mandatory quarantine to check their locations. South Korea and China leveraged their data collection systems to monitor those under mandatory quarantine. China integrated health data from the health-care system with real-time monitoring systems to develop a health code system with epidemiology maps. Similarly, South Korea's Smart Quarantine System pools travel information, immigration status, health data, and mobile data to check whether incoming travellers have visited high-risk countries and to contact potential COVID-19 carriers.

CASE STUDY 2:

South Korea's Smart Quarantine System

South Korea's Smart Quarantine System provides the government with comprehensive information on incoming travellers by drawing on various government ministries and agencies to consolidate data on travel, immigration status, health, and even roaming service for mobile usage from telecommunication companies. This allows South Korea to efficiently monitor and contact high-risk incoming travellers. Moreover, the data pooling allows government officials to co-ordinate with medical institutions three times a day to prioritize care more efficiently for high-risk travellers.

Distribution of Medical Supplies

The pandemic created a sudden increase in demand for medical resources and difficulties in allocating these in a fair and effective manner.[8] For instance, Canada suffered from a shortage of personal protective equipment (PPE) in the earlier stages of the pandemic, which posed a challenge for public health authorities.[9] The process of providing medical supplies ranges from procurement to distribution, but our analysis focuses on the innovative uses of digital technology for distribution of PPE, vaccines, and other medical resources.

Some key cases from Asia of applying technology to medical supply distribution include facilitating vaccination rollout and PPE dispensation. For vaccination appointment scheduling, apps developed either by the government or through public-private partnerships emerged across several Asian countries such as Malaysia (MySejahtera app) and Indonesia (PeduliLindungi app).

CASE STUDY 3:

South Korea Battles Vaccine Wastage: Naver and Kakao

When rolling out COVID-19 vaccinations, South Korea proactively battled vaccine wastage by partnering with two local tech giants: Naver and Kakao. To begin, the Korea Centers for Disease Control and Prevention (KCDC) established a centralized online booking system for people to schedule their vaccination appointments. The partnerships between KCDC and Naver and Kakao further improved vaccination efficiency and minimized wastage by creating a live map that tracked appointment cancellations or no-shows in nearby vaccination facilities so that others close by could take the dose instead.

Other countries added additional features beyond scheduling to the apps. For example, in South Korea, a collaboration with tech companies Naver and Kakao combatted vaccine wastage by allowing users to track the availability of vaccines as cancellations or no-shows emerged using a map feature. Meanwhile in Singapore, the government app (Health

Hub) also stored digital vaccination certificates. Singapore also took a technological and centralized approach to distributing more common medical supplies like masks, using a website to organize pickup schedules. This was supplemented by the Temasek Foundation program, which distributed free masks using vending machines that required a government ID scan to enforce rationing.

CASE STUDY 4:

Mask Rationing Through Vending Machines in Singapore

In addition to digitally organizing vaccination, Singapore applied similar technological organization in rationing PPE such as masks. The government created a website to organize pickup slots. Government mask supplies were supplemented by private-sector initiatives to provide more masks to the public. The Temasek Foundation, notably, innovatively used vending machines to provide a contact-free method of mask distribution. Users could obtain only two free reusable masks per person after scanning the barcode of any government ID.

South Korea and Taiwan also used centralized tracking systems to ensure the proper rationing of masks. Notably, Taiwan leveraged crowdsourced information as data for the National Health Insurance mobile app, enabling users to make online purchases and reservations for convenient store pickup.

Telehealth

Telehealth refers to "the delivery of health care services by health care professionals, where distance is a critical factor, through using information and communication technologies (ICT) for the exchange of valid and correct information."[10] While there has been much support for telehealth as a way of expanding health-care coverage, its implementation in Canada before the pandemic was limited due to restrictions on physician licensing and payments and doubts about the security of virtual meeting software.[11] However, much like in other sectors, the COVID-19 outbreak has led to a shift in the health-care sector, with governments recommending and even introducing greater support – regulatory and financial – for the expansion of telehealth.[12]

Countries in the Asia Pacific region saw an uptake in the various telehealth services and apps in two general cases: when patients have COVID-related concerns, and when they seek medical advice for other non-COVID-related diseases, conditions, or treatment needs. For the former, Indonesia's Check COVID-19 app, Japan's LINE Healthcare, and China's Ping An Good Doctor are examples of either private sector-led or public-private partnered digital initiatives that have helped screen suspected COVID-19 patients and eased some of the burden on the hospital system. For the latter, Ali Health and We Doctor in China, GrabHealth in Indonesia, Doctor Anywhere in Singapore, and VieVie and Jio Health in Vietnam are examples of digital solutions that offer remote doctor consultations, medication ordering, and even medication delivery options for patients seeking help with common illnesses and chronic conditions, reducing hospital inflows and risks of infection and allowing medical resources to be better prioritized for front-line pandemic-combatting efforts.

CASE STUDY 5:

Telemedicine in Indonesia: GrabHealth

In Indonesia, the rollout of several telemedicine options has been integral to maintaining access to everyday health care for Indonesians staying at home under lockdown. GrabHealth, for example, is powered by the health tech firm Good Doctor, and provides round-the-clock online access to medical professionals. It also streamlines medical purchases and deliveries in the app, so that patients can go straight from an e-consultation to ordering a medical prescription.

Some telehealth and telemedicine apps also added functions to facilitate testing and vaccine booking. Not only have Asian countries taken several steps forward in incorporating advanced technologies like AI robots, blockchain, and cloud computing to their telehealth drives, but they have also been actively building an institutional and legislative environment to enable the frictionless rollout of telehealth initiatives.

Implications for Canada

Asia's successful response to the initial outbreak of the COVID-19 pandemic, helped in part by their use of digital technologies, stresses the importance of these digital tools in alleviating the impacts of a pandemic. For instance, the South Korean government has been able to reduce the average time needed for contact tracing from 24 hours to 10 minutes through its Epidemiological Investigation Support System, which greatly contributed to the success of South Korea's early response against COVID-19. Singapore's TraceTogether was seen as an innovative solution for contact tracing, and it was replicated in Australia and then elsewhere.

But the examination of these digital solutions quickly demonstrates that it is not the lack of ideas or access to technology that makes the deployment of these solutions challenging

in Canada. Instead, this research demonstrates that what has made the rollout of these digital solutions possible in Asia are institutional and social attitudes, which are explored in the following section. It is in this analysis that this study identifies relevant lessons for Canada beyond highlighting interesting technology solutions.

03

BUILDING BLOCKS: ENABLING FACTORS OF DIGITAL TECHNOLOGY DEPLOYMENT

Institutional Factors

Economies in Asia have several institutional factors that contributed to their overall early success in response to COVID-19 and their ability to develop and roll out digital tools for pandemic responses. Their "advanced institutional capacities"[13] can be broken down into the following four factors:

1. Infectious disease-specific laws and protocols, particularly in the event of a major outbreak, delineating clear roles for government ministries and agencies, and providing frameworks for their close co-ordination in pandemic response;
2. New or reformed specialized agencies with clear mandates to monitor, manage, and co-ordinate pandemic responses at a country-wide level;
3. Government agencies with legal access to key information to conduct their duties, and the authority to establish their own systems to fulfil their law-given mandates; and
4. All the previous legal and institutional factors function in accordance to already existing laws governing privacy and data use and collection for health purposes.

RELEVANT LAWS CONTRIBUTING TO THE DEPLOYMENT OF TECHNOLOGY

TABLE 1

Relevant laws contributing to the deployment of technology

COUNTRIES	RELEVANT LAWS
Brunei	*Infectious Diseases Act 2010*
Hong Kong	*Public health exemptions in the Personal Data (Privacy) Ordinance*
Indonesia	*Electronic Information and Transactions Law No. 11/2008, Revision: Law No.19/2016 (EIT Law)*
Malaysia	*Malaysian Medical Council Advisory on Virtual Consultation (During the COVID-19 pandemic, Telemedicine Act 564, Medical Device Act (737) 2012, Medical Device Authority Act (738) 2012*
People's Republic of China	*Drug Administration Law amended in 2019 to legitimize the sale of prescription drugs online*
Singapore	*COVID-19 (Temporary Measures) Act 2020, Infectious Diseases Act (Chapter 173; COVID-19 Stay Orders), National Telemedicine Guidelines*
South Korea	*Law on the Prevention and Management of Infectious Diseases (Article 76-2)* *Quarantine Act (Article 29-2)*
Taiwan	*Infectious Disease Control Act*

Based on their experiences with severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) in 2003 and 2015, respectively, several governments in Asia have established specialized agencies and laws to swiftly respond to a pandemic. The Centre for Health Protection in Hong Kong, the National Centre for Infectious Diseases in Singapore, the Centers for Disease Control and Prevention (KCDC) in South Korea, and the Central Epidemic Command Center in Taiwan were established after the SARS

outbreak in 2002 and 2003. At the onset of COVID-19, these agencies became crucial, co-ordinating the pandemic response across government ministries and levels, and using several digital and analog methods to determine response measures based on timely data.

Infectious disease laws, such as those shown in Table 1, gave governments in Asia, especially the recently established public health agencies, certain key rights that aided in the rollout of digital tools in pandemic response. First, these laws allowed public health agencies to access and manage a wealth of personal and health data from government and private sources to assist them in determining health measures to curb transmission of an infectious disease. Second, in collaboration with government, these agencies established their own electronic systems to better perform their law-mandated duties in the event of a health crisis.

For instance, China concentrated on using information technology to access key population health and contact-tracing data to inform measures during a public health crisis like COVID-19. The government also shared this data with the necessary health authorities to properly assess transmission rates and risks and inform response measures. China's provinces were given the option to link their originally incompatible QR health codes, which had been fragmented during the rollout process, to an intermediary provided through the National Integrated Government Service Platform. Providing a platform on which this data could be managed and shared in multiple formats facilitated the exchange of information and standardization of the risk assessment and travel advisory standards among different jurisdictions.[14]

Similarly, South Korea's Quarantine Law allows the KCDC to designate "countries with localized, high prevalence of infection as 'quarantine inspection required areas'," and mandate travellers from these locations to fill out a health status questionnaire and enter quarantine.[15] To facilitate this process during COVID-19, the South Korean government, in collaboration with the KCDC, created and mandated the use of a smartphone app for travellers entering the country. Inbound passengers had to download it and use it to declare their health status on entry and to report their health condition over a 14-day quarantine. Through the app, travellers can also directly contact the KCDC with medical concerns.[16]

South Korea's Smart Quarantine System is also a key example of an electronic system used by the KCDC to fulfil its duties of monitoring and enforcing quarantines during infectious disease outbreaks. The database gathers data from different ministries, the country's COVID-19 health declaration app for travellers, and even commercial entities (e.g., mobile and credit card companies) and is directly accessible to the KCDC. In turn,

the KCDC can inform and share data relevant for local governments and clinics about potential COVID-19 cases and individuals who may need treatment or monitoring over their quarantine living in their jurisdiction.[17]

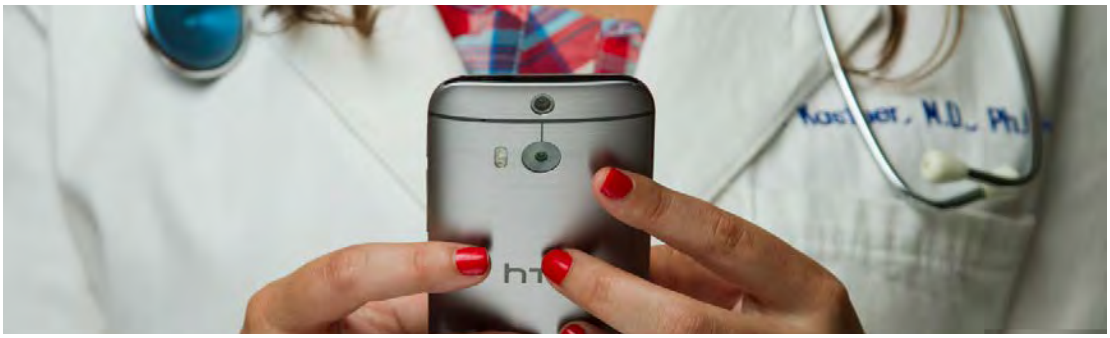
Another pandemic-relevant sector that benefited from institutional capacity, especially in legislation, has been telehealth. China amended its Drug Administration Law in 2019 to legalize the sale of prescription drugs online, which granted access to telemedicine to Chinese residents during strict lockdowns in several Chinese cities.[18] Singapore, on the other hand, issued its National Telemedicine Guidelines in 2015 to set out best practices – in areas including consent, privacy, and data storage – for health practitioners providing services in a telehealth context. As part of its broader Smart Nation Initiative, the Singaporean government took an incremental approach and further introduced the Ethical Code and Ethical Guidelines (2016) and Telehealth Product Guidelines (2017) to address emerging issues.[19] Although Singapore is still in the piloting stage before formally licensing telemedicine services, the legal framework-setting prior to the pandemic outbreak has helped the country to respond to changing health-care priorities and continue establishing the governance framework.[20]

The pandemic has changed how people consult medical practitioners, with both Asian countries and Canada experiencing increased demand for telehealth. One study by the Canadian Medical Association reported that while virtual care in Ontario increased slowly from 0.2% of total ambulatory visits in the first quarter of 2012 to 1.8% by the fourth quarter of 2019, the percentage of virtual visits skyrocketed with the onset of the pandemic. During the second quarter of 2020, virtual visits made up 70.2% of ambulatory visits, with the majority of them through phone calls.[21] While a return to a new normal may increase in-person visits, it is likely that telemedicine will remain a popular alternative for doctor consultations. The increased uptake of telehealth among Ontarians hints to telehealth being a viable option for people seeking care in Canada, particularly during another pandemic, and will require evolving legal and institutional support similar to that seen in Asia.

Another aspect contributing to the deployment of any digital technology in pandemic response in Asia was the compliance of electronic systems and digital tools to existing legal and regulatory frameworks governing personal information and data privacy. In South Korea's case, institutional changes that occurred in the very early days of the pandemic were built on the critical lessons learned from the 2015 MERS outbreak. With the Infectious Disease Control and Prevention Act already containing post-MERS provisions for the government's conditional use of personal data during a public health emergency, amendment processes were fast-tracked so that the contact-tracing platform

for COVID-19, Smart Management System, had the legal basis to leverage cellular GPS location and credit card transaction data for much faster tracing and tracking through the Epidemiological Investigation Support System.[22] Another example is Taiwan's TRACE system, developed as part of the Taiwan Centers for Disease Control's four-year project, that aims to build cross-disciplinary information-sharing and thereby facilitate value-added analysis and decision-making during times of infectious diseases.[23]

As for Hong Kong, the recognition of COVID-19 as a "notifiable infectious disease" by the Prevention and Control of Disease Ordinance entails disclosures of the data subject's identity, location, and personal health data to a third party without consent, albeit in the situation when the "absolute right to life and public interest" overrides "personal data privacy."[24] Although such an exemption is designed to facilitate the health authorities' access to information via the contact-tracing apps StayHomeSafe and LeaveHomeSafe, it has often been criticized for the lack of clarity and transparency about who constitutes a legitimate third party.



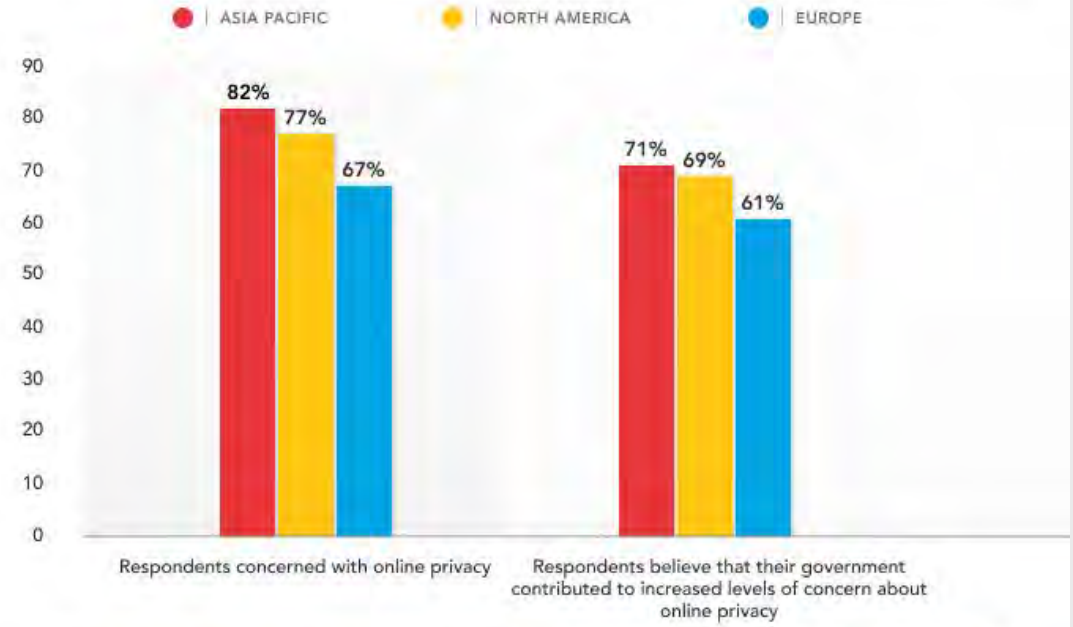
Social Contexts

To further explain the successful deployment of digital technology against COVID-19 in Asia, it is important to examine and gain a nuanced understanding of the social contexts that have enabled the digital measures introduced by governments.

First, it is important to note that Asian citizens share concerns about data and privacy with North Americans and Europeans. According to a 2019 global survey (see Figure 2), respondents from the Asia Pacific tend to be more concerned about their online privacy in comparison to their North American and European counterparts.[25] More importantly, more Asia Pacific respondents credit their governments for contributing to increased concern over online privacy in comparison to North American and European counterparts.[26] These survey results suggest that Asians are as concerned, if not more, about their privacy than North Americans and Europeans.

FIGURE 2

CIGI-IPSOS Global Survey: Internet security & trust 2019



Source: https://www.cigionline.org/sites/default/files/documents/2019%20CIGI-Ipsos%20Global%20Survey%20-%20Part%201%20%26%202%20Internet%20Security%2C%20Online%20Privacy%20%26%20Trust.pdf

In fact, the use of invasive forms of digital technology in response to COVID-19 have raised questions and backlashes in the region. Seoul's collection, storage, and use of personal data for contact tracing and surveillance have raised concerns and criticism from civil society.[27] In Hong Kong, the public has shown great reluctance in digitally providing their personal information, and they have opted to provide their information manually. For instance, the sign-up rate for LeaveHomeSafe was approximately 33% in February 2021, and relevant government agencies have been pushed to provide further explanations and assurances about data privacy.[28] In Taiwan, critics of the island's digital approach to infection surveillance and quarantining still advocate for further transparency and specificity from the government on pandemic data use, retention, and protection.[29] Similarly, the discovery that the Singaporean government used TraceTogether's data for criminal investigation led to a major public uproar.[30]

Additionally, governments in Asia have challenges related to public trust that can impede the use and adoption of digital technology in pandemic response. According to the OECD, European and North American economies, such as Canada (60%), the United

States (46.5%), and the Netherlands (78.1%) generally reported a higher level of trust in government than both Japan (42.3%) and South Korea (44.8%).[31]

In this context, governments in Asia endeavoured to build trust in their public health measures, including digital tools, through the COVID-19 pandemic. In South Korea, the government discloses as much data as possible to the public – including "movement paths, transportation means, medical treatment institutions, and contacts of patients of the infectious disease" – a lesson learned after tight information control during the MERS outbreak led to high public dissatisfaction.[32] This level of data transparency in South Korea is supported by one of the most comprehensive and strict data privacy laws in the region, a key policy piece contributing to enhanced public trust.[33]

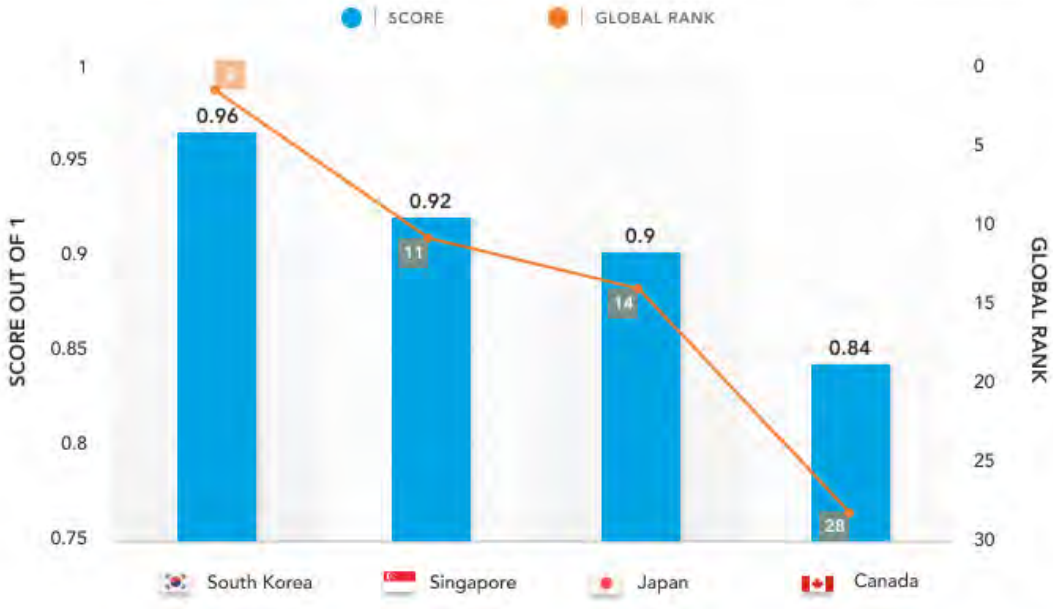
While a national survey showed that over 80% of respondents preferred having transparent information on infection clusters and locations where cases were found, Seoul's transparency policy around infection clusters or movements of anonymized individual cases was not without controversy.[34] The identification and public disclosure of infection clusters in LGBT+ nightclubs in Seoul raised public concerns over the collection and use of data for health purposes. The government quickly moved to offering anonymous testing, lowering the risk that LGBT+ individuals may not get tested for fear of being outed and stigmatized.[35] The government's responsiveness and sensitivity to a public concern, particularly one of a minority group fearing discrimination, enhanced trust as reflected by the increase in the amount of people getting tested through the new service after this particular outbreak.[36]

Further, the South Korean and Taiwanese governments also clarified that data gathered for the pandemic was only accessed, shared with, and used by key health agencies, like the KCDC and the Central Epidemic Command Center, and strictly for public health purposes. Taiwan's efforts in engaging the public in their responses, particularly with Taiwan's civic tech sector contributing to the creation of a mask-availability app, likely also contributed to trust building.[37]

An important point to consider is the familiarity of the Asian public with digital public service and tools. In the 2020 United Nations E-Government Development Index (EGDI) – which scores countries based on their online service index, telecommunication infrastructure index, and the human capital index – Asia as a region scored second highest in the world at 0.64, just behind Europe (0.82) and ahead of the Americas (0.63), with the world average being 0.6.[38] In terms of individual economy rankings, South Korea is a trailblazer, placing second globally behind Denmark. Other Asian e-government adoption leaders are Singapore and Japan. Canada lags behind these three Asian economies and the United States, only outranking China.

FIGURE 3

2020 United Nations E-Government Development Index (EGDI)



Source: https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20E-Government%20Survey%20(Full%20Report).pdf

Any country with an EGDI score of 0.75 to 1 is considered "very high." In the 2020 EGDI rankings, Asia, as a region, ranks second in the world for e-government development behind Europe but ahead of the Americas. Individually, 15 Asian countries (32% of the region) achieved spots in the very high EGDI category. Notable Asian frontrunners are South Korea, Singapore, and Japan, who globally ranked second, 11th, and 14th respectively, placing well ahead of Canada (28th).[39] This shows that populations across Asia, particularly in South Korea, Singapore, and Japan, have higher levels of familiarity with digital public services, creating a more welcoming environment for pandemic digital tools like contact-tracing apps or mobile SMS public health warning systems.

Further, collaboration between governments and key tech players to develop and roll out COVID-19 digital tools, either as stand-alone mobile apps or additional functions within an app, contributed to the public's ability to engage with such technologies. Beijing's link-up with WeChat or Alipay for contact tracing, symptom self-checks, and surveillance is a prime example. Likewise, large tech companies Grab and Gojek, which are very familiar

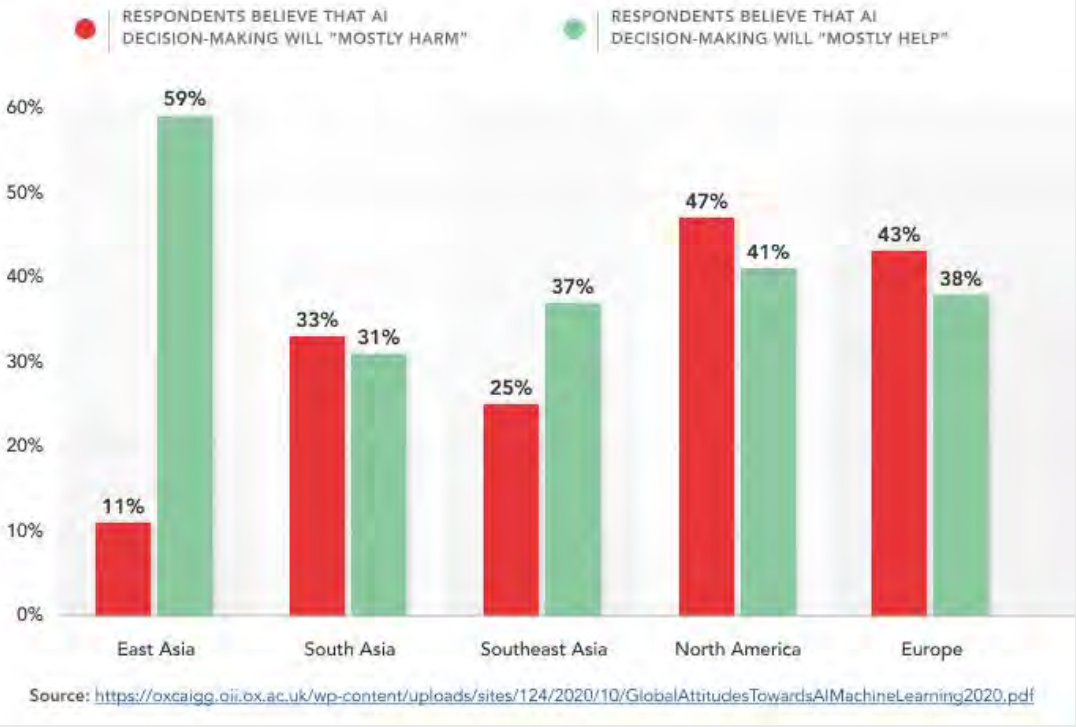
to the public, also partnered with governments in Southeast Asia to provide automated symptom-assessment questionnaires, free physician video consultations, and even drive-through vaccination clinics (especially for health-care workers), all done and booked through their respective mobile apps. Similarly, South Korea partnered up with Kakao and Naver to facilitate vaccine distribution.

The experiences with digital public service and integration of COVID-19 specific solutions with popular, familiar mobile apps and services may have eased concerns about taking up digital solutions proposed by governments in Asia. Also, the platform effects of these ubiquitous services must be taken into consideration. For instance, WeChat and Alipay are so ubiquitous in China that it is almost impossible to conduct day-to-day tasks without them. Apps such as Grab, Gojek, or Kakao enjoy similar statuses in their respective economies. These mobile applications provided an existing and widespread foundation for convenient dissemination of digital pandemic response tools.

Finally, differing attitudes about technology may have influenced the public support or, at least, toleration of digital tools used in response to COVID-19 in Asia. According to a poll by Oxford, there is a sharp discrepancy of global risk perception of AI decision-making by region, with generally more Asian respondents having a positive attitude toward AI in comparison to North American and European respondents (see Figure 4).[40] Furthermore, the public trust in the technology sector on average remains stronger in Asia as well. According to an Edelman study, 20 of 22 economies around the world ranked technology as a top trusted sector in 2016. However, in 2021 this number declined to 7 out of 22. The remaining seven countries – including India, Indonesia, and South Korea – still showed high levels of trust toward their technology sectors. As such, trust in the technology sector remains relatively strong in Asia, even as it declined in other parts of the world. As a result, local populations were likely more amenable to the use of digital tools through the pandemic.[41]

FIGURE 4

Global attitudes towards AI, machine learning & automated decision making (Oxford 2020)



Source: https://oxcaigg.oii.ox.ac.uk/wp-content/uploads/sites/124/2020/10/GlobalAttitudesTowardsAIMachineLearning2020.pdf

Conclusion

All in all, this analysis adds more nuance to the understanding of the institutional and social factors that have enabled the deployment of digital tools in response to COVID-19 in Asia. First, several Asian governments had the institutional capacity and preparedness to roll out digital tools in response to COVID-19. Past experiences with pandemics encouraged Asian economies to better prepare institutionally for new infectious disease outbreaks at regional or global levels. Both legal and institutional factors laid the foundation to employ technology against COVID-19, mostly as a way to facilitate the agile and effective implementation of already existing laws and agency-based procedures legally required for pandemic responses.

It is important to note that although legislation did not necessarily mandate the creation of digital tools, it gave the government and health agencies the power to develop them

to facilitate the performance of their duties during a pandemic. While some countries, like China, chose to use digital tools to centralize certain aspects of their previously decentralized health-care systems, the key takeaway for a Canadian context is that digital tools can better enable government coordination, and improved cross-sectoral and cross-regional data sharing, essential components for properly assessing infection rates, facilitating evidence-based policy-making and building a comprehensive and effective public health response during a health crisis.

This institutional capacity also allowed governments to be responsive when concerns around the use of "intrusive" digital tools in Asia emerged, with some governments taking different, locally specific measures to earn and maintain public support or, at the very least, acceptance, of such practices (as seen with South Korea's quick implementation of anonymous testing). Other key factors enabling the rollout of technology in pandemic responses include prior familiarity and experiences of Asian governments and societies with digital public service, and collaboration with popular and ubiquitous mobile apps and services.

For Canada, the key takeaways are not necessarily the technical aspects of the digital tools for pandemic response seen in Asia, but the enabling factors that allowed for their deployment. As discussed in the following section, the enabling factors relevant to institutions and social contexts need to be addressed in Canada before technology can be successfully implemented in a health crisis. In the following section we provide recommendations and key takeaways for Canada, including legal and institutional frameworks allowing for comprehensive and secure data governance, mechanisms to build trust in technology and digital literacy among the public, and re-defining collaboration between public and private sectors.

04

RECOMMENDATIONS AND KEY TAKEAWAYS

1. **Reform data governance framework – in both the short and long term.**

   One of the key factors of success in the use of digital technologies to fight the pandemic in Asia is the ability of governments to share personal data between different ministries and levels of government. While the more intrusive forms of data collection and usage would not align with Canada's social values, Canadian policy-makers have been consistently advised to develop a more coherent model of data governance at the national level, not just for the pandemic response, but to modernize Canada's public administration, facilitate health-care delivery, and improve economic competitiveness.[42]

   Reform of data governance is not merely a bureaucratic matter; it is a political matter that entails greater conversations about a better definition of a *national* public health act, as well as the standardization of data collection and reform of privacy legislation at both the federal and provincial/territorial levels. COVID-19 has created a window of opportunity to push for reforms on this front. As the case studies from Asia show, the regulatory and policy clarity for data use over the pandemic at a national level facilitated inter-government communication and collaboration. It also allowed infectious disease response agencies like South Korea's KCDC to develop digital tools that furthered its mandate and operations through the

pandemic. Hence, it is critical that the government of Canada continue to support essential data governance programs like the Pan-Canadian Health Data Strategy and its close collaboration with PHAC, as well as provincial and territorial governments. This will be a long-term objective.

A key lesson for Canada from the use of digital tools in Asia examined here, was the infectious disease and data governance legislation that made provisions and protocols for data access and use during health crises. In the short term, Canada should consider creating a nationwide data governance framework or at least a protocol for data sharing tailored for public health emergencies such as COVID-19, which would enable the collection and use of data for digitally-enabled tools and co-ordination among different ministries and levels of government. For the long term, this entails more foundational conversations about the role of federal and provincial/ territorial governments in public health policy, as well as the reform of data governance, especially that of health data, which would enable the flow of data across Canada with greater public trust.

2. **Build channels for public participation – and eventually, public ownership.**

The previous section explained the role of public trust across the Asia Pacific region in the governments' use of digital tools and their approach to personal data. As shown, the effectiveness of programs deploying digital technologies as pandemic response have relied significantly on community buy-in. Digital solutions should be developed in a way that actively channels public input, be it in the form of surveys/questionnaires, requests for comment, information gathering, or real-time feedback. By providing citizens the opportunity to engage in the technology deployment process, the public better understands the mechanisms and rationales behind these tools and platforms and, at the same time, develops a stronger sense of ownership. Such an attitude has been instrumental in the high uptake and subsequent effectiveness of many digital solutions deployed throughout the Asian region for combatting the pandemic.

For example, in Taiwan the mask map portal that crowdsourced mask inventory information became a space for civic participation; the public became co-developers of the solution, as opposed to subjects of data collection or surveillance. In return, the leveraging of civic engagement and collective intelligence creates a greater sense of public ownership and fosters a virtuous cycle of trust building. In the short term,

creating more channels for public input on digital solutions would be useful. In the long term, the integration of digital technology into public health policies should channel greater public input and transparency, and eventually foster a strong sense of public ownership over these digital solutions.

3. **Re-think the public-private partnership.**

   The case studies from Asia highlight the benefit for the government of Canada to re-think the model of public-private partnerships in the development of digital solutions. In Asia, the collaboration between public health agencies and major tech companies such as WeChat, Alipay, Kakao, Naver, Grab, or Gojek has enabled the rollout of digital solutions in various areas of COVID-19 response. However, these responses were made possible because of a different type of relationship between the public and the private sectors; governments have a more hierarchical relationship with the firms, and the tech companies are often seen as "national champions" that have a stake in the well-being of the citizens.

   During COVID-19, the Canadian private sector contributed to the government of Canada's digital solutions, but the lack of co-ordination and consistency in the development and deployment processes make interoperability and data sharing difficult as solutions usually end up being vendor-centric and narrow-focused.[43] According to the Edelman report, the Canadian public's trust in the technology sector is at an all-time low (60%), which compares poorly to its Asian peers such as Indonesia (88%), China (77%), South Korea (71%), and Singapore (70%).[44] Researchers have highlighted concerns about public procurements in technologies like AI primarily benefiting the private sector.[45] In this context, Canada should identify a principled approach to public-private partnerships in the development of digital solutions that foster and maintain public trust.

4. **Strengthen public understanding – and eventually, trust – in technology.**

   The public engagement with digital solutions introduced by governments in Canada and Asia has underscored the importance of strengthening the public understanding of these new tools. This should of course be built on the premise that the government of Canada continue to build digital literacy and technological capacity internally, within its ministries, agencies, and personnel.

Educating the public on how their data is collected and used and how they can properly address misuse of their data could enhance trust in future rollouts of digital solutions, especially those designed for public health purposes. In preparation for the next pandemic, PHAC can have an active role in raising awareness about digital tools for health, the management and use of data, and how data is kept safe.

Nonetheless, education is largely a long-term effort. In the short term, government agencies like PHAC could contribute to digital literacy efforts that strive to establish best practices and guidelines on health data governance for local governments and the private sector.

Asian governments have shown responsiveness to public queries and criticisms of their technology during the pandemic, enhancing trust (or at least, acceptability) of the digital solutions. In the long run, this involves greater investment in education and digital literacy of citizens so they can more easily navigate the government uses of new data-driven technologies with greater trust and confidence.

APPENDIX A

Contact Tracing

BRUNEI

In Brunei, the BruHealth app tracks people entering and exiting public premises and facilities (e.g., places of worship, restaurants, government offices, gyms, schools, hospitals, taxis, and buses) by scanning a QR code. For individuals who do not have the mobile BruHealth app, facility managers can use the PremiseScan app to process them.[46] Complementing these digital efforts, public health officials also have a dedicated team supporting manual contact tracing. The Ministry of Health has made it clear that businesses must post QR codes at entrances. Ignoring these health directives carries legal repercussions as a violation of Brunei's Infectious Diseases Act. Penalties include jail time of up to five months or up to BND10,000 (C$9,070.70). Police and the military have been deployed to help enforcement of the app, particularly at mosques.[47] They have supported contact-tracing efforts as well. Due to this stringent enforcement and high rate of mobile penetration, Brunei has a remarkably high participation rate, with 95% of Bruneians having registered on the app as of September 2020.[48]

INDONESIA

The Communications and Information Ministry and the State-Owned Enterprises Ministry collaborated to launch the PeduliLindungi ("Care Protect") app in March 2020.[49] The app uses Bluetooth to track when people's smartphones come into proximity with each other.[50] Phone numbers are also used to track the movements of confirmed COVID-19 patients for up to 14 days, enabling the government to notify people who have come into close contact with confirmed COVID-19 carriers via text messages.[51] Text messages are used to contact suspected and confirmed COVID-19 cases. Furthermore, the app can be used to identify large crowds and send alerts to the police in real time.[52] The PeduliLindungi app is supplemented by another app called 10 Rumah Aman ("10 Safe Houses"), which uses AI to track the body temperatures of people nearby.[53] The heat-mapping data comes from a

third-party app called Prixa, where users can self-record their temperature.[54] However, use of PeduliLindungi or 10 Rumah Aman is not a legal prerequisite to enter public premises or facilities.[55]

CHINA

Beijing introduced a nationwide pandemic contact-tracing system in late February 2020 after the initial lockdown by repurposing the country's existing data infrastructure supported by platforms WeChat and Alipay. These two mobile applications are often referred to as the "super apps," not only because they have a near-ubiquitous adoption rate with each boasting one billion users in China, but also because they offer a huge variety of services within the app. First introduced as a local project in Ant Financial's headquarter city Hangzhou, the add-on "health code" function runs in the form of a mini app[56] in Alipay – later made available in WeChat and official apps from provincial governments – in which users submit their national ID number, contact information, travel history, and health status to the National Integrated Government Service Platform, to obtain an automatically generated QR code.[57] Leveraging the colossal amount of real-time data on these platforms, government agencies integrate movement data and conduct big data analysis to assign a colour code – green means safe and unrestricted travel, yellow and red mean quarantine and isolation – to decide if the individual can travel to another municipality or enter public spaces.[58] Requiring users to scan their QR code when entering public places and transit systems, the system allows for backward tracing of contacts if a confirmed case is identified. The users can, conversely, obtain travel advisories and real-time information on infectious risks they might have been exposed to through these built-in functions. When a confirmed or suspected case is identified, a thorough survey will be conducted on the individual's movement history and potential close contacts, using a combination of analysis on data collected through the health code system, community-based manual investigation, and calls for self-reporting through neighbourhood committees and the internet.[59] In this way, the infected individual's trajectory and past activities can usually be tracked down in a very detailed manner every two hours.

MALAYSIA

MySejahtera was specifically developed by the Malaysian government to help manage the COVID-19 pandemic and promote Malaysia's Prevention and Control of Infectious Diseases Act 1988.[60] The app allows users to monitor their health through self-assessments and find medical facilities for COVID-19 screening and treatment.[61] The app contains a

check-in feature where QR codes are used to track people entering public facilities.[62] For people who do not have a smartphone, one person in the family or the household can add multiple people on the app as dependants.[63] MySejahtera is not legally mandatory all over the country but has recorded 21 million active users as of February 2021, with 18 to 20 million check-ins daily.[64] The government has only made use of the app mandatory for areas of the country with access to high-speed internet as of February 9, 2021.[65] Aside from the national MySejahtera, some state governments have rolled out their own contact-tracing apps. The Selangor government, for example, released its app Selangkah in May 2020 and rolled out an updated version in February 2021.[66] The updated version has compatibility with the national MySejahtera app, as it allows scanning for both MySejahtera and Selangkah QR codes.[67] It also offers GPS check-in as an alternative to QR code scanning. In addition to contact tracing, Selangkah also tracks crowd trends (e.g., how busy a place is), places where COVID-19 infection has been detected, users' exposure risk based on location history, and a dashboard for police to monitor visitor numbers.[68]

SINGAPORE

Singapore's approach to contact tracing revolves around the mobile application Trace Together and location check-in system, SafeEntry. TraceTogether was launched in March 2020. After the user registers with personal details in the app, TraceTogether generates an anonymous identification number for the phone's user. Later on, the app uses Bluetooth signals to exchange the anonymous identification number with other phones running TraceTogether within proximity.[69] No GPS or location data is collected, only the record of anonymous ID's the phone came within close contact. The data is stored locally on the phone. Only the Ministry of Health can de-crypt and associate the anonymous ID with the real personal information used on sign up. This and the exchange records are only accessed by health authorities if the user tests positive for COVID-19 and is contacted for contact tracing purposes.[70] For demographics (e.g., children and senior citizens) that do not have mobile phones, small Bluetooth-enabled tokens with unique QR codes have also been introduced. If the token user tests positive for COVID-19, the token is then turned over to the authorities, since unlike the mobile app, the token cannot upload data via the internet.[71]

TraceTogether works in concert with SafeEntry, Singapore's digital check-in system which distributed unique QR codes to public locations considered high-traffic areas. This included work offices, malls, public transport and restaurants. Use of both systems became mandatory in December 2020.[72] Starting in June 1, 2021, only the TraceTogether app or token were accepted to fulfil the mandatory SafeEntry check-ins at public premises and facilities.[73]

Singaporeans must scan the locations' QR code with their TraceTogether app and submit personal information (name, identification number, and mobile number) to gain access to stores, restaurants, taxis, train stations, schools, offices, and so on. Likewise, people must scan the code again when leaving to check out of a location. Similarly, people using the TraceTogether token can check-in by tapping the token on a SafeEntry scanner device.[74] As of April 22, 2021, over 90% of the population have either downloaded the TraceTogether app or collected a token.[75]

The data from SafeEntry and TraceTogether are analyzed by teams of contact tracers working round the clock, who verify the data and closely monitor follow-up actions such as quarantine, swab tests, and further surveillance.[76] Additionally, Singaporean police and the military were also pulled into contact tracing, using CCTV footage and data visualization to trace people who were not immediately identifiable through the apps.[77] People who have been found to be in close contact with a person who tested positive for COVID-19 are required to go into quarantine for 14 days, and breaking quarantine can result in a fine and/or jail time.[78] Businesses who do not comply with the contact-tracing regime could face penalties under the COVID-19 Act.[79] At the start of the pandemic, there was a four-day average in identifying and quarantining the close contacts of a person diagnosed with COVID-19, but with the use of new technology, that average dropped to 1.5 days.[80]

SOUTH KOREA

Seoul's Epidemiological Investigation Support System (EISS) is an AI-powered smart city management platform that conducts contact tracing of confirmed COVID-19 patients, cutting down the process from 24 hours to 10 minutes. The Ministry of Land, Infrastructure, and Transport (MOLIT) developed the EISS in collaboration with the KCDC, Ministry of Science and ICT, Financial Services Commission, National Police Agency, 22 credit card companies, and all three mobile service providers. The EISS collects GPS, mobile, and credit card transaction data from these entities, and identifies the movements and potential close contacts on the map-based interface under the Law on the Prevention and Control of Infectious Diseases. The EISS was based on MOLIT's smart city data hub technology, and its management was passed onto the KCDC a month after its development.[81]

TAIWAN

The Central Epidemic Command Center in Taiwan, a government agency that is activated during serious disease outbreaks, plays a pivotal role in the integration and co-ordination

of pandemic-combatting efforts. It works with major telecommunication companies across the island to set up a GPS-based Intelligent Electronic Fences System (IEFS), which makes use of individuals' cell phone signals.[82] The system monitors the location of the quarantined and their potential contacts to be tracked in a relatively accurate and efficient manner when needed. For instance, in the Diamond Princess Cruise incident where more than 700 cases were confirmed while it docked at several cities in Taiwan, the IEFS helped track down as many as 600,000 potential contacts, which allowed measures to be taken to prevent community outbreak. Deployment of technology and online platforms has been particularly helpful in Taiwan's case given its relatively small health workforce. When a confirmed case with unknown origin is identified, places the patient visited are uploaded onto a contact-tracing platform called TRACE, established in 2017 by the Taiwan Centers for Disease Control. Since TRACE is connected to other government databases, it can facilitate collection of contacts' information through self-reporting and real-time monitoring. Following the generation of a contact list, TRACE is then used for automatic text messaging between health officials and the potential contacts to keep track of their quarantine and health conditions.[83]

VIETNAM

For contact tracing, the country mainly used an app called Bluezone, which uses GPS or Bluetooth technology to log users' locations, personal information, and close contacts.[84] The government has leveraged high public trust to garner 20 million downloads of the app by the end of July 2020.[85] Manual contact tracing supplements the app, with face-to-face interviews used to extract more information.[86] In enforcing quarantine and social distancing, local neighbourhood watchers report to the authorities.[87] In addition to Bluezone, Vietnam also used the health self-declaration app NCOVI early on the pandemic to complement its contact-tracing efforts.[88] As of February 2021, there have been "7.8 million installations, 18 million medical declaration records, 52.95 million health monitoring records, and 7.25 million QR code scanning records" for NCOVI.[89]

Monitoring and Surveillance

BRUNEI

For people found to be positive for COVID-19 and their family members, the Brunei government has implemented a stringent surveillance mechanism using the iMSafe bracelet. The bracelet contains a Bluetooth chip locator and a QR code that pairs with an

Android mobile phone. The bracelet and phone must always remain on – switching them off automatically results in a violation of Brunei's Infectious Disease Act.[90] Switching off the device or leaving the established quarantine premises results in real-time alerts sent to the police.[91] The surveillance system has a nearly 100% penetration rate of the population as it uses digital patient records from the national health database.[92]

HONG KONG

The Office of the Government Chief Information Officer was given the task in late January 2020 of coming up with tech-driven surveillance solutions to support the 14-day mandatory quarantine for inbound travellers, while at the same time protecting the privacy and data of the individuals.[93] On entering Hong Kong, everyone is issued a wristband with a unique QR code, which is then scanned and paired with the StayHomeSafe app, allowing the government to monitor whether these individuals stay within their designated places of quarantine.[94] Using the geofencing technology, the app creates a composite signature of one's dwelling by detecting the set of unique environmental communication signals, including Wi-Fi networks, cellular networks, and Bluetooth, thus triggering an alert that's sent to the health authority and police when the user goes out of range.[95] Such technology is deemed suitable for large-scale monitoring and quarantine arrangements in a densely populated city like Hong Kong, as it detects cases when the user is travelling vertically in the same apartment building, which would otherwise be regarded as no movement using GPS.

Designed to only detect whether the quarantined individual is inside or outside of the range, or if the wristband is removed, the Hong Kong government also ensures the preservation of privacy by employing geofencing technology that will not track or record users' exact location. The StayHomeSafe app's decentralized data storage model (i.e., personal data is only stored on each individual's mobile phone and is not collected by the government or solution provider, unless infection is confirmed) is in compliance with the Hong Kong Personal Data (Privacy) Ordinance.[96] In fact, the Hong Kong government has often been challenged by the public on personal data protection issues and thus has to make sure it clearly communicates and explains the use of technologies and addresses public concerns.[97] More generally, when the interest of public health prevails and collection of data becomes necessary, authorities must ensure the measures are necessary, appropriate, and proportionate.[98]

CHINA

Building on the health code system's ability to accurately track contacts and movements, China's health surveillance ecosystem helps ensure potential sources of transmission can be quickly identified and isolated from the public, while at the same time minimizing disruptions to personal and economic activities. The government deploys its existing "Internet Plus" – a series of policy initiatives that apply internet technology to traditional industries and social services to enhance connectivity and productive efficiency – to boost the effectiveness of the health code. By integrating health data from the country's health-care system with the real-time, automated system monitoring and updated information on users' movements, the health code system helps produce "epidemiology maps" that inform people of infectious risks, thus allowing them to self-regulate their mobilities accordingly. Such an approach to surveillance technologies also gives the municipal governments room to tailor their solutions to local needs.[99] Starting in April 2020, the health code also became a requirement for all inbound travellers entering mainland China. To board their transportation, they need to get a negative result for both nucleic acid and IgM antibody tests.[100] Another feature of the Chinese health surveillance ecosystem is the deployment of AI-powered technologies, for example when monitoring residential compound lockdowns, particularly in the early months of the pandemic. AI-based contactless temperature detection software, leveraging facial recognition technology and infrared thermal technology, has also been installed at entrances to public spaces to identify people with higher temperatures to screen suspected cases.[101]

SOUTH KOREA

Following the MERS outbreak in 2015, the KCDC created the Smart Quarantine System, which pools data on travel, immigration status, health information, and roaming service for mobile usage from relevant ministries and agencies (such as the Ministry of Foreign Affairs, Ministry of Justice, and Health Insurance Review & Assessment Service) and telecom companies. Basically, this system allows the government to check whether incoming travellers have visited high-risk countries, communicate with potential COVID-19 carriers, and share information about high-risk incoming travellers with medical institutions three times a day so that they can receive prioritized care.[102]

In addition, Seoul rolled out two mobile apps for monitoring and surveilling confirmed and potential COVID-19 carriers: the Self-Check Mobile App and Self-Quarantine Safety Protection App. The Self-Check Mobile App was developed by the Ministry of Health and Welfare and released on March 12, 2020, to monitor incoming travellers. Designated

incoming travellers must install this app upon entry and provide their passport number, name, contact information, and address in South Korea, and then conduct self-screening through the app over 14 days. The data collected through the app is cross-checked by the Ministry of Justice, which is responsible for the immigration portfolio, and then shared with local health authorities.[103]

The Ministry of Public Safety and Security also launched the Self-Quarantine Safety Protection App on March 7, 2020, for more general monitoring of those mandated to self-isolate. Users provide the address of quarantine and conduct self-screening for COVID-19 through this app twice a day. The results of self-screening are sent to the public health official who is responsible for monitoring the individual who is quarantining. Also, if the quarantining individual leaves the location of quarantine, the app sets off an alarm for both the individual and the public health official.[104]

Distribution of Medical Resources

INDONESIA

The national government is organizing vaccination appointments using the PeduliLindungi app, a government website, the telephone, and WhatsApp. Vaccination for front-line medical workers began in January 2021. The Ministry of Health and the Communications and Information Ministry have partnered with the state-owned telecommunications company PT Telekomunikasi Indonesia to launch the One Vaccination Data integrated database, which lists medical workers according to their identity card number.[105] The Minister of Health, Budi Gunadi Sadikin, announced in January the goal of vaccinating 1.5 million health-care workers by February, followed by public servants and then the general public within 15 months. The overall government goal is to vaccinate 181.5 million people (roughly two-thirds of the population) by the end of the year. Unfortunately, government vaccination efforts are lagging (only nine million people have been fully vaccinated as of May 2021), hampered by data issues.[106]

In an effort to speed up vaccination and reduce the expense of the government's free vaccination program, the national government approved the Indonesian Chamber of Commerce and Industry's proposal of launching a private vaccination scheme on May 17, 2021, called Vaksinasi Gotong Royong (VGR), which roughly translates to "vaccination mutual assistance."[107] Under the VGR, private and state companies can purchase their own vaccines for employees and their dependants, with priority given to labour-intensive companies, especially those operating in areas at high risk for COVID-19. The companies

register for the program and acquire vaccine doses through Kimia Farma, which is a subsidiary of the government-owned vaccine manufacturer Bio Farma.[108]

In the private sector, telemedicine startup Halodoc raised $80 million in funding to co-ordinate national vaccination drives with the Health Ministry using its scheduling technology. Halodoc also partnered with ride-hailing giant Gojek to run drive-through vaccination services in Jakarta for the elderly.[109] As of April 2021, the Halodoc-Gojek operation is running seven drive-through vaccination clinics.[110] Gojek, Halodoc, and the Hermina Hospital Group are also operating a drive-through vaccination drive specifically targeting Gojek motorbike and car taxi drivers. This drive complements the government program to inoculate public service workers, including those working in transportation.[111] The vaccine procurement program is being led by the Indonesian Chamber of Commerce and Industry. The Health Ministry also partnered with Gojek's rival, Grab, in late February 2021 to run vaccine drives, with the aim of vaccinating 70% of the Indonesian population by March 2022. Grab's drive-through vaccination centre in Bali was the first of its kind in Southeast Asia.[112]

MALAYSIA

The Malaysian government began rolling out vaccines in late February 2021, beginning with front-line workers. To facilitate vaccination appointments, the MySejahtera app is being used to register for the vaccine and receive confirmation. Other methods of registration include a hotline, the Special Committee on COVID-19 Vaccine Supply Access Guarantee (JKJAV) website, public and private health-care facilities, and outreach programs in rural areas.[113] People eligible for the vaccine will receive two weeks' notice on the MySejahtera app regarding the time and place, along with reminders via SMS and text three days before the appointment. Adults can register both themselves and their dependants. Once a person has received two doses of the COVID-19 vaccine, they will be issued a digital vaccination certificate as proof.[114] According to JKJAV, approximately 34% of the population have registered for vaccines as of early April 2021.[115] In the private sector, Grab launched a program in February 2021 to promote vaccine access and education. The company announced that all Grab employees and their families would be given free vaccines if they were not covered by the national vaccination program. Grab also partnered with the government to display information about the COVID-19 vaccines on its app to combat disinformation and encourage vaccination.[116]

SINGAPORE

The Singaporean government launched a public distribution of five million masks in February 2020 amid news of stores running out of masks. The government used the Mask Go Where website to co-ordinate the effort.[117] Developed by the Government Technology Agency, the website tells Singaporeans their designated place, day, and time of mask collection based on their postal code and using real-time data.[118] Under the program, each household was entitled to a pack of four masks. The program was concluded on June 14, 2020.[119] In addition to the government program, Singaporeans also had access to private supply drives. Notably, the Temasek Foundation, the philanthropic arm of state-owned enterprise Temasek Holdings, launched four, two-week-long mask distribution programs.[120] Temasek started its programs in June 2020, complementing three earlier government-run programs. The Temasek program provided two free reusable masks per person, distributed via vending machines that scanned the barcode of any government ID.[121] Temasek's most recent supply distribution occurred in March and April 2021, distributing both masks and alcohol-free hand sanitizer.[122]

Singapore also has an extremely efficient vaccine distribution system in place, powered by a national virtual system that encompasses all 38 of the country's vaccination centres. As of mid-April 2021, the system was processing 50,000 vaccination records a day for both Singaporean citizens and foreigners living in Singapore.[123] Singaporean residents register for vaccination appointments on a government website using their names and phone numbers and receive a unique booking link within a few days to a week later. The booking process includes a questionnaire about physical health and allergies that must be answered before an appointment slot is provided. Vaccination appointments at national hospitals can also be made through the government health app, Health Hub, which also tracks COVID-19 test results and stores a digital copy of vaccination certificates once a person has been fully vaccinated.[124]

SOUTH KOREA

During the earlier stages of the pandemic, South Korea suffered from a severe shortage of masks. Hence, Seoul introduced the Official Mask Sales System on February 29, 2020, which sought to limit hoarding and ensure fair distribution for everyone. While the Official Mask Sales System itself was not digital, its operation was dependent on datasets from the Health Insurance Review & Assessment Service (HIRA), such as the Drug Utilization Review program, a nationwide database that shows a patient's real-time health history as it is pertinent for prescribing medicine, to which both doctors and pharmacists have

access.[125] The Official Mask Sales System also relied on information from the Ministry of Food and Drug Safety, the National Information Society Agency (NIA), and the Ministry of the Interior and Safety (MOIS).[126]

Collaborating with partner agencies like NIA and MOIS, HIRA managed the data – such as mask inventories and pharmacy locations – and disclosed it to inform the public.[127] HIRA also managed the sales of masks in pharmacies, allowing South Koreans to purchase their masks in any pharmacy, while preventing hoarding, as the program displayed whether an individual exceeded their weekly quota of two masks per week or not. Further, NIA and private developers used the data on mask availability to create websites and apps that displayed real-time availability of masks in each pharmacy. These tools provided centralized, real-time data on mask distribution that stabilized the supply at the onset of the pandemic.[128]

As for vaccine distribution, the KCDC has a centralized online booking system, much like that in other countries. A noteworthy innovation is the agency's collaboration with South Korean tech giants Naver and Kakao (equivalent to Google and Facebook/WhatsApp), through which doses of vaccines newly available in nearby pharmacies or clinics as a result of cancellations or no-shows are displayed on their map app so that doses are not wasted.[129]

TAIWAN

Taiwan's name-based mask rationing system improved through its three phases by introducing several tech solutions as it developed. To address the problem of panic-buying and stockpiling during the early days of the pandemic and ensure sufficient mask supply, Taiwan's Ministry of Health and Welfare implemented the Mask Rationing Plan 1.0. It leverages the pre-existing National Health Insurance (NHI) database, with a near-universal 99% coverage rate, to distribute surgical masks through NHI-contracted pharmacies across Taiwan. The system then incorporated a real-time mask-availability map, leveraging crowdsourced information from the public, that provides users with information on mask inventories in their proximity in version 2.0. Mask Rationing Plan 3.0 further allows users to make online purchases and reservations for convenient store pickup on the NHI mobile app.[130] As such, the use of digital means greatly improved the rationing system's efficiency and helped minimize physical contact during lineups. In return, digitizing the mask distribution process also allows data to be reported back to the system, thus providing timely feedback for further planning and decision-making in the subsequent management and allocation of medical resources.[131]

Telehealth

INDONESIA

Indonesia has several telemedicine resources, led by private sector tech startups. Halodoc, in collaboration with Gojek, launched the Check COVID-19 app, which screens users who have COVID-19 symptoms.[132] The app guides users through automated questions about symptoms, and then classifies them into low, medium, or high risk. Those with medium- or high-risk ratings proceed to an online chat with a doctor while those with a low-risk rating are informed about preventive health procedures. Through the rating procedure, the Halodoc-Gojek app helps take the stress off of hospitals in Indonesia. Halodoc has also partnered with Blibli (an e-commerce site) to enable access to Check COVID-19 on the Blibli site. Halodoc also released a new feature for its telemedicine service for booking rapid tests and swab tests online.[133] Alodokter is another app also providing online consultations with doctors through an app, recording 32 million visits in March 2020 alone.[134] Both Alodokter and Halodoc have AI chatbots where users can access information about COVID-19 for free. Gojek's own COVID-19 Info Centre also has access to Halodoc's telemedicine app, enabling users to get medication and schedule rapid COVID-19 swab tests in addition to the online medical consultations.[135]

GrabHealth, powered by Good Doctor, is another telemedicine alternative. It provides round-the-clock medical consultations and also provides medicine purchases and deliveries.[136] Meanwhile, Indopasifik Teknologi Medika Indonesia has created a pharmacy app called Lifepack that allows users to order medication and consult doctors for prescriptions, all online.[137] In addition to startup initiatives, there have also been public-private partnerships, such as a collaboration between the Ministry of Health, ride-sharing service Grab, and digital health app Good Doctor Technology Indonesia to allow COVID-19 screening online and give users access to advice from doctors based on their symptoms, thereby reducing hospital inflows.[138]

JAPAN

In Japan, the Medical Practitioners Act (1948) requires doctors to meet with their patients in person, technically.[139] Therefore, telemedicine had been restricted to a limited number of specific diseases, and there were many restrictions on treatment rules that prevented doctors from introducing telemedicine services.[140] However, following the COVID-19 outbreak, the Ministry of Health, Labour, and Welfare (MHLW) issued a guideline for online treatment, which has temporarily allowed doctors to provide telemedicine

treatment, and Tokyo proceeded to make this change permanent even after the pandemic ends.[141] Over 10,000 clinics have started to offer telehealth (telephone and online) since the beginning of the pandemic.[142] LINE, a messenger app with over 84 million users in Japan, collaborated with the MHLW to provide telehealth services related to COVID-19, and announced the plan to roll out a telehealth specific app. Startups such as Medley and MICIN, which provide telehealth platforms for doctors, have seen an uptick in sign-ups as well.[143]

MALAYSIA

In Malaysia, the primary means of accessing digital health services is through the website DoctorOnCall. DoctorOnCall is a telemedicine service that enables users to consult doctors and order medicine using video call, audio call, or chat on their smartphones or computers.[144] Patients can also upload medical reports or pictures of physical symptoms (e.g., rashes).[145] DoctorOnCall strives to make health care more accessible to Malaysians by reducing wait times and offering remote service.[146] The service was founded in 2017 but has become increasingly important during the COVID-19 pandemic.[147] In February 2020, the Ministry of Health announced a partnership with DoctorOnCall to provide free health advisory services related to COVID-19, in an effort to stem disinformation about the pandemic and reduce the need to physically visit health facilities for advice.[148] The COVID-19 portal also offers a self-assessment test with the option of consulting with a doctor to verify symptoms and get advice on next steps.[149]

CHINA

Innovation in delivering health care virtually has been an ongoing trend in China prior to the pandemic as part of the greater effort in promoting Internet Plus Health Care. The pandemic accelerated this trend by prompting many first-time users to switch from in-person medical visits to online consultations, for both COVID-19-related services and other health concerns. Ping An Good Doctors, the health-care arm of insurance giant Ping An, launched a service through its app in the early days of the pandemic to virtually link over 10,000 medical professionals to users seeking consultation on the new disease.[150] Similar services were offered by Ali Health (run by Alibaba and available through the Alipay app) and WeDoctor (run by Tencent and available through the WeChat app), which are easy to access and easy to use.[151] These telemedicine platforms are also used by the country's primary-care system to offer a more efficient, time-saving alternative to patients who need follow-up treatments for common illnesses or chronic diseases during the pandemic,

alleviating workload for front-line medical workers and minimizing COVID-19 infections during hospital visits. Experiments with blockchain and robotic technologies have been initiated to find ways to deliver medications more easily and quickly to patients in need.[152]

For the country's immunization campaign that started in December 2020, provinces launched various local versions of online appointment booking platforms, mostly available through a mini app inside WeChat or as a stand-alone mobile app. In Shanghai for example, vaccination appointments are booked through the pre-existing health-care app "Health Cloud," where many users already have health profiles set up.[153] When making an appointment, the app provides users information on the date and location of vaccine availability and gives real-time updates on any changes that occur after the booking. Some modifications and customizations have been made to the vaccine booking functions to better cater to the needs of certain groups of people. Elderly people who have difficulties coping with the digital means can book instead through the lite version of Health Cloud available at physical terminals in their neighbourhood, with a much-streamlined process.[154]

SINGAPORE

Singapore has a well-structured telemedicine sector regulated by the Ministry of Health under the Licensing Experimentation and Adaptation Programme Regulatory Sandbox launched in 2018, with the aim of thoroughly exploring potential risks in the telemedicine industry.[155] The government aims to fully license telemedicine by 2022 under the Healthcare Services Bill.[156] In February 2021, the government closed the sandbox program and announced the beginning of the transition to fully licensed telemedicine. While the transition is in process, the government released a voluntary listing of telemedicine providers that have met certain requirements and are authorized to provide services.[157] With the release of the list in February 2021, the Ministry of Health also provided a statement highlighting the importance of telemedicine in fighting COVID-19.[158] As of April 2021, there are over 600 authorized telemedicine providers on the list.[159] A notable telemedicine service is the Doctor Anywhere app, which provides doctor consultations through its virtual clinic (video calling) medication delivery services.[160] The video consultations cost between $15 and $20 per call and are run by medical doctors licensed by the Singapore Medical Council.[161] The number of app users increased three to four times since January 2020.[162]

VIETNAM

In the private sector, Singapore-based health startup, Doctor Anywhere, has been operating since 2019, offering 350 telemedicine consultations a day – a 600% increase since the start of the COVID-19 pandemic.[163] Some of Doctor Anywhere's key local partners in Vietnam include Saigon Eye Hospital, DoLife Hospital, and Thu Cuc Hospital.[164] Vietnam also has home-grown telemedicine initiatives, such as VieVie, Jio Health, and MyDoc.[165] VieVie is an app founded in 2017 that allows Vietnamese residents to access doctor consultations by registering with a cell phone number.[166] Patients have the option to either use chat messages or call a doctor. Although use of the app is generally free, certain services can only be accessed by paying for the premium subscription service, VieVie Gold.[167] Another option is Jio Health, a telemedicine app founded in 2014 in the United States that later relocated to Vietnam.[168] Jio Health has a physical clinic in Saigon in addition to its app services.[169] Finally, there is Docosan, which specializes in a booking system to help manage crowded waiting rooms and connect patients with health specialists using a cloud-based scheduling system.[170] The app is a free directory to find and make appointments with health-care professionals in Hanoi and Ho Chi Minh City. The app also enables patients to manage their own medical records by integrating e-payment and insurance services in the app.[171]

In April 2020, the Ministry of Health partnered with the Ministry of Information and Communications to launch new telemedicine projects in response to the increasing importance of remote medical services during the COVID-19 pandemic.[172] For example, the Hanoi University Medical Hospital ran a two-month pilot digital hospital project to test remote doctor-to-patient communications.[173] The Ministry of Health also approved the remote health examination and treatment[174] project for 2020-2025 to further develop national telemedicine programs.[175]

ABOUT APF CANADA

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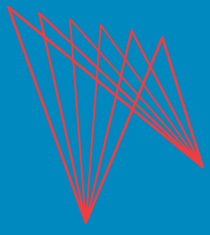

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SUPPLY CHAIN DISRUPTIONS DURING THE COVID-19 PANDEMIC:

Lessons for Canada

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EXECUTIVE SUMMARY

The spread of COVID-19 around the world produced significant economic turmoil. In 2020, global GDP declined by 4.3%, global trade declined by 8%, and foreign direct investment flows declined by 35%.[1] One of the main causes of economic stress was the impact that COVID-19 had on global value chains (GVCs). Like many countries around the globe, Canada also experienced its share of supply chain disruptions due to protectionism and logistical strains during the pandemic. This is largely because many multinational corporations, including Canadian ones, rely on Asian GVCs for COVID-19 related goods such as medical supplies and PPE. This interconnectedness, while important in today's globalized economy, was detrimental to supply chains, especially at the beginning of the pandemic.

This paper explores five major problems that contributed to the breakdown of supply chains during the COVID-19 pandemic and offers recommendations for how to better handle these issues in the future. We identified the following five problems:

1. The increase in demand for certain goods, which caused a manufacturing shortage. Throughout the pandemic, there was an overwhelming demand for any COVID-19-related product. Companies could not produce these goods fast enough to meet the demand, which subsequently caused supply chain issues;

2. Goods that cannot be domestically produced, through reshoring or refocusing operations, and for which there are only a few supply chains readily available, and the problems that followed in relying on specific companies for production;

3. Temporary export restrictions that were put in place by the countries that were able to produce these goods domestically;

4. The overreliance on certain economies for COVID-19-related goods, which in some cases resulted in the decision to reshore production; and

5. The logistical challenges companies faced in transporting vaccines. Once vaccines had been manufactured, the next challenge for multinational corporations was determining the best way to distribute and transport them. There were challenges in temperature requirements, transportation methods, and deliveries to remote communities.

After examining these problems and how some companies overcame them, our paper proposes the following recommendations:

- Create a supply chain task force;
- Increase access to data related to supply chains;
- Carefully assess decisions to reshore;
- Ensure due diligence to avoid supporting unsafe labour practices;
- Support collaboration between stakeholders;
- Foster an information-sharing innovation ecosystem in Canada; and
- Diversify Canada's stockpiling strategy.

RÉSUMÉ

La propagation de la COVID-19 dans le monde a provoqué des bouleversements économiques importants. En 2020, le PIB mondial a diminué de 4,3 %, le commerce mondial a diminué de 8 % et les flux d'investissements directs étrangers ont diminué de 35 %.[1] L'une des principales causes du stress économique était l'impact que la COVID-19 a eu sur les chaînes de valeur mondiales (CVM). Comme de nombreux pays, le Canada a également connu sa part de perturbations au niveau des chaînes d'approvisionnement durant la pandémie en raison du protectionnisme et de contraintes logistiques. Cela s'explique en grande partie par le fait que de nombreuses sociétés multinationales, y compris canadiennes, dépendent des chaînes d'approvisionnement asiatiques pour les produits liés au COVID-19, tels que les produits médicaux et les équipements de protection individuelle (EPI). Bien qu'importante dans l'économie mondialisée d'aujourd'hui, cette interrelation a nui aux chaînes d'approvisionnement, surtout au début de la pandémie.

Cet article explore cinq problèmes majeurs qui ont contribué à la rupture des chaînes d'approvisionnement pendant la pandémie de COVID-19 et propose des recommandations pour mieux gérer ces problèmes à l'avenir. Nous avons dégagé les cinq problèmes suivants :

1. L'augmentation de la demande de certains produits, qui a provoqué une pénurie de fabrication. Tout au long de la pandémie, la demande de tout produit lié au

COVID-19 a été massive. Les entreprises ne pouvaient pas produire ces biens assez rapidement pour répondre à la demande, ce qui a entraîné des problèmes de chaîne d'approvisionnement.

2. Les biens qui ne peuvent pas être produits au niveau national, au moyen de la délocalisation ou du recentrage des opérations, et pour lesquels il n'y a que quelques chaînes d'approvisionnement facilement disponibles, et les problèmes qui ont suivi en s'appuyant sur des entreprises spécifiques pour la production.

3. Les restrictions d'exportation temporaires mises en place par les pays qui étaient en mesure de produire ces biens au niveau national.

4. La dépendance excessive à l'égard de certaines économies pour les biens liés à la COVID-19, ce qui, dans certains cas, a entraîné la décision de délocaliser la production.

5. Les défis logistiques que les entreprises ont dû relever pour transporter les vaccins. Une fois les vaccins fabriqués, le défi que devaient ensuite relever les multinationales était de déterminer la meilleure façon de les distribuer et de les transporter. Les exigences en matière de température, les méthodes de transport et les livraisons aux communautés éloignées ont posé des problèmes.

Après avoir examiné ces problèmes et la façon dont certaines entreprises les ont surmontés, notre article propose les recommandations suivantes :

- créer un groupe de travail sur la chaîne d'approvisionnement;
- accroître l'accès aux données relatives aux chaînes d'approvisionnement;
- évaluer soigneusement les décisions de délocalisation;
- assurer une diligence raisonnable pour éviter de soutenir des pratiques de travail dangereuses;
- soutenir la collaboration entre les parties prenantes;
- favoriser un écosystème d'innovation pour le partage de l'information au Canada; et
- diversifier la stratégie de stockage du Canada.

01

INTRODUCTION

The rapid spread of COVID-19 in early 2020 caused a sudden increase in global demand for medical goods that could limit the spread of the virus or reduce its deadliness. The overwhelming demand for these products put stress on global value chains (GVCs), which encompass the full range of activities involved in bringing a product to market. It caused universal shortages of medical goods and personal protective equipment (PPE), equipment designed to protect the wearer from and limit the propagation of the COVID-19 coronavirus. Companies found themselves ill-equipped to meet the increased demand due to low stockpiles of the required goods, the difficulties involved in quickly scaling up production, and the complexity of co-ordinating the safe delivery of goods to those in need.

BOX 1:

GVCs and Supply Chains

The term "GVC" refers to the complete production process of a good that has gone through various stages of manufacturing in multiple countries. Multinational corporations (MNCs) use GVCs to minimize the costs of production and take advantage of the efficiencies gained from specialization. Some MNCs can produce a desired good through GVCs at a lower cost than they could in the company's home country.

Supply chains are an integral part of many GVCs; they encompass all the steps taken to get the good to a customer. While GVCs include the manufacturing and assembly process of a good that is produced across multiple countries, supply chains refer to the sourcing and on-time delivery of finished products and their intermediary components to a customer.

Supply chains were particularly affected by the pandemic as they typically rely on a "just-in-time" model of production, meaning that goods are produced and arrive right before they are placed on the shelves or are included in the manufacturing process. The last-minute nature of this system meant that companies were left with insufficient inventory when the demand for medical goods increased.

Many Canadian MNCs rely on Asian GVCs to produce goods. Goods produced in Canada, such as automobiles, often rely on intermediary goods from Asia that then have "value" added to them through modifications made in Canada. These value-added exports highlight the interconnectedness of Canadian goods and GVCs in Asia. For example, a recent Statistics Canada report that analyzed 2016, 2017, and 2018 trade data found that almost 50% of Canada's domestic production inputs rely on some Chinese content.[2] These Canadian goods that rely on inputs from Asian GVCs are often adversely affected when a sudden external shock, such as an increase in global demand, leads to supply chain failures.

In March 2020 the Institute for Supply Management conducted a survey of 600 firms in the United States and found that 75% of the companies had experienced supply chain disruptions as a result of COVID-19.[3] Like many countries around the globe, Canada also experienced its share of supply chain disruptions due to protectionism and logistical strains during the pandemic.

Asia Pacific countries are some of the leading manufacturers of medical goods and PPE due to their large manufacturing capabilities and were among the first to experience large-scale supply chain disruptions caused by the pandemic. Firms based in Asia Pacific countries faced the same difficulties that plagued companies and MNCs around the world, but they have more experience combatting widespread airborne viruses due to the 2002 SARS outbreak in Asia and the 2015 MERS outbreak in South Korea. This experience provided many Asian countries with the tools necessary to mitigate supply chain tensions during the COVID-19 pandemic.

Methodology and Scope

This report analyzes the major causes of supply chain failures during the COVID-19 pandemic and, through the study of various cases, investigates how countries and MNCs dealt with these failures. Through a review of academic and other expert-led research on the supply chain issues faced by MNCs during the pandemic, we found that five issues were most common and tended to contribute to the breakdown of supply chains and the shortage of essential goods during the pandemic:

1. The exponential increase in demand for COVID-19-related goods, which caused a manufacturing shortage;
2. The challenges some countries faced in producing these goods domestically – and the challenges that followed in relying on specific companies for production;
3. The temporary export restrictions that were put in place by some countries that could produce these goods;
4. The overreliance on particular economies for these goods, which in some cases resulted in the decision to reshore production; and
5. The logistical challenges faced in transporting vaccines.

We then relied on desk research to explore how these problems evolved over the course of the pandemic and analyzed how MNCs in Asia responded and adjusted to them. We

use various case studies that described these problems to provide context and outline what can and has been done to address these issues. The examples were also chosen based on various criteria:

- Their relevance to the Canadian experience;
- The amount of information available to fully explore the supply chain problem faced by the firm and the conditions that hampered the disruption; and
- Their ability to represent a combination of cases where government policies were enacted, either in hampering or encouraging the functioning of supply chains, and where government policy was lacking. The various policy responses serve as the basis for the recommendations presented in the final section.

The paper ends with policy recommendations to help Canada mitigate future supply chain tensions brought on by global crises.

02

SUPPLY CHAIN FAILURES AND ADAPTATION DURING COVID-19

1. Inability to Increase Production in the Face of Increased Demand

The pandemic caused a rise in demand for PPE, test kits, and other COVID-19-related goods. This rapid rise in demand had an impact on the manufacturing of these goods. Thus, the first issue we identified was that these particular goods could not be produced fast enough to meet the world's demand, thereby causing supply chain issues.

A National Health Service report published in April 2020 stated that "demand from trusts for PPE escalated exponentially with demand for some items increasing [by] 5000% overnight."[4] At the beginning of the pandemic in March 2020, the WTO predicted that to meet the worldwide demand of PPE, industry would have to increase manufacturing by 40%.[5]

Many manufacturers struggled with demand because of the shift to just-in-time manufacturing. Prior to the pandemic, many COVID-19-related goods were purchased as needed, and manufacturing companies produced them to meet demand.[6] The problem was that when this demand increased exponentially in such a short period of time, many companies simply could not keep up. Supply cannot be increased – and manufacturing cannot ramp up – overnight.

This problem of increased demand causing a strain on manufacturing companies occurred throughout the pandemic and continues today. According to a survey conducted by Statista in February 2021, 11.5% of Canadian businesses reported that they expected shortages of respirators between February and May 2021, while 8.3% said they expected a shortage of nitrile gloves during the same period.[7]

Our first case study explores how the Samsung Smart Factory program helped various companies adapt to the sudden increase in demand.

CASE STUDY: SAMSUNG SMART FACTORY PROGRAM

As global demand for COVID-19 test kits increased, two Korean-based virus test kit manufacturers, KogeneBiotech and SolGent, struggled to keep up. South Korea implemented a successful testing regime called "K-prevention" to limit the spread of COVID-19.[8] The manufacturing process for test kits requires a tremendous amount of labour and state-of-the-art-facilities to meet regulatory requirements, so when demand for the test kits soared, these two companies found themselves short-staffed and ill-equipped.

The impetus to significantly increase biomanufacturing capacity came when South Korea issued an emergency use authorization that prompted manufacturers to rapidly produce test kits. The Korean CDC disclosed information on testing methods that allowed manufacturers to speed up development.[9]

In 2015, Samsung, South Korea's largest technology company, developed its Smart Factory program, which focuses on providing bespoke solutions for manufacturers to increase their production volume. The goal of the program is to use emerging technologies to optimize manufacturing. Since 2015, the Smart Factory program has supported 2,161 small and medium-sized enterprises (SMEs) by providing them with the technology and expertise to improve their competitiveness in manufacturing.[10]

As the COVID-19 crisis grew, Samsung leveraged its Smart Factory program to ensure test kits were being manufactured as quickly and efficiently as possible by acting as consult and advising SolGent and KogeneBiotech. Samsung ensured the companies were taking advantage of the technologies available to them to produce as many test kits as possible. In the case of SolGent, Samsung improved productivity by 73%. KogeneBiotech's productivity improved by 79%.[11] The assessment and improvement program for SolGent and KogeneBiotech only took six weeks in total. The significant gains in productivity from the measures introduced by the Smart Factory program and the speed with which the

assessment was completed emphasize the importance of knowledge sharing between large companies and SMEs, especially during times of crisis when critical products need to be manufactured quickly and consistently.

For example, SolGent used to import the tubes used in its COVID-19 test kits from Germany, but due to supply chain disruptions it was forced to switch to a domestic supplier.[12] However, 40% of this new supplier's products were defective, which necessitated labour-intensive checks for foreign substances.[13] Upon realizing that the lack of access to quality tubes was restricting the production of test kits, Samsung, along with the Ministry of SMEs and Startups and the Korea Federation of SMEs (KBIZ), equipped SolGent with internal tube manufacturing capabilities so that it could make tubes suitable for its test kits and access them easily. Samsung's Smart Factory program eliminated the need for employees to check the tubes, saving time and money as well as increasing production capacity.

The program also assisted with boosting mask production. Four mask manufacturers saw their production increase by 51% after Samsung assisted with their production processes.[14] The conglomerate shared technical know-how, provided access to its global network of raw materials, and helped engineer factory layouts that optimized production.

Samsung also took its efforts overseas to aid a Polish company called PTAK in shifting its production from fashion to mask manufacturing by equipping it with automated production. Recently, the Ministry of SMEs and Startups brokered a collaboration between Poonglim Pharmatech, a syringe supplier, and Samsung to improve production and efficiency as vaccines began to be distributed in South Korea. As a result, Poonglim increased capacity from 4 million to 10 million low dead space syringes.[15] While the pandemic led to manufacturing shortages and supply chain issues, collaboration between firms took off in South Korea, which insulated the country from increased vulnerability in domestic supply chains for PPE.

2. Challenges With Domestic Production

Governments and MNCs tend to rely on three major strategies to overcome goods shortages: reshoring, refocusing operations, and diversifying supply chains. All three strategies are meant to increase the supply of critical goods and ensure that these goods are easily accessible. The first strategy, reshoring, achieves this goal by relocating factories within domestic jurisdictions to protect companies from foreign policy changes, political conflicts, and other external forces. Reshoring has the additional benefit of

keeping transport relatively straightforward. The second strategy, refocusing, is adopted by companies that make a similar product to the one that's in demand to shift their operations so they can meet increased demand. One example of this is the decision of a Canadian hosiery company, Threads, to start producing non-medical-grade face masks early in the pandemic. The final strategy, diversifying supply chains, is to ensure there are multiple suppliers for particular goods, so that if one production site is unable to deliver the product on time there are still others that can supply it. This strategy also ensures that companies avoid overreliance on one supplier. While these strategies have proven effective in many cases, there are some goods for which none of these options is available. Sometimes, as it was the case with some PPE products, supply problems arise for goods that cannot be domestically produced through reshoring or refocusing operations, and for which there are only a few supply chains readily available.

CASE STUDY: THE PRODUCTION OF NITRILE GLOVES

Nitrile gloves are a prime example of this type of good. The raw materials needed for manufacturing nitrile gloves are only available in Asia, which severely limits the ability to diversify suppliers and mitigate the risk of shortages. This also means that it is inefficient to produce nitrile gloves in Canada, since the materials would have to be shipped and cannot be extracted on site. Refocusing operations is also an unattractive option because there are almost no cases where the equipment needed to make the gloves is sufficiently similar to the machinery in any other factory, so the costs to adapt operations to be able to produce the gloves is high.

The case of Top Glove, a Malaysian rubber glove manufacturer, illustrates the difficulties that arise when global supply of a good is heavily dependent on a few companies and domestic production is not an option. Top Glove supplies 26% of the world's nitrile gloves, with 47 production facilities across the Asia Pacific. Countries all over the world have relied on the company to supply them with nitrile gloves during the pandemic. However, in March 2021 it came to light that Top Glove had been employing forced and illegal labour practices in its Malaysian factories.[16] The discovery was accompanied by reports of verbal and physical abuse against employees. In response to these findings, the United States cancelled its contract with Top Glove.[17] Furthermore, the poor working conditions led to massive outbreaks of COVID-19 among Top Glove workers. In December 2020, Top Glove announced that approximately 5,000 employees had been infected with COVID-19 after an outbreak in one of its factories and dormitories.[18] The close working conditions and small living spaces made it particularly difficult to contain the huge outbreak.

For goods that cannot be easily manufactured domestically, such as nitrile gloves, Canada remains particularly vulnerable during supply shocks. However, it is important that the country take an active role in ensuring suppliers are reliable, employ ethical and inclusive labour practices, and can meet the demand of a global crisis.

3. Temporary Export Restrictions

The third problem we identified was the export restrictions that some countries imposed at the beginning of the COVID-19 pandemic in response to the shortage of critical goods. Export restrictions are defined as any restriction that a country imposes on its exports of specific goods. Restrictions are not necessarily always outright bans but can also be specific licensing requirements or an exporting country's government imposing a right of first refusal.[19]

Export restrictions have a negative effect on supply chains because they limit the supply of goods to other countries. When imposed temporarily, they may not have major consequences beyond temporary supply chain disruptions, short-term goods shortages, and global price increases caused by the shortages.[20] But export restrictions can also lead to a permanent realignment of supply chains away from the country that imposed restrictions, as other countries find more reliable exporters.[21] In the long-term, export restrictions risk reducing overall confidence in the international market and lead to market inefficiencies through a domino effect, whereby other countries also choose to rely on domestic goods rather than imports.[22]

Likely because of these negative long-term effects, export restrictions and prohibitions have been banned among WTO members since the 1994 General Agreement on Tariffs and Trade (GATT), which states in Article XI that quantitative restrictions be generally eliminated. However, the GATT does allow the use of export restrictions in specific instances, most notably when "[e]xport prohibitions or restrictions are temporarily applied to prevent or relieve critical shortages of foodstuffs or other products essential to the exporting [Member]."[23] In other words, export restrictions are permitted among WTO members as long as they are *temporary, targeted, and transparent*.[24] The problem is that temporary, targeted, and transparent were never clearly defined by the GATT or the WTO.[25] The consequences of this became clear at the beginning of the COVID-19 pandemic.

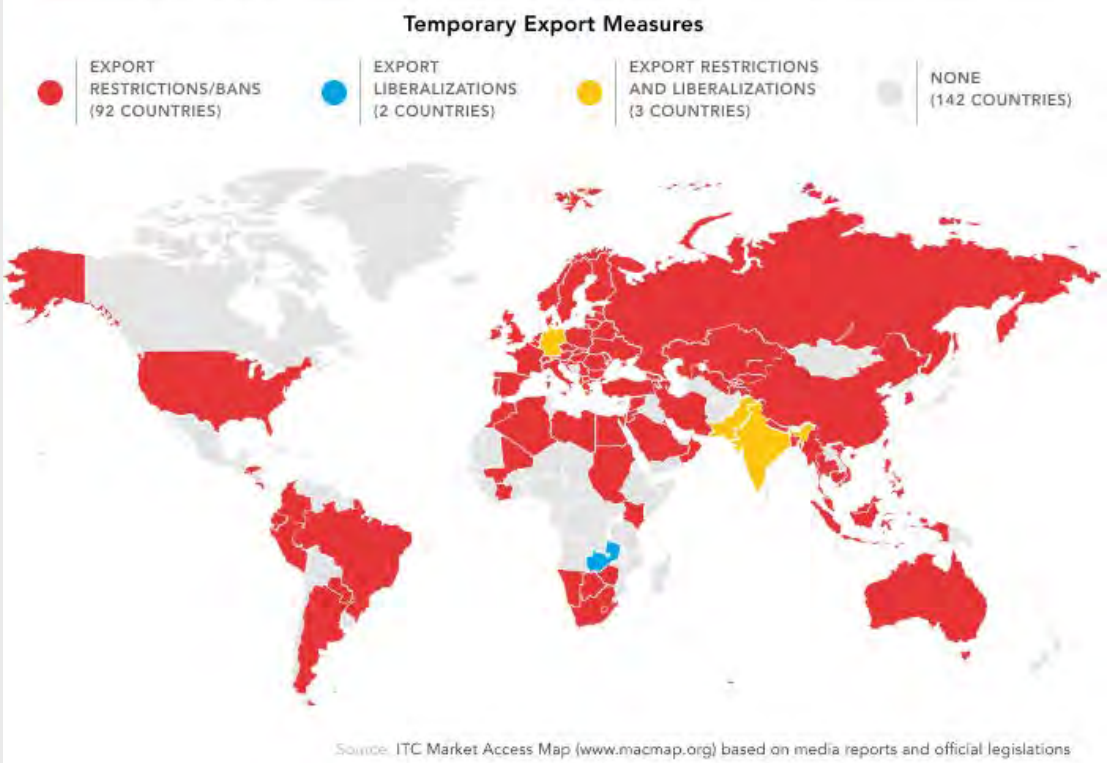
According to the WTO, export bans accounted for over 90% of pandemic-related trade restrictions in G20 countries.[26] In April 2020, the WTO reported that 80 countries had imposed export restrictions or prohibitions on goods to combat the effects of COVID-19.[27]

As highlighted in Figure 1, the number of countries imposing export restrictions or bans has since grown even higher, reaching upwards of 90 countries as of August 2021.[28] As of June 2021, the International Trade Centre reports that 98 countries still have export restrictions in place. According to the Congressional Research Service, most export restrictions were in one of two categories of goods: either medical goods (such as pharmaceuticals, or medical equipment and supplies) or foodstuffs.[29]

FIGURE 1

COVID-19 temporary export measures

Affected products include personal protective equipment (e.g. masks, gloves), pharma products, hand sanitizer, food, and certain other products.



Source: ITC Market Access Map (www.macmap.org) based on media reports and official legislations

Overall, between January 2020 and April 2021, there were more than 220 actions taken by countries either banning or limiting exports of certain goods, citing COVID-19-related reasons.[30] That being said, the real number of restrictions is likely much higher as it is

difficult to ascertain the exact number of restrictions, as many countries did not notify the WTO of their restrictions – many countries still refuse to admit to restricting the export of essential goods during the pandemic.

Most restrictions were adopted early on in the pandemic, and while some have since been rescinded, many remain in place today. In fact, the United Nations Conference on Trade and Development reports that 60% of export restrictions related to medical and personal protective goods that were implemented at the beginning of the pandemic remain in place today.[31] For example, one of the United States' export restrictions initially imposed in April 2020 was "allocating certain scarce resources or threatened health and medical resources to domestic use … due to the COVID-19 pandemic." This included N-95 filtering masks, respirators, surgical masks, and surgical gloves. This specific restriction has since been extended multiple times and is still in place today.[32]

There are also new vaccine-related export restrictions that have since been implemented – the United States, the European Union, and India, three large vaccine-producing entities, have all imposed export restrictions on either the vaccines themselves or on materials that are necessary to produce the vaccine.[33]

The lack of transparency around what was defined as temporary or targeted export restrictions meant that for many countries, there was – and still is – no information available concerning how long the restrictions will last or which products they might be extended to include.

The following example clearly demonstrates the effects of export restrictions on PPE supply chains, and the ways in which the unclear definition around "temporary" export restrictions negatively impacted Canadian companies and consumers.

CASE STUDY: MEDICOM

In early 2020, when the virus had not yet been declared a pandemic, the Chinese government acquired all face masks that had been, and were being, produced in China. China is one of the largest suppliers of face masks and the shortage was quickly noted by companies with production facilities in the country. One of these was Medicom, a Canadian manufacturing and distribution company that has three production facilities in China. In early March 2020, the company's COO noted that its products had been requisitioned by the Chinese government and none of the goods were being exported.[34]

The nationalization of face mask production in China did not last long. Face mask exports from China increased drastically by May 2020, but by then a global mask shortage had already erupted. Even short-term restrictions can be damaging when the relevant agencies aren't notified. When a country registers certain export restrictions with the WTO, it gives the affected parties the opportunity to consult with the country imposing the restrictions to determine the ways in which their imports will be affected and how the effects can be mitigated. For example, according to Article 12 of the 1994 GATT, export restrictions or prohibitions on foodstuffs require members to "give due consideration to the effects of such prohibition or restriction on importing members' food security."[35] The article further states that the member imposing the restriction will consult with any member that has a significant interest in the decision to restrict or prohibit exports of the foodstuff on request.[36] Such mechanisms encourage members to consider the effects of their restrictions on others and provide the means for them to be held accountable for their decisions.

China's decision to not announce their restriction on mask exports, whether it was an official export restriction or not, is representative of the tactics some countries have used during the pandemic to ensure they have sufficient goods for their citizens. The lack of transparency promotes distrust and individualism at a time when international co-operation is necessary to address the global pandemic. The Chinese government's decision to requisition Medicom's products also highlights the risks of producing essential goods in other countries. During a global crisis, the location of the products matters more than the location of the company's headquarters.

4. Trade Dependencies and Reshoring

The fourth problem we identified was countries' dependency on one economy – in many cases, China. It is well known that the world is dependent on China for manufacturing. According to the United Nations Statistics Division, China was responsible for 28.7% of global manufacturing output in 2019.[37]

In terms of PPE specifically, in 2018 China was producing 60% of the world's protective garments, 59% of the world's respirators and surgical masks, and 51% of the world's medical goggles.[38] When the COVID-19 pandemic began, China's exports of PPE declined substantially. For example, just in the first two months of 2020, China exported 22.8 million fewer kilograms of masks than it did during the same period in 2019 – and the demand was exponentially higher in 2020.[39] That being said, it should be noted that during the second quarter of 2020, China did significantly increase its exports of PPE.[40]

When one economy plays such a crucial role in the manufacturing of PPE supplies, reduced exports from that country impact the supply chain and create shortages of those supplies in other countries – which is exactly what occurred at the beginning of the COVID-19 pandemic.

While the world's dependency on China for medical supplies disrupted supply chains, certain countries' attempts to break from this dependency engendered even further disruptions. In response to China's role as a manufacturing superpower, some countries decided to reshore. Reshoring is defined as when manufacturing corporations that were previously located in foreign jurisdictions move back within domestic borders – essentially, redirecting any corporations that were abroad back to the home market.[41]

Reshoring can have benefits, such as increasing manufacturing jobs in the domestic market, reducing production costs for the company through reduced transportation expenses, and helping to balance trade and budget deficits.[42] However, reshoring can also have significant drawbacks. Reshoring aggravates the WTO principle of reciprocity, which encourages equitable trade and investment interactions, and is typically against the principle of supply chain diversification that has become axiomatic for proponents of the rules-based trading system. Reshoring disrupts GVCs by attempting to localize supply chains. Reshoring may also invite long-term costs, such as labour and capital costs, as well as opportunity costs that eliminate gains from trade.[43]

Reshoring has been a noticeable trend since 2019, due to a large variety of factors, such as the shift to just-in-time manufacturing, increasingly automated manufacturing processes, and geopolitics. That being said, reshoring has accelerated significantly during the COVID-19 pandemic. A survey of over 3,400 North American manufacturing companies published by Thomasnet, an online product sourcing and supplier platform for North American manufacturers, found that 69% of companies surveyed in May and June 2020 were considering bringing production back to North America.[44] A more recent survey of 120 US manufacturing executives, conducted by Kearney in 2021, found that 41% of companies have already reshored some of their manufacturing operations back to the United States in the past three years and that 22% plan to reshore some manufacturing in the next three years.[45]

Reshoring from China specifically is a reoccurring phenomenon among companies. The Kearney survey also found that 41% of US companies said they would try to reduce their dependence on China specifically for manufacturing.[46] A survey of 346 US companies conducted by PwC and the American Chamber of Commerce in Shanghai found that around 18% of companies surveyed are planning on moving production out of China, either to other non-US locations or back to the United States.[47]

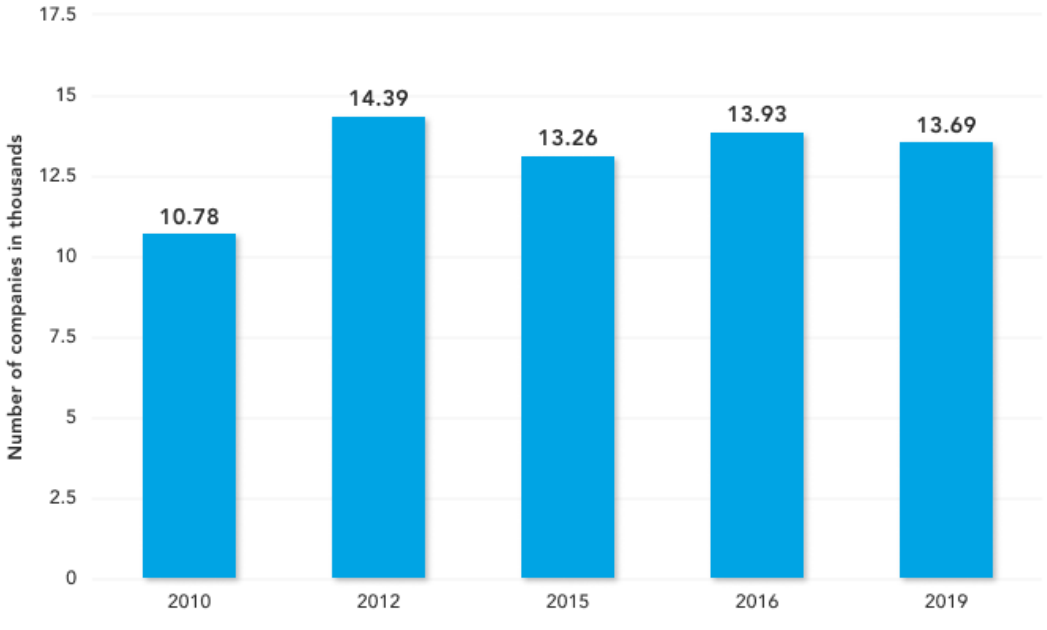
Evidently, the need to decrease manufacturing dependency on China proved salient for many economies during the pandemic – and reshoring was a decision that many considered as a solution. Next, this paper provides an example of how one Japanese company dealt with its reliance on China by reshoring – and explains why many other Japanese companies chose not to reshore.

CASE STUDY: JAPAN'S SUBSIDIES PROGRAM

Japan's economy has been particularly reliant on China. In February 2020, Japanese imports from China were cut in half, resulting in profound supply shocks reverberating throughout the economy, as many finished goods produced in Japan rely on Chinese inputs. In 2018, Japan relied on China for about 20% of its parts and materials, and much of Japan's face mask imports (80% of masks are imported) came from China.[48] Additionally, 60% of Japan's antibiotic components came from China.[49]

FIGURE 2

Number of Japanese companies operating in China between 2010 and 2019 (in 1,000s)



Source: Statista, https://www.statista.com/statistics/1024308/japan-companies-operating-china-number/

Considering how this dependency impacted Japan's economy and supply chains, Japan has become a proponent of reshoring during the pandemic. Japan's 2020 budget, expanded to deal with the pandemic, included a subsidy program aimed at bringing Japanese firms back home to protect Japanese products from unilateral trade-related policy decisions by foreign governments. The program covers up to two-thirds of costs for major companies to reshore and three-quarters for SMEs.[50] Then Prime Minister Shinzo Abe stated at the time that the plan was earmarked for high value-added products and goods for which Japan has a particular reliance on a single economy.

Iris Ohyama, a Japanese consumer plastics manufacturer, was the first recipient of this subsidy. Iris Ohyama shifted its operations in 2020 to produce masks made of nonwoven fabric. The subsidy was initially earmarked for shifting production to produce PPE, but given supply chain concerns, the Japanese government increased the subsidy to provide the company with the means to shift its facilities out of Dalian and Shanghai in China to Miyagi, a prefecture in northern Japan. Since Iris Ohyama's use of the subsidy, more than 1,600 companies have applied to the program, with 56 firms using funds to increase domestic production as of September 2020.[51]

And yet many other firms refuse to take advantage of the program. Some Japanese firms are stating that reshoring back home would be "impractical and uneconomical."[52] Many firms argue that what they produce in China is ultimately going to the Chinese consumer – meaning moving production to Japan would only increase costs and delivery times. A spokesperson for Yorozu Corporation, a Japanese company that produces auto components, told Reuters that most of its customers were in China, and that "the parts we make are so big we need to be near our customers to control our costs."[53]

While reshoring might mean less dependence on one particular economy, it also means greater dependence on a country's own domestic production. The OECD has found that this reliance on one's own local production actually leads to more vulnerability to supply chain shocks.[54] Japan's key problem at the beginning of the pandemic was overreliance on one economy and a lack of diversity in its supply chain. Reshoring all its manufacturing to its own economy will eventually recreate the problem of low diversity in its supply chains.

Ultimately, general reshoring of all manufacturing companies is not the solution to the dependency problem. Specific risk-based reshoring based on certain critical sectors, such as what Iris Ohyama did, can be helpful for diversification and for reducing dependence – but it must be done carefully, and it will not (and should not) be an option for all companies.

5. Logistics of Vaccine Distribution

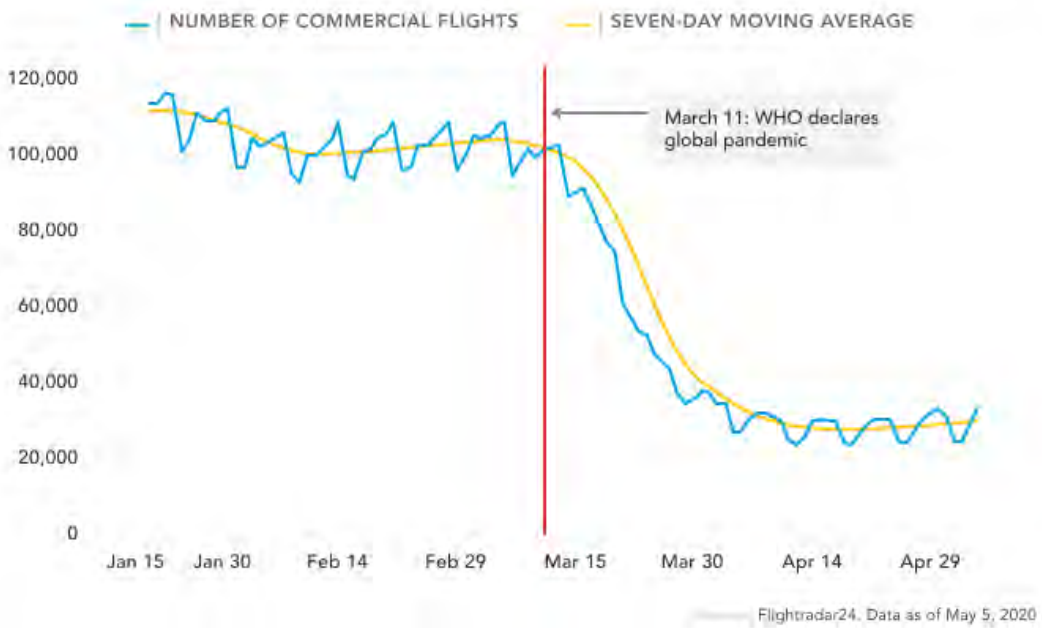
The development of a vaccine effective against COVID-19 led to optimism among many that the end of the pandemic was in sight, but it also led to another set of supply chain issues. The next challenge for MNCs was determining the best way to distribute and transport vaccines. Vaccines may be less potent if they are not transported using complex cold chain systems to meet temperature requirements. Additionally, there are significant logistical challenges as vaccines must be delivered overseas and to remote communities quickly to prevent the further spread of COVID-19 and put an end to the health crisis. This is especially difficult considering the decrease in air cargo capacity due to the COVID-19 pandemic – global air cargo capacity decreased approximately 35% from 2019 to 2020.[55]

CASE STUDY: YUSEN LOGISTICS

One company that emerges as a success story is Yusen Logistics. Owned by a Japanese shipping company called Nippon Yusen Kabushiki Kaisha, Yusen formed a unique logistics network that combines air, ground, and sea transport.

FIGURE 3

Coronavirus pandemic hits global travel



Yusen leverages multiple modes of transportation from air, land, and coastal marine freight transportation. Like many others, Yusen had to deal with the challenge of adapting to the shortage in air cargo capacity as a result of the massive decline in air travel after the outbreak of the pandemic (Figure 3). Because Yusen can only use airports certified to receive pharmaceutical goods, shipments of products using air travel was significantly limited.[56] As a result of restricted air cargo, Yusen invested in technologies like real-time GPS and temperature tracking for road and sea freight to optimize diverse cargo transport.

Yusen Logistics also refined their South East Asia Link (SEAL), which uses cross-border trucking connecting Singapore, Malaysia, Thailand, Cambodia, and Vietnam.[57] There is a high-demand corridor between the Thai and Vietnamese capitals that the cross-border trucking service was able to employ as an alternative to less-efficient air and ocean transport. Air freight is about 50% more expensive and ocean freight is about 10 days longer than the SEAL trucking system in transporting goods in this corridor, so the SEAL provided a viable and cost-effective alternative. The fleet of trucks runs from Singapore to Malaysia five times a week and between Malaysia, Thailand, and Vietnam about three times a week. The result of the enhanced less-than-truckload system cut lead times at a cheaper rate in a corridor experiencing high growth rates in terms of volume.[58] Yusen is planning to expand the system into a pan-regional trucking network. This will be part of the planned railway expansion between Kunming and Singapore.

Yusen is also expanding its involvement in Malaysia vaccine logistics through its subsidiary Tasco. Tasco took on the challenge of ultra-low temperature storage when it acquired two major cold chain service providers in Malaysia in 2021. Tasco's Cold Supply Chain Logistics is currently the largest cold chain provider in Malaysia. Yusen provides an example of innovative approaches to transportation and regional connectivity that has proven to be helpful for the region during the pandemic. Bolstering private companies to optimize trading routes and transportation modes can fortify a country's response to future crises.

03

CONCLUSION

This paper has described five key problems that exacerbated supply chain disruptions during the pandemic: manufacturing shortages; challenges with domestic production; temporary export restrictions; trade dependencies and reshoring; and logistics of vaccine distribution. To overcome these issues, we propose the establishment of a supply chain task force that will promote transparency, research, and funding of initiatives that will increase our understanding of GVCs, public-private discussion and collaboration, identification of critical goods, and cultivation of a diversified stockpiling strategy. These measures could ensure that Canada is better prepared to weather any future global crises that have a significant impact on supply chains.

Recommendations

The supply chain tensions examined in this paper are often intertwined. Export restrictions can lead companies to decide to reshore or encourage firms to hire logistics companies to determine the viability of diversifying their supply chains. Due to this interconnectedness, the following policy recommendations address issues from multiple case studies.

- **Creation of a supply chain task force:** The shortages and delays caused by supply chain tensions are one of the key problems highlighted in this paper. Export restrictions, logistics problems, and labour tensions have all contributed to huge

delays in the delivery of medical goods during the pandemic. To combat these issues, we propose the creation of a supply chain task force that is committed to developing and implementing rapid response mechanisms that can quickly address sudden shocks to supply chains. The purpose of the task force will not only be to respond to crises, but also to prepare preventive mechanisms that can identify potential disruptions and provide a framework that can be used to respond to these issues. The task force will provide support to the government and private companies in the form of technical assistance or consulting services and funding to support the implementation of any programs deemed necessary;

- **Increase access to supply chain data:** The primary services offered by the supply chain task force would be related to research and funding. At the beginning of the pandemic, it became clear that companies did not have easy access to their supply chain data. Companies that invested in creating supply chain maps were better prepared to respond to the pandemic early on. The maps are able to facilitate a co-ordinated response to crises, as different divisions of an MNC have access to the same information and the shareholders can make educated decisions about how best to ensure production is unaffected. The map also enables companies to respond quickly to foreign government policies that may affect their production, such as export restrictions or reshoring subsidies. Furthermore, mapping makes it easy to identify areas of tension that might require additional help from a third source, such as a logistics company, to reorganize supply chains. However, the mapping process can be incredibly expensive and difficult to maintain. The supply chain task force could therefore provide a valuable service by identifying critical goods that need to be easily accessible during a crisis and key suppliers, and then later providing these companies with a subsidy to encourage them to map their supply chains. Another policy option would be to grant companies that use supply chain mapping preference in government contracts to encourage other companies to do the same and ensure that in the event of a crisis supply chain data will be readily available;

- **Carefully assess decisions to reshore:** The government of Canada can also use the supply chain task force to address decisions to reshore. In addition to identifying the criticality of goods, and the vulnerability of supply chains, the task force can also be used to assess the feasibility of reshoring or near-shoring critical and vulnerable supply chains. To achieve this goal, the task force will consult members of the business community, producers, health-care representatives, scientists, trade specialists, and economists, among others. Once the imperative for reshoring is determined, a security mandate from the federal government would be necessary to

enforce reshoring. It is important that the imperative for reshoring be thoroughly scrutinized, as restructuring entire supply chains may eliminate gains from trade;

- **Ensure due diligence to avoid supporting unsafe labour practices:** As noted in the Top Glove case study, manufacturers will occasionally employ unsafe labour practices that lead to delays, in this case due to COVID-19 outbreaks and human rights violations. Therefore, it is useful to have a body that can ensure companies are doing their due diligence with regard to labour conditions and practices, either by facilitating their investigations into working conditions or prompting companies that provide critical goods to review the labour conditions at their factories. This is especially important for goods like nitrile gloves, that cannot be produced domestically either by refocusing operations or reshoring. The German government has recently adopted a bill that makes it the responsibility of any company located in Germany with 3,000 employees or more to monitor and eradicate human rights violations within the company.[59] This is another approach that encourages companies to ensure that no part of their supply chain is jeopardized by labour abuses or poor working conditions;

- **Support collaboration between stakeholders:** Another way in which the task force could ease supply chain tensions is by providing a forum for discussion. One of the key takeaways from the COVID-19 pandemic is that responses were not organized quickly enough and did not always involve the right actors. It is therefore important to have a body whose role it is to ensure the relevant personnel, whether that be trade ministers or local businesspeople, are meeting with one another in a timely fashion to address supply chain problems during a crisis. The case of Yusen Logistics revealed that the private sector must be consulted in the development of supply corridors and infrastructure. The task force can encourage discussion by offering stakeholder roundtables, workshops, and direct consultations. These can provide an impetus for collaboration to identify the challenges and potential solutions to problems with freight movement in Canada;

- **Foster an information-sharing innovation ecosystem in Canada:** The Samsung case study is a great example of a large conglomerate aiding SMEs in South Korea through sharing technical know-how and key networks to optimize their production processes. As part of the supply chain task force's mandate to promote discussion, we suggest that it foster an innovation ecosystem in Canada and encourage large corporations to connect with SMEs. This will not only build resilience during massive global supply shocks and demand surges, but it will also allow companies to increase their productivity. Intentionally creating linkages between universities, the

science base, civil society, and industry, as well as fostering knowledge sharing between firms, can be achieved through a systems of innovation approach. This can begin by offering fundamental research and applied R&D funding support for the Canadian research landscape to explore areas of industrial improvement. Canada has expanded existing programs such as granting councils with funding that is earmarked for areas to improve industrial capacity, like automation applications in manufacturing processes. The government of Canada can also engender partnerships through the Superclusters Initiative and the National Research Council; and

- **Diversify Canada's stockpiling strategy:** Canada already has a stockpiling protocol in the form of the National Emergency Strategic Stockpile (NESS), but this is only one form of stockpiling. The NESS relies on the management of a public stock of critical goods by a public authority and requires adequate funding during the interim periods. While a good starting point, Canada would also benefit from expanding stockpiling strategies beyond the NESS, particularly to guard against the strain and product expiry risks as experienced during the pandemic[60]. Other forms of stockpiling include requiring producers to maintain pre-defined stocks of critical products and/or intermediate goods, like active pharmaceutical ingredients. This can be achieved via fiat, preferential sourcing (granting companies that comply with stockpiling requirements coveted procurement contracts with the government), or financial incentives like subsidies or tax breaks. It is necessary to do a review of the costs imposed on private companies with mandatory stockpiling requirements. Cost analyses will have to be completed to ascertain the degree to which the added costs limit the supply of critical goods, rendering the stockpiling requirement counterproductive. A feasibility study should be conducted to compare the just-in-time inventory model that has become ubiquitous in global value chains with a "just-in-case" model where inventory exceeds demand in the event of a demand surge. In some instances, added inventory may present only a marginal cost to firms for which the government can compensate either through subsidies or tax breaks.

ABOUT APF CANADA

ASIA PACIFIC FOUNDATION OF CANADA

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ENDNOTES

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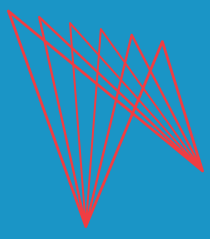

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TOWARD AN ECOSYSTEM APPROACH:

COVID-19, Canada-Asia Pacific Relations, and International Organizations

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EXECUTIVE SUMMARY

COVID-19 has posed an enormous challenge to governments and international organizations worldwide, with many bemoaning the failure of global organizations (such as the WHO and the UN) and the decline of multilateralism when the world needed it most. But other forms of international co-operation have continued despite the gridlock at the global level. In particular, international organizations of all kinds in the Asia Pacific were proactive and diverse in their responses to the pandemic. Lessons from the pandemic experience of international organizations in the Asia Pacific can help countries like Canada better respond to the current pandemic and prepare for future health crises through international engagement.

This report details the context and actions in the pandemic responses of prominent international organizations in the Asia Pacific, finding that they often outperformed global international organizations in adapting to the pandemic. These organizations quickly recognized the spread of the new coronavirus and subsequently pivoted their programs, research, and funding to tackle pandemic-related challenges in the fields of health, economics, trade, investment, political co-operation, and regional integration.

Most notably, we observed different international organizations in the Asia Pacific fulfil diverse roles in responding to the pandemic, often collaborating with one another and filling gaps left by global and national efforts. These international organizations ranged from intergovernmental regional associations to networks of cities and civil society organizations. Despite being a key player in global multilateralism, Canada's relationships with international organizations in the Asia Pacific has been limited to a few organizations. This report highlights opportunities to increase sharing or promote collaboration on the multisectoral challenges posed by COVID-19 in the Asia Pacific.

We propose a new *ecosystem approach* to explain how international organizations of different mandates and levels function together and how countries like Canada can maximize their engagement with them. One of the key principles of the ecosystem approach is that engagement should not be limited only to international organizations performing at the highest levels on the global stage. It thus provides further rationale for Canada to pursue resilient and long-term engagement strategies in the Asia Pacific, with international organizations of diverse sizes, scales, and scopes.

Our report concludes with considerations and recommendations for federal, provincial, and municipal governments on how to use the ecosystem approach to address the current pandemic and plan for future health crises with international engagement in the Asia Pacific in mind. In brief, we call on Canadian governments to:

- Recognize and advocate for interconnectedness of health, trade, and economic resilience and support more sustained Canadian engagement in the Asia Pacific;
- Enhance ministerial communication, co-operation in international health programming, and engagement; and
- Amplify opportunities for Canadian leadership with locally driven initiatives.

RÉSUMÉ

La COVID-19 a posé un défi colossal aux gouvernements et aux organisations internationales du monde entier, beaucoup déplorant l'échec des organisations mondiales (comme l'OMS et l'ONU) et le déclin du multilatéralisme au moment où le monde en avait le plus besoin. Mais d'autres formes de coopération internationale se sont poursuivies malgré la paralysie au niveau mondial. En particulier, les réponses à la pandémie des organisations internationales de toutes sortes dans la région de l'Asie Pacifique ont été proactives et diversifiées. Les leçons tirées de l'expérience des organisations internationales de cette région en matière de pandémie peuvent aider des pays comme le Canada à mieux réagir à la pandémie actuelle et à se préparer aux futures crises de santé, grâce à un engagement international.

Ce rapport décrit en détail le contexte et les mesures prises par les principales organisations internationales de la région de l'Asie Pacifique pour faire face à la pandémie, et constate qu'elles ont souvent été plus performantes que les organisations internationales mondiales pour s'adapter à la pandémie. Ces organisations ont rapidement reconnu la propagation du nouveau coronavirus et ont ensuite réorienté leurs programmes, leur recherche et leur financement pour relever les défis liés à la pandémie dans les domaines de la santé, de l'économie, du commerce, des investissements, de la coopération politique et de l'intégration régionale.

Nous avons notamment observé que différentes organisations internationales de la région de l'Asie Pacifique ont joué des rôles divers dans la réponse à la pandémie, en collaborant

souvent les unes avec les autres et en comblant les lacunes laissées par les initiatives mondiales et nationales. Au nombre de ces organisations internationales, mentionnons des associations régionales intergouvernementales, des réseaux de villes et des organisations de sociétés civiles. Même s'il est un acteur clé du multilatéralisme mondial, les relations du Canada avec les organisations internationales en Asie Pacifique se sont limitées à quelques organisations. Ce rapport souligne les opportunités d'accroître ou de promouvoir la collaboration au niveau des défis multisectoriels posés par la COVID-19 dans la région Asie-Pacifique.

Nous proposons une nouvelle *approche écosystémique* pour expliquer comment des organisations internationales ayant différents mandats et relevant de divers niveaux fonctionnent ensemble et comment des pays comme le Canada peuvent maximiser leur engagement auprès d'elles. L'un des principes clés de l'approche écosystémique est que l'engagement ne devrait pas être limité aux seules organisations internationales performantes au plus haut niveau sur la scène mondiale. Cela donne une raison supplémentaire au Canada de poursuivre des stratégies d'engagement résilientes et à long terme dans la région de l'Asie Pacifique, avec des organisations internationales de taille, d'envergure et de portée diverses.

Notre rapport se termine par des considérations et des recommandations à l'intention des gouvernements fédéral, provinciaux et municipaux sur la façon d'utiliser l'approche écosystémique pour faire face à la pandémie actuelle et pour planifier les futures crises sanitaires en tenant compte de l'engagement international dans la région de l'Asie Pacifique. En bref, nous demandons aux gouvernements canadiens :

- de reconnaître et de promouvoir l'interrelation entre la santé, le commerce et la résilience économique, ainsi que d'appuyer un engagement canadien plus soutenu dans la région de l'Asie Pacifique;
- d'améliorer la communication ministérielle, la coopération dans les programmes de santé internationale et l'engagement; et
- d'accroître les possibilités de leadership canadien au moyen d'initiatives locales.

01

INTRODUCTION

As a novel coronavirus spread around the world in early 2020, eventually becoming a pandemic, governments and organizations worldwide struggled to mount timely and effective responses. Much attention has been given to country-specific responses and a limited number of global organizations, which have elicited criticism for their slow and often gridlocked responses to the crisis. Many attempts to extract "lessons learned" from pandemic responses thus far have been hampered by a tendency toward siloed investigations of specific countries' responses or those of singular global bodies such as the WHO, to the detriment of providing a more global, holistic picture.[1]

Our focus at the Asia Pacific Foundation of Canada is on the Asia Pacific region. When we looked at how the region was responding during the first year of the pandemic, we found many international organizations operating in the Asia Pacific that were often months ahead in pandemic response compared to other parts of the world. During this period, Canada's place within the diverse landscape of international organizations in the region appeared limited to a few organizations, and mainly focused on trade, economics, and development.

This observation led us to examine the diverse array of international organizations in the Asia Pacific and their pandemic responses, and highlight Canada's health-related engagement with them. Our goal was to see what we could learn to inform a more resilient approach to Canada's health-crisis-related engagement with international organizations

in the region to help mitigate the adverse effects of the pandemic and plan for future health crises.

While many countries turned inward and focused on domestic issues, we witnessed a growth of inter-regional cohesion and co-operation in the Asia Pacific. Our report finds that, throughout 2020, Asia Pacific-focused international organizations outperformed global international organizations in their response to the pandemic. These organizations quickly recognized the spread of the new strain of coronavirus. Subsequently, they pivoted their programs, research, and funding to tackle pandemic-related challenges in the fields of health, economics, trade, investment, political co-operation, and regional integration.

At the same time, Canada's involvement in international organizations in the Asia Pacific is limited to a few organizations, and existing engagement has gone through cycles of activity and inactivity. International organizations in the Asia Pacific have thrived during the pandemic, some of which are perhaps among the top global performers responding to the pandemic by helping with and enabling co-ordination, collaboration, and information sharing. This provides further reason for Canada to be planning for and enacting resilient and long-term engagement strategies in the region and with regional actors. It also provides the rationale behind one of the key findings of this report: that engagement should not be limited only to international organizations performing at the highest levels on the global stage.

Toward an Ecosystem Approach to Research and Engagement

During the pandemic, policy-makers, scholars, and commentators paid a great deal of attention to formal (and often global) international organizations and their responses to the pandemic. These discussions were largely based on the concepts from international relations scholars who study international organizations and who focus primarily on the institutionalization of international organizations through treaties, formal agreements, and relations between member states. However, our scan of international organizations in the Asia Pacific illustrated the need for a more complex understanding of international organizations than what these traditional definitions allow.

We found that a variety of international organizations – including those that are not based on formal agreements and those formed by non-state actors – played significant roles in Asia Pacific international co-operation before and during the pandemic. We thus adopted a broader, more holistic definition of international organizations that includes

many bodies that are rarely considered by policy-makers and international relations scholars. Furthermore, we observed that these organizations played different roles during the first year of the pandemic, often addressing gaps left by global or national efforts and frequently collaborating with each other. It became clear to us that it was more fruitful to survey this "ecosystem" of international organizations rather than query the effectiveness of individual organizations.

Combined, our inclusive definition of international organizations and our observations of the ecosystem of international organizations in the Asia Pacific helped form the foundation for our *ecosystem approach* to our research on international organizations. The ecosystem approach also forms the backbone of our recommendations for Canada's engagement with international organizations in the Asia Pacific, especially with regard to future health crisis planning. Both our definitions of international organizations and the ecosystem approach are expanded on in the next section.

Methodology

Over the period of January to July 2021, our team of researchers systematically reviewed the responses to the COVID-19 pandemic of international organizations in the Asia Pacific through documentary research (via websites, stated agendas, statements, reports, news coverage, and webinars) and an examination of secondary literature. This report highlights several organizations out of a vast array of international organizations operating in the Asia Pacific that help portray our ecosystem approach and are relevant to informing Canada's future health crisis response and engagement in the Asia Pacific.

This desk research was supplemented by interviews with representatives of some of the organizations we identified. The interviews aimed to uncover otherwise inaccessible information, such as the underlying motivations, various barriers, and real-world experiences of implementing the policies and approaches described by the organizations. In addition, we talked with several experts in the fields of international relations and global health to help us better understand the broader context of these organizations' pandemic responses and how Canada might be able to engage more effectively in the future.

To document Canada's global and Asia Pacific-specific engagement during the pandemic, we surveyed Global Affairs Canada's news releases from 2020 to 2021 and identified press releases from our selected international organizations that acknowledged Canadian contributions. We also used preliminary 2020 data from the Organisation for Economic

Co-operation and Development and Canada's Statistical Yearbooks from 2012 to 2019 to put Canada's pandemic-era international assistance in recent historical context.

Overview

The next section of this report provides a brief overview of how the context in which international organizations were operating when the pandemic hit has contributed to and revealed an ecosystem of international co-operation, and expands on this report's definitions of international organizations and the *ecosystem approach*.

We then identify key international organizations in the Asia Pacific that help us to best understand the dynamism and diversity of pandemic responses in the region. Overviews of a selection of international organizations is also used to highlight where Canada has been or could be engaged for future health crisis planning and preparedness that are further elaborated on later in the report.

The third section of this report briefly reviews and summarizes some of Canada's participation in international pandemic-related responses and programs and its existing engagements with international organizations in the Asia Pacific specifically related to health and pandemic recovery.

Recommendations are presented as opportunities for Canada to increase its future health emergency preparedness via deepening engagement with the international organization ecosystem in the Asia Pacific.

02

HOW COVID-19 REVEALS AN EMERGING ECOSYSTEM OF INTERNATIONAL ORGANIZATIONS

The previous section introduced the concept of an *ecosystem approach* to international organizations, both as a reflection of ongoing trends that shaped how international organizations responded to the COVID-19 pandemic thus far and as a new way for Canada to think about its engagement with the Asia Pacific.

In this section, we examine three trends in recent years that explain why global institutions have fallen in stature and reveal an emerging ecosystem of international organizations. Doing so demonstrates the shortcomings of focusing on global international organizations to the neglect of a broader range of organizations. Finally, we lay out in detail our definitions of an *ecosystem approach* and *international organizations* used throughout this report, and compare it with traditional conceptions still common in both the policy and academic worlds. This sets up our discussion of the pandemic responses of international organizations in the Asia Pacific in the following section.

The Limits of Global International Organizations During the COVID-19 Pandemic

Global international organizations have been roundly criticized for their sluggishness and lack of action in response to the pandemic.[2] The World Health Organization's hesitance in declaring COVID-19 a pandemic and its lack of power to enforce the principles and rules

underlying the global health system have renewed calls for fundamental reform.[3] The UN Security Council, which is the only UN body able to make legally binding agreements for its members, was fraught with divisions between the United States, China, and Russia, which inhibited its ability to take pandemic-related action.[4] Similarly, the United Nations General Assembly and the World Trade Organization made a few statements of solidarity but did not initiate or propose more substantial policy measures, with the latter also facing a funding shortfall during the beginning of the pandemic. While the Group of Seven (G7) did not meet in 2020, it held a few emergency meetings with health ministers and finance ministers in February and March. Its emergency summit at the end of March produced 31 commitments but no concrete action plan.[5]

Out of all the global institutions and forums, the pandemic response of the Group of 20 (G20) has perhaps shown the most potential for addressing future health-related emergencies. Yet many of its statements since March 2020 have been nonspecific and lacked concrete action steps. Critics have also cited its inability, due to internal disputes, to follow through with proposed steps such as providing funding for the International Monetary Fund (IMF) or World Bank.[6] For example, the G20 Leaders' Summit released a statement on COVID-19 in late March to reiterate its commitment to working with other international organizations such as the WHO, IMF, and World Bank to fight the pandemic.[7] In May 2021, it organized the Global Health Summit in Rome – the first G20 summit on health – at which members adopted the Rome Declaration.[8] It reiterated that the pandemic is both a global health and socioeconomic crisis, stating that overcoming the crisis will require equitable global distribution of vaccines, as well as other health measures and tools (such as diagnostics, therapeutics, and personal protective equipment [PPE]), and benchmarks to put the world on a path toward inclusive, sustainable, and balanced economic growth. Although it proposed further discussions of the 16 principles at the G20 Summit in October and at other forums such as the World Health Assembly, the mechanisms for monitoring the execution of concrete steps by G20 members remain vague. Regardless of the outcomes, G20 initiatives like the Global Health Summit, commitments to the Sustainable Development Goals, and India's hosting of the G20 in 2022 will ensure that pandemic response and recovery issues remain on the G20's agenda for the foreseeable future, but questions remain regarding its action steps.

Though signs such as the Global Health Summit in Rome indicate that global institutions might step up to the plate in the remaining half of 2021, the picture of global institutions during the first year of the pandemic did not inspire confidence in multilateral co-operation. However, as global institutions struggled to address the pandemic, other international organizations demonstrated resilience and even innovation in the face of the pandemic, and showed a diverse array of pandemic-related activity and responses, especially in the

Asia Pacific.[9] Furthermore, co-operation through other channels, such as bilateral aid, has actually increased during the pandemic.[10] What we are seeing now, then, may not be a decline in international co-operation but rather a shift away from global institutions.

Three Trends Informing Our Ecosystem Approach

This shift away from global institutions did not come out of the blue during the pandemic. Recent developments have seen both political scientists and policy-makers broaden their understanding of what constitutes an "international organization" and view the international order less as revolving around a set of key global institutions and more as a mosaic of a diverse set of relationships, networks, and organizations.[11] When we focus on the fields of global health and pandemic response, these changes become even more pronounced. Below are three key trends that have underpinned this subtle yet important shift in international relations, which has only intensified since the COVID-19 pandemic emerged as one of the most important global challenges in our generation.

FRAGMENTATION AND REORGANIZATION OF THE INTERNATIONAL ORDER

The international community's failure to mount a timely and co-ordinated response to COVID-19 was not a foreordained result, but rather the product of years of movement away from multilateralism and intensifying rivalry between the world's two major powers – China and the United States. Various scholars and commentators have persuasively argued that the stalling of global action in the face of the COVID-19 pandemic merely advances trends that pre-existed the pandemic, such as trade conflicts and decoupling along the US-China trade rift, increasing politicization of key multilateral institutions, and an air of skepticism toward international co-operation from influential leaders such as former US president Donald Trump.[12] In particular, Canada's soured relations with both China and the United States and Sino-U.S. tensions also impacted Canada's early response to the pandemic in many aspects, ranging from difficulties within a Canada-China joint effort to develop a vaccine to the impacts of increasing politicization of the World Health Organization and its early pandemic response.[13] Just as the world needed more globally co-ordinated responses to the pandemic, tensions between global powers paralyzed the very organizations and initiatives that were best positioned to deliver such a response.

As countries have increasingly shied away from global multilateral institutions and initiatives, other grouping formats have become more attractive. Regionalism, for

example, has been particularly apparent in global trade, where regional trade blocs have risen in prominence due to rising uncertainty in global supply chains from the US-China trade conflict and the disruption of these chains during the beginning of the COVID-19 pandemic.[14] More recently, minilateralism – referring to informal, small groupings between countries with similar values or interests – has become yet another way for countries to pursue mutual goals when co-operation is unlikely at the global level.[15] Examples of minilateral groupings range from the largely economically focused BRICS (Brazil, Russia, India, China, and South Africa) and MIKTA (Mexico, Indonesia, Korea, Turkey, and Australia) formations to the Quadrilateral Security Dialogue between the United States, Australia, India, and Japan. These trends show that countries have still been willing to pursue international co-operation through other channels despite misgivings about co-operation at the global level.

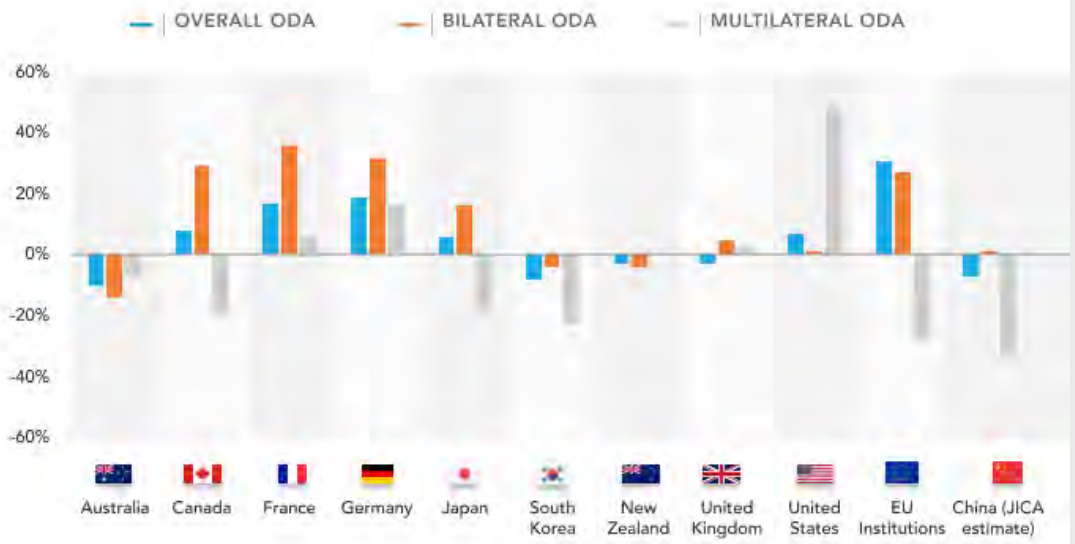
As COVID-19 reached pandemic proportions in the spring of 2020, many countries responded with inward-looking and nationalistic responses such as limiting the export of medical supplies and PPE and withdrawing support from the World Health Organization – most notably the United States. Much of this can be explained as "medical nationalism," where countries put their own pandemic response interests and needs before what would be in the world's interests.[16] But rising populism and a trend toward deglobalization over the past several years have also contributed to an increased preference for self-serving, nationalistic policies among governments and a distrust of global co-operation.[17]

In the context of rising nationalism and rivalries, many influential countries also moved away from "health governance" toward "health diplomacy," which refers to largely bilateral efforts to use health-related programming and international aid not only to address global health problems but also to advance other foreign policy aims, such as increasing soft power.[18] This took the forms of "mask diplomacy" (by governments such as those of China, Japan, South Korea, and Taiwan) and "vaccine diplomacy" (by governments such as those of China and India at first, and from mid-2021 Japan and the United States). Another way to view the trend toward health diplomacy is to observe the changes in Official Development Assistance (ODA) from major donor countries during the pandemic thus far. Though total ODA rose to its highest level ever recorded in 2020 – representing an overall 3.5% increase in real terms from 2019 – most of these gains came from increases in bilateral pandemic aid, while multilateral contributions from countries including Canada, Japan, and South Korea actually fell.[19] While health diplomacy can have a beneficial impact on global health, it also detracts from global governance and multilateral assistance that might ultimately be more effective.[20]

FIGURE 1

Percent change of ODA among selected donor countries from 2019 to 2020

Note: Figures are based on the OECD's preliminary figures for ODA in 2020, with the exception of figures for China, which are based on estimates from researchers at the Japan International Cooperation Agency. China does not calculate ODA statistics, as it does not follow the ODA reporting guidelines set by the OECD Development Assistance Committee. The majority of China's official international assistance comes in non-ODA categories, including non-concessional loans and commercial projects.



Note: This Fig. 1 graphic was updated on March 9, 2022, to correct a data aggregation error.

Source: OECD, "COVID-19 spending helped to lift foreign aid to an all-time high in 2020", Paris (April 13, 2021), https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/ODA-2020-detailed-summary.pdf; Naohiro Kitano and Yumiko Miyabayashi, "Estimating China's Foreign Aid: 2019-2020 Preliminary Figures", JICA Ogata Sadako Research Institute for Peace and Development, Tokyo (December 14, 2020), https://www.jica.go.jp/jica-ri/publication/other/l75nbg000019o0pq-att/Estimating_Chinas_Foreign_Aid_2019-2020.pdf

EXPANSION OF MANDATES FOR INTERNATIONAL ORGANIZATIONS

Though the COVID-19 pandemic has indeed accelerated existing trends away from multilateralism and toward bilateral, regional, and minilateral efforts, it has also underscored the impossibility of separating health issues from other policy areas such as security, economics, trade, and development. Existing global concepts such as the Sustainable Development Goals have already led many international organizations to view health as a part of broader economic and development planning.[21] In addition, issues

previously neglected in global health co-operation, such as gender, Indigeneity, and human rights, have been increasingly incorporated into global health frameworks over the past decade.[22]

However, most of the organizations addressed in this report had focused on issues such as security, economics, trade, and development, with attention to public health generally garnering less attention. Yet, under the "politics of crisis" that unfolded as the pandemic grew, international organizations in the region had the urgent impetus to expand their work to include pandemic and health-related programs and responses.[23] The disproportionate impact of the COVID-19 pandemic along lines of race, socioeconomic status, age, Indigeneity, gender, and other axes of difference, in Canada and beyond, also revealed for many organizations need to expand their policy and program areas.[24] By addressing and adapting to rapidly changing circumstances throughout 2020, the mandates of these organizations and the boundaries between policy areas have become increasingly malleable and blurry, offering new opportunities for collaboration between organizations and for innovation to address interconnected policy issues.

SUBNATIONAL NETWORKS, POLICY LEARNING, AND THEIR ROLE IN INTERNATIONAL HEALTH CRISES

Finally, the growth of international civil society and knowledge sectors surrounding international organizations in recent years has led to new interest in the role of international organizations and subnational communities in sharing knowledge and promoting policies despite the gridlock in global institutions. Rather than focusing on binding formal agreements and policy initiatives, scholars and policy-makers have increasingly pointed toward the role international organizations play in "policy transfer" or "policy learning," a process by which members share their own practices and learn from each other, which can lead to greater policy co-ordination.[25] Beyond formal organizations, there has been a growing literature on and appreciation of "epistemic communities," referring to communities of technical and scientific experts that advise governments and play a role in international organizations and forums.[26] Formal organizations such as the UN have become increasingly reliant on these epistemic communities to develop knowledge, inform policy and encourage co-operation between member states, giving these communities significant yet unappreciated influence in international co-operation.[27] Last but not least, subnational networks, particularly those involving civil society organizations, have also had a significant impact on international co-operation, not just in terms of voicing the viewpoints and concerns to international organizations, but also providing "alternative" channels of international co-operation themselves.[28]

The importance of epistemic and subnational networks is especially apparent in the field of global health, which has long been "populated by diverse entities with different legal status and structures, different governance models, and complex patterns of accountability and interaction."[29] The World Health Organization, while still the most recognizable global health institution, increasingly operates as an influential partner rather than a dominant trendsetter in global infectious disease prevention and response. Meanwhile, states, while still forming the bedrock of international co-operation on health, are no longer the only or even the most important actors in this space. As has been made evident during the COVID-19 pandemic, private foundations, business and industry, and international NGOs have played outsized roles in raising awareness about COVID-19, procuring medical supplies, and funding the research and production of vaccines. The global scientific community, attached to national governments through affiliation or funding, has largely transcended disagreements between countries to accelerate co-operation on COVID-19 research and bring effective testing and vaccines in record time.

And as our report reveals, there is an increasingly complex yet underappreciated landscape of regional organizations, infectious disease surveillance networks, and subnational forums that serve as important conduits for information and experience between countries and peoples. We uncovered previously overlooked connections, meetings, and relationships that were unfolding outside of traditional understandings of international organizations and their mechanisms. All of these actors and relationships form part of what international relations expert Sophie Harman describes as a "more dispersed and inclusive form of global health security that is more equipped to respond to global political issues during a major pandemic."[30]

What Is an Ecosystem Approach to International Relations?

As can be seen by the trends above, the international order has become more fragmented and many countries and policy-makers are losing their confidence in key global institutions. Countries have increasingly turned to bilateralism, regionalism, and minilateralism to account for the shortfall in international co-operation at the global level. At the same time, the international community has become more aware of the interconnectedness of health and other policy areas. A plethora of new bodies and actors, ranging from epistemic communities to subnational networks, have increased communication and policy learning between states. These developments necessitate a new approach toward understanding and engaging with the "ecosystem" of international organizations that now exists in the Asia Pacific – an ecosystem approach.

It is useful to begin by comparing our conception of the ecosystem approach to international relations with how international relations scholars – and consequently the broader foreign policy community – have traditionally approached multilateralism and international organizations.

Recent surveys of international organization literature define "international organizations" as intergovernmental organizations involving three or more countries that are based on formal agreements and involve a permanent secretariat.[31] Critics of this narrow definition often point to larger "regimes" in international relations – that is, rules, norms, and procedures arising from interstate co-operation – as being more influential than formal organizations themselves.[32]

Still, these definitions fail to account for the enormous number of bodies devoted to international co-operation that often work closely with each other, overlap in mandate and geographical focus, and involve subnational and non-state actors typically neglected by international relations scholars and policy-makers. Though there have been debates about what the value of such a large number of international organizations might be, as two scholars recently observed, "we must still account for why most states belong to many hundreds of these organizations."[33] In other words, we need a better understanding of what roles these myriad organizations play in helping states respond to problems that require international co-ordination and co-operation.

Our definition of international organizations in this report, thus refers to both formal and informal organizations with membership or participation from three or more countries, including those made up of national and subnational governments, non-governmental and grassroots organizations, and individuals. They do not have to be based on formal agreements, but there is some level of mutual understanding underlying the existence of the organization that provides for regularly held meetings between members. International organizations also have a wide range of fields and purposes, such as supporting economics and trade, infrastructure and development, security and non-traditional security, or human rights and social justice. Some of the international organizations examined in this report are global in scope but operate in the Asia Pacific, and others are based in and solely operate in the region.

Understood this way, this intentionally broad and flexible definition of international organizations necessitates a radically different approach to viewing the landscape of international co-operation. Instead of focusing on the actions and effectiveness of a few key organizations, such as the UN and the WHO, an approach involving this new definition of "international organizations" seeks to understand and identify the roles that various organizations play in a given area of co-operation.

In other words, such an approach focuses on the *ecosystem* of international organizations. In an ecosystem, individual components play complementary roles in the continuing operation and resilience of the overall system, and no single component is responsible for the entire system's success or failure.[34] This ecosystem approach directs us away from unproductive questions about the "failure" or "success" of individual organizations in responding to a certain problem, as these organizations do not operate in a vacuum. Rather, it assesses the response and efficacy of international organizations "in terms of the conditions under which they matter or do not, rather than a wholesale rejection of their worth."[35]

Leaders in a session of the 2015 East Asian Summit.

Source: government.ru

An *ecosystem approach* also takes into account a multitude of interactions and opportunities for engagement at various levels and scales. It enables a fresh perspective with which to understand the work of many types of organizations, from small micro-lateral interactions between Indigenous rights groups advocating for vaccine equity, to large regional institutions such as the Asia Development Bank, whose work has pivoted to include support for COVID-19 response operations in the region. This work constitutes a vast, interconnected, and interdependent world that cannot be fully encapsulated using a singular orthodox definition of international organizations, but that the ecosystem approach serves to encompass.

We summarize a few key differences between what we consider the existing "traditional approach" and the ecosystem approach as we conceive of it in the following table:

TABLE 1:

Traditional vs. ecosystem approach

Traditional Approach	Ecosystem Approach
Focus on global institutions (e.g., UN agencies and World Bank/ IMF), regional intergovernmental unions (e.g., EU and ASEAN), and bilateral relations	Focus on international organizations and networks at every level, from global institutions to informal epistemic communities and civil society networks
International organizations' work is primarily viewed independently, with success or failure evaluated on an individual basis rather than a collective basis	International organizations work with each other to collaborate on common issues, co-ordinate responses, and complement each others' efforts
Key international organizations are linchpins in the global multilateral system, such that gridlock or dysfunction in one international organization leads to the crippling of multilateral or regional co-operation	Gridlock or dysfunction in an international organization does not cripple multilateral or regional co-operation, but rather leads members to redirect focus to other international organizations and different types of groupings (e.g., regionalism and minilateralism)
Relationships between countries are contingent on bilateral relations and membership in common international organizations	Relationships between countries involve interpersonal relationships that may persist beyond the deterioration of bilateral ties and stalemates in international organizations

Traditional Approach	Ecosystem Approach
International organizations' mandates are viewed with a narrow lens, focusing on their specific policy area(s) without consideration for other policy areas or political factors	International organizations' mandates are viewed with a broad lens, underlining the inextricable links and interactions between different policy areas and political factors
Outside of global institutions, members participate in a subset of international organizations based on region or ideology, and participation in an international organization leads to perceptions of belonging in a certain "bloc"	Members participate in a wide variety of international organizations to diversify their engagement and avoid relying on a single "bloc" of relationships
Member states view foreign relations as solely the purview of the national government, and neglect or even dismiss subnational and epistemic relationships as important parts of their international engagement strategies	Member states view subnational and epistemic relationships as integral parts of their international engagement, incorporating the views and activities of subnational and individual actors in their strategies

Conclusion

The global landscape has undoubtedly changed in recent years from a globalized, interconnected world centred around a few key global institutions to one that is increasingly fragmented into regions, blocs, and nationalisms. However, far from being the death knell of multilateralism and international co-operation, the COVID-19 pandemic has revealed the resilience of international co-operation through an assortment of multilateral, regional, minilateral, bilateral, and subnational channels. This "ecosystem"

of international co-operation also did not begin with the COVID-19 pandemic, but rather was built up over years of existing efforts. Furthermore, international co-operation has moved away from formal policies and treaties on narrow areas of co-operation, toward an expansive understanding of the interconnectedness of different policy areas and the value of informal policy co-ordination and knowledge sharing. To meet these new realities, our examination of international organizations in the Asia Pacific must adopt an ecosystem approach, focusing on the roles that each organization has played during the pandemic. The following section will demonstrate that the Asia Pacific ecosystem of international organizations has mostly responded in a timely and proactive manner to the challenge of the pandemic, raising lessons and potential opportunities for Canadian engagement in the region.

03

INTERNATIONAL ORGANIZATIONS AND COVID-19 IN THE ASIA PACIFIC

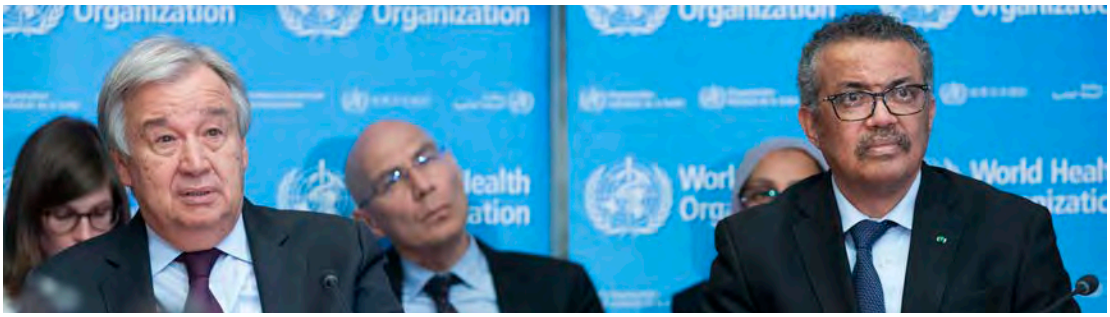
The ecosystem of international organizations engaged in pandemic response in the Asia Pacific is complex, intertwined, and extremely diverse in size, scope, and actions. In this section, we highlight the pandemic-related work by a handful of international organizations to demonstrate how they fit within the framework of an ecosystem approach by collaborating with other international organizations to co-ordinate pandemic responses, advise policy actions, and adapt from its original mandates to prioritize alleviating pandemic-related issues. Our research reveals an overwhelming emphasis on staying interconnected through an ecosystem approach of co-operating, collaborating, and co-ordinating response actions on subnational and international levels.

World Health Organization Regional Offices

The World Health Organization is a specialized body within the United Nations that promotes health and well-being worldwide. It was originally established at the end of the Second World War to help eradicate infectious diseases. Since its inception, it has worked on several pandemics, but these represent only a small portion of its overall work on public health and well-being. A much more prominent part of its efforts, for example, focuses on non-communicable diseases in the developing world owing to the induction of formerly colonized economies and working toward the 2015 UN Sustainable Development

Goals (SDGs), of which health is a central part.[36] The WHO possibly did not react as quickly as many observers had hoped because since the wave of decolonization from the 1970s onward, lower- and middle-income countries have gained increasing focus and control within the WHO, which plays a significant role in shaping its programs, operations, and decision-making. And much of the work on the SDGs, which aims to ensure that "no one is left behind," focuses on the developing world.

In the last few decades, the WHO has taken a larger role of a depository and disseminator of health and disease related data. The WHO's legally binding International Health Regulations (IHR) treaty was last modified in 2005. The IHR places obligations on states to report and share information about significant health events and emergencies that have potential to cross borders. The IHR also grants the WHO the ability to declare a Public Health Emergency of International Concern (PHEIC), gather and share data, and make response recommendations. The IHR defines a PHEIC as "an extraordinary event which is determined to constitute a public health risk to other States through the international spread of disease and to potentially require a coordinated international response."[37] A PHEIC declaration is the WHO's highest level of alert, signalling the need for countries worldwide to immediately take action, share information, and collaborate. Characterizing an event as a pandemic, on the other hand, comes with no clear definition; it simply means – rather vaguely – that an epidemic is affecting countries worldwide, and it comes with no guidelines about what to do. While IHR is legally binding, the WHO has no enforcement mechanisms and relies on a combination of shaming, praise, and private diplomacy to encourage rather than enforce country compliance.[38]



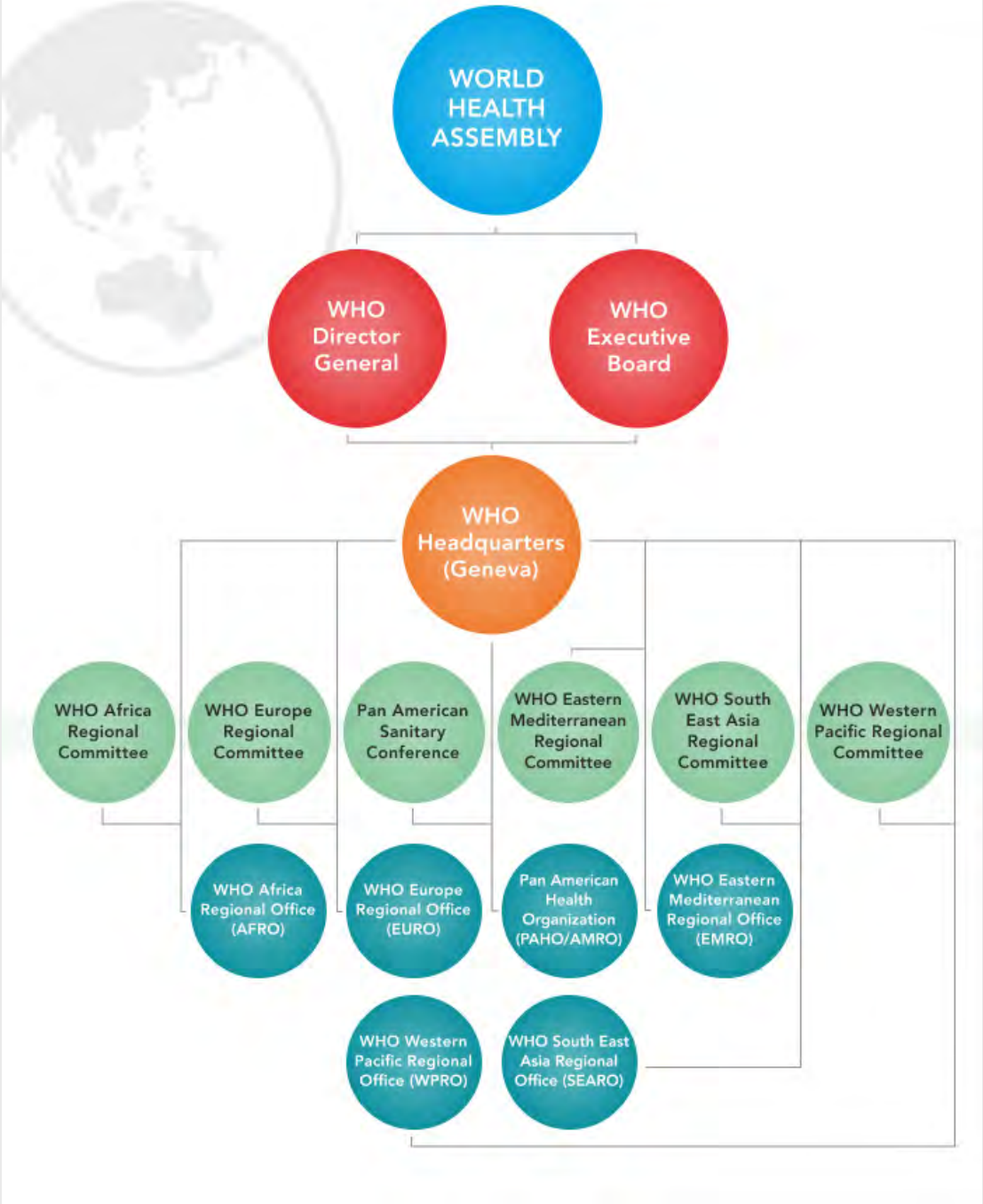
UN Secretary-General António Guterres and WHO Director-General Tedros Adhanom Ghebreyesus at a briefing on COVID-19 at the WHO Headquarters in Geneva on February 24, 2020.

Source: UN Photo/ Jean Marc Ferré

It has been argued that external observers tend to focus too much on the Geneva Secretariat as the head of communications, rather than the likely more up-to-date and influential regional offices.[39] This is another poorly understood attribute of the WHO's institutional structure: The nature of the division and dissemination of information in the region through the WHO regional offices as opposed to the Geneva Secretariat means that, in practice, the regional offices are a potentially better source for reliable, up-to-date, and accurate information.

FIGURE 2

World Health Organization organizational chart



The WHO secretariat is headquartered in Geneva, but operationally it functions through 149 field offices, which are overseen by six regional offices that maintain a high degree of autonomy. Each office has its own regionally elected director that oversees its own budget. There are two regional offices that cover the Asia Pacific region. The Manila-headquartered WHO Western Pacific Region includes 37 countries (including China) in Northeast and Southeast Asia and Oceania and a quarter of the world's population.[40] The New Delhi-headquartered WHO South-East Asia Region includes 11 countries in South and Southeast Asia. This division of the Asia Pacific between two regional offices means that neighbouring countries may not be able to communicate through the same WHO networks and channels.[41] This means that the organization itself may not always speak with one "voice," but may reflect the needs and circumstances of different countries and geographical regions depending on the regional office. Some argue that this decision-making grants the WHO potential for better co-ordination and co-operation, but it also often leads to fragmentation.

FIGURE 3

World Health Organization Regional Offices

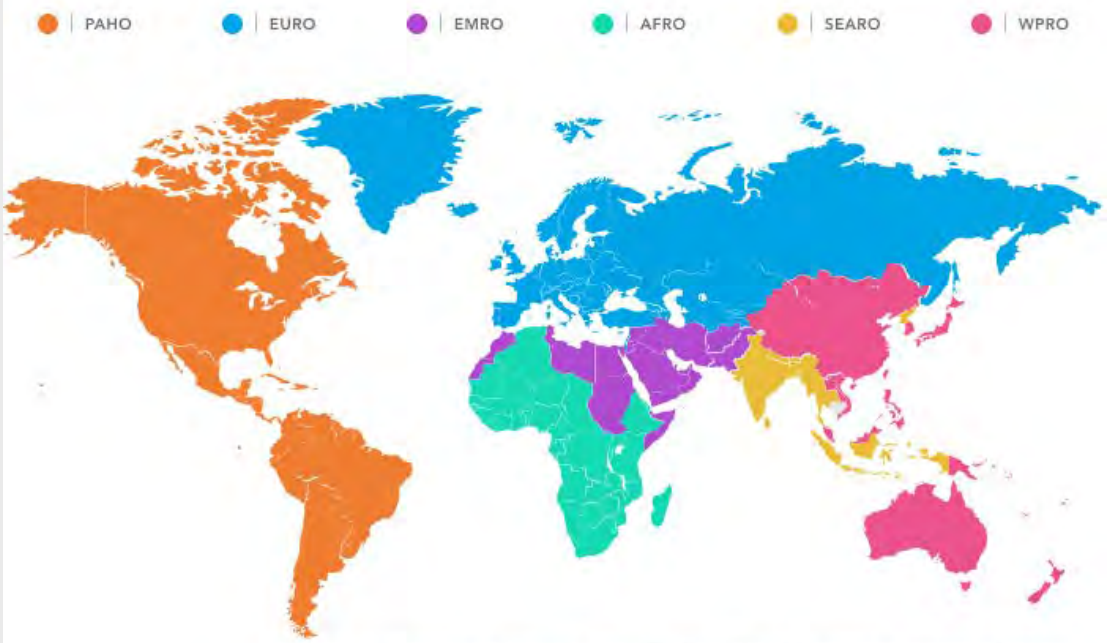


Image source: https://en.wikipedia.org/wiki/File:World_Health_Organisation_regional_offices.svg
Public domain image

An omission in the WHO's pandemic-related work in the Asia Pacific that could promise lessons for Canada is the absence of Taiwan. Taiwan is not a member of the WHO in its own rank, and thus is not included in any of the reporting systems in the Asia Pacific. This may have reduced the ability of Taiwan to share its lessons learned around the world, and resulted in countries, including Canada, paying less attention to and not learning from the many successes Taiwan had in curbing the spread of COVID-19. There is potential for Canada to further engage with Taiwan to learn from its early pandemic response and ongoing initiatives.[42]

The WHO's overall budget is small (for the two years of 2020 and 2021, it is US$4.8B) compared to the tasks it must deliver on. Funding is also dependent on contributions from members and non-state actors and is divided between membership fees (which account for about 20%), voluntary payments, and project-specific funding. The United States and the Bill and Melinda Gates Foundation were the two largest funders at the start of the pandemic, so when former president Trump threatened to leave the WHO in summer 2020 over what he claimed was a lack of independence from China, it hampered an already strained organization. The threat to defund and terminate ties with the organization dealt a critical blow to the WHO's credibility and ability to respond to the pandemic.[43]

While the virus spread from Wuhan around the world, reliance on the WHO's Geneva Secretariat's international presence and influence may have slowed and confused the responses of multiple countries, including Canada. For example, the WHO declared the disease a Public Health Emergency of International Concern (PHEIC) on January 30, two days after its director general visited Beijing. Declaring a PHEIC is one of the most powerful tools the WHO has in its arsenal, yet it was only after the WHO declared COVID-19 a pandemic on March 11 that many countries, including Canada, adjusted their approaches accordingly.[44] While experts often contend that the WHO's declarations were too late, in retrospect, it could also be said that Canada missed the significance of the WHO declaring a PHEIC on January 30, placed more emphasis on the declaration of a pandemic on March 11, and could have better relied on information from other sources and its own intelligence gathering.

Navigating the WHO's written materials and guidelines related to COVID-19 can be complicated as these documents number in the hundreds. Reflecting this complexity, in the summer of 2020, the WHO even went so far as to create its own guide to its guidelines.[45] Several of the WHO's changing guidelines have caused confusion and demonstrated a lag between the policies of many countries. For example, the WHO's initial reaction to travel restrictions and lockdowns expressed concern that these would hurt economies and supply of medical goods and do little to prevent the spread of the virus, which many economies and

subnational jurisdictions have shown to be incorrect (e.g., Australia, China, New Zealand, Taiwan). Similarly, the early stance on widespread use of masks was that they would create a false sense of security and take PPE away from those that needed it the most. By the time the WHO reversed this decision on the use of masks on June 5, 2020, it did so with hesitation expressing concern about personal comfort. By that time, over 100 countries around the world had already recognized the effectiveness of widespread mask use and adopted mask policies. The WHO continues to lack a clear stance on the role of aerosol transmission despite pleas from medical communities around the world about the need to mitigate against such risks. Thus, the actions of the WHO during the COVID-19 pandemic demonstrate how it has performed more as a slow-moving information depository rather than a fast-acting source for policy-oriented knowledge, as it had been in some previous health emergencies.

Pacific Islands Forum (PIF)

Year of founding: 1971

Members:

- 18 member states

  (Australia, Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu);

- 5 member states

  (Palau, Marshall Islands, Nauru, the Federated States of Micronesia, and Kiribati announced their intention to leave PIF in February 2021);

- 1 associate member territory

  (Tokelau); and

- 5 observer territories

  (American Samoa, Guam, Northern Mariana Islands, Timor-Leste, and Wallis and Futuna).

Structure:

- Governed by a 2005 agreement and the 2014 Framework for Pacific Regionalism;
- Annual leaders' meetings and a Forum Officials Committee set policy; foreign and economic ministers meet annually;
- PIF Secretariat implements policy based on most recent Strategic Framework; and
- Hosts annual dialogue with Forum Dialogue and Development Partners; chairs the Council of Regional Organisations in the Pacific (CROP).

Areas of co-operation:

- Originally focused on high-level political and economic co-operation, including foreign policy, security, trade and governance; and
- Most recent Strategic Framework (2017-2021) outlines four strategic outcomes: (1) promoting people-centred development; (2) maximizing the potential of our shared Pacific Ocean; (3) increasing economic prosperity; and (4) strong Pacific governance for a peaceful and stable region.

Relationship with Canada:

- Canada has been a dialogue partner with the PIF since 1989 and has primarily engaged with PIF member states on the issue of climate change; and
- Canadian contributions to international climate change adaptation initiatives (e.g., Green Climate Fund) have supported projects in Pacific Islands states.

The Pacific Islands Forum (PIF) is the primary political and security co-operation organization in the Pacific and has played an important role throughout the COVID-19 pandemic in co-ordinating a regional response. The PIF is one of multiple key regional organizations in the Pacific that are co-ordinated through the PIF-chaired Council of Regional Organizations in the Pacific, which includes the technical and scientific development co-operation-focused Pacific Community (SPC) and other organizations.

Due to the relative isolation of the Pacific Islands from the rest of the Asia Pacific, the region was spared from COVID-19 infection until mid-March, when imported cases through air travel prompted border closures and declarations of states of emergency. Concurrently, a steep drop in commercial air travel to and from the region affected ongoing efforts to acquire PPE and testing equipment, in addition to other humanitarian goods. Following an appeal on March 30, 2020, by Samoa for a regional response to the unfolding health and logistical crisis, Tuvalu, acting in its capacity as the chair of the PIF, triggered the Biketawa Declaration, the security declaration adopted by PIF leaders in 2000 that serves as the framework for co-ordinating regional responses to crises affecting PIF countries. It was the first time the Declaration had been invoked for a health crisis, which was provided for under the Boe Declaration of 2018 that expanded the PIF's definition of regional security to include human security and humanitarian assistance.[46]

With the PIF chair noting that "never before has the full Forum Membership simultaneously been in crisis,"[47] the foreign ministers of PIF members met on April 7 to approve a Pacific Humanitarian Pathway on COVID-19 (PHP-C), ensuring streamlined delivery of key medical and humanitarian supplies while respecting COVID-19 border controls through direct political co-ordination between PIF governments.[48] The PHP-C is overseen by a Ministerial Action Group composed of government ministers of seven PIF countries and supported through a regional taskforce composed of senior government officials and personnel from other key Pacific organizations such as the Pacific Community. On June 17, 2020, the Ministerial Action Group met for the first time and identified protocols that would prioritize the deployment of technical personnel, the transport of medical and humanitarian supplies, the repatriation of PIF state nationals, and the maintenance of biosecurity.[49] In August, the Pacific Humanitarian Team (PHT), helmed by the UN Office for the Coordination of Humanitarian Affairs, launched a humanitarian air service designed to support the PHP-C in transporting key goods and personnel across the region in the absence of sufficient commercial flights. Through close co-ordination with the WHO's Joint Incident Management Team (handling the regional public health response and explored in further detail later in this report) and the PHT (handling the regional humanitarian response), the PHP-C played an important political co-ordination role that facilitated existing efforts from other regional mechanisms. The PIF's pandemic response demonstrates that collaborations with other international organizations are necessary and vital to ensure the transportation of key goods and personnel.

Following an assessment of the socioeconomic impacts of the pandemic on PIF member economies, PIF economic ministers met on August 11-12. They agreed to release a statement appealing for financing and debt relief from the international community and established a regional COVID-19 Economic Recovery Taskforce.[50] Further meetings of

trade officials in November prioritized e-commerce as a significant component of existing PIF trade strategy plans and an increasingly important part of post-COVID-19 economic recovery.[51]

Overall, the PIF functions within an ecosystem through its interconnectedness of member states that collaborate to address the political and economic impacts of COVID-19, co-ordinate COVID-19 response plans with other organizations, and circulate policy actions.

Pacific Joint Incident Management Team (JIMT)

Year of founding: 2019

Members:

- 25 partner organizations

  (including the Asian Development Bank, Australian DFAT, International Federation of the Red Cross, International Organization for Migration, New Zealand MFAT, UN Office for Coordination for Humanitarian Affairs, Pacific Islands Forum, Pacific Islands Health Officers' Association, Pacific Community, UN Population Fund, UNICEF, UN Resident Coordinator Office, UN Development Programme, UNWOMEN, USAID, US CDC, US Embassy Suva, World Food Programme, World Bank, and World Health Organization); and

- 21 reporting states and territories

  (American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna).

Structure:

- Helmed by WHO Western Pacific Regional Office's Division of Pacific Technical Support;
- Divided into key pillars; and
- Weekly co-ordination meetings and consultation meetings with Pacific health ministers.

Areas of co-operation:

- Pandemic technical guidance and training;
- Disease surveillance;
- Medical equipment and PPE procurement and distribution;
- Laboratory testing; and
- Vaccine procurement and distribution.

Relationship with Canada:

- None at present.

Though we have highlighted individual organizations and bodies thus far, it is important to note that much of the pandemic response work accomplished at the regional level was the result of collaborative, ad-hoc initiatives between different organizations. For example, during the pandemic, the WHO Pacific Regional Office's Division for Pacific Technical Support worked with the Pacific Community (SPC) and a network of 25 other UN agencies and development partners to form a WHO Pacific Joint Incident Management Team (JIMT), which focuses on Pacific Island countries. This collaboration highlights the close-knit co-operation between regional bodies such as the SPC, the regional offices of the WHO, and other development institutions and NGOs that occurred during the pandemic.

Though much of the SPC's Public Health Division's pre-pandemic efforts were devoted to prevention and control of non-communicable diseases, which have been and remain significant challenges and burdens on Pacific health systems, the SPC has collaborated with the WHO since 1996 to develop the Pacific Public Health Surveillance Network (PPHSN), a network of public health laboratories and epidemiological focal points that shares health data, co-ordinates the procurement of testing and surveillance supplies, and conducts training for public health personnel. In the fall of 2019, the JIMT was formed to address a measles outbreak in the Pacific.[52] As case numbers of what became known as COVID-19 began to rise in the Asia Pacific region, the JIMT shifted to focus on this new emerging threat on January 28, 2020, two days before the WHO officially designated the outbreak a Public Health Emergency of International Concern.[53] A similar Pacific Humanitarian Team COVID-19 Humanitarian Response Plan was launched in May by the UN's Office for the Coordination of Humanitarian Affairs to handle non-medical humanitarian needs arising from the COVID-19 pandemic.[54]

In creating the JIMT, the WHO, the SPC, a wide range of partner organizations (such as UNICEF and the World Food Programme), and development partners (such as the Australian and New Zealand foreign ministries) combined forces and created a single cluster for health co-operation between Pacific Island countries and territories. Technical working groups focusing on various aspects of the COVID-19 response, including laboratory testing, PPE procurement, and point of entry measures, were developed to handle requests from countries and territories, co-ordinating a regional effort around that area. Beginning in February, the JIMT organized weekly co-ordination calls among Pacific health ministers and the WHO regional director, as well as held weekly meetings among partner organizations. These meetings became daily in March as the pandemic worsened around the world. By February 4, the JIMT had developed a Pacific Action Plan for the first six months of the pandemic and shifted to a Phase II implementation plan by mid-summer.

COVID-19 response supplies being unloaded in the Solomon Islands in April 2020, as part of the support packages organized under the Pacific Joint Incident Management Team with financial support from the Australian Department of Foreign Affairs and Trade.

Source: Department of Foreign Affairs and Trade, Government of Australia

Despite Pacific Island countries not having their first local cases of COVID-19 until early March, the JIMT led with a proactive approach toward preparing for potential future local outbreaks. In early February, the JIMT focused on assisting with point of entry detection and infection control measures, developing an inventory of PPE and laboratory equipment, and providing technical support to Pacific Island countries and territories in developing national response plans. As knowledge about the virus increased, the JIMT also adapted the WHO guidelines and protocols to the Pacific context and distributed a Pacific COVID-19 Toolkit to health ministries. Armed with US$1.3M in initial funding from the Australian and New Zealand governments, the JIMT began procuring PPE and other medical supplies with the aim of developing a regional stockpile and ensuring that each Pacific Island country or territory would have sufficient supplies in the event of an outbreak. The SPC also secured funding to expand laboratory testing capacity throughout the Pacific Island members, which only had four laboratories able to perform PCR testing prior to the pandemic (two of which were in Australia and New Zealand).

By the end of April 2020, approximately two months after Pacific Island states had registered their first cases, more than 368,109 individual items of medical and laboratory equipment had been delivered to Pacific Island countries and territories. RT-PCR testing capabilities had been established in four additional countries and territories in the Pacific, and 100,000 point-of-use GeneXpert PCR testing cartridges had been distributed, allowing rapid, local PCR testing in many Pacific Island countries and territories for the first time. The SPC conducted training webinars and technical forums with nurses, physicians, clinical directors, and health ministers to disseminate knowledge and experience about various aspects of COVID-19 response, ranging from the use of PCR tests to the development of digital contact tracing systems.

These efforts were brought about well in advance of the implementation of the Pacific Humanitarian Pathway for COVID-19 (approved by the Pacific Islands Forum in June 2020) and the receipt of PPE from the WHO's Global COVID-19 Supply Chain System (first shipment arrived in August 2020), amid a dearth of both PPE supplies and commercial flights to and from the region beginning in March. The central nature of the JIMT has also allowed it to efficiently distribute resources based on requests and need, and more effectively interface with potential donors and development partners.

Association of Southeast Asian Nations (ASEAN)

Year of founding: 1967

Members:

- 10 member states

  (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam); and

- 2 observer states

  (Papua New Guinea and Timor-Leste).

Structure:

- Guided by 2008 ASEAN Charter, which forms the legal framework underpinning the association;
- Annual leaders' meetings and biannual foreign ministers' meetings set policy; ministers of similar portfolios meet regularly;
- ASEAN Secretariat, divided into three community pillars, implement ASEAN policy; and

- Holds annual ASEAN Plus Three (ASEAN, China, Japan and South Korea) and East Asian Summit (ASEAN +3, Australia, India, and New Zealand) forums.

Areas of co-operation:

- Political-Security Community (foreign policy, transnational crime and terrorism, defence, etc.);
- Economic Community (finance, energy, digital economy, monetary policy, trade, etc.); and
- Socio-Cultural Community (education, health, labour, environment, disaster management, human rights, etc.).

Relationship with Canada:

- Canada has been a dialogue partner with ASEAN since 1977, and has had a dedicated ambassador to ASEAN since 2016;
- Canada-ASEAN co-operation is guided by the Joint Declaration on ASEAN-Canada Enhanced Partnership (2009), and implemented through joint plans of action, the most recent one having been signed for 2021-2025;
- Canadian contributions to ASEAN regional development include funding for biosecurity and public health emergencies (around C$16M allotted through Global Affairs Canada since 2013), support for MSMEs, and educational exchanges and scholarships;
- An ASEAN-Canada Free Trade Agreement, a priority item under Brunei's position of chair for 2021, is in discussions; and
- Canada contributed C$3.5M toward the ASEAN COVID-19 Response Fund in May 2021.

The Association of Southeast Asian Nations (ASEAN) is a regional organization that promotes economic, political, and security collaboration and integration through a process of consultation and consensus.

ASEAN has an established public health infrastructure owing to its experience fighting the SARS outbreak of 2003-2004 and various other communicable diseases in the region. For example, the ASEAN Emergency Operations Centre Network for public health emergencies (EOC) and the ASEAN BioDiaspora Regional Virtual Centre (ABVC) were created with

funding programs from Global Affairs Canada that began in 2013 to address emerging biological threats. Other existing public health infrastructure included the Regional Public Health Laboratories Network, the ASEAN Plus Three Field Epidemiology Training Network (ASEAN +3 FETN), and the ASEAN Risk Assessment and Risk Communication Centre.[55] These networks and centres, in particular, gave consistent opportunities for epidemiologists and infectious disease scientists in ASEAN member states to conduct training in other countries and discuss best practices and findings with their peers well before the pandemic. However, ASEAN lacked a specific agency responsive to epidemics or pandemics since the inactivity of the ASEAN Technical Working Group on Pandemic Preparedness and Response formed in 2008, and it did not develop a regional pandemic response plan akin to its Joint Disaster Response Plan formulated in 2017 for natural disasters.[56]

ASEAN began discussing the COVID-19 outbreak at the senior official level on January 3, 2020, based on a report from a Chinese epidemiological focal point relayed to the ASEAN Secretariat. By January 30, the date on which the WHO declared the outbreak to be a Public Health Emergency of International Concern, the EOC began publishing daily situational reports on the COVID-19 situation and facilitated real-time information sharing through instant messaging between ASEAN member state public health officials, while the ABVC provided disease outbreak modelling based on the information received from Chinese health officials and the WHO. On February 3, senior health officials of ASEAN states and China, Japan, and South Korea (ASEAN +3) held a special video conference sharing technical information on COVID-19. Further information-sharing sessions between Chinese and ASEAN senior health officials and experts were held on February 20 and March 12. Shortly after the WHO declared the COVID-19 outbreak to be a pandemic on March 11, ASEAN senior health officials held a video conference on March 13 to discuss the state of individual member states' pandemic response readiness and identified common gaps that could be addressed collectively through ASEAN.[57]

Coupled with official statements of concern from ministerial-level officials such as the ASEAN chair on February 15, ASEAN defence ministers on February 19, ASEAN foreign ministers on February 20, and ASEAN economic ministers on March 10, this timeline of action suggests that ASEAN leaders and health officials recognized the threat of COVID-19 and acted to facilitate a regional response to the growing outbreak comparatively early relative to other regional organizations, in the Asia Pacific and beyond. In particular, the existence of established infectious disease response networks and standing meetings between ASEAN health officials meant that knowledge sharing and policy co-ordination persisted on a regular basis throughout the pandemic.

In the first half of 2020, at least four video conferences discussing COVID-19 public health response and clinical management experiences in ASEAN countries were held through the EOC and ASEAN +3 FETN. Meanwhile, at least five video conferences were held between ASEAN health officials and foreign health officials – particularly those from countries with significant outbreaks such as China, Italy, and France – to share experiences combatting COVID-19 from across the world. Initiatives between ASEAN and various external countries also led to technical support and programming to enhance COVID-19 response, including a US$5M project with South Korea to increase molecular testing capability, several research and technical expertise projects with the European Union, and the beta launch of an online ASEAN Portal for Public Health Emergencies with Canada.

Flags of ASEAN member states raised for the 2011 ASEAN Summit in Jakarta, Indonesia.

Source: Gunawan Kartapranata

By the 37th ASEAN summit and related summits (e.g., ASEAN Plus Three and East Asia Summits) in mid-November 2020, ASEAN member states were able to propose, develop, and launch the following initiatives specifically targeted to addressing problems caused by the pandemic:

- The Hanoi Plan of Action, a non-binding commitment from ASEAN member states to refrain from placing trade restrictions on essential goods such as food and medical supplies (a similar commitment was issued between members of the ASEAN Plus Three grouping);[58]

- An ASEAN Strategic Framework for Public Health Emergencies, to complement the existing ASEAN Joint Disaster Response Plan and other mechanisms for natural disaster response;[59]
- A new Centre for Public Health Emergencies and Emerging Diseases, with funding from Japan and Australia, which will become the key co-ordinating body of ASEAN's regional response to disease outbreaks, providing technical support and facilitating outbreak reporting and information sharing;[60]
- An ASEAN COVID-19 Response Fund launched with approximately US$10M in initial pledges from ASEAN member states and dialogue partners;[61]
- An ASEAN Regional Reserve of Medical Supplies for Public Health Emergencies,[62] with initial seed contributions from the 2020 ASEAN chair, Vietnam;[63]
- An ASEAN Comprehensive Recovery Framework with five broad strategies implemented over three phases, with one section on enhancing member states' and ASEAN's health systems capacity to deal with infectious diseases but with most of the plan dedicated to socioeconomic recovery, including food security, unemployment, trade integration, digital transformation, and sustainable development; and[64]
- A declaration agreeing in principle to the formation of an ASEAN travel bubble, called the ASEAN Travel Corridor Arrangement Framework.[65]

The announcements of major COVID-19 response initiatives over the course of the November ASEAN Summit and related meetings have largely been overshadowed by the February 1 coup in Myanmar, which has so far presented a major challenge to the bloc's "ASEAN Way" approach of dealing with political crises within member states consisting of non-interference, quiet diplomacy, no use of force, and decision-making through consensus. However, advancements toward the implementation of the ASEAN Comprehensive Recovery Framework have been highlighted in several high-level meetings and conferences since the beginning of 2021.[66]

Despite these developments, it is unclear just how many funds have been raised for widely touted new initiatives such as the ASEAN COVID-19 Response Fund and the ASEAN Regional Reserve of Medical Supplies for Public Health Emergencies, nor is there any clear indication that these funds and reserves have been dispensed effectively to support member states. Though there were media reports in February 2021 suggesting that ASEAN member states had considered using US$10M of the US$15M raised thus far in the ASEAN COVID-19 Response Fund to acquire vaccines for the bloc, there has not been any official confirmation of any such action from ASEAN.[67] Furthermore, as of June 2021, though

many leaders and officials have encouraged the speedy establishment of the ASEAN Travel Corridor and the ASEAN Centre for Public Health Emergencies and Emerging Diseases, these measures are still in the process of development and implementation.

There are lingering questions about how much of Southeast Asia's relative success in containing the COVID-19 pandemic in 2020 and early 2021 can be attributed to ASEAN's regional response. During the first wave of the pandemic in spring 2020, as with most of the world, many ASEAN countries took their own national and local measures against the outbreak and did not pursue policy co-ordination with neighbouring countries. Furthermore, though some ASEAN member states have been considered model examples of COVID-19 containment, others have struggled to manage large waves of infection. Crucially, the entire region has faced unprecedented spikes of COVID-19 cases since the emergence of the Delta variant of COVID-19 during spring 2021, and as of June there is no indication of ASEAN co-ordination on vaccine procurement and distribution, seen as the key to stemming this current wave.[68] Some commentators have criticized the lack of co-ordination on issues that fall squarely within the ambit of the intergovernmental organization, such as migrant workers' issues, and have noted that the arrival of proposals to create novel initiatives to respond to the pandemic only began in the April 2020 special ASEAN summit, a month after COVID-19 was declared a pandemic.[69] The joint statement of the ASEAN Peoples' Forum, a collection of civil society groups and individuals meeting on the sidelines of the November ASEAN Summit, went so far as to call ASEAN's collective response "largely token and unco-ordinated," with country-based responses to the socioeconomic impacts of the pandemic "inadequate and inefficient."[70]

However, ASEAN's actions need to be considered in the context of the bloc's structure, which prioritizes members' autonomy and consensus-building over centralized policy-making, and the worldwide state of multilateralism, which has also been widely considered to have faltered in the face of the current crisis. ASEAN's lack of a regional pandemic response plan and co-ordination centre, akin to the mechanisms previously created for natural disasters, meant that any initiatives specific to a collective pandemic response necessarily had to be negotiated and built anew while member states have been managing ongoing outbreaks and, since February 2021, a political crisis in Myanmar. Regular meetings within various sectors and all levels of government, as well as existing institutional infrastructure for disaster management and health co-ordination, likely contributed to the relatively rapid agreement and alignment of ASEAN member states on these new mechanisms. These mechanisms illustrate the potential that ASEAN's relatively robust regionalism has to offer for creating regional solutions to collective threats.

Asia-Pacific Economic Cooperation (APEC)

Year of founding: 1989

Members:

- 21 member economies

  (Australia, Brunei, Canada, Chile, China, Hong Kong SAR, Indonesia, Japan, South Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taiwan, Thailand, United States, and Vietnam).

Structure:

- Annual economic leaders' meeting hosted by host economy, which rotates on an annual basis, set policy agenda; annual ministerial meeting of foreign and economic ministers provides recommendations to leaders;
- Decision-making based on consensus, and all agreements and initiatives are voluntary and non-binding;
- Sectoral ministerial meetings, four high-level committees, and working groups carry out APEC's work and initiatives; and
- APEC Study Centres Consortium and APEC Business Advisory Council allow for engagement with academic and business sectors of member economies.

Areas of co-operation:

- Guided by 1994 Bogor Goals, APEC aimed to "free and open trade and investment in the Asia Pacific" by 2020;
- Key pillars include trade and investment liberalization, business facilitation, and economic and technical co-operation; and
- Working groups' mandates span from digital economy and tourism to global health and counter-terrorism.

Relationship with Canada:

- Canada was one of the original 12 founding members; and
- Canada has been a co-chair of the APEC Health Working Group for 2018-2018 (with Papua New Guinea) and 2020-2021 (with Malaysia).

The Asia-Pacific Economic Cooperation (APEC) is a regional economic forum dedicated to leveraging the growing interdependence of the Asia Pacific. Every year one of the members serves as host.

Malaysia was challenged with hosting APEC in 2020, when the organization shifted its focus toward COVID-19 responses and virtual meetings. APEC's first policy briefs and reports on COVID-19 came out in April that year. At that time, the link between public health and economic resilience became an explicit part of its agenda when it recognized that the APEC region accounted for 40% of COVID-19 cases. The agenda sought to respond to how the pandemic would dramatically shrink the APEC region's economic output, leading to the unemployment of 23 million people. However, its take on the pandemic was not only driven by concerns over the economy. APEC noted that health-care systems were strained as a result of a shortage of beds and medical supplies. Thus, regional co-operation would be crucial for the region's response and economic recovery plan. Regional co-operation among APEC countries called on members to exchange information, keep supply chains open, and co-ordinate policy.[71] Over the course of the year, APEC working groups included pandemic-related discussion in their wide-ranging work including food security; micro, small, and medium-sized enterprises (MSME) digitization; tourism; and health.

Health has been a key agenda within APEC since the outbreak of SARS in 2003. It was quick to recognize the impact of epidemics on business and the economies within its members and created a Health Task Force that year. Over the next few years, APEC raised awareness in addressing avian and influenza pandemic preparedness. In 2007, it pitched the need for a set of guidelines for how to keep APEC economies functioning during a pandemic.[72] In support of creating such guidelines and the importance of the relationship between public health and economic growth, APEC raised the status and capacity of the task force by turning it into the Health Working Group (HWG). Since then, the HWG has worked to raise awareness of the relationship between health and the economy, trade, and security among its members and it has also engaged with the WHO and ASEAN.

Canada, being one of the HWG co-chairs with Malaysia for 2020-2021, has helped shape the dialogue during the pandemic thus far.[73] In 2020, the HWG held two virtual meetings (February and September), focusing on COVID-19 and stressing the need for co-operation and collaboration. It expressed its continued support for the Vaccination Action Plan, which aims to support member economies to vaccinate their populations and overcome three key challenges: supply chain interruption, vaccine hesitancy, and regulation for vaccine approval. Canada's chair stressed the importance of digital literacy for improving the implementation of vaccination programs and boosting vaccine confidence. Its latest five-year plan (2021-2025), which it approved at the September meeting, emphasizes

a "Health in All Policies" approach with a focus on the intersection between health and economy. The HWG will also continue to engage with and build on related work by other global and regional dialogue mechanisms.[74] The Steering Committee on Economic and Technical Cooperation is currently reviewing the HWG's work as part of regular four-year cycle reviews to determine if its mandate will continue for another four years. News is expected in August.

APEC's broader pandemic responses include a holistic approach to economics through unlocking the potential of MSMEs. The pandemic exposed female workers and MSMEs to the economic challenges of adjusting to a contact-less environment. Thus, APEC has brought significant attention to advancing policies surrounding access and effective use of digital technologies. By adopting digital solutions, MSMEs can manage transactions at a distance, efficiently deliver goods, facilitate access to financial services, and engage with new and existing customers. APEC's discussions of adapting to digital spaces encourage its 21 member economies to prioritize these items on its agenda.

Overall, APEC's pandemic response reveals the significance of maintaining co-operation in exchanging information and co-ordinating policies during health crises. APEC promoted policies of boosting vaccine confidence, ensuring the equitable distribution of vaccines, co-ordinating the smooth flow of essential goods, and advancing digital infrastructure. APEC's role in the ecosystem of international organizations has thus been to generate agreement and momentum around shared pandemic response policies.

Asian Development Bank (ADB)

Year of founding: 1966

Members:

- 68 total members
- 49 regional members

(Afghanistan, Armenia, Australia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Cook Islands, Federated States of Micronesia, Fiji, Georgia, Hong Kong SAR, India, Indonesia, Japan, Kazakhstan, Kiribati, Kyrgyzstan, Laos, Malaysia, Maldives, Marshall Islands, Mongolia, Myanmar, Nauru, Nepal, New Zealand, Niue, Pakistan, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, South Korea,

Sri Lanka, Taiwan, Tajikistan, Thailand, Timor-Leste, Tonga, Turkmenistan, Tuvalu, Uzbekistan, Vanuatu, and Vietnam); and

- 19 nonregional members

  (Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States).

Structure:

- Board of Governors, composed of one representative from each shareholder country, sets policy and elects Board of Directors, a 12-member body responsible for the operation of the bank;
- Voting power is distributed according to number of shares held in the bank, with Japan and the United States holding the largest number of votes (around 15% each); and
- Management team headed by President, who has traditionally been a Japanese national, and divided into various thematic departments and country offices throughout the region.

Areas of co-operation:

- ADB defines itself as a development organization dedicated to poverty reduction in the Asia Pacific through public sector lending, economic growth, and regional development; and
- Five key areas of co-operation include education; environment, climate change, and disaster risk management; finance sector development and infrastructure; regional co-operation and integration; and private sector lending.

Relationship with Canada:

- Canada is a founding member of the ADB and has a voting share of roughly 4.5%; and
- Since the ADB's inception, Canada has provided over US$8B in capital subscription.

The ADB defines itself as a development organization dedicated to poverty reduction in the Asia Pacific, through economic growth and regional development. This is achieved primarily through public sector lending along five key areas: education; environment, climate change, and disaster risk reduction; finance sector development and infrastructure; regional co-operation and integration; and private sector lending. During the COVID-19 pandemic, the ADB presented rapid responses through financing vaccine procurement and financing to protect economies, governments, private sectors, and vulnerable groups.

Since the start of the pandemic, the ADB shared presentations, working papers, policy briefs, and reports on challenges to fighting the pandemic (e.g., PPE supply chain bottlenecks and shortages), data on responses of its member countries, and various budget support mechanisms that it developed in response to the 2008 financial crisis, as well as the Asia Pacific Disaster Response Fund (APDRF), which it has since applied to its response to COVID-19.

Health care workers set up a COVID-19 vaccination site in Caloocan City, Philippines in June 2021. The vaccines were procured with the assistance of the Asian Development Bank's COVID-19 Asia Pacific Vaccine Access Facility (APVAX).

Source: Asian Development Bank

The APDRF was established as a special grant in 2009 to provide fast-tracked funds to developing member countries (DMCs) for emergency life-saving purposes in the immediate aftermath of major disasters triggered by a natural hazard. Prior to the pandemic the fund had been exclusively applied to natural hazard-related emergencies in the region, an instance of disaster planning and preparation being applied to the COVID-19 crisis.

Between March and April 2020, the fund was applied directly to procuring emergency medical equipment and PPE, paying front-line health-care workers, improving testing capacity, alleviating immediate response needs, and delivering appropriate medical services in DMC locations.

In April 2020, the ADB published a brief describing its approach to DMCs in responding to the pandemic and the related crisis through finance, knowledge, and partnerships. The brief describes a "three-pronged approach: (i) support countries' immediate needs to respond to the pandemic and its secondary effects; (ii) strengthen sector-wide pandemic preparedness, stabilize the economies, and strengthen health systems; and (iii) address systemic constraints limiting effective responses, working with the private sector and international organizations like the United Nations."[75]

In the pandemic's initial stages, the ADB's disaster response mechanisms played an important role in the pandemic response timeline and budget overall. In March 2020, the ADB provided an initial COVID-19 support package to its DMCs totalling US$6.5B. In the following two months, under the APDRF, the ADB granted:

- US$3M to the Philippines;
- US$3M to Indonesia;
- US$500,000 to Maldives;
- US$1M to Mongolia;
- US$2M to Pakistan; and
- US$1.53M to the Federated States of Micronesia.[76]

In December 2020, the ADB Board of Directors approved the Asia Pacific Vaccine Access Facility (APVAX), a US$9B financing instrument to facilitate COVID-19 vaccinations across DMCs. As of December, APVAX had approved four constituencies for funding: Indonesia, Philippines, Afghanistan, and South Pacific Islands. The ADB plans to prepare a series of country-specific financing proposals to meet the unique needs of DMCs while enhancing the ADB's ability to process support faster and with lower transaction costs. The APVAX facility and the policy variations described in the plans are slated to take effect over 36 months from the December Board approval and may be extended for up to 24 months subject to the outcome of a review and prior Board approval.[77] Canada has provided US$8B in capital to ADB as of December 31, 2020, and has contributed and committed US$2.11B to Special Funds since joining the bank.[78]

Asia Infrastructure Investment Bank (AIIB)

Year of founding: 2015

Members:

- 86 total full members and 17 prospective members
- 46 regional full members

  (Afghanistan, Australia, Azerbaijan, Bahrain, Bangladesh, Brunei, Cambodia, China, Cook Islands, Cyprus, Fiji, Georgia, Hong Kong, India, Indonesia, Iran, Israel, Jordan, Kazakhstan, South Korea, Kyrgyzstan, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Oman, Pakistan, Philippines, Qatar, Russia, Samoa, Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Tonga, Turkey, United Arab Emirates, Uzbekistan, Vanuatu, and Vietnam); and
- 40 nonregional full members

  (Algeria, Argentina, Austria, Belarus, Belgium, Benin, Brazil, Canada, Côte d'Ivoire, Denmark, Ecuador, Egypt, Ethiopia, Finland, France, Germany, Ghana, Greece, Guinea, Hungary, Iceland, Ireland, Italy, Liberia, Luxembourg, Madagascar, Malta, Netherlands, Norway, Poland, Portugal, Romania, Rwanda, Serbia, Sudan, Sweden, Switzerland, United Kingdom, and Uruguay).

Structure:

- Board of Governors, composed of one representative from each shareholder country, sets policy and elects Board of Directors, a 12-member body responsible for the bank's operation;
- Voting power is distributed according to number of shares held in the bank, with China holding the largest number of votes (around 26.1%); and
- Management team headed by President and divided into various thematic departments.

Areas of co-operation:

- AIIB focuses on sustainable infrastructure development lending, or "Infrastructure for Tomorrow"; and

- Lending revolves around four thematic priorities: green infrastructure; connectivity and regional co-operation; technology-enabled infrastructure; and private capital mobilization.

Relationship with Canada:

- Canada joined the AIIB in 2018, with a capital subscription of roughly US$1B and a voting share of roughly 1%.

Like the ADB, the Asia Infrastructure Investment Bank (AIIB) also refocused its efforts and project funding in response to the pandemic. The AIIB is a multinational bank focused on supporting sustainable infrastructure projects mainly in developing Asia that formed in 2016 (Canada joined in 2018). The purpose of the AIIB has been to (1) foster sustainable economic development and invest in infrastructure and productive sectors to improve infrastructure connectivity in Asia and create wealth; and (2) promote regional co-operation and partnership.[79] As a bank with a mission of improving social and economic outcomes in Asia through infrastructural development, the pandemic directed the AIIB's focus toward targeting economic recovery and vaccine accessibility. By adapting to achieving these goals, the AIIB has shifted from its original mandate of infrastructural funding to mitigate economic, financial, and public health pressures arising from COVID-19.[80]

The AIIB's COVID-19 response began in February when it first donated US$1M to help secure medical supplies for Wuhan and Beijing, China. The AIIB sourced medical supplies globally to donate 51,000 medical masks, 46,000 protective clothing items, 17,000 surgery aprons, 21,000 boxes of surgery gloves, and other essential prevention supplies.[81] It donated a total weight of 40 tons of equipment to Wuhan and Beijing on February 24, 2020, with more batches to follow.

In April, the AIIB committed to creating a US$5B COVID-19 Crisis Recovery Facility (CRF) that would operate from April 2020 to October 2021. It later increased available financing to US$13B and extended the availability to April 16, 2022, "to both public and private sector entities in any AIIB member facing, or at risk of facing, serious adverse impacts as a result of COVID-19."[82] The CRF will provide emergency financing in addressing needs for public health financing and alleviating liquidity constraints of productive sectors.[83]

Historically, the AIIB has lacked a clear presence in health projects while the ADB has maintained a strong presence in health financing.[84] With the pressures of the pandemic

mounting on countries globally, the AIIB was forced to halt its funding for infrastructure projects. The pandemic has propelled the AIIB's funding to shift to supporting and prioritizing vaccine accessibility for low- and middle-income nations through its CRF. So far, most of the AIIB's health projects are co-financed under the ADB's APVAX.

Under the CRF, the AIIB launched vaccine financing to foster sustainable economic recovery through vaccine procurement and rollout. The AIIB's Board of Directors approved a loan of US$300M to procure COVID-19 vaccines in the Philippines for its first vaccine financing project. The loan is co-financed with the ADB, where the ADB plans to support the Philippines government's efforts in providing vaccines for approximately 50 million people. The AIIB will also provide immediate financing support of US$21M to the government of Mongolia to procure vaccines through APVAX.[85] The project will be supported under AIIB's CRF and the ADB's APVAX to ensure timely access to eligible COVID-19 vaccines in supporting economic and social recovery in Mongolia.

Like other international organizations mentioned in this paper, AIIB reports have emphasized the significance of using digital infrastructure as a method of economic recovery and preparedness for future crises. While COVID-19 forced many businesses to transition to e-commerce, the AIIB pointed out that e-commerce operations are mostly based in developed markets, with developing nations lacking adequate logistics and infrastructure to enable this shift. Therefore, AIIB has suggested that digital inclusion of developing nations, MSMEs, and women-led businesses is necessary to support social and economic recovery from COVID-19.[86]

AIIB's research through the pandemic stresses the importance of multilateral development banks which bring financiers together to ensure consistent socioeconomic projects and provide counter-cyclical financing and protection against political risk.[87] In attempts to uphold international standards of quality, safety, and equity in vaccine financing, the AIIB is working closely with other multilateral development banks like the World Bank, IMF, and the International Finance Corporation.[88] Through these institutions, government officials can interact with each other in summit meetings to prioritize actions and mobilize to achieve policy goals. Participation is crucial in the meetings as it often influences decision-making for pandemic responses. The pandemic has revealed that international financial institutions can support the public and private sector to mitigate the impacts of COVID-19 and provide a safety net for the vulnerable. Collaborations among these banks demonstrate the importance of interconnectivity to foster information sharing, mutual observation, and mutual learning across East Asia.[89]

In response to the economic challenges brought on by COVID-19, the AIIB forecasts a future shaped by green infrastructure, social infrastructure, asset recycling or privatization, technology-enabled infrastructure, and connectivity and regional co-operation. COVID-19 has shifted efforts in the world to prepare for ecocatastrophes, forcing international organizations to consider environmental, social, and governance standards in business activities. The AIIB suggests that stimulus packages for members can be oriented toward sectors and technologies that improve resilience to future environmental changes and crises. The pandemic has also exposed global under-investments in social infrastructure, revealing a deficit in basic health-care facilities in all countries. Not only is public investment in social infrastructure encouraged for handling future crises, but connectivity infrastructure is also promoted. COVID-19 has increased our awareness of how technologies can be used in various ways. Investing in connectivity infrastructure will be essential to building more resilient supply chains. With the economic challenges countries face from the pandemic, the AIIB foresees that governments will promote asset recycling or privatization to alleviate fiscal constraints. By fostering a low-interest-rate environment, private investors and companies can take advantage of investment opportunities.[90]

Overall, the pandemic has shifted the AIIB's focus from its main mission of funding infrastructure to health-care funding. The CRF funding emerged near the beginning of the pandemic and grew dramatically to help ensure the equitable distribution of vaccines for low and middle-income countries. Meanwhile, the APVAX facility demonstrates the significance of collaborating with other international organizations such as the ADB. As a development bank with a history of financing health projects, the ADB had greater experience in responding to health crises. By collaborating with the ADB, the AIIB was able to better structure its redirection of financing health projects. Both banks also share the same vision of a sustainable economic recovery, allowing its co-ordination of pandemic responses to flow smoothly within an ecosystem framework.

Council for Security Cooperation in the Asia Pacific (CSCAP)

Year of founding: 1993

Members:

- 21 member committees

  (Australia, Cambodia, Canada, China, European Union, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, North Korea, Papua New Guinea, Philippines, Russia, Singapore, South Korea, Thailand, United States, and Vietnam); and

- The Pacific Islands Forum is an associate member.

Structure:

- Track 1.5 and Track 2 dialogue mechanism between strategic studies centres in the Asia Pacific region, closely integrated with ASEAN;
- Governed by the CSCAP Charter, which establishes a Steering Committee co-chaired by an ASEAN member and non-ASEAN member, and a permanent Secretariat; and
- Steering Committee meets twice annually; several subcommittees and study groups meet on operational and regional security issues.

Areas of co-operation:

- Non-governmental forum on regional security, maritime, and peacekeeping issues; and
- Focuses on producing policy documents and building consensus on issues considered too sensitive for official dialogues.

Relationship with Canada:

- Canada was a founding member;
- The Asia Pacific Foundation of Canada serves as Canada's CSCAP committee; and
- Canada will co-lead a new study group on COVID-19 and pandemic-era security in the Asia Pacific, approved by the Steering Committee in July 2021.

Pandemic-related issues have influenced security dialogue mechanisms in Asia over the last year, paralyzing the activities of some and shifting directions of others to address the crisis. For example, the Council for Security Cooperation in the Asia Pacific (CSCAP) recognized that the spread of COVID-19 has changed international relations dynamics and that the post-pandemic world will likely feel and operate differently. CSCAP is a Track 1.5 and Track 2 dialogue focused on peacekeeping, maritime, and security issues and is closely integrated with ASEAN in its overlapping membership, priority issue areas, and communication channels.

CSCAP has in the past dedicated some of its discussions to health issues. For example, in the early 2000s it created a study group around avian flu and SARS. To date, however, CSCAP member committees have not focused on the COVID-19 pandemic, with the notable exception of a 2020 Australia National University led ad-hoc perspective series on COVID-19 and security.[91] The CSCAP 2021 Outlook suggests that the pandemic facilitated a dramatic shift in US-China relations for the worse by eliminating any prior sense of collegiality in their previously tense relationship. It also suggests that the post-Cold War era trend of allowing markets and efficiency to dictate international trade is being replaced by steps toward a new focus on economic, trade, and supply chain resilience.[92] In July 2021, however, the CSCAP Steering Committee approved a proposal by the Asia Pacific Foundation of Canada (Canada's acting CSCAP secretariat) for a three-part study group on COVID-19 and pandemic-related security in the Asia Pacific. APF Canada will lead this study group together with New Zealand and Vietnam and potential participants include some of Asia's most marginalized states, including North Korea and Myanmar. The study group will consider pandemic-related great power relations, economic recovery, and preparation.

Within the framework of an ecosystem, CSCAP holds great potential to conduct research and development on health crises policy to build regional confidence and security co-operation across the Asia Pacific. In times of future health crises, CSCAP's contributions of dialogues, consultations, and co-operation can breed policy discussions among government and non-government actors. Since CSCAP consists of a variety of contributors with their own sets of diverse experiences, knowledge, and expertise, CSCAP can offer more comprehensive perspectives to explore and analyze health security policy trends. Considering Canada's recent involvement in CSCAP through APF Canada's study group on COVID-19 and pandemic-era security in the Asia Pacific, Canada can explore the possibility of shaping CSCAP's work. The Canadian government has the option of playing a more integral role in supporting research behind health crisis planning from a security-focused perspective. With the support of the Canadian government, the Public Health Agency of Canada also has the possibility of fitting into the ecosystem by collaborating with CSCAP to better prepare for Canada's health crisis planning.

Quadrilateral Security Dialogue (Quad)

Year of founding: 2007 (first iteration); 2017 (current iteration)

Members:

- 4 member states

  (Australia, India, Japan, and the United States)

Structure:

- Irregularly scheduled summits between leaders of the four member states;
- Occasional meetings with leaders from New Zealand, South Korea, and Vietnam (termed the "Quad Plus"); and
- Three working groups were established in March 2021 to facilitate initiatives around COVID-19 vaccine deployment, climate change response, and strategies for emerging and critical technologies.

Areas of co-operation:

- Originally focused on security co-operation between democratic states, most recently around the concept of the "Free and Open Indo-Pacific"; and
- Since March 2021, scope has expanded to include COVID-19 vaccination, climate change, and emerging technologies through new working groups.

Relationship with Canada:

- None at present, though Canada has participated in regional "freedom of movement" operations in the South China Sea.

The Quadrilateral Security Dialogue (the Quad) is an example of the increasing trend toward minilateralism in the Asia Pacific that has also pivoted to address health-related issues since the beginning of the COVID-19 pandemic.[93] The Quad is an informal alliance with shared concerns over China's growing influence in the region. Since 2020, the group has agreed to focus on working together to strengthen and assist countries in the Indo-Pacific with COVID-19 vaccination, in close co-ordination with the existing relevant multilateral mechanisms including WHO and COVAX. The current agenda includes co-operating on safe and effective COVID-19 vaccine manufacturing in 2021.[94]

In March 2020, at the request of the United States, Quad members held the first meeting of the "Quad Plus," an expanded iteration of the existing Quad including representatives from New Zealand, South Korea, and Vietnam to discuss their respective approaches to the growing pandemic.

In March 2021, at its first summit meeting held virtually, the Quad pledged to launch a senior-level Quad Vaccine Experts Group, the Quad Climate Working Group, and the Quad Critical and Emerging Technology Working Group to respond to the economic and health impacts of COVID-19. It had been reported before the summit meeting that the four countries were working to develop a plan to distribute COVID-19 vaccines to countries in Asia as part of a broader strategy to counter China's influence (including its so-called "vaccine diplomacy"), and that India had urged the other three countries to invest in its vaccine production capacity. While publicly available documents on the Quad are limited and the group is not accountable to any legally binding framework, they appear to be on track to move forward with plans as stated above. The next summit meeting is slated to be held in person by the end of 2021.

Canada's involvement in Quad activities has been limited. Canada's first participation in a Quad military exercise took place in January 2021 when the Royal Canadian Air Force joined the Quad naval exercise "Sea Dragon" in the Pacific Ocean. Nonetheless, the Canadian foreign policy community has discussed Canada's potential to engage with the Quad in future initiatives.[95]

Infectious Disease Surveillance Networks

In the wake of past outbreaks of SARS, Ebola, Zika, and other diseases, the emergence of regional infectious disease surveillance networks reflects the growing connections among countries, with disease outbreaks shifting from local to regional to global levels. Regional disease surveillance networks focus on sharing information and monitoring outbreaks using technology and surveillance. In contrast to more formal international organizations such as the WHO, these networks tend to reflect cross-border collaborations between epidemiologists, scientists, ministry officials, health workers, border officers, and community members, in ways that complement national and local initiatives already in place. These types of networks have grown in recent years, and expanded to include training, capacity-building, and multidisciplinary research. Today, six of these networks are linked through Connecting Organizations for Regional Disease Surveillance (CORDS), two of which (Mekong Basin Disease Surveillance Foundation and The Asia Partnership on Emerging Infectious Diseases Research) are based in the Asia Pacific.[96]

MEKONG BASIN DISEASE SURVEILLANCE FOUNDATION

The Mekong Basin Disease Surveillance (MBDS) Foundation is a self-organized network started in 2001 that connects six regional Mekong Basin countries in disease surveillance and outbreak response at the national and subnational levels. MBDS is a component of the outbreak reporting system Program for Monitoring Emerging Diseases (ProMED), spearheaded by health ministries from member countries to collaborate on infectious disease surveillance and control. The Ministries of Health of Cambodia, China, Laos, Myanmar, Thailand, and Vietnam signed a memorandum of understanding in 2001 in Kunming, China, with the regional co-ordinating office agreeing to be located in the Thai Ministry of Public Health.[97]

During 2020, the MBDS engaged in a number of cross-border disease prevention activities including the "Exchange situation of pandemic (COVID-19) in Point of Entry (POE) screening measures and surveillance cooperation on disease prevention and investigation meeting," a bilateral meeting between Thai and Laotian border health authorities. In the fall and winter of that year, the group co-published reports on COVID-19 response efforts among Mekong Basin countries, held meetings and forums on disease prevention, and presented overviews of COVID-19 responses with a focus on regional collaboration and lessons learned during the pandemic. These activities were aimed at containing the spread of COVID-19, sharing information on the outbreak transmission, co-ordinating individual and collective responses, case management and stakeholder collaboration, and deployment of human and material resources in outbreak control. The network has also applied tools such as Geographic Information Systems and engaged in tabletop and simulation exercises on pandemic response at the country and regional levels. Following a simulation in May 2021, leaders in participating countries gathered virtually to discuss the outcomes of the scenarios and present their findings and lessons learned.[98]

THE ASIA PARTNERSHIP ON EMERGING INFECTIOUS DISEASES RESEARCH

The other Asia Pacific-focused infectious disease surveillance network operating within the CORDS umbrella is the Asia Partnership on Emerging Infectious Diseases Research (APEIR). Established in 2006 to promote regional collaboration on all emerging infectious diseases, APEIR consists of researchers, health practitioners, and government authorities from Cambodia, China, Laos, Indonesia, Thailand, and Vietnam. The group's focus is on communication and knowledge sharing with an emphasis on reducing the impact of infectious disease outbreaks in poor and marginalized groups in the region.

A recent collaborative webinar among CORDS and two other regional health networks focused on vaccine equity in Asia. The webinar was attended by 97 participants from various institutions and backgrounds, including government, universities, private sector, and others, representing at least 10 countries. Participants shared best practices and opportunities to improve COVID-19 vaccination in countries in the region, with a particular focus on underserved groups and addressing gaps to vaccine access in those locations.[99]

Subnational Networks and Regional Civil Society

The membership of most international organizations looked at thus far in this report is made up of states, technical experts, and major economies. Subnational and non-state actors can often participate in these organizations, but their voices, perspectives, and needs are not always included or highlighted in organizational initiatives or documentation. Meanwhile, many of these actors have set up their own organizations and networks, collaborating and sharing information throughout the pandemic. While these activities fall outside of the traditional conception of international organizations, their work merits inclusion in this report for the vital role they have played in documenting, supporting, and facilitating local and grassroots responses to the pandemic. COVID-19 has had a disproportionately negative impact on women, the elderly, Indigenous and ethnic minority communities, youth, and other vulnerable populations in the Asia Pacific, just as it has in Canada. Additionally, local governments and communities have often had a disproportionate burden in implementing public health measures and providing COVID-19 economic and humanitarian relief. We examine three broad categories of subnational and non-state organizations below: local government, Indigenous peoples, and civil society.

LOCAL GOVERNMENT

Subnational governments are often more connected with local realities and more responsible for social services and public health measures directly impacting communities on the ground. They are therefore valuable sources of information and important partners in effective pandemic response for national governments and international organizations.[100] Many local governments in the Asia Pacific have been connected through the United Cities and Local Governments organization, a global network of municipalities that also includes regional chapters, such as its Asia-Pacific section (UCLG ASPAC) based

in Jakarta, Indonesia. Building on its existing efforts to advocate for local governance and address development issues, which included finalizing a manifesto for its work through 2021-2025, UCLG ASPAC also pivoted to increase co-operation and policy sharing between its member cities by collecting COVID-19 best practices from different Asia Pacific cities in a report published in April 2020, organizing numerous webinars on COVID-19 response and urban resilience, and facilitating the donations of medical supplies between member cities.[101]

Our interview with representatives from the Federation of Canadian Municipalities (FCM), the leading organization representing Canadian municipalities at the federal and international level, also confirmed that Canadian cities have been engaging through the global UCLG network. Bev Esslinger, a city councillor from Edmonton, shared how experiences raised by mayors and councillors from other parts of the world resonated with the challenges that Edmonton was facing, such as the importance of gender considerations in local pandemic response and the issue of homelessness due to the pandemic.[102] Furthermore, FCM has been involved in international co-operation programs with cities throughout the world, including those in Vietnam and Cambodia, which have had to adapt during the pandemic.[103] These collaborations and interactions between cities across the Asia Pacific highlight underappreciated and underutilized pathways for Canadian governments to engage. Canada, in future, could take better advantage of these pathways to further understand, reach out to, and work with local governments around the world in foreign policy and pandemic response.

INDIGENOUS PEOPLES

Domestic organizations in Asia Pacific countries have played important roles in responding to the pandemic by helping meet Indigenous communities' needs. Assistance has included supporting quarantine efforts and movement of people, securing food and PPE, COVID tests, and educating populations on COVID-19 and mitigation measures.[104] However, Indigenous participation in international co-operation has also been increasingly pronounced in recent years, particularly surrounding the issue of Indigenous health and business. In the years preceding the pandemic, Indigenous people in Canada, Australia, and New Zealand organized numerous exchanges and studies that focused on transnational Indigenous health issues.[105] For example, the International Group on Indigenous Health Measurement, a network of government and non-government personnel from these countries (plus the United States), initiated meetings between 2005 and 2013.[106]

There remains significant potential to build off such work and existing networks, either directly with grassroots or local initiatives or via international organizations in the Asia Pacific. One avenue to support this could be through APEC, as one of New Zealand's goals as chair this year is to create space to discuss Indigenous issues.[107] Its work to establish an Indigenous business leaders' dialogue could be expanded to include health considerations. Another potential opportunity is through supporting the work of the WHO's Health and Human Rights Team, which has driven Indigenous health work at that organization.[108]

International Indigenous organizations have also played a significant role in advocating for Indigenous perspectives and concerns throughout the pandemic. The Chiang Mai, Thailand, based Asia Indigenous Peoples Pact has operated since 1992 and has 46 member organizations from 14 economies in the region. It put out its first statement on COVID-19 on March 26 and created a dedicated web page for its COVID-19 response.[109] The organization has produced numerous reports and rapid assessments about the impact of COVID-19 on Indigenous communities, highlighted the work that some Indigenous groups have done to beat the odds and contain COVID-19, and provided grants for Indigenous youth initiatives responding to COVID-19 in their local communities.[110]

CIVIL SOCIETY

Finally, civil society networks have also played a key role during the pandemic. Our research and interviews focused on the efforts of Southeast Asian regional civil society, which has largely revolved around the formal ASEAN civil society process represented by the ASEAN People's Forum/ASEAN Civil Society Conference (APF/ACSC). The APF/ACSC's annual meetings, usually coinciding with the major ASEAN summits, have been a channel for the participation of civil society and marginalized peoples in ASEAN and have helped widen the space for democratic engagement and transnational exchange in the regional body.[111] In November 2020, the APF/ACSC hosted almost 1,200 delegates virtually and in Hanoi, Vietnam, to discuss the COVID-19 pandemic and other issues, producing a joint statement that called for COVID-19 relief for marginalized sectors of society, increased community-based and participatory governance, people-to-people partnerships and cross-learning spaces, and the protection of human rights in public health responses to the pandemic. For the first time, the body also endorsed a resolution calling for the development of an alternative regionalism to complement the existing formal ASEAN civil society process, voicing its frustration and discontent with current ASEAN state-led efforts to address grassroots concerns.[112]

Academic research units, such as the University of the Philippines Center for Integrative Development Studies' Program on Alternative Development (AltDev), have also documented and supported grassroots efforts to respond to the pandemic, especially those that are stepping in where formal governments have been lacking. Prior to the pandemic, AltDev had been working to build an alternative regional civil society network distinct from the formal ASEAN civil society process. Its research in 2020, which culminated in a report of Southeast Asian grassroots organizations' activities during the pandemic, underscored the importance of diverse sources of expertise to contribute to policy perspectives, particularly where marginalized and Indigenous communities are the targets of such policies.[113] Many of these organizations have worked hard during the pandemic to overcome barriers, share and disseminate information, and build networks to help provide services, medical supplies, and food required to support pandemic responses, and thus deserve more recognition and support from formal governments. AltDev's emphasis on participatory research to amplify the voices of the people on the ground, while also working alongside state-based frameworks and holding state agencies accountable to the communities they serve, is also a model for how grassroots-oriented research and development can contribute to local resilience and pandemic readiness for future public health crises.[114]

Mawk Kon Local Development Organization, a civil society organization in Myanmar, distributing COVID-19 prevention kits to returning migrant workers in April 2020.

Source: ILO/Mawk Kon Local Development Organization (MKLDO)

Conclusion

This report focuses on how international organizations in the Asia Pacific responded to the pandemic, with a focus on Canada's place within these mechanisms. As the pandemic

unfolded across the world, existing international organizations in the Asia Pacific that had previously focused on trade and economics, infrastructure development, or security and politics took on pandemic response agendas. Organizations like the WHO that already focused on public health seemed less prepared to adapt to the pandemic environment as they were embroiled in geopolitical tensions, and in some cases, they had difficulty meeting expectations under a global spotlight when it came to taking a leading role in global pandemic response. International organizations identified in this section exhibited diverse approaches to the pandemic. Yet, Canadian involvement in these initiatives and activities during the first year of the pandemic was limited. This is reflective of Canada's level of engagement in the Asia Pacific region overall and highlights the tremendous opportunities to further engage. Our in-depth examination of the international organizations' actions yielded some significant themes that help explain and contextualize shifts in policies around this pandemic, and thus anticipate what we might expect during future pandemics as well.

Disaster response and connections forged in previous natural hazard environments emerged as a theme characterizing the activities of several of the international organizations in this report. In some cases, such as the example of the Quadrilateral Security Dialogue, ad-hoc collaborations taking place in response to a natural hazard formed the basis for later co-operative pandemic response activities. Other institutions, such as the Asia Development Bank, were able to adapt existing disaster response mechanisms created in response to human-made crises (such as the Asian financial crisis in this case) to facilitate pandemic response. The ADB's use of its Asia Pacific Disaster Response Fund to administer pandemic response funds to developing member countries is another example of adapting existing disaster frameworks to fit immediate needs during the pandemic. The Pacific Islands Forum, on the other hand, was able to repurpose its framework to co-ordinate a regional response to crises, the Biketawa Declaration, for its pandemic response. Not unlike the story of the US automobile manufacturers producing ventilators in the spring and summer of 2020, the adaptation of existing disaster response mechanisms to pandemic relief was made possible by various forms of financial infrastructure created in previous disaster environments.

A more subtle theme emerged around the expansion of mandates and shifting priorities in response to the COVID-19 pandemic. In some cases, such as with PIF, the institution's focus on democratization in the Asia Pacific took on a broader focus on "development" in the region, opening the door for a host of other projects and mandates that were not previously on the organization's agenda. This kind of subtle "mission creep" could be interpreted as an opportunistic expansion of the goals of such organizations, not unlike the post-9/11 expansion of goals that flourished under the banner of fighting terrorism.

The Quad, for example, has resolved to pay for excess manufacturing capacity in India to be used to produce a billion doses of the Novavax and Johnson & Johnson vaccines for use in Southeast Asia.[115]

On the one hand, trying to identify and assess Canadian engagement in international organizations in the Asia Pacific pandemic response context is a difficult task as there is no central portal with such information and there has been little written on Canada's engagement with such a broad set of international organizations. This challenge of noting and assessing Canada's engagement with international organizations in the Asia Pacific may also be indicative of the lack of an overarching strategy in Canada–Asia Pacific relations that predates the pandemic. On the other hand, when and how key international organizations in the Asia Pacific reacted to the COVID-19 crisis highlighted several potential opportunities for Canada to take a more active role around future disaster or pandemic planning and response within the region. By closely examining the specific actions, timelines, public statements, and funding of key Asia Pacific international organizations, the shifting of policies and priorities around public health and connections to economic and political interrelations in the region become less opaque. Canada's existing engagement within regional institutions and the nature of interactions in these institutions when their priorities pivoted to pandemic response reveal several areas of potential Canadian contributions to these priorities, and thus in the region more broadly, which could, in turn, help Canada better prepare for the future.

04

CANADA'S PANDEMIC RESPONSE AND INTERNATIONAL ENGAGEMENT

How does Canada's pandemic response fit with its international engagement in the Asia Pacific? Our assessment of Canadian engagement in international organizations in the Asia Pacific has shown that there is a great deal of opportunity for further engagement around public health, but that an ecosystem approach should drive this engagement in the Asia Pacific.

This report highlighted the diverse relationships and interactions taking place in the Asia Pacific to further illustrate the many opportunities for engagement in international organizations in the region. The ecosystem of international organizations in the Asia Pacific provided numerous channels for pandemic-related discussions and responses. There was no one organization that was able to do everything; rather, it was that such a variety of international organizations took action that highlights the need for diversity in engagement. As the world reacted to the COVID-19 crisis, Canadian engagement in the Asia Pacific has been hindered by its limited role in the region prior to the pandemic. In confronting the challenges faced from the pandemic, our findings suggest that opportunities abound for Canada to focus on developing health policy that prioritizes international engagement in the Asia Pacific.

Canada's COVID-19 Related International Engagement

Our scan of Canada's COVID-19 related international engagement highlights that Canada follows the traditional approach of engaging with international organizations through viewing international engagement from the purview of the national government. The paragraphs below highlight examples of Canada's interactions with traditional global international organizations, many of which have been criticized for not acting quickly enough, or for general inactivity, such as the UN, G7, G20, WHO, and WTO. These examples underscore the potential benefits to Canada engaging at multiple institutional levels with more diverse stakeholders.

For example, Canada invested in the WHO's Access to COVID-19 Tools (ACT) Accelerator, which motivates collaboration to develop and equitably distribute affordable vaccines worldwide. Since Canada joined the ACT-Accelerator, its investments had totalled more than C$1.3B as of May 2021, when this report was written.[116] The ACT-Accelerator aims to facilitate the collaboration of scientists, governments, businesses, civil society, global health organizations, and philanthropists in speeding up the development and equitable distribution of tests, treatments, and vaccines through cross-border co-operation.

Another WHO-supported program that Canada has been involved with is COVAX, a vaccine-sharing alliance within the vaccine pillar of the ACT-Accelerator. COVAX launched in April 2020 for wealthier countries to pool money in buying and ensuring the access of vaccines to countries in need. Canada is investing C$440M in COVAX, with half of the funds used for securing vaccines for Canada, while the other half supported access to vaccines for lower and middle-income countries.[117] In June 2021, at the time this report was written, Canada was one of two wealthy countries taking and using vaccines from the COVAX fund, presenting a controversial image internationally. The controversy motivated 32 organizations and agencies to place pressure on Canada to donate its excess vaccines.[118] In June 2021, Canada announced its pledge to donate 13 million surplus vaccines to developing nations in a weekend summit in Britain.[119] The nature of Canada's participation in COVAX has been the subject of criticism. For example, as of June 2021, Canada was the only G7 country slated to draw from COVAX's vaccine supply in the program's first allotment, which drew criticism for potentially hindering the global equitable distribution process rather than facilitating it.

Canada has also collaborated with the G20, the WTO, APEC, and other institutions to strengthen global supply chains in supporting long-term economic recovery. In its capacity as a WTO member, the Canada-led Ottawa Group's Trade and Health Initiative (a grouping within the WTO composed of Australia, Brazil, Canada, Chile, European Union,

Japan, Kenya, South Korea, Mexico, New Zealand, Norway, Singapore, and Switzerland) advocated in November 2020 for global co-operation to strengthen global supply chains while facilitating the flow of essential medical supplies and vaccines.[120]

The Ministerial Coordination Group on COVID-19 (a grouping composed of Australia, Brazil, Canada, France, Germany, India, Indonesia, Italy, Mexico, Morocco, Peru, South Korea, Singapore, South Africa, Turkey, and the United Kingdom), a minilateral initiative put forward by Canada in April 2020, shares COVID-19 pandemic responses. The group agreed that a strong and co-ordinated global health response was needed, pledging to reinforce global links, support sustainable development, ensure the necessary flow of goods and services, promote free trade, and work with international partners.[121] However, the group's activity gradually declined as the pandemic progressed, failing to maximize its potential of staying interconnected and co-ordinated in response mechanisms. Moreover, the grouping consisted of countries that have traditionally held close ties with Canada.

The theme of maintaining essential global links through the pandemic re-emerges constantly in this paper, highlighting the significance of collaborative and co-ordinated efforts in responding to COVID-19's impact. While Canada has engaged in successful international pandemic response initiatives like COVAX and the ACT-Accelerator, most of its engagement is limited to traditional international organizations. However, this pandemic serves as an opportunity for Canada to learn from the pandemic responses of international organizations in the Asia Pacific. Canada can expand out of its traditional approach to international organizations by embracing an ecosystem approach of diversifying its engagement.

Canada's COVID-19 Related Engagement With the Asia Pacific

Pre-pandemic relations, initiatives, and programs set the stage for Canada's engagement with the region during the pandemic. Canada has been a dialogue partner of ASEAN since 1977 and of the PIF since 1989, as well as a founding member of APEC and the ADB, and has been a shareholder in the AIIB since 2018. The following table summarizes Canada's existing engagement with international organizations in the Asia Pacific and the ministries or departments involved in each relationship.

TABLE 2:

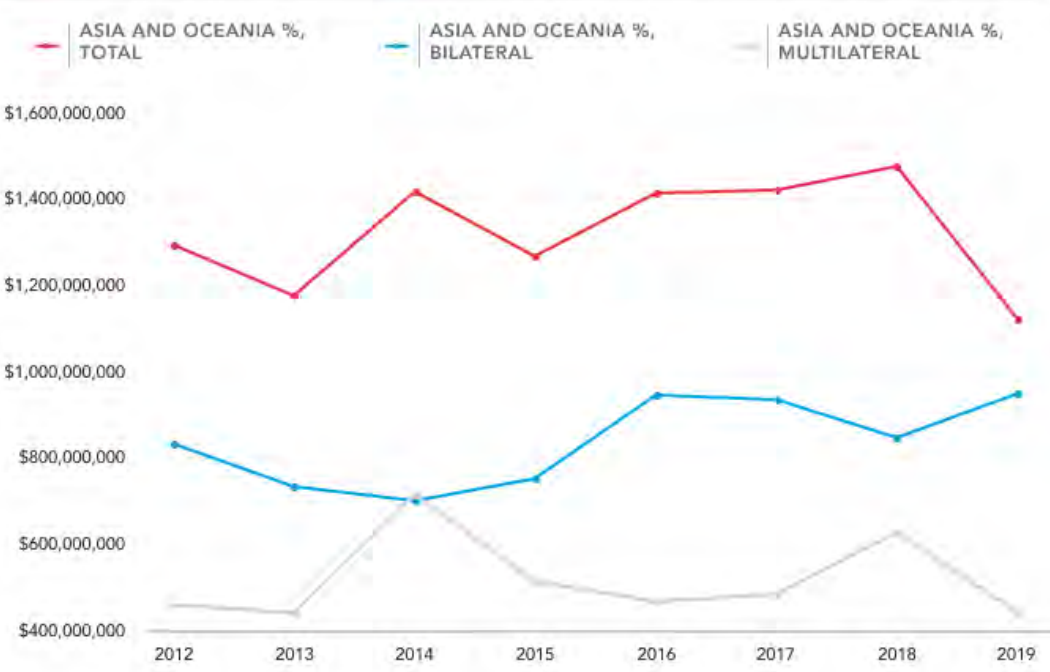
Canada's existing engagement with international organizations in the Asia Pacific, divided by ministry/ department responsible

Global Affairs Canada (GAC)	Public Health Agency of Canada (PHAC)	Department of Finance Canada
Asia-Pacific Economic Cooperation (APEC)	APEC (Health Working Group only)	Asian Infrastructure and Investment Bank (AIIB)
Association of Southeast Asian Nations (ASEAN)		
Pacific Islands Forum (PIF)		
Mekong Basin Disease Surveillance Foundation (MBDS)		
Asian Development Bank (ADB)		

Since 2012, Canada has consistently contributed at least C$1B in official international assistance to Asia and Oceania, which represents roughly a fifth of total international assistance spending per year. As is the case with Canada's international assistance globally and most other major donor countries' international assistance, the majority of this assistance is bilateral in nature. Overall annual contributions to Asia Pacific regional multilateral organizations and development banks have lagged in comparison and have been on a declining trend in recent years – from around C$715M in 2014 to just over C$440M in 2019 (both in 2021 dollars), the last year for which official statistics are available.

FIGURE 4

Canada Official International Assistance to Asia and Oceania, 2021 CAD



Source: Global Affairs Canada, Statistical Reports on International Assistance, 2012-2019[iv] (https://www.international.gc.ca/gac-amc/publications/odaaa-lrmado/sria-rsai.aspx?lang=eng&_ga=2.90602778.1650743651.1626209077-553966843.1623451460)

Canada has been a consistent partner in health development in the Asia Pacific, most notably in contributing roughly C$16M through the ASEAN-Canada Global Partnership Program for the Mitigation of Biological Threats (2014-2022).[122] This contribution helped fund several key components of ASEAN's public health infrastructure and also contributed to the Mekong Basin Disease Surveillance network.[123] During the pandemic, Canada further provided C$3.5M to the ASEAN COVID-19 Response Fund[124] and C$4.5M in medical supplies to the ASEAN Secretariat and member countries.[125] As well, Canada contributed C$500,000 to the APEC Women and the Economy Sub-fund, which supports initiatives within the APEC region to advance women's economic participation and achieve gender equity progress.[126] Furthermore, Canada donated medical supplies and humanitarian aid to Asia Pacific countries such as China and India during their worst COVID-19 waves, including C$10M to the Indian Red Cross[127] and 16 tonnes of PPE to China.[128]

Thus, Canada has contributed in significant ways to global health security and epidemic preparedness in the region, remains actively engaged in several important regional organizations, and plays a large role in international assistance in the region. However, in comparison to what has been publicized by Global Affairs Canada about Canada's engagement on the pandemic at the global level, the level of Canada's engagement in the Asia Pacific—relative to the region's proactiveness and initial success during the pandemic—still has a great deal of underutilized opportunity.

Crucially, we found that a great deal of opportunity exists for PHAC's increased involvement in Canada's engagement on global health matters in the Asia Pacific, a role which has thus far been primarily led by GAC. While PHAC has co-chaired the APEC Health Working Group on behalf of the Canadian government for 2018-2019 and for a second two-year term for 2020-2021, our interviews indicated that PHAC has not been engaged with any other regional organization in the Asia Pacific. This is despite GAC being actively involved in supporting infectious disease surveillance and response capability in ASEAN and the MBDS network, as well as the PIF on policy issues more broadly. In short, federal ministries and agencies such as PHAC and GAC have an opportunity not only to be better coordinated in order to contribute expertise and resources to regional health security, but also to participate in technical exchange and information sharing on infectious disease outbreaks and management with partners in the region.

Conclusion

These activities illustrate that Canada is doing a lot at the global level and has long-standing engagements in the Asia Pacific. However, the bulk of Canadian pandemic response abroad

has been focused on “traditional” forms of engagement, primarily through slow-moving large global institutions, with limited engagement in the Asia Pacific region overall. Though Global Affairs Canada has been involved in initiatives to counter infectious disease and emerging health threats both globally and in the region, there remains a great deal of promising opportunity for strengthened co-operation between GAC and other federal ministries and agencies, such as PHAC. Opportunities to do more to improve its current response, aid much needed global co-operation, and plan for future health crises are laid out in the next section.

05

A CANADIAN COVID-19 AND FUTURE HEALTH CRISES INTERNATIONAL ENGAGEMENT STRATEGY

International organizations profiled in this report tend to focus on building networks for sharing information and developing policies and programs for problem solving across political and geographical boundaries. As we have noted, however, Canada's involvement in international and regional organizations in the Asia Pacific has been focused mainly on economics and trade, highlighting potential areas for deeper and more sustained engagement in the region. The pandemic has clearly shown, however, that economics, trade, and politics are closely related to public health and that, moving forward, international organizations, regardless of their primary focus, will (and should) continue to include a health lens in their work.

The ecosystem approach is not only a method for making sense of the diversity and interconnectedness of international organizations in the Asia Pacific; it is also the foundation for our set of recommendations for informing Canada's future engagement.

We outline considerations and recommendations for federal, provincial, and municipal governments for both future health crises (post-pandemic) planning and addressing the current ongoing COVID-19 pandemic with an eye toward Asia Pacific engagement with a specific focus on:

- Recognizing and advocating for interconnectedness of health, trade, and economic resilience and supporting more sustained Canadian engagement in the Asia Pacific;

- Enhancing ministerial communication, co-operation in international health programming, and engagement; and
- Amplifying opportunities for Canadian leadership with locally driven initiatives.

Recognizing and Advocating for Interconnectedness of Health, Trade, and Economic Resilience

The first significant finding of the report underscored that economics, trade, and politics do not operate in silos but are intricately related to health. Most organizations lacking an explicit health component followed networks that were already in place along trajectories previously established for natural disasters.

International organizations expanded their mandates and priorities during the pandemic to include health-related programming, funding, and dialogue demonstrating how health needs to be incorporated into other areas of global co-operation. Of particular note was how international organizations with a focus on economic and infrastructure development expanded and shifted their efforts to integrate public health, demonstrating that now, and ahead of the next global health crisis, more work needs to be done to address health and economic inequities.

Noting that international organizations with differing mandates all came to address the pandemic in one way or another speaks to the need to maintain an awareness of the impact of health on politics, security, and economic and social well-being. That such a variety of international organizations played a role in the early pandemic response (and continue to do so) – and not just those with a health focus in pre-pandemic times – speaks to the equal need to engage with the diverse ecosystem of international organizations and not only those with established health-related mandates and programs. Canada could benefit from a health cognizant lens with which to view diplomatic and international organizations and engagement in the Asia Pacific.

Recognizing this trend of the expansion of health-related programming across international organizations can help anticipate what possible future pandemic responses might entail, as well as potential avenues of communication and policy-making to draw upon during future crisis response. It also highlights the potential benefits of diversifying sources of information about health crises and pandemic responses for Canada.

Our research suggests that Canada's approach to the pandemic in 2020 warrants deeper consideration of the degree to which relations and responses within the Asia Pacific,

international tensions, and limitations of global international organizations such as the WHO were shaping global responses to the pandemic. The Canadian government could have benefitted from acting more decisively on the WHO's early declarations and guidelines. But, more fundamentally, the Canadian government could have drawn on more diverse sources of global public health information, including those in the Asia-Pacific region, to better formulate its own approach to the pandemic and avoid overreliance on a single authority.

Indeed, given that recent years have seen the WHO shift its role away from fast-adapting crisis response toward a more static repository of knowledge and data, it seems that Canada's policy approach would do well to seek diverse sources of information rather than relying too heavily on any one source. That is not to say that the WHO is irrelevant, but rather that, given the various competing political agendas of its members, the value, role, and abilities of the WHO were perhaps overemphasized in Canada and abroad. The way the Canadian government continued to point to WHO guidelines as the driver behind Canadian COVID-19 countermeasures demonstrates the need for a more reflexive, nimble, and diversified approach for Canada. Rather than tying itself to any singular institution or entity, our research suggests that Canadian COVID-19 policy would benefit from a multipronged approach, considering Canada's many new and existing opportunities for engagement with the Asia Pacific region. More attention should be paid to how the structure and focus of the WHO affect the speed and nature of its responses to pandemic threats, and how the organization can be affected by political issues such as the US-China rivalry and nationalistic pandemic responses around the world. These considerations could help Canadian policy-makers better contextualize the role and merits of the WHO within the broader ecosystem of global public health.

The study also underscored that Canada's involvement in international organizations in the Asia Pacific prior to the pandemic has been focused primarily on economics, trade, and development within a few key organizations. A deeper engagement in the region could better prepare Canada to both learn from a more diverse set of international organizations and contribute to pandemic responses through a more varied set of channels during current and future global health crises. This notion was repeatedly underscored by interviews in which participants emphasized the importance of building relationships of trust and collaboration between organizations in Canada and the Asia Pacific. The need for engagement with an ecosystem approach – along bilateral, regional, multilateral, minilateral, and subnational scales – was a salient theme. While financial support and funding were also important potential avenues to help build international relationships and demonstrate good faith, interviewees underscored that these were no substitute for the time and dedication to developing such relationships prior to a crisis.

The following recommendations will help ensure that Canada can maintain the relationships and information-sharing streams in times of crisis, and they are especially important in the event that future pandemic plans do not adequately address real-time developments.

RECOMMENDATIONS

1. **Engage in the Asia Pacific with an ecosystem approach.**
   Support deeper, more sustained engagement in the Asia Pacific via an ecosystem approach that considers the importance of maintaining relationships, trust, and good faith. Re-evaluate Canada's representation on regional organizations, strengthening and expanding beyond existing engagement with ASEAN and PIF/SPC.

2. **Strengthen the WHO.**
   Help strengthen the WHO (e.g., funding, advocating for reform) so it is less beholden to program specific funding, geopolitical influence struggles, and is more institutionally nimble in times of crisis.

3. **Expand sources of global health information.**
   Broaden the approach of where we get our global health information beyond solely relying on the WHO's Secretariat in Geneva, to include direct engagement with WHO regional offices, regional organizations, disease surveillance networks, epidemiology networks, and expert networks (Track 2, etc.).

4. **Assemble an ad-hoc crisis engagement committee.**
   Assemble an ad-hoc committee in times of crisis to ensure consistent engagement across regions globally and ensure the inclusion of experiences and knowledge from the Asia Pacific at different levels (multilateral, regional, minilateral, bilateral, and subnational).

5. **Create a storehouse of Canada's engagement in the Asia Pacific.**
   Create a storehouse of Canada's international and subnational health-related engagement with international organizations in the Asia Pacific. There is no central source with readily available information on what each ministry, department, or government actor is doing with international organizations in the field of health in the Asia Pacific. In times of crisis, not having an accurate picture of who is doing what and where makes it difficult to quickly access information, act, and formulate evidence-driven policy-making. This would add to the ability of PHAC and an ad-hoc crisis engagement committee to act in times of crisis.

Enhancing Ministerial Communication, Co-operation in International Health Programming, and Engagement

Canada's engagement in North America and Europe has typically been stronger and more diversified than its engagement in the Asia Pacific, which we argue had the potential to create blind spots in knowledge. Our study revealed many drawbacks to overreliance on top-down directives from major global sources of health data, such as the World Health Organization, when crafting policy in Canada. While such large global institutions can be a reliable source of statistics, cross-country comparisons, and various forms of metadata for pandemic approaches, international organizations in the Asia Pacific also proved to be a significant source of relevant, timely, and accurate health information required to make innovative and timely policy decisions in Canada.

Subnational actors and local grassroots groups were also often agile and able to respond to new data as it became available, potentially making them a more reliable source of information when weighing policy decisions. These combined findings encourage an approach to pandemic mitigation and policy-oriented knowledge that views important decision-making processes not as linear, top-down, and authoritative. Rather, our findings indicate the value of implementing a diversified, flexible, multi-scalar approach to pandemic response and mitigation that views the many mechanisms at work in the Asia Pacific as an *ecosystem*. This ecosystem paradigm reflects the diversity and importance of interconnected activities of engagement mechanisms in the Asia Pacific, as well as the need for continual cultivation and cross-pollination in order to ensure shared health and prosperity.

Maximizing the benefits of an ecosystem approach may also require building more channels for communication and co-operation within the federal government and further elaborating a whole-of-government approach towards public health crises. After all, just as pandemics do not abide by country borders, planning and responses are not bound neatly according to ministerial and departmental boundaries. This may require flexibility and openness for these (and other ministries) to both understand that their work is relevant, connected to, and beneficial for other departments and ministries. For example, PHAC could benefit from accessing or using GAC infrastructure, platforms, and networks, especially if it addresses the need to revitalize the Global Public Health Intelligence Network (GPHIN) to its previous standard before it experienced cuts and restructuring.[129] PHAC involvement in GAC health co-operation efforts could also help strengthen interpersonal relationships with public health officials and scientists in the Asia Pacific, complementing the largely media-focused GPHIN. Finally, collaboration between PHAC and GAC could strengthen Canada's international health assistance and promote Canadian expertise and

resources abroad.[130] As a practical first step, integrating the existing health development work and engagement of GAC in the Asia Pacific with PHAC's expertise in global public health surveillance and pandemic preparedness and response could potentially better prepare Canada for future public health crises, particularly those arising from or involving the Asia Pacific region.

This could also require integration of diverse perspectives and public health concerns in Canada's foreign policy and engagement, using an ecosystem approach of engagement that could provide the communication platforms and infrastructure for PHAC to act quickly when the next pandemic strikes. The recommendations below would begin to build such an approach, while also providing more opportunity for PHAC to stay plugged into conversations happening in the diverse array of international organizations across the Asia Pacific, increasing opportunities for bilateral side conversations and information sharing that could prove vital for future pandemic responses.

RECOMMENDATIONS

6. **Increase communication between government ministries and agencies, such as between PHAC and GAC.**
   Increase opportunities for institutional co-operation, collaboration, and channels for communication between ministries and agencies involved in global public health, such as between PHAC and GAC, with the aim to develop long-term institutional links on health-related files and initiatives. Increased communication between government agencies with existing ties in the region can further strengthen Canada's overall preparedness and response to future health crises. At the same time, increased communication between Canadian agencies with international presence in health-related programs, organizations and expert communities – where both PHAC and GAC are involved already – has the potential to boost Canada's effective presence and activity overseas.

7. **Ensure representation of PHAC on global health development programs, particularly those in the Asia Pacific.**
   Ensuring representation of PHAC on global health development programs, including those led by GAC, is critical for staying interconnected through an ecosystem in times of health crises. A limited presence in global health development programs is a missed opportunity for PHAC to contribute its resources, knowledge, and expertise in disease outbreaks and management, and to develop interpersonal relationships with public health officials and scientists in the Asia Pacific that can be called upon

as a complementary source of emerging outbreak information in addition to existing surveillance tools like the GPHIN.

8. **Add international engagement as a component of Canada's pandemic plan.**
   Add international engagement, with a focus on international organizations in the Asia Pacific, to Canada's next health/pandemic crisis plan. Within the ecosystem approach, international engagement is necessary to co-ordinate and collaborate with other international organizations to ensure concerns are addressed and to build on information sharing.

9. **Continue to expand international assistance for pandemic readiness and infectious disease surveillance.**
   Funding should be targeted toward projects in the Asia Pacific in line with Canada's foreign policy objectives and health crisis preparedness planning as a way to strengthen its presence in the region. Canada's presence opens higher possibilities of pathways for collaborations and co-ordination response plans with countries in the Asia Pacific during times of health crises.

Amplifying Canadian Leadership With Locally Driven Justice Initiatives

Engaging and supporting the many locally driven initiatives and networks within the Asia Pacific, both those highlighted in this report and others, is a good opportunity for Canada to maximize its potential as a global supporter of equity, inclusion and human rights. Contemporary struggles to create a more equitable society (for example, by coming to grips with the legacies of colonialism and taking an intersectional feminist approach to addressing inequalities around race and gender) are a reality in contemporary Canadian society. The global rise of anti-democratic populist leadership and distrust in scientific authority that has coincided with the pandemic serves as an additional rationale for Canada's existing and aspiring commitments to social justice, health equity and feminist international assistance, particularly in its engagement in the Asia Pacific.[131] Our findings indicate that this would be best undertaken as part of a broad approach drawing on relations with both large multilateral institutions and grassroots NGOs, high-level diplomacy as well as bilateral and multilateral diplomatic efforts, and on the ground, relationship building through bottom-up approaches, as well as financial assistance.

The pandemic disproportionately affected Indigenous communities in Canada and throughout the Asia Pacific. Given Canadian movements toward reconciliation and

decolonization, there is an opportunity to tie these aspirations to similar locally driven initiatives abroad, as they overlap with global health. The pandemic has illustrated the important links between social vulnerability, equity, and diversity and public health. Our interviews revealed several important collaborative efforts toward community development, decolonization, and democratization taking place at the grassroots level, which are gaining momentum and urgency in the COVID-19 era. These movements, which are often overlooked and under supported by the agendas of more well-known organizations and agencies in the region, have the potential for greater inter-regional co-operation with important policy implications. For example, Professor Eduardo C. Tadem, Convenor of the Program on Alternative Development, University of Philippines, underscored that policy-makers tend to brush over the lived expertise of grassroots groups in favour of more technocratic expertise, but solutions do not always have to come from institutional experts.[132] Practical experiences and local expertise can have extremely valuable and important implications for policy and programming.

Another opportunity for local engagement could be through field epidemiology training networks, which played a significant role in sharing best practices and training epidemiologists during the pandemic. The main such network in the Asia Pacific is the ASEAN Plus Three Field Epidemiology Training Network (ASEAN+3 FETN), which conducts numerous cross-border training exercises and has held numerous video conferences before and during the pandemic. As far as we have been able to observe, Canada's Field Epidemiology Training Program (FETP) does not possess a similar overseas training component and largely conducts field epidemiology domestically.[133]

Hmong women in Thailand pose for a photo in 2011. The Hmong community in Thailand is one of the nine "hill tribes", or Indigenous groups, recognized by the Thai government

Source: UN Photo/ Kibae Park

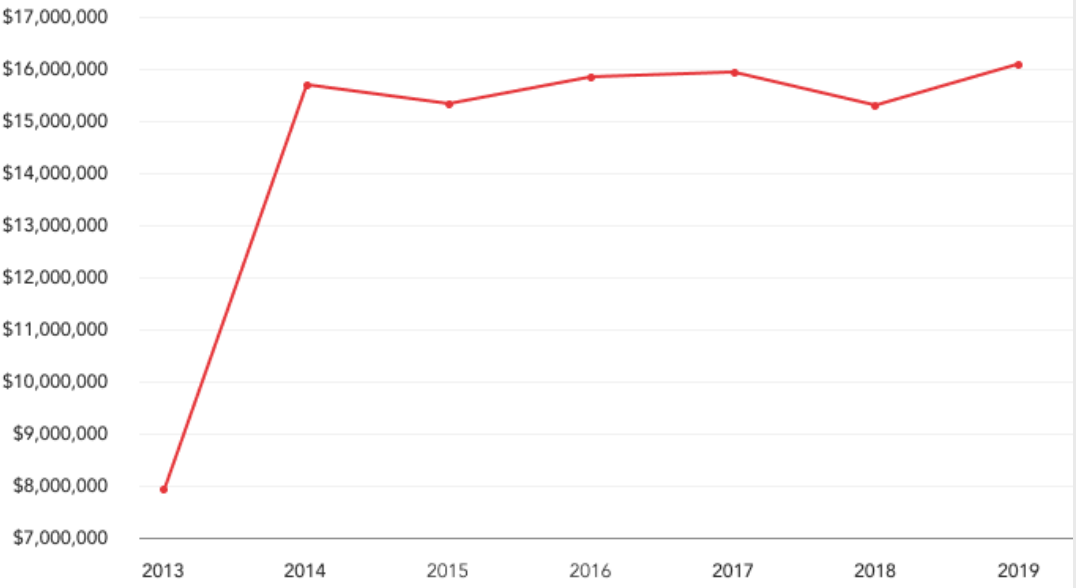
Thus, Canadian support for such initiatives through health-oriented objectives could create new opportunities to build relationships at the subnational level (between, for example, Indigenous communities, labour organizations, LGBTQ+ groups, and other

equity-seeking communities spanning across the Pacific), at the epistemic level (between, for example, Canada's FETP and the ASEAN+3 FETN), and within formal international organizations (such as APEC, which has recently brought health and Indigenous concerns into higher prominence in its work).

Our interviews with AltDev researchers also highlighted the Canada Fund for Local Initiatives (CFLI), an initiative run by Global Affairs Canada designed to support civil society organizations in implementing local projects, as a key area where Canada has made a difference.[134] Through the CFLI, Canada has previously supported local civil society initiatives, such as the 2017 ASEAN Civil Society Conference/ASEAN Peoples' Forum, with one-time grants. Since 2014, the Canadian government has spent between C$15M and C$16M (in 2021 dollars) on around 600 projects globally each year through the CFLI, a figure that represents less than 0.3% of the total international assistance budget each year. Given the significant impact that COVID-19 has on local and marginalized communities, providing additional funding through CFLI for local COVID-19 recovery projects would be a potentially impactful and cost-effective way to broaden Canada's Asia Pacific engagement.

FIGURE 6

Canada Fund for Local Initiatives, 2021 CAD



Source: Global Affairs Canada, Statistical Reports on International Assistance, 2012-2019" (https://www.international.gc.ca/gac-amc/publications/odaaa-lrmado/sria-rsai.aspx?lang=eng&_ga=2.90602778.1650743651.1626209077-553966843.1623451460)

These types of partnerships involve building trust between local governments and organizations, as well as making space for more diverse and underrepresented voices at the table. They also have important implications for future health crises and how societies in Canada and the Asia Pacific prepare for future pandemics. Canada could be encouraging knowledge exchange and best practices for supporting health and economic equality through grassroots channels like those above. The pandemic highlighted time and time again that a weak point of public health and health-care policy was equality of care, as refugees, migrant labourers, women, minorities, Indigenous groups, and others faced added risks and barriers. These trends were especially noticeable throughout the Asia Pacific, where Canada could play a larger role in helping diminish such inequities, bringing its foreign policy more closely in line with its aspirations as a global leader in equity and diversity. Whereas Japan and South Korea, for example, have expended much effort in designing and improving health-care systems in parts of Southeast Asia, Canada could provide targeted support for health equity initiatives in the region as well. This could be accomplished in conjunction with bilateral, minilateral, regional, and global institutions along the lines in the recommendations below.

RECOMMENDATIONS

10. **Fund subnational efforts on global health and equity.**
    Funds targeted to subnational efforts on global health and equity are crucial as subnational actors are more aware of the realities in local communities. Global health and equity requires a holistic perspective, involving both national and subnational levels, to address the specific needs and challenges of communities. Canada should expand on its existing programming through the Canada Funds for Local Initiatives to achieve these goals.

11. **Engage consistently with epidemiological groups and networks.**
    Canada should engage consistently with epidemiological groups and networks to build on training and knowledge sharing surrounding disease outbreaks. Epidemiological groups and networks also complement national and local initiatives already in place through involving the cross-border collaboration of epidemiologists, scientists, ministry officials, health workers, border officers, and community members. Canada should consider expanding its Field Epidemiology Training Program to include participation in Asia Pacific field epidemiology networks such as the ASEAN+3 FETN, which could provide valuable overseas experience and connections for Canadian epidemiologists.

12. **Provide tools to engage with counterparts in the Asia Pacific for provincial and municipal governments, and key civil society organizations.**
    Provincial and municipal governments and key civil society organizations should be provided the necessary tools to engage with counterparts in the Asia Pacific. Since Canada's engagement has been through the purview of the national government, the inclusion of these actors would enable a bottom-up approach to knowledge sharing and health policy co-ordination (e.g., APF Canada's early pandemic dispatches/ school policy tracker; UCLG's webinars and policy toolkits for municipalities).

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CONCLUSION

With all this in mind, how Canada chooses to engage will be limited by human and capital resources and changing priorities within the government. The COVID-19 pandemic has demonstrated the inextricable link between health, trade, and economic resilience, revealing the dependency of each factor to function through an ecosystem framework. Thus, we have argued that a more reflexive, nimble, and diversified ecosystem approach in the Asia Pacific could reap benefits and opportunities for Canada in contrast to a traditional approach to international organizations. Canada can start to further insert its presence in the Asia Pacific through funding more projects aligned with its health crisis preparedness planning. By establishing a strong presence, Canada may find value and effectiveness in collaborating and co-ordinating health response plans for future health crises. Canada's diversification of engagement in the Asia Pacific could also potentially broaden its bandwidth of global health information from outside of the WHO, to include knowledge and expertise from global surveillance networks and other epistemic or subnational groups.

Finding a balance in Canada's engagement with international organizations in the Asia Pacific will also require further collaboration, co-operation, and co-ordination among federal ministries and departments. We recognize that furthering a whole-of-government, inter-agency approach to global public health is a long-term process, and one that has been of longstanding concern for the Canadian government. One concrete step for Canada

to move forward in this direction could be to better integrate PHAC and GAC's respective strengths in order to extend the reach of Canada's public health internationally. Moreover, financial support for subnational efforts is required for improving the health pandemic responses executed in regions and communities across Canada. With each region of Canada being so diverse, a bottom-up approach driven by community actors will help to address each region's specific needs during health crises. Since pandemics and other health crises are likely to increase in frequency and severity in the future, lessons from the international realm gleaned by federal initiatives through the Canadian engagement strategy in Asia will have an impact.

ABOUT APF CANADA

ASIA PACIFIC FOUNDATION OF CANADA

FONDATION ASIE PACIFIQUE DU CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

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APPENDIX

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List of International Organizations in the Asia Pacific Region

Bolded organizations are featured in this report.

Organization	Membership
Association of Southeast Asian Nations (ASEAN)	**10 member states** (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam). **2 observer states** (Papua New Guinea and Timor-Leste) **10 dialogue partners** (Australia, Canada, China, European Union, India, Japan, New Zealand, Russia, South Korea, and the United States) Co-ordinator of the **ASEAN Plus Three** (ASEAN, China, Japan, and South Korea) and East Asia Summit (ASEAN Plus Three, India, Australia, and New Zealand) forums
Trilateral Cooperation Secretariat (TCS)	**3 member states** (China, Japan, and South Korea).
Pacific Islands Forum (PIF)	**18 member states** (Australia, Cook Islands, Fiji, French Polynesia, Kiribati, Marshall Islands, Micronesia, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu) **1 associate member territory** (Tokelau) **5 observer territories** (American Samoa, Guam, Northern Mariana Islands, Timor-Leste, and Wallis and Futuna) **19 dialogue and development partners** (Canada, China, Cuba, European Union, France, Germany, India, Indonesia, Italy, Japan, Malaysia, Philippines, South Korea, Spain, Taiwan, Thailand, Turkey, United Kingdom, and the United States)
Pacific Community (SPC)	**26 member states and territories** (American Samoa, Australia, Cook Islands, Fiji, France, French Polynesia, Guam, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, United States, Vanuatu, and Wallis and Futuna)

Organization	Membership
South Asian Association for Regional Cooperation (SAARC)	**8 member states** (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka) **10 observer states** (Australia, China, European Union, Iran, Japan, Mauritius, Myanmar, South Korea, United Kingdom, and the United States)
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)	**7 member states** (Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand)
Shanghai Cooperation Organization (SCO)	**8 member states** (China, India, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, and Uzbekistan) **4 observer states** (Afghanistan, Belarus, Iran, and Mongolia) **6 dialogue partners** (Armenia, Azerbaijan, Cambodia, Nepal, Sri Lanka, and Turkey)
Indian Ocean Rim Association (IORA)	**23 member states** (Australia, Bangladesh, Comoros, France, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Oman, Seychelles, Singapore, Somalia, South Africa, Sri Lanka, Tanzania, Thailand, United Arab Emirates, and Yemen) **9 dialogue partners** (China, Egypt, Germany, Italy, Japan, South Korea, Turkey, United Kingdom, and the United States)
WHO South-East Asia Regional Office (WHO SEARO)	**11 member states** (Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, North Korea, Sri Lanka, Thailand, and Timor-Leste)
WHO Western Pacific Regional Office (WHO WRPO)	**37 member states and territories** (American Samoa, Australia, Brunei Darussalam, Cambodia, China, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Hong Kong SAR, Japan, Kiribati, Laos, Macao SAR, Malaysia, Marshall Islands, Mongolia, Nauru, New Caledonia, New Zealand, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Philippines, Pitcairn Islands, Samoa, Singapore, Solomon Islands, South Korea, Tokelau, Tonga, Tuvalu, Vanuatu, Vietnam, and Wallis and Futuna)

Organization	Membership
WHO-SPC COVID-19 Joint Incident Management Team (JIMT)	**25 partner organizations** (including the Asian Development Bank, Australian DFAT, International Federation of the Red Cross, International Organization for Migration, New Zealand MFAT, UN Office for Coordination for Humanitarian Affairs, Pacific Islands Forum, Pacific Islands Health Officers' Association, Pacific Community, UN Population Fund, UNICEF, UN Resident Coordinator Office, UN Development Programme, UNWOMEN, USAID, US CDC, US Embassy Suva, World Food Programme, World Bank, and World Health Organization) **21 reporting states and territories** (American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna)
Mekong Basin Disease Surveillance (MBDS)	**6 member states** (Cambodia, China, Laos, Myanmar, Thailand, and Vietnam)
Asia Partnership on Emerging Infectious Diseases (APEID)	**6 member states** (Cambodia, China, Laos, Indonesia, Thailand, and Vietnam)
South Asia One Health Disease Surveillance Network (SAOH-Net)	**8 member states** (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka)
Pacific Public Health Surveillance Network (PPHSN)	**22 member states and territories** (American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna)
Asia-Pacific Economic Cooperation (APEC)	**21 member economies** (Australia, Brunei, Canada, Chile, China, Hong Kong SAR, Indonesia, Japan, South Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Peru, Philippines, Russia, Singapore, Taiwan, Thailand, United States, and Vietnam)
Pacific Economic Cooperation Council (PECC)	**21 member committees** (Australia, Brunei Darussalam, Canada, Chile, China, Colombia, Ecuador, Hong Kong SAR, Indonesia, Japan, Korea, Malaysia, Mexico, Mongolia, New Zealand, Peru, Philippines, Singapore, Taiwan, Thailand, United States, Vietnam, and the Pacific Islands Forum)

Organization	Membership
Council for Security Cooperation in the Asia Pacific (CSCAP)	**21 member committees** (Australia, Cambodia, Canada, China, European Union, India, Indonesia, Japan, Malaysia, Mongolia, Myanmar, New Zealand, North Korea, Papua New Guinea, Philippines, Russia, Singapore, South Korea, Thailand, United States, and Vietnam) **1 observer committee** (Pacific Islands Forum)
Asian Development Bank (ADB)	**49 regional members** (Afghanistan, Armenia, Australia, Azerbaijan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Cook Islands, Federated States of Micronesia, Fiji, Georgia, Hong Kong SAR, India, Indonesia, Japan, Kazakhstan, Kiribati, Kyrgyzstan, Laos, Malaysia, Maldives, Marshall Islands, Mongolia, Myanmar, Nauru, Nepal, New Zealand, Niue, Pakistan, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Tajikistan, Thailand, Timor-Leste, Tonga, Turkmenistan, Tuvalu, Uzbekistan, Vanuatu, and Vietnam) **19 nonregional members** (Australia, Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States) **68 total members**
Asia Infrastructure Investment Bank (AIIB)	**46 regional full members** (Afghanistan, Australia, Azerbaijan, Bahrain, Bangladesh, Brunei, Cambodia, China, Cook Islands, Cyprus, Fiji, Georgia, Hong Kong, India, Indonesia, Iran, Israel, Jordan, Kazakhstan, South Korea, Kyrgyzstan, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Oman, Pakistan, Philippines, Qatar, Russia, Samoa, Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Tonga, Turkey, United Arab Emirates, Uzbekistan, Vanuatu, and Vietnam) **40 nonregional full members** (Algeria, Argentina, Austria, Belarus, Belgium, Benin, Brazil, Canada, Côte d'Ivoire, Denmark, Ecuador, Egypt, Ethiopia, Finland, France, Germany, Ghana, Greece, Guinea, Hungary, Iceland, Ireland, Italy, Liberia, Luxembourg, Madagascar, Malta, Netherlands, Norway, Poland, Portugal, Romania, Rwanda, Serbia, Sudan, Sweden, Switzerland, United Kingdom, and Uruguay) **86 total full members; 17 prospective members**
Quadrilateral Security Dialogue (Quad)	**4 member states** (Australia, India, Japan, and the United States)

Organization	Membership
BRICS	**5 member states** (Brazil, Russia, India, China, and South Africa)
MIKTA	**5 member states** (Mexico, Indonesia, South Korea, Turkey, and Australia)
Colombo Process	**12 member states** (Afghanistan, Bangladesh, Cambodia, China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, and Vietnam)
Asia Indigenous Peoples Pact (AIPP)	**46 member organizations from 14 countries** (Bangladesh, Cambodia, Japan, India, Nepal, Myanmar, Laos, Thailand, Vietnam, Malaysia, Indonesia, Timor-Leste, and Taiwan)
ASEAN Civil Society Conference / ASEAN Peoples' Forum (ACSC/ APF)	Delegates from civil society organizations in ASEAN member states
United Cities and Local Governments – Asia Pacific (UCLG ASPAC)	**183 members** (including municipal governments, provincial governments, and local government associations)
Migrant Forum in Asia (MFA)	**51 member organizations from 18 countries and territories** (Bangladesh, Cambodia, Hong Kong SAR, India, Indonesia, Israel, Japan, Korea, Lebanon, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, and Thailand).

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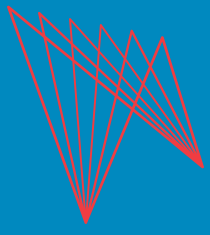

ASIA PACIFIC FOUNDATION OF CANADA

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+ DECEMBER 2021

2021 National Opinion Poll

Canada's Generational Perspectives on Asia

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ASIA PACIFIC FOUNDATION OF CANADA
FONDATION ASIE PACIFIQUE DU CANADA

About APF Canada

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas.

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, Digital Media, and a regular Asia Watch newsletter that together support these thematic areas.

APF Canada also works with business, government, and academic stakeholders to provide custom research, data, briefings and Asia Competency training for Canadian organizations. Advisory services are available by request. We would be pleased to work with you to meet your research and business intelligence needs.

BUSINESS ASIA ›
Trade and Investment

PERSPECTIVES ASIA ›
Surveys and Polling

STRATEGIC ASIA ›
Regional Security

DIGITAL ASIA ›
Digital Technologies

ENGAGING ASIA ›
Domestic Networks

SUSTAINABLE ASIA ›
Sustainable Development

EDUCATION ›
Asia Competency

Click to go to section

About the National Opinion Poll

Since 2004, the Asia Pacific Foundation of Canada has been conducting regular nationwide surveys to assess Canadian attitudes toward countries in the Asia Pacific, and their perceptions of Canada-Asia relations. Unique in its construction and its objectives, APF Canada's National Opinion Poll has been instrumental in drawing a portrait of Canadians' perspectives on Asia and the region's increasing relevance to Canada's prosperity.

The *2021 National Opinion Poll: Canada's Generational Perspectives on Asia (2021 NOP)* is a thematic survey and focuses on analyzing Canadian perspectives about the Asia Pacific, its importance for Canada's future growth, and Canadians' awareness about the region – areas of exploration crucial to strengthening Canada-Asia relations. In keeping with its thematic approach, the *2021 NOP* further explores generational divides in knowledge, awareness, and perceptions of Canada-Asia relations to better inform future engagement by government, businesses, APF Canada, and other stakeholders. The objectives of this national poll are three-fold:

- To determine Canadians' feelings towards and awareness of the Asia Pacific.
- To gauge Canadian perspectives on the need for building Asia competency, and identify barriers and best methods to build knowledge, awareness, and competency.
- To inform policy-makers, educators, and practitioners' strategies to build Canada's Asia competency as the country prepares to actively engage with countries in the region.

Executive Summary

The Asia Pacific is the current epicentre of global economic growth, innovation, and talent. While Canada considers deeper engagement with the region, it is pertinent to consider Canadian perspectives and awareness of the Asia Pacific, especially among young adults, to ensure that the country is keeping pace with changing global dynamics. With this in mind, the Asia Pacific Foundation of Canada's *2021 National Opinion Poll: Canada's Generational Perspectives on Asia* explores Canadians' views about the Asia Pacific and their opinions on the need and ways to build more awareness and competency about the Asia Pacific, with a thematic focus on young adults' awareness, knowledge, and perceptions of Asia.

According to 2016 Canadian census data, Canada's younger generation (18-to-44 years) is more diverse in terms of race and ethnicity than the country's older generations. This NOP explores how this diversity, and the experience of multiculturalism, translates into differences in opinions and views about Asia across generational lines. Awareness about Asia and its diversity is arguably the first step towards understanding and accepting differences and identifying similarities with Asians and Asian countries. It is central to combating anti-Asian racism in Canada, nurturing a sustainable, multicultural Canadian society, and maintaining and developing business and government relations with the whole of the Asia Pacific. This poll helps identify the gaps in Canadians' awareness about Asia – and effective ways to fill those gaps and prepare Canadians for the changing socio-economic structure of Canada and the global economy.

The data has been weighted to the population estimates across provinces, age, and gender. The generations are identified as follows:

- **Generation Z:** 18 to 24 years old
- **Millennials or Gen Y:** 25 to 34 years old
- **Generation X:** 35 to 54 years old
- **Baby Boomers:** 55+

11 Key Takeaways

1

Generation Z is more likely to identify as Canadians of Asian descent than Baby Boomers.

In this NOP, 15% of all respondents self-identify as being of Asian descent. But strikingly, 29% of Gen Z (18-to-24 years) identify as Canadians of Asian descent, compared to less than 6% of respondents aged 55 and above. Across the survey, Canadians of Asian descent report higher interest and awareness about Asian culture, languages, and current events, and express warmer feelings toward Asia.

IMPRESSIONS AND PERSPECTIVES

2

Three out of five respondents name China as the first country or territory that comes to mind when thinking about 'Asia.'

Furthermore, when thinking about China, the first words that come to mind for most respondents are "communism" and "population." For 13% of Canadians, Japan is the first country they associate with 'Asia,' and 6% name India. When thinking of Japan, Canadians most commonly relate the country with "cuisine" or "technology." For India, respondents think primarily about "cuisine," but also "population" and "poverty." Baby Boomers are the most likely generation to think of China first, while they are the least likely generation to think of Japan or the Philippines first.

INTEREST, AWARENESS, AND KNOWLEDGE

3

China and Japan are the two Asian economies Canadians have the most knowledge about.

About one-quarter of Canadians believe they have "a fair amount" to "a lot" of knowledge about China and Japan. One in two respondents say they have at least "a little" knowledge about the three most commonly associated Asian economies – China, Japan, and India. Self-assessed knowledge for the Southeast Asian countries of Indonesia, the Philippines, and Singapore is the lowest. Slightly more Gen Z respondents reported "a fair amount" or "a lot" of knowledge about China, Japan, India, and the Philippines compared to all other generations.

4

A majority of Canadians are interested in learning more about Asia.

More than half of the respondents are interested or currently engaged in learning more about Asian cuisine, history, or tourism. Younger Canadians (below 34) are generally more interested in learning more about Asia. Specifically, they show more interest than their older counterparts in Asian languages and culture, such as music, art, literature, gaming, media,

and entertainment. Meanwhile, older Canadians (55+) are more interested in Asian history, tourism, politics, and current affairs compared to young Canadians.

LEARNING ABOUT THE ASIA PACIFIC

5 Respondents who are interested in learning more about Asia identified community engagement, emphasis on Asia in the education system, and more media coverage as the top three most effective methods to build Canadians' awareness about Asian countries or Asians.

Interestingly, compared to other respondents, Canadians of Asian descent are more likely to believe that more community engagement and teaching Asian languages are effective methods. However, they don't find an increased emphasis on teaching about Asia or more news media coverage of Asia as effective as the rest of Canadians.

6 Traditional mainstream news outlets are the most popular source of knowledge and exposure to Asia for Canadians, followed by online mainstream news outlets and conversations with personal networks.

But there are significant generational divides. Gen Z and Millennials are more likely to get information from their social circles and popular culture about/from Asia, with social media close behind as the third most popular source. By contrast, a majority of Baby Boomers choose traditional mainstream news outlets as their top source of information about Asia. Generation X is equally likely to choose traditional or online mainstream news outlets or conversations with personal networks as their top sources of information about Asia.

7 Seven in 10 respondents across all age groups say they had too little or no exposure to Asia in their high-school education.

Only 18% of Canadians identify education as a source of their knowledge and exposure to Asia. Furthermore, among the respondents interested in learning about Asia, 46% said that an increased emphasis on teaching about Asia in the Canadian education system would be an effective method to build Canadians' awareness about Asia and Asians.

ASIAN LANGUAGES

8 Thirteen per cent of Canadians have conversational fluency in at least one Asian language, the majority being Canadians of Asian descent.

Among respondents who can speak an Asian language, 70% know Cantonese or Mandarin (Chinese), about 21% speak Hindi, and 15% speak Punjabi. The remaining languages saw 10% or less. Younger Canadians are more likely to express conversational fluency than the older generations.

9

When asked about languages Canadians would like to learn the most besides English or French, Chinese, including Mandarin and Cantonese (12%), and Japanese (6%) are the second and fourth top choices, behind Spanish (46%) and Italian (8%).

Nonetheless, seven out of 10 respondents said they would be open to learning an Asian language. The most popular factor that would encourage Canadians to learn an Asian language is visiting an Asian country for tourism purposes (42%). Three out of 10 respondents said that factors such as free courses, the need to work or study in an Asian country, and family would encourage them to learn an Asian language. The younger generations are more enthusiastic about learning an Asian language compared to the older generations.

IMPACT OF ASIA PACIFIC ON CANADA

10

A majority of Canadians think that Asian technology, immigrants, culture, and economic growth will positively impact Canada in the next 10-to-20 years.

Seven out of 10 think technology and innovation in Asia will positively impact Canada's future, 62% think the same for immigration from Asia, 58% for the influence of Asian cultures and traditions on Canada, and 57% for economic growth in the Asian region. Baby Boomers are significantly more pessimistic about the impact of most factors than the younger generations.

11

Compared to older Canadians, younger generations are more likely to believe that building Asia competency about society, culture, and protocols will be important for Canada's future economic growth and social diversity.

Almost half of Gen Z and Millennials believe it is "important" or "very important" to understand Asian society and culture for Canada's future economic growth and social diversity, compared to about 35% of the two older generations. Notably, twice as many Canadians of Asian descent think understanding Asia is "important" or "very important" for Canada's future economic growth and social diversity compared to the rest of respondents.

Survey Results

The following sections of this report highlight the key findings from APF Canada's *2021 National Opinion Poll: Canada's Generational Perspectives on Asia*, and, in addition to presenting general Canadian views, provides an analysis of generational differences. Where relevant, differences in opinions expressed by self-identified Canadians of Asian descent and non-Asian descent have also been discussed. Variations in attitudes across provinces, gender, and education have not been reported.

Identifying the Generations

While the data is weighted to the population estimates across province, age, and gender to be representative of the Canadian population, in this survey, young adults (18-to-34 years) were oversampled to provide more confidence in our findings of their opinion. Throughout the report, we have analyzed the data by generations as identified in *Table 1*.

TABLE 1

Identifying the Generations

Gen Z	Millennials	Gen X	Baby Boomers
18-24 years	25-34 years	35-54 years	55+ years
Unweighted Sample			
453	555	745	839
Weighted Sample			
282	425	884	1002

Base: n=2592

Canadians of Asian Descent

By the Numbers: Canadians of Asian Descent

+ 55% identify as male
+ 48% live in Ontario, 26% in British Columbia, and 15% in Alberta
+ 39% consider themselves East Asians, 22% South Asians, and 13% Southeast Asians

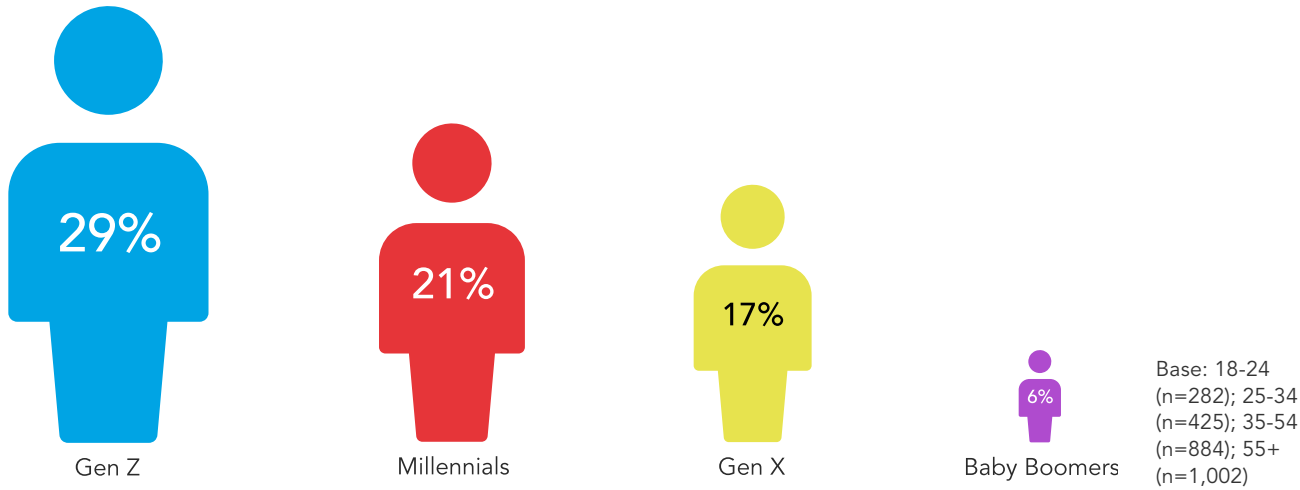
Over the last 20 years, the population of Canadians of Asian descent has steadily grown by 4.3% annually. According to Canada's 2016 population census, the latest available, 17.7%[12] of the Canadian population identify as people of Asian origin, with 5.1% of Canadians of Chinese origin, 4.0% of Indian origin, and 2.4% of Filipino origin – the three most prominent Asian diasporas in Canada. Given Canada's fast-changing demographics, it is important to monitor how Canadians' awareness of Asia, their sources of information about Asia, and Canada's education system are evolving along with these trends. It is also important to keep track of Canadians feelings toward Asia and Asian people, especially as anti-Asian racism continues to be a pressing issue in Canada.

In this NOP, 14.6% of respondents identified as Canadians of Asian descent with the majority of those respondents under the age of 35. Specifically, 29% of respondents aged 18-to-24 identify as Canadians of Asian descent[3] *(Figure 1)*.

FIGURE 1

Asian Canadians, by age (% of sub-group sample)

Question: Do you identify as a Canadian of Asian descent?

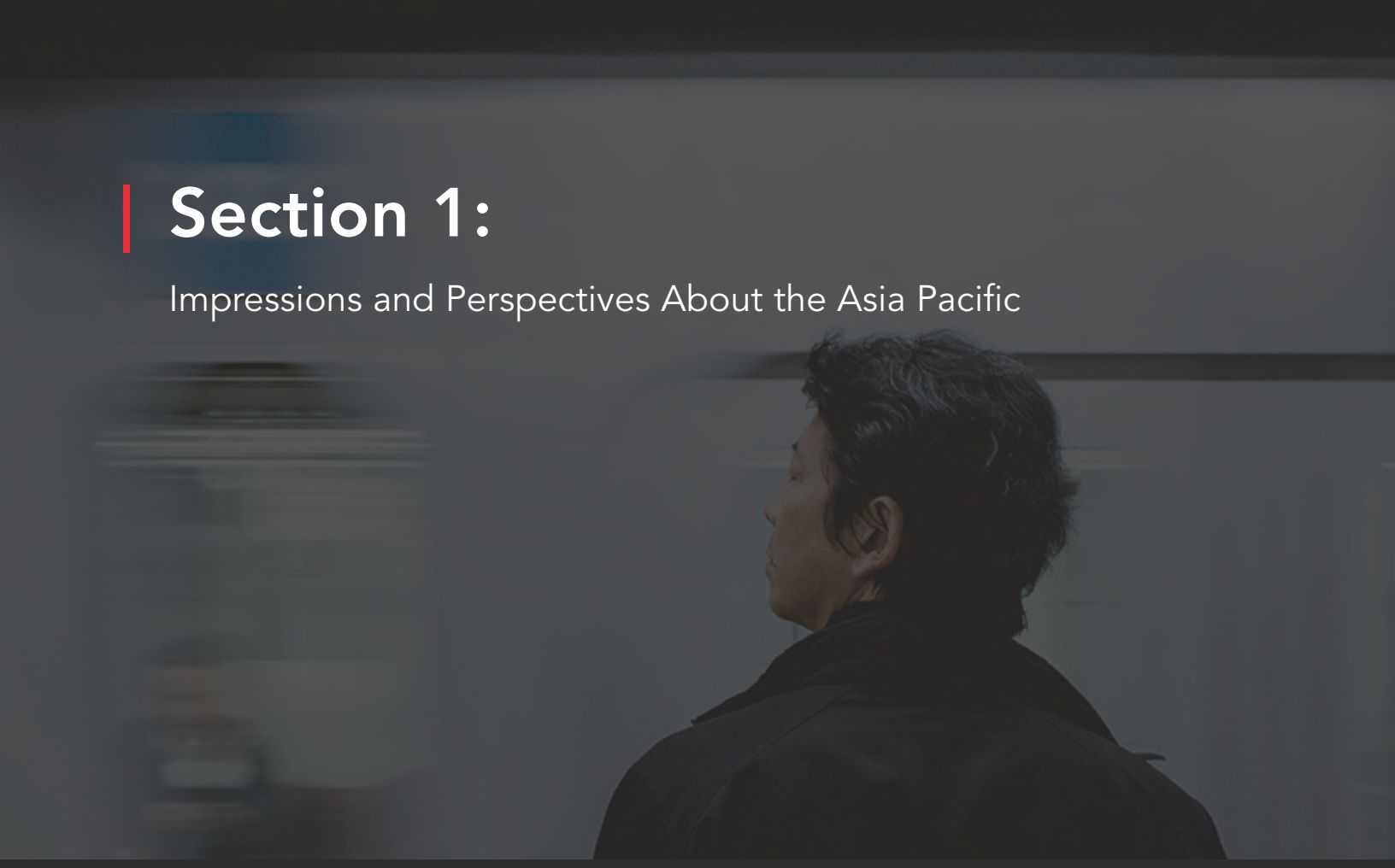


[1] Includes all residents of Canada above the age of 14.
[2] In October 2022, Statistics Canada will release the 2021 census demographic data, which promises to better reflect Canada's diversity as the agency recognizes the growing diversity of the Canadian population.
[3] According to the 2016 Census data, 21.5% of Canadians aged 15 to 24 and 21.2% of Canadians aged 25 to 34 identified as Canadians of Asian descent.

Across the report, we compare responses from Canadians of Asian descent with those of other Canadians and highlight significant differences. While our report focuses on the overall Canadian opinion and generational divides, we find ethnicity plays a significant role in experiences, awareness, feelings, and perspectives about Asians and Asia. And since Canadians of Asian descent make up a significant share of Canadian youth, those differences significantly impact overall Canadian opinion.

Section 1:

Impressions and Perspectives About the Asia Pacific



KEY POINTS:

+ When thinking about Asia, a majority of Canadians (64%) think of China first. Still, Canadians' perception of Asia has broadened compared to 2017 (NOP), with more respondents in 2021 thinking about Japan (13%) and India (6%) first.

+ Millennials hold the warmest feelings of all generations toward Asian countries, while Baby Boomers hold the coldest feelings.

+ While Canadians still reserve their most unfavourable feelings for China, overall feelings toward China have picked up from 3.6 in 2020 to 4.5 in 2021. Millennials hold neutral feelings (5.0) toward China. (This survey was in the field in early September 2021, before the release of Meng Wanzhou and the two Michaels later that month).

+ More than half of the respondents say they don't know enough about the Japanese and Indian prime ministers, but most Canadians know Chinese President Xi Jinping. However, respondents have the least confidence in President Xi to do the right thing regarding world affairs, with 56% saying they have "no confidence at all."

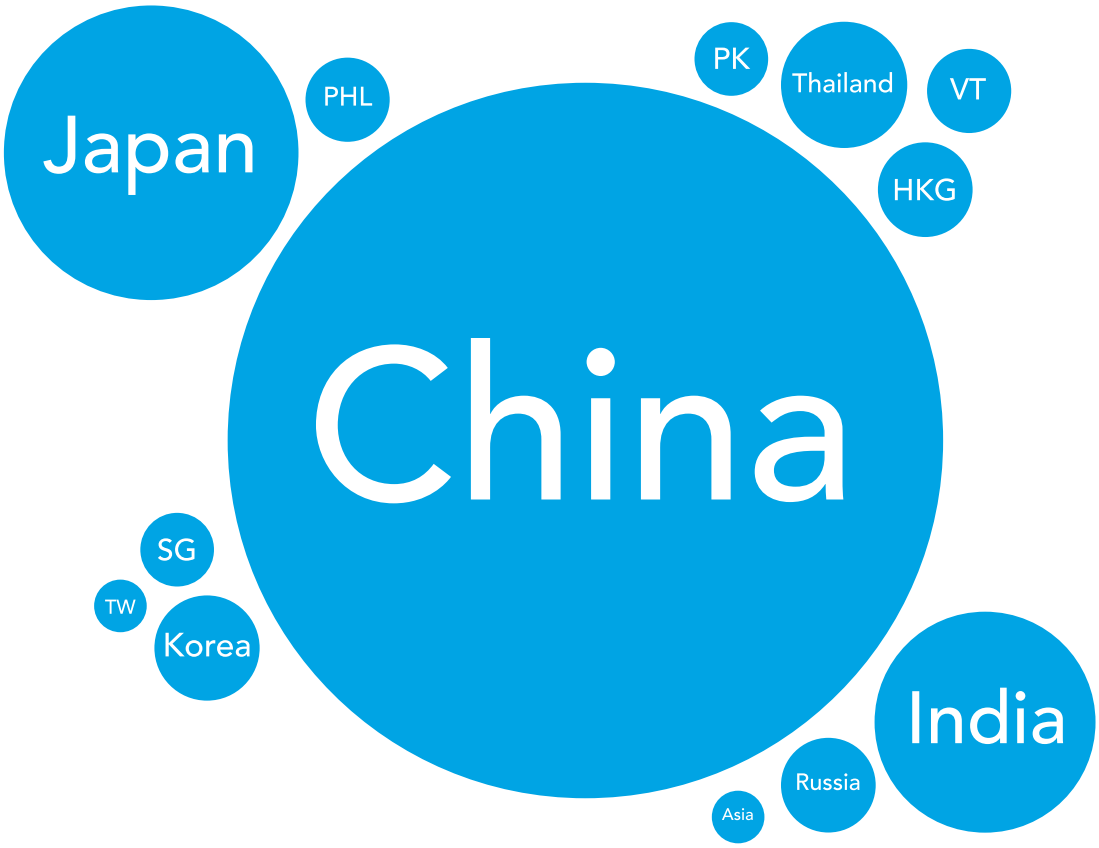
First Impressions

China continues to dominate Canadians' mental image of Asia, but to a lesser degree than in our 2017 NOP. For 64% of Canadians, China is the first country to come to mind when thinking about Asia *(Figure 2)*.

FIGURE 2

China dominates Canadians mental image of Asia

Q: When you think about "Asia," what is the first country or territory that comes to your mind?



Base: All respondents (n=2,592)

Notes: (1) Among respondents who mention Korea, 0.4% of the 1.4% said "South Korea" specifically. (2) 7.4% of responses are excluded from the word cloud because they mention territories outside the Asia Pacific (1.9%), other Asia Pacific territories mentioned by less than 0.5% of the sample (1.6%), or other/missing (3.5%).

While a majority of respondents across all generations think of China first, Baby Boomers are the most likely generation to associate Asia with China. In contrast, they are the least likely generation to think of Japan or the Philippines.

When we asked the same question in 2017, 69% of respondents said they thought of China, and only 10% and 5% thought of Japan and India. This year more respondents think of Japan (13%) and India (6%), especially youth, suggesting that Canadians' perceptions of Asia are slowly broadening.

Canadians first impression of Japan tends to be positive, but it tends to be negative for China and India

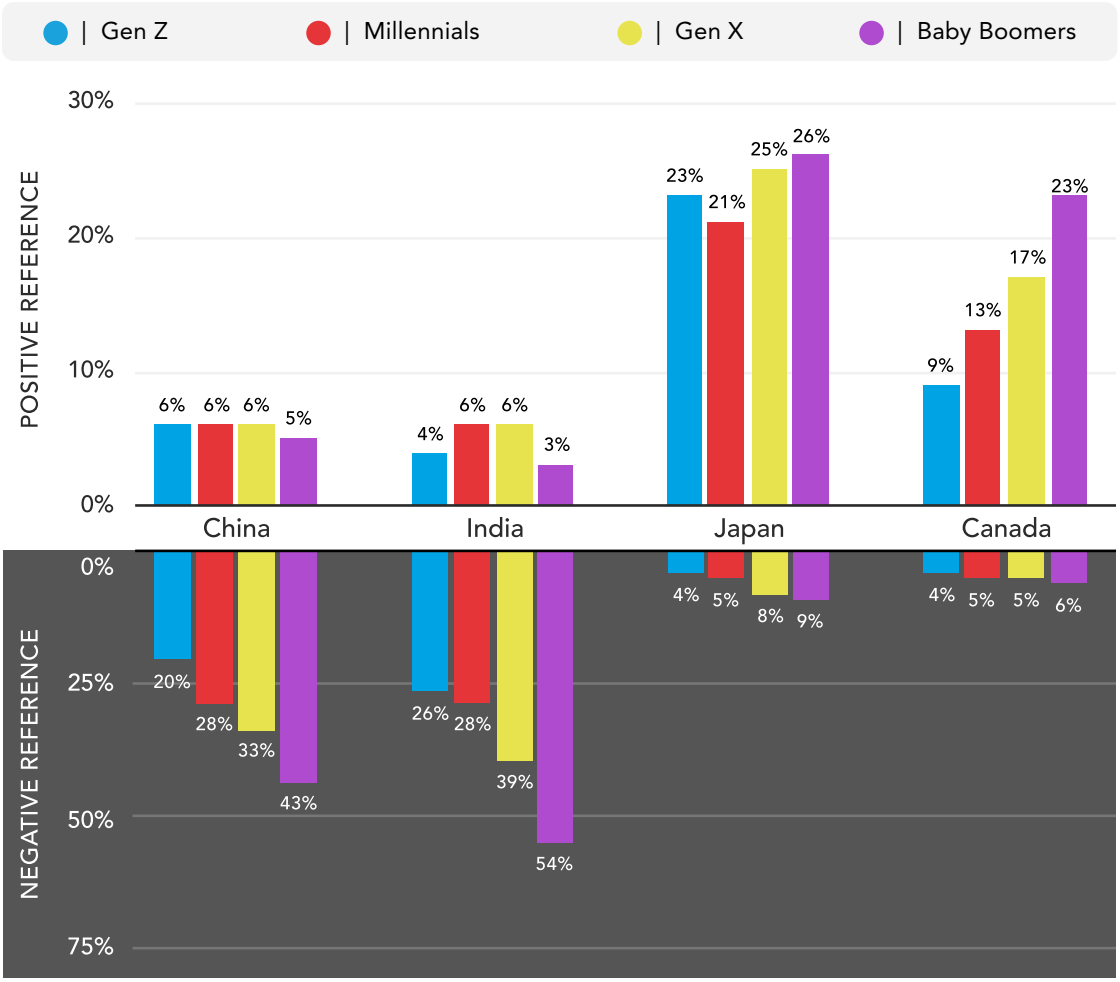
We also asked Canadians about the first things that come to mind when thinking about China, Japan, India, and Canada. Their answers, limited to a maximum of 20 words, were coded and grouped into categories.

We found that more than one-third of respondents think of something negative first when thinking about China and India, and very few think of something positive. For Japan and Canada, more respondents thought of something positive first. Also, as shown in *Figure 3*, the older the respondents are, the more they think of something negative first for all countries.

FIGURE 3

A third of respondents think of something negative when thinking about China and India

Q: When thinking about the following countries, what is the first thing that comes to your mind?



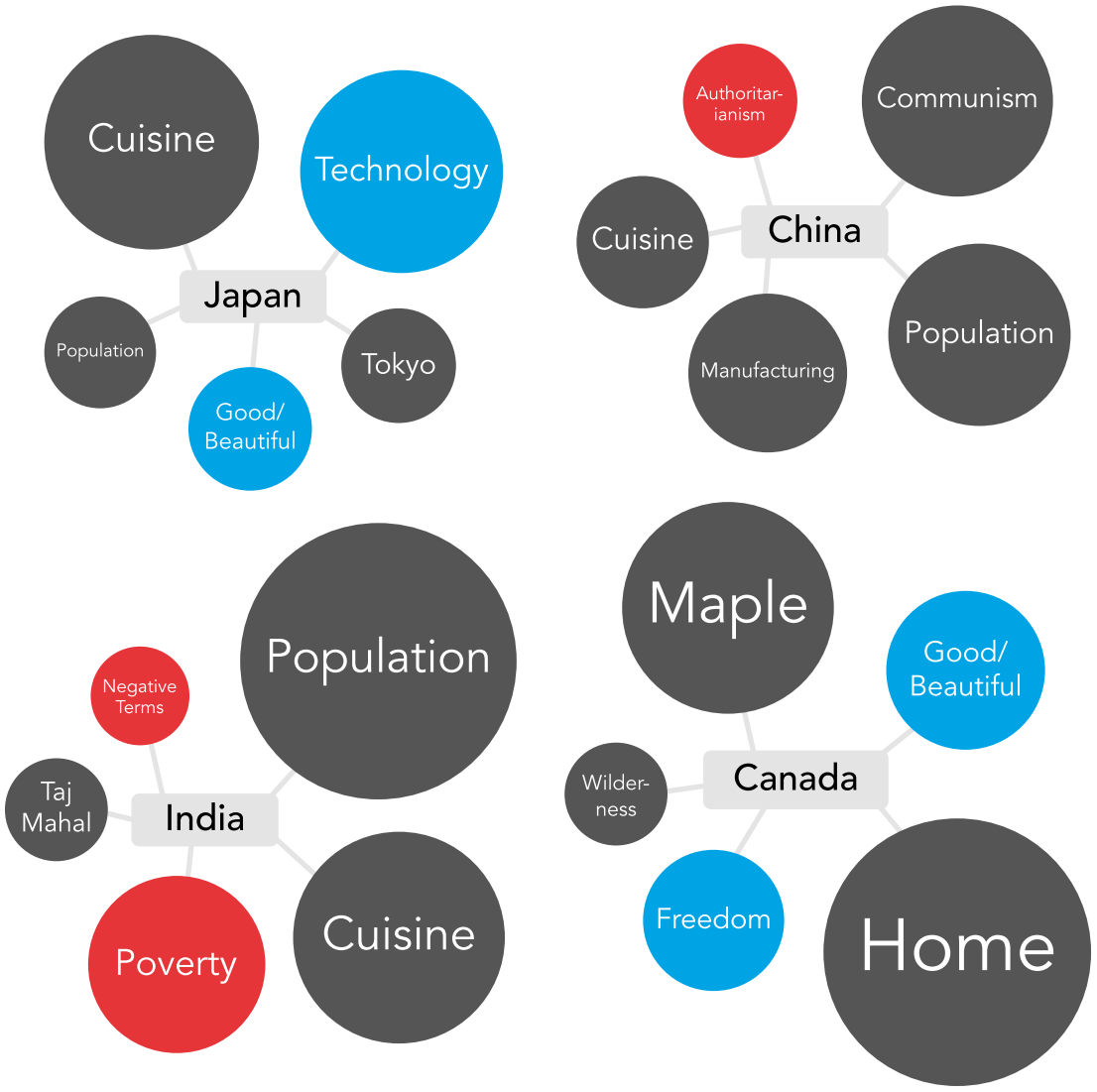
Base: 18-24 (n=282); 25-34 (n=425); 35-54 (n=884); 55+ (n=1,002)

The most common reference made for China was "communism" (11%). For India, Canadians reference "crowds" and large "population" the most (21%), and for Japan, "food and cuisine" was referenced the most (13%). Interestingly, for all three countries, references to the large population and to cuisine fall within the top five 'first things' to come to mind for Canadians (*Figure 4*). And for all countries, the younger the respondents are, the more likely they are to reference "food and cuisine," while the older they are, the more likely they are to reference the population and crowds.

FIGURE 4

Top FIVE "first things" that come to Canadians' minds when thinking about …

Q: When thinking about the following countries, what is the first thing that comes to your mind?



Base: All respondents (n=2,592)

Note: Red bubbles represent negative references and blue bubbles represent positive references.

Feelings toward Asia Pacific economies

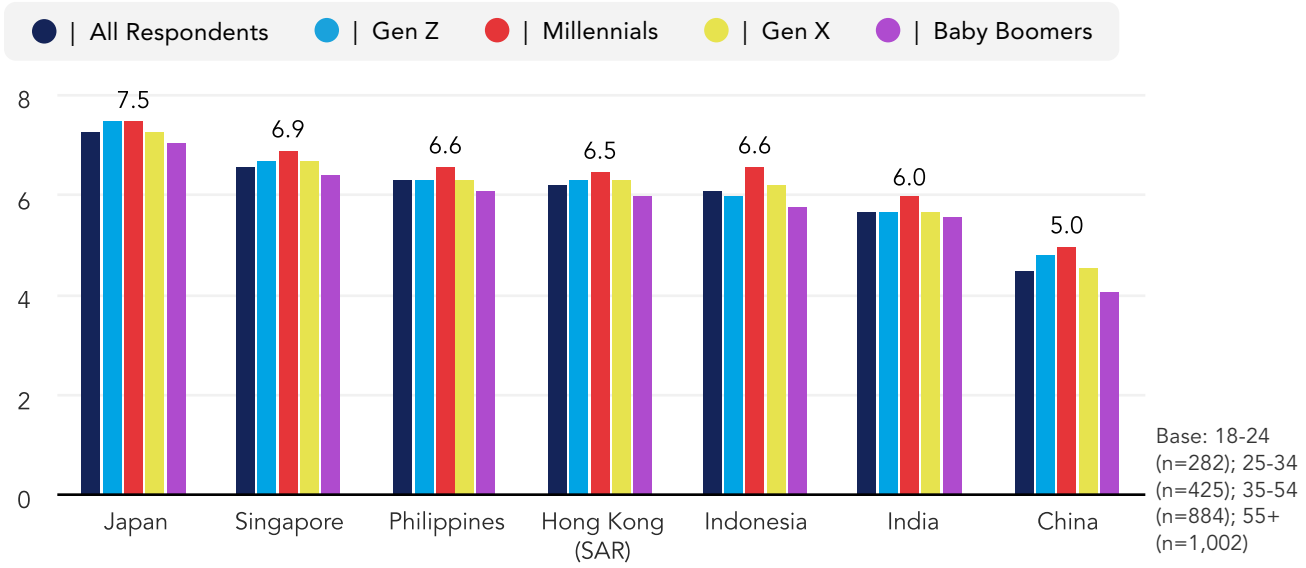
Through our NOPs, APF Canada has tracked Canadians' feelings toward Asian economies for more than a decade. Canadians are asked to rate their feelings on a scale of 1 to 10, with 1 meaning a "very cold, unfavourable" feeling, and 10 meaning a "very warm, favourable" feeling.

As has always been the case[4], Canadians hold the warmest feelings toward Japan of all Asian economies and the coldest feelings toward China. This year, the average feeling toward China bounced back from a decade-low of 3.6 in 2020 to an average of 4.5. It should be noted that Canadians were polled in early September 2021 before the resolution of the Meng Wanzhou case and the release of the two Michaels at the end of September.

FIGURE 5

Millennials hold the warmest feelings toward all Asian economies

Q: Please rate your feelings towards each of the following countries, regions, or territories, with 1 meaning you have a "very cold, unfavourable" feeling, and 10 meaning you have a "very warm, favourable" feeling.



As *Figure 5* shows, in 2021 Millennials hold the warmest feelings of all generations toward all Asian economies, while Baby Boomers hold the coldest feelings toward all Asian economies. Conversely, older generations hold warmer feelings toward Australia. The gap in feeling is the largest for China, where Millennials rated their feelings toward China at 5.0 compared to 4.1 for Baby Boomers.

[4] Figure 8 of APF Canada's 2020 National Opinion Poll shows the evolution of Canadians feeling over the last decade.

Canadians of Asian descent hold warmer feelings toward all Asian economies compared to the rest of Canadians, and most significantly for China (+1.3 pts) and Hong Kong (SAR) (+1.0 pts) (see *Table 2*).

As Canadian youth are ethnically more diverse and boast a larger population of Canadians of Asian descent, we might assume that this is the reason Millennials hold warmer feelings toward Asia than Baby Boomers. However, we found that ethnicity does not explain the difference in opinion between the two groups for most countries. As shown in *Table 2*, Millennials hold the warmest feelings toward most Asian countries – for both the Canadians of Asian and non-Asian descent groups.

TABLE 2

Generational Divide and Feelings Towards Asia Pacific Economies

Question: Please rate your feelings towards each of the following countries, regions, or territories, with 1 meaning you have a "very cold, unfavourable" feeling, and 10 meaning you have a "very warm, favourable" feeling.

Generations	AUS	CHN	HKG	IND	IDN	JPN	PHL	SGP	ZAF	USA
Canadians of Asian descent	7.3	5.6	7	6.2	6.6	7.7	6.6	7.2	5.9	6.2
Gen Z	7.1	5.4	6.8	6	6.2	7.7	6.1	6.9	5.6	5.8
Millennials	7.4	5.8	7	6.5	6.9	7.9	6.8	7.6	6.5	6.8
Gen X	7.3	5.6	7.1	6.1	6.5	7.5	6.5	7.3	5.9	6.2
Baby Boomers	7.2	5.4	6.6	6.4	6.4	7.6	6.9	6.8	5.4	5.7
Canadians of non-Asian descent	7.9	4.3	6	5.6	6	7.2	6.2	6.4	6	6.1
Gen Z	7.7	4.6	6.1	5.5	5.9	7.5	6.3	6.6	6.1	5.9
Millennials	7.7	4.8	6.2	5.8	6.4	7.4	6.5	6.6	6	6.2
Gen X	7.9	4.4	6	5.6	6.1	7.2	6.3	6.5	6.1	6
Baby Boomers	8.1	4	5.9	5.6	5.8	7.1	6.1	6.3	5.9	6.2
Canadian Average	7.8	4.5	6.2	5.7	6.1	7.3	6.3	6.6	6	6.1

Base: All respondents (n=2,592); Canadians of Asian descent (n=379); Canadians of non-Asian descent (n=2,213)

Note: Data referenced in the report's text is highlighted in yellow

Furthermore, it is interesting to note that, overall, Gen Z holds more negative feelings toward Asia compared to Millennials. However, this is not the case among Canadians of non-Asian descent for Singapore and Japan, whereas among Canadians of Asian descent, Gen Z hold more negative feelings toward Singapore and Japan compared to Millennials. For other Asian economies, the difference in the feelings of Gen Z and Millennials is larger for Canadians of Asian descent than it is for Canadians of non-Asian descent. As a result, among Millennials, Canadians of Asian descent hold vastly more positive feelings toward Asia compared to Canadians of non-Asian descent. However, within Gen Z, the feelings of Canadians of Asian descent are only slightly more positive than those of Canadians of non-Asian descent, except for the Philippines, where it is more negative.

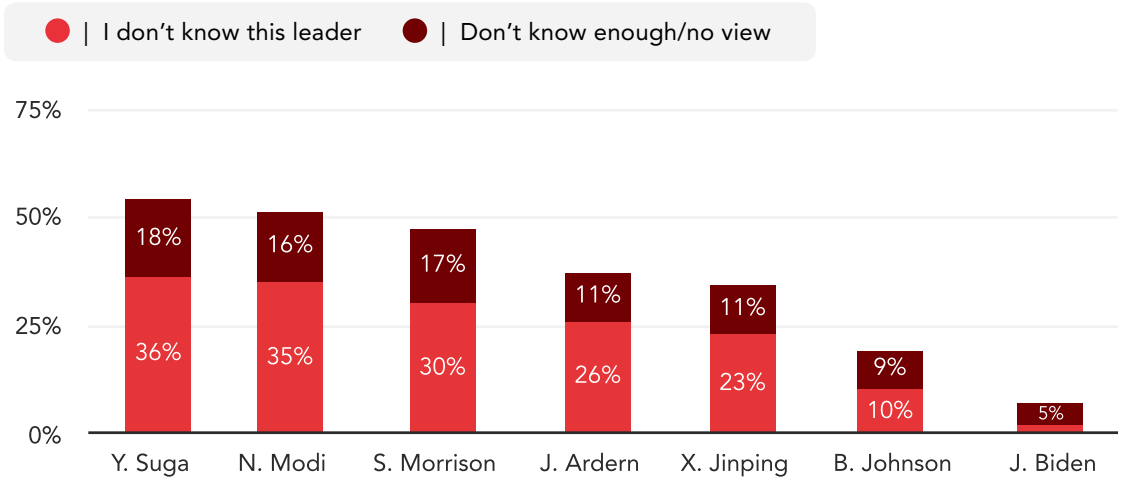
Trust in Asia Pacific leaders

Most Canadians say they don't know enough about Asian leaders, except for Chinese President Xi Jinping, who has been in power since 2013. When asked about their level of confidence in leaders to "do the right thing regarding world affairs," 36% say they don't know about the Japanese Prime Minister – Yoshihide Suga at the time of polling – and 35% say they don't know about Indian Prime Minister Narendra Modi (*Figure 6*). For China, only 23% say they don't know Xi Jinping. In comparison, 93% of respondents have an opinion of Joe Biden. Finally, for all leaders, significantly more Gen Z and Millennials say that they "don't know the leader" compared to the two older generations.

FIGURE 6

Among Asian leaders, more than half of Canadians don't recognize or know enough about Japanese and Indian leaders, while the majority knows about China's leader

Q: How much confidence do you have in each leader to do the right thing regarding world affairs?



Base: All respondents (n=2,592)

The respondents who have no view or say they don't know about the leaders were scaled out in *Figure* 7, in order to compare the level of trust Canadians have in each leader. With 56% saying that they have "no confidence at all" in him to "do the right thing" regarding world affairs, Xi Jinping is the least trusted leader from the list, followed by Narendra Modi (26%). For the two leaders, more say they have "no confidence at all" than "a lot of confidence." On the other hand, Canadians have the most confidence in New Zealand Prime Minister Jacinda Ardern, with 51% saying they have "a lot of confidence."

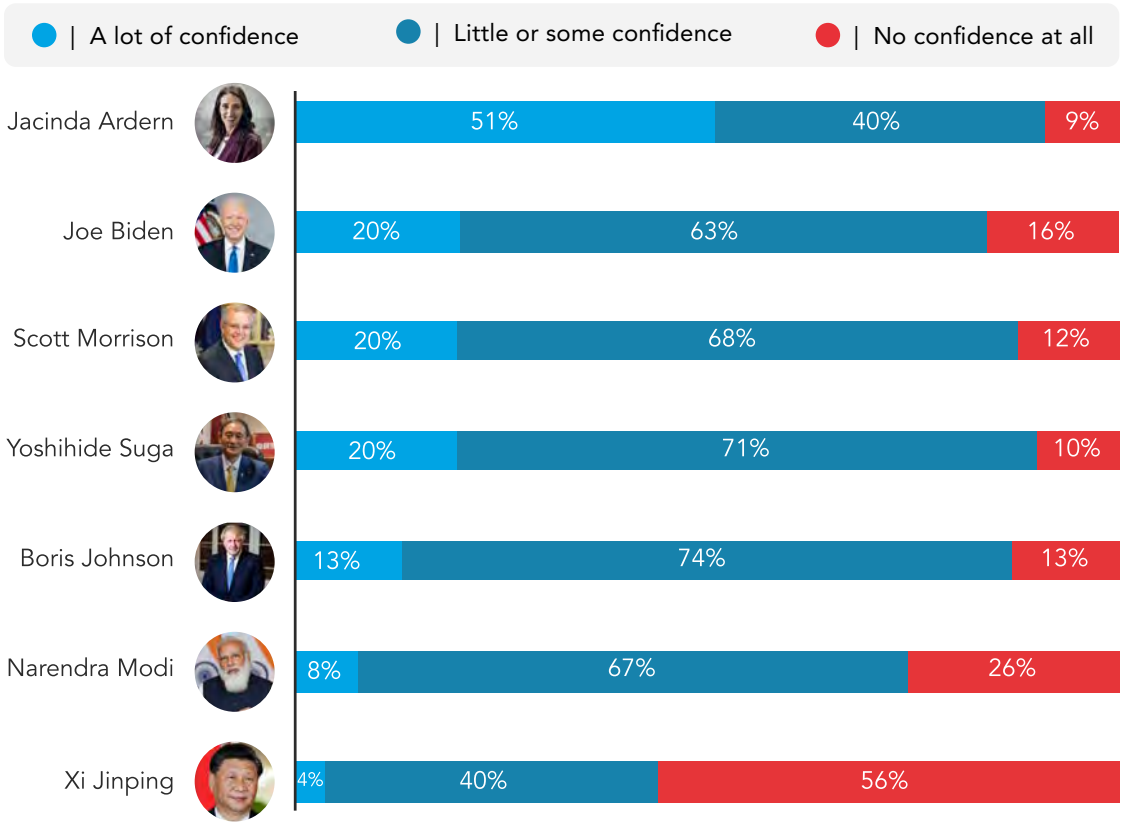
Generational Divide

There are only minor differences between generations in the confidence they have in world leaders. Interestingly, of all four generations, more Gen Z respondents say that they have "no confidence at all" in Narendra Modi (India) (40%), Scott Morrison (Australia) (20%), and Yoshihide Suga (Japan) (17%).

FIGURE 7

Canadians have the least confidence in Xi Jinping to do the right thing regarding world affairs

Q: How much confidence do you have in each leader to do the right thing regarding world affairs?



Base: All respondents (n=2,592)

Note: Responses exclude respondents who said "I don't know this leader" or "I don't know enough/no view."

Section 2:

Interest, Awareness, and Knowledge About Asia

KEY POINTS:

+ A majority of Canadians under the age of 55 are "somewhat interested" about Asia and willing to receive information about Asia.

+ The most popular areas of interest for Canadians interested in learning about Asia are Asian food and cuisine (66%) and Asian history (64%).

+ Canadians report limited knowledge about Asia. At most, 26% say they have a fair amount or a lot of knowledge about China.

+ Gen Z respondents reported slightly more knowledge of most Asian economies compared to other generations.

+ Despite Gen Z's perceived superior knowledge of Asia compared to other generations, Baby Boomers display more actual knowledge of Asian geography and current events.

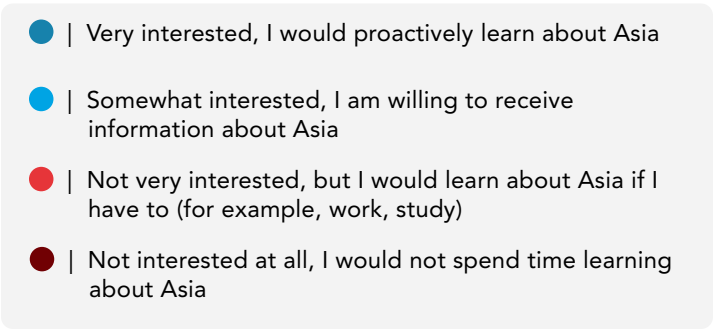
Interest in Learning About Asia

Measuring Canadians' interest in Asia provides insight into Canadians' openness to Asia and Asians and their willingness to learn about Asia, a region of significant economic and social importance for Canada.

FIGURE 8

A majority of Canadians are interested in learning about Asia

Q: How interested are you in learning more about Asia (e.g. its politics, society, people, culture etc.)?



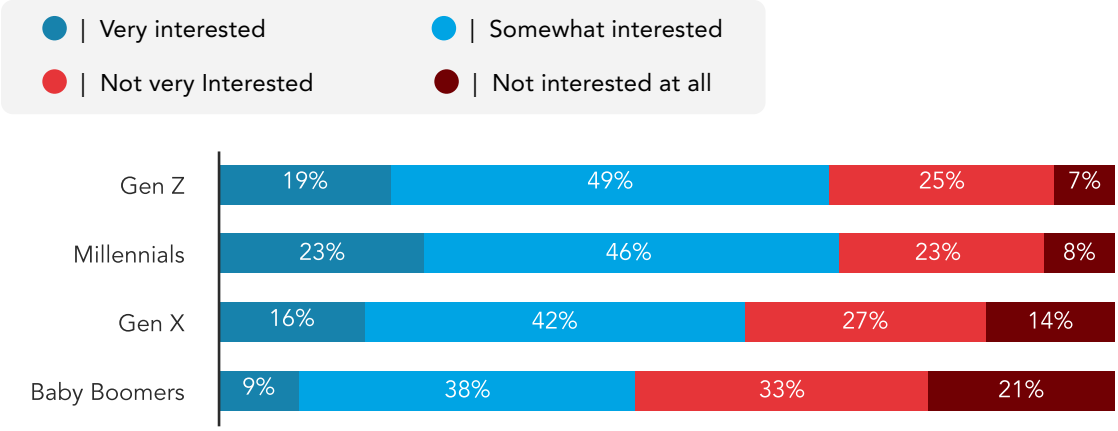
All respondents (n=2,592)

Our 2021 NOP found that a majority (57%) of Canadians are somewhat or very interested in learning about Asian politics, society, people, and culture. However, only 15% say they are "very interested" and would proactively learn about Asia (see *Figure 8*).

FIGURE 9

Gen Z and Millennials are more interested to learn about Asia than older generations

Q: How interested are you in learning more about Asia (e.g. its politics, society, people, culture etc.)?



Base: 18-24 (n=282); 25-34 (n=425); 35-54 (n=884); 55+ (n=1,002)

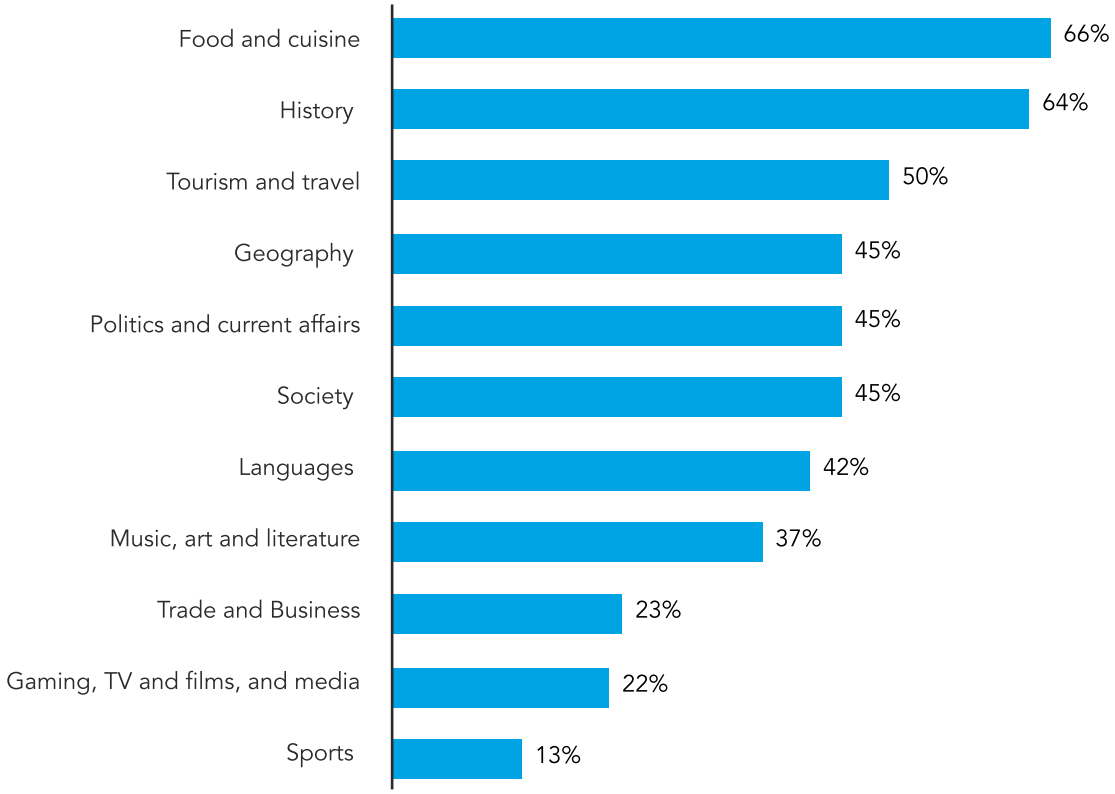
Baby Boomers are the only group where a majority of respondents is not interested in learning about Asia (53%, *Figure 9*). For respondents younger than 35 years, 68% are interested in learning more about Asia.

Among respondents interested (very/somewhat) in learning more about Asia, 66% are interested or engaged in Asian food and cuisine, and 64% are interested or engaged in Asian history (*Figure 10*). Canadians are also widely interested in Asian tourism, geography, politics and current affairs, society, languages, and music, art and literature.

FIGURE 10

Canadians are most interested about Asian cuisine and history

Q: Which of the following Asia-related areas are you most interested in or currently engage in among the following? Please select all that apply.



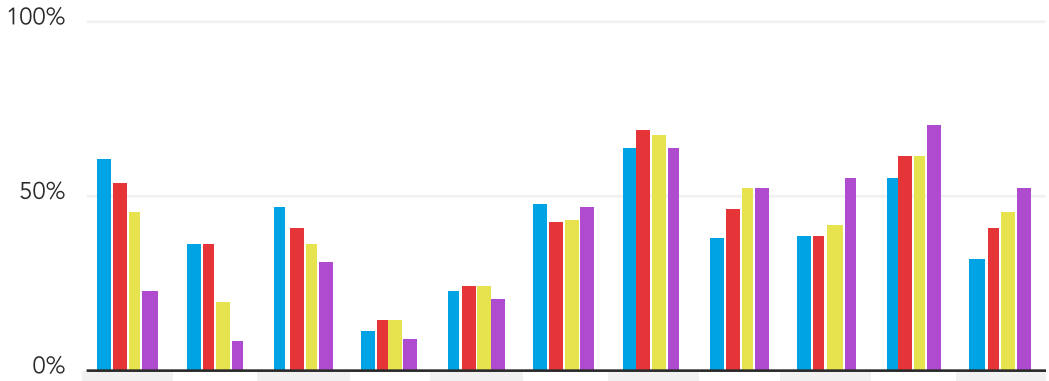
Base: Respondents interested in learning more about Asia (n=1,520)

There is a significant interest or engagement in languages, gaming and movies, and music and art among Canadian youth. But with age, interest in these areas diminishes (*Figure 11*). Notably, Baby Boomers stand out for their low interest in Asian languages (23%), which contrasts with all other generations. It becomes a prominent trend, as noted further in this report. Instead, Baby Boomers interested in Asia are more interested or engaged in Asian geography, history, and politics than any other group.

FIGURE 11

Asia-related area Canadians are most interested or currently engage in, by generations

Q: Which of the following Asia-related areas are you most interested in or currently engage in among the following? Please select all that apply.



	Languages	Gaming, movies, etc.	Music, art, etc.	Sports	Trade and Business	Society	Food and cuisine	Tourism and travel	Politics	History	Geography
Gen Z	61%	36%	47%	12%	23%	48%	64%	38%	39%	55%	32%
Millennials	54%	36%	41%	15%	25%	43%	69%	46%	39%	62%	41%
Gen X	45%	20%	36%	15%	25%	44%	67%	53%	42%	62%	45%
Baby Boomers	23%	8%	31%	9%	21%	47%	64%	53%	55%	71%	53%

Base: Respondents interested in learning more about Asia; 18-24 (n=198); 25-34 (n=302); 35-54 (n=533); 55+ (n=487)

Interestingly, among respondents interested in Asia, Canadians of non-Asian descent across all generations show more interest in Asian history compared to Canadians of Asian descent. The difference is most striking for Baby Boomers, where 74% of Canadians of non-Asian descent are interested or engaged in Asian history compared to only 44% of Canadians of Asian descent. However, Canadians of Asian descent of all ages are more interested in Asian languages than Canadians of non-Asian descent. Again, the difference is striking for the oldest generation as 52% of Canadians of Asian descent who are Baby Boomers are interested in Asian languages compared to 20% for Canadians of non-Asian descent who are also Baby Boomers.

Self-assessment of Awareness About Asia

Before testing Canadians on their knowledge of Asia, we asked them to self-assess their level of knowledge about Asian history, culture, demographics, and current events for different Asian countries.

At most, 26% say they have "a fair amount" or "a lot" of knowledge about China, followed by Japan (24%) and India (17%). About half of the respondents say they have a little bit of knowledge for all three countries, and the rest say they have almost no knowledge of the countries. For other Asian economies, about half the respondents say they have almost no knowledge (see *Figure 12*). In comparison, only 4% say they have almost no knowledge about the United States, while reported knowledge of Australia is comparable to that of China and Japan.

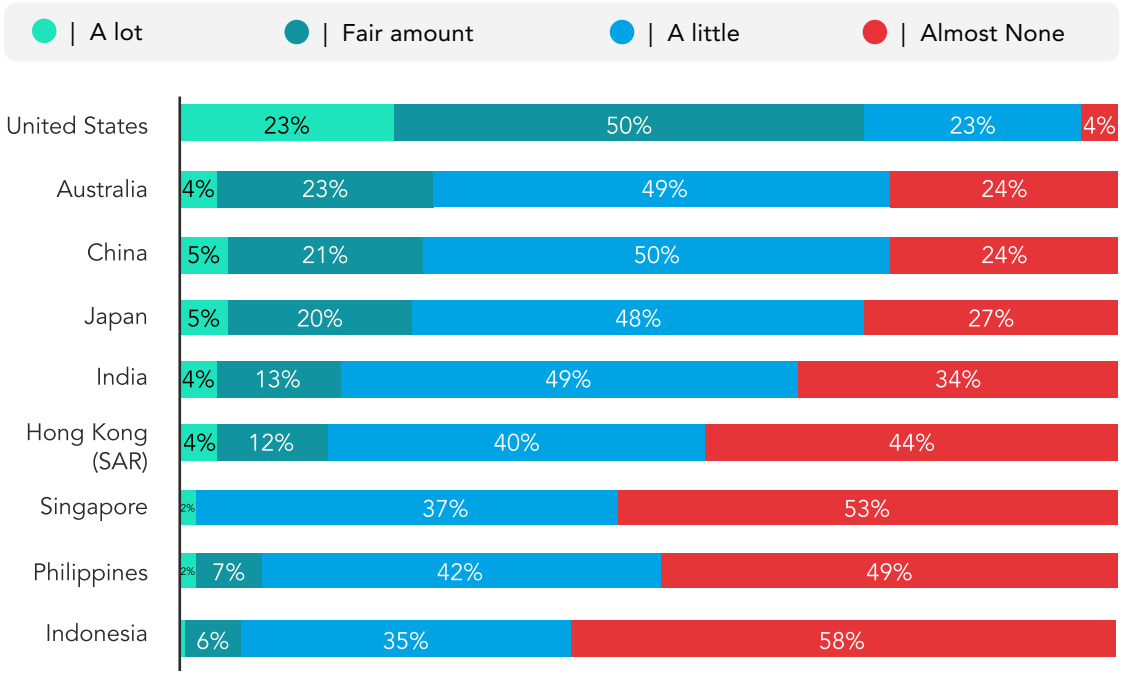
Perceived Knowledge Among Canadians of Asian and Non-Asian Descent

Canadians of Asian descent reported significantly more knowledge about Asian economies compared to other Canadians. About twice as much for China, Japan, and India, and three times as much for other Asian economies.

FIGURE 12

Three-quarters of Canadians report at least a little bit of knowledge about China and Japan, but few have a lot of knowledge

Q: How much knowledge (history, culture, demographics, current events) do you have about the following regions and economies?



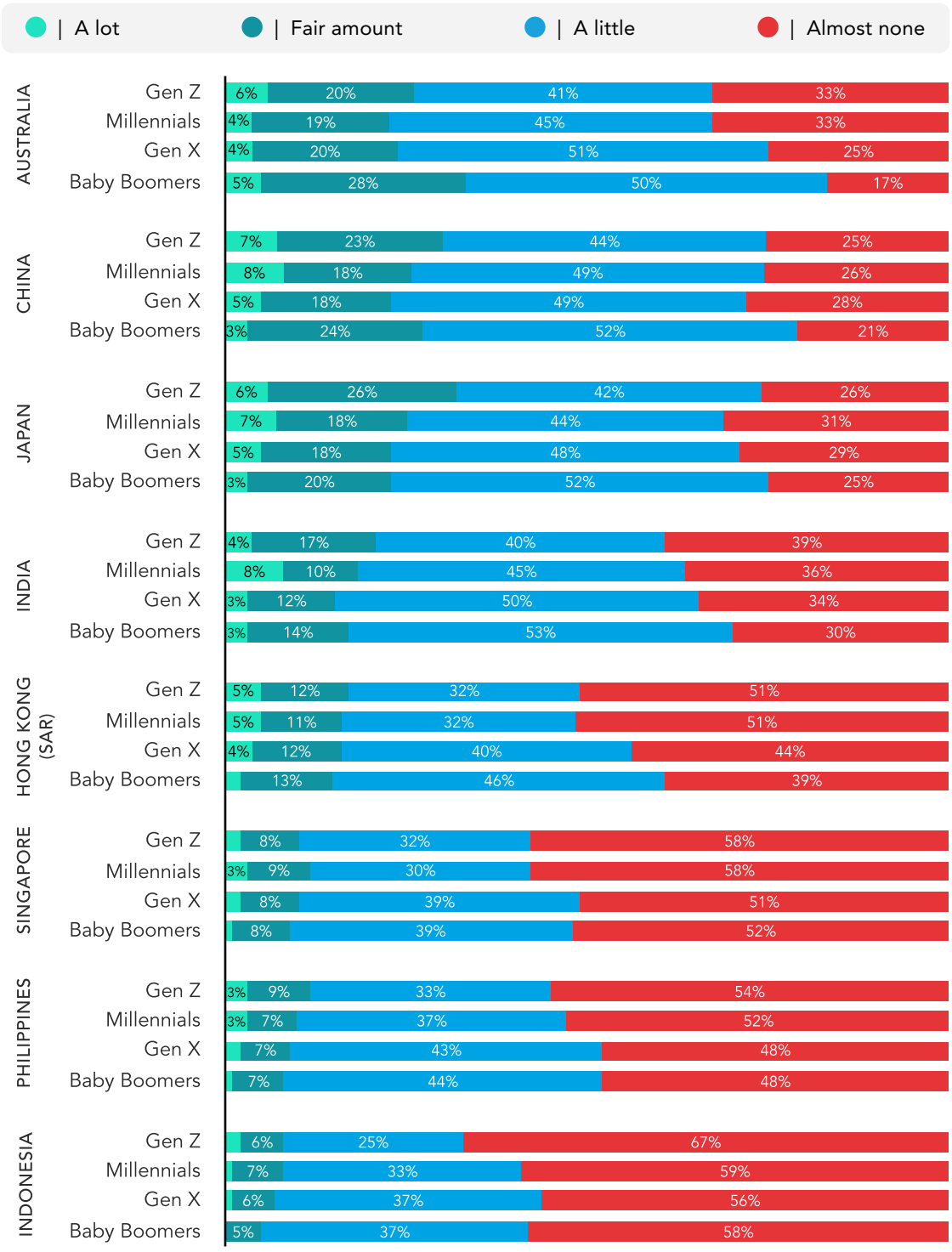
Base: All respondents (n=2,592)

Interestingly, slightly more Gen Z respondents reported "a fair amount" or "a lot" of knowledge of China, Japan, India, and the Philippines compared to all other generations (*Figure 13*). Reported knowledge of these economies is nearly the same for Millennials, Gen X, and Baby Boomers. Notably, 32% of Gen Z reported at least a fair amount of knowledge about Japan while the population average is 24%, and 30% reported the same for China, while the population average is 26%.

FIGURE 13

Knowledge of Asia, by age

Question: How much knowledge (history, culture, demographics, current events) do you have about the following regions and economies?



Base: 18-24 (n=282); 25-34 (n=425); 35-54 (n=884); 55+ (n=1,002)

Measured Awareness About Asia

After asking Canadians about their perceived knowledge, we posed questions about Asia and current events to measure actual knowledge.

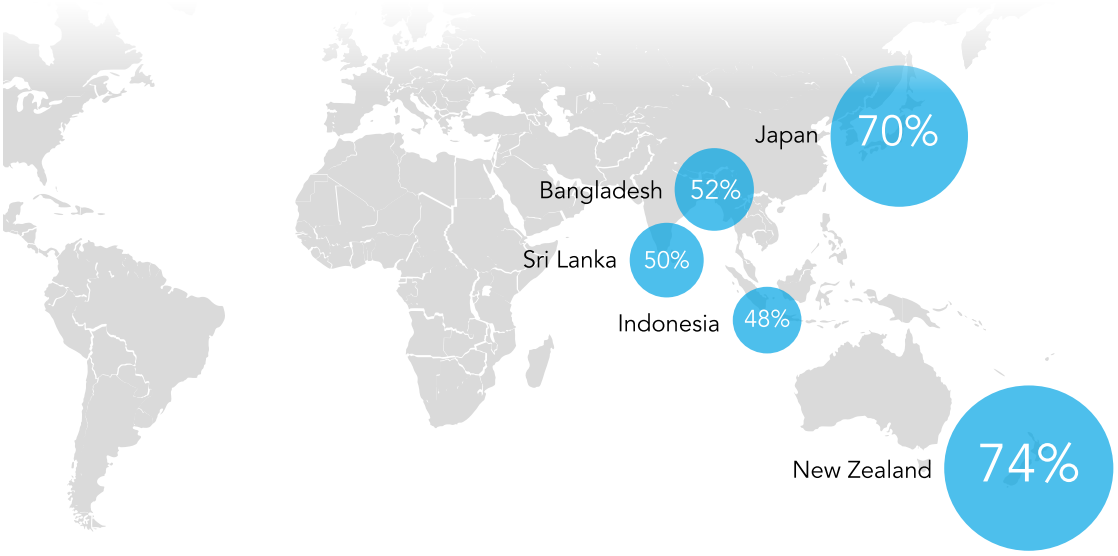
In the first question, respondents were asked to identify five Asia Pacific countries pinpointed on a map. Just above one-quarter of all respondents (27%) correctly identified all five countries, with Baby Boomers having slightly more success than the other groups (29%).

Nonetheless, 74% identified New Zealand correctly, 70% identified Japan correctly, and about half of the respondents correctly identified the remaining three Asian countries (*Figure 14*). Particularly, Baby Boomers had more success identifying Sri Lanka and New Zealand compared to other generations.

FIGURE 14

Seven in ten correctly identified Japan on a map

Q: Name the five countries pinpointed on the map. Choose from the following list...

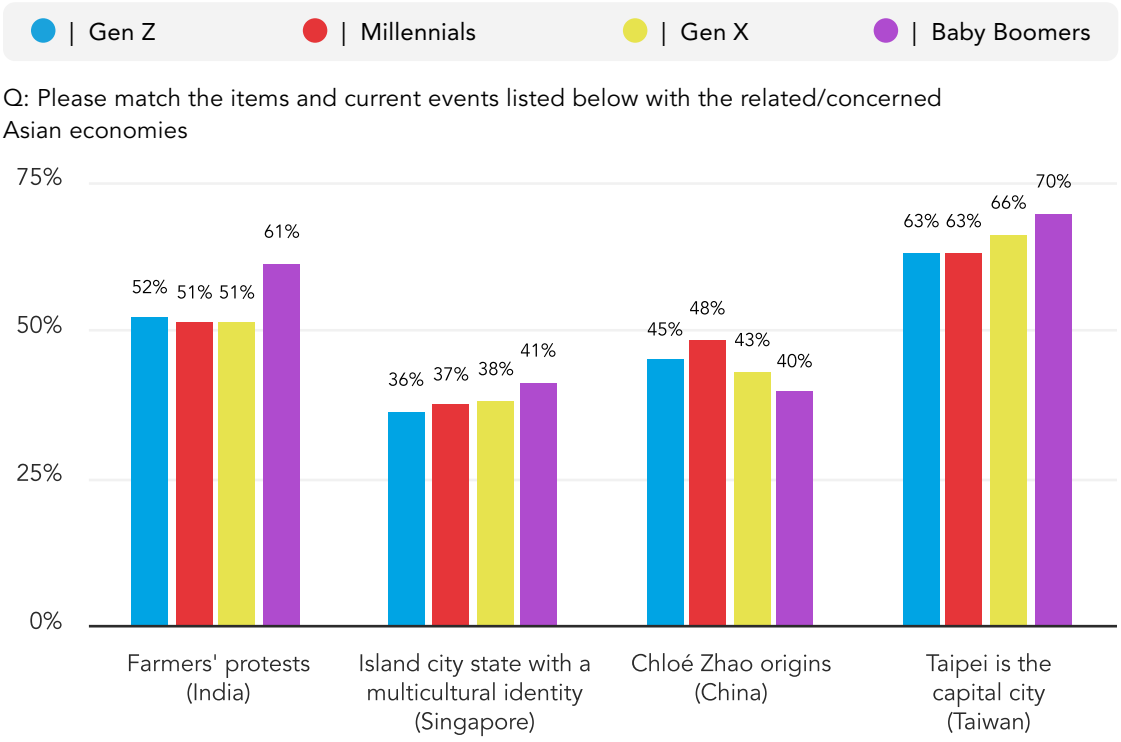


Base: All respondents (n=2,592)

In a second question, the respondents were asked a set of unrelated questions that they had to link to corresponding Asian economies. Only 14% of the respondents answered all four questions correctly. Again, Baby Boomers had more success with geography compared to other generations and were more aware of the current events, but had a more challenging time with the popular culture question about Oscar-winning Chinese filmmaker Chloe Zhao (*Figure 15*). For all questions, the success rate of Gen Z, Millennials, and Gen X is very similar.

FIGURE 15

Baby Boomers score higher in Asian geography



Finally, we checked for Canadians' awareness of current humanitarian crises in the Asia Pacific. *Figure 16* displays the share of respondents that have heard about the humanitarian crises.

Overall, Canadians are much more aware of the Taliban insurgency in Afghanistan than other crises, with only about one-tenth of respondents unaware of it. However, it is worth noting that only weeks before our polling in September 2021, the Afghan crisis intensified with the Taliban taking over the South Asian country. Conversely, only two-thirds of respondents report having heard about the National Security Law in Hong Kong or the Rohingya refugee crisis in Bangladesh.

Baby Boomers are significantly more aware of all events than other generations. On average, 79% of Baby Boomers are aware of an event compared to about two-thirds of respondents from younger generations. The three younger generational groups have similar awareness of events with minor differences (see *Figure 16*).

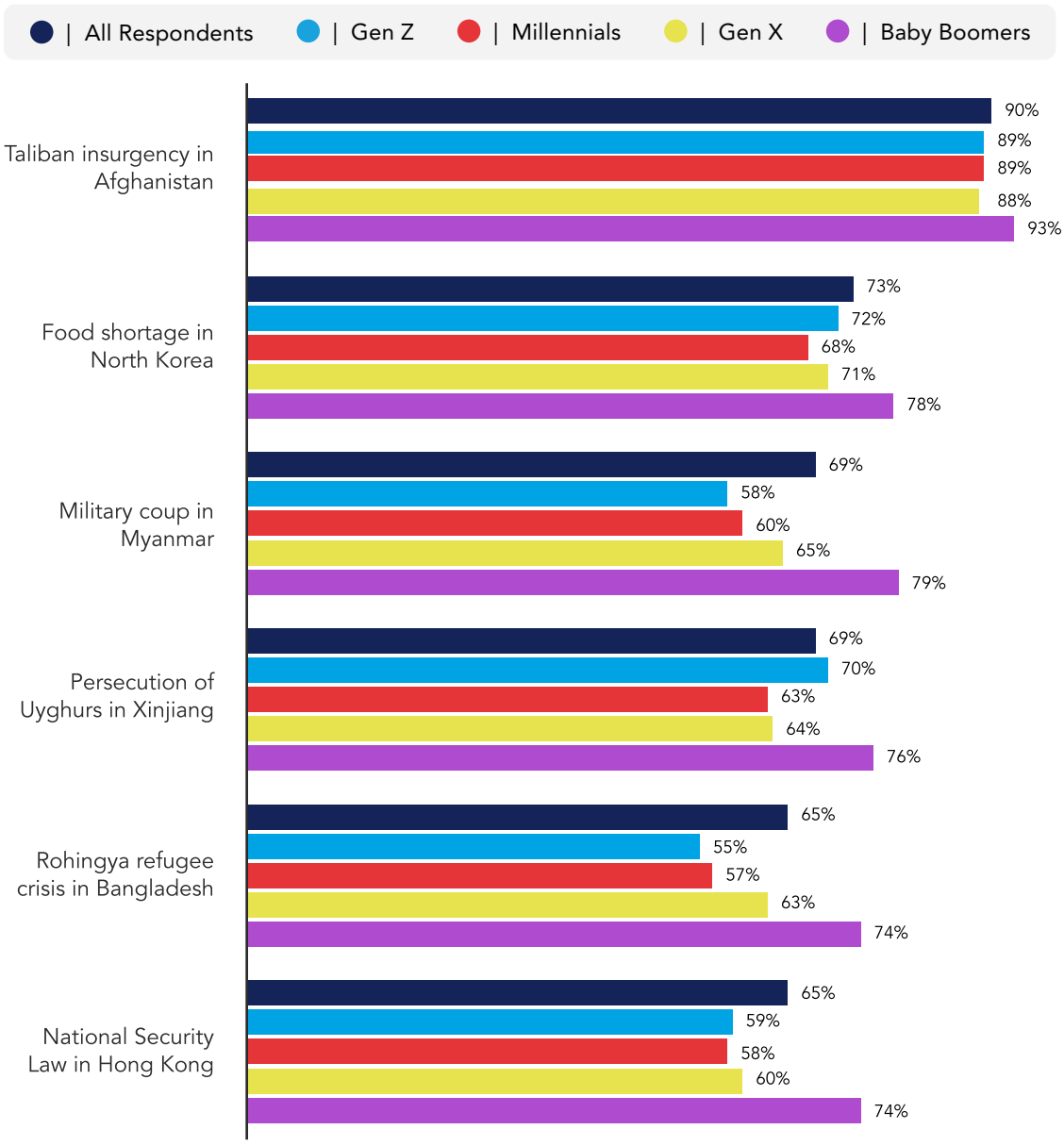
Interestingly, we found that Baby Boomers have more knowledge of Asia than Gen Z, although a higher share of Gen Z respondents self-reported having at least "a fair amount" of knowledge about history, culture, demographics, and current events in China, India, Japan, and other

Asian countries. While we only tested Canadians on their awareness of geographic knowledge and current events in this poll, it would be interesting to see how the different generations fare on a language or cultural awareness test in future studies. After all, Baby Boomers reported the highest interest of all generations for Asian geography, history, and politics, but were the least interested of all generations in Asian languages and culture.

FIGURE 16

Baby Boomers are the most aware of humanitarian crises in Asia

Q: Have you heard about the following humanitarian crisis in Asia?
Share of respondents who have heard of the following events:



Base: 18-24 (n=282); 25-34 (n=425); 35-54 (n=884); 55+ (n=1,002); All respondents (n=2,592)

Section 3:

Where Do Canadians Learn About Asia?

KEY POINTS:

+ Popular culture about or from Asia is the most popular source of information about Asian history, culture, people, politics, and current affairs for Gen Z and Millennials, unlike the older generations who mostly source their information from traditional mainstream news outlets.

+ Younger generations (Gen Z and Millennials) are more likely to consider education as a source of information about Asia/Asians compared to older generations.

+ Although Facebook dominates social media usage across all generations, TikTok is a popular medium for Gen Z social media users.

+ When searching for more information about Asia/Asians, almost half of Gen Z and Millennials cite "language barriers" as a key challenge. Meanwhile, three out of 10 Baby Boomers say they don't seek additional information about Asia/Asians, compared to 12% of Gen Z and Millennials.

+ Consistent with the average opinion, Gen Z recommends increasing community engagement and an emphasis on teaching about Asia in schools, but they also highlight the need to increase access to student exchange programs and have Asian languages as optional foreign languages at schools.

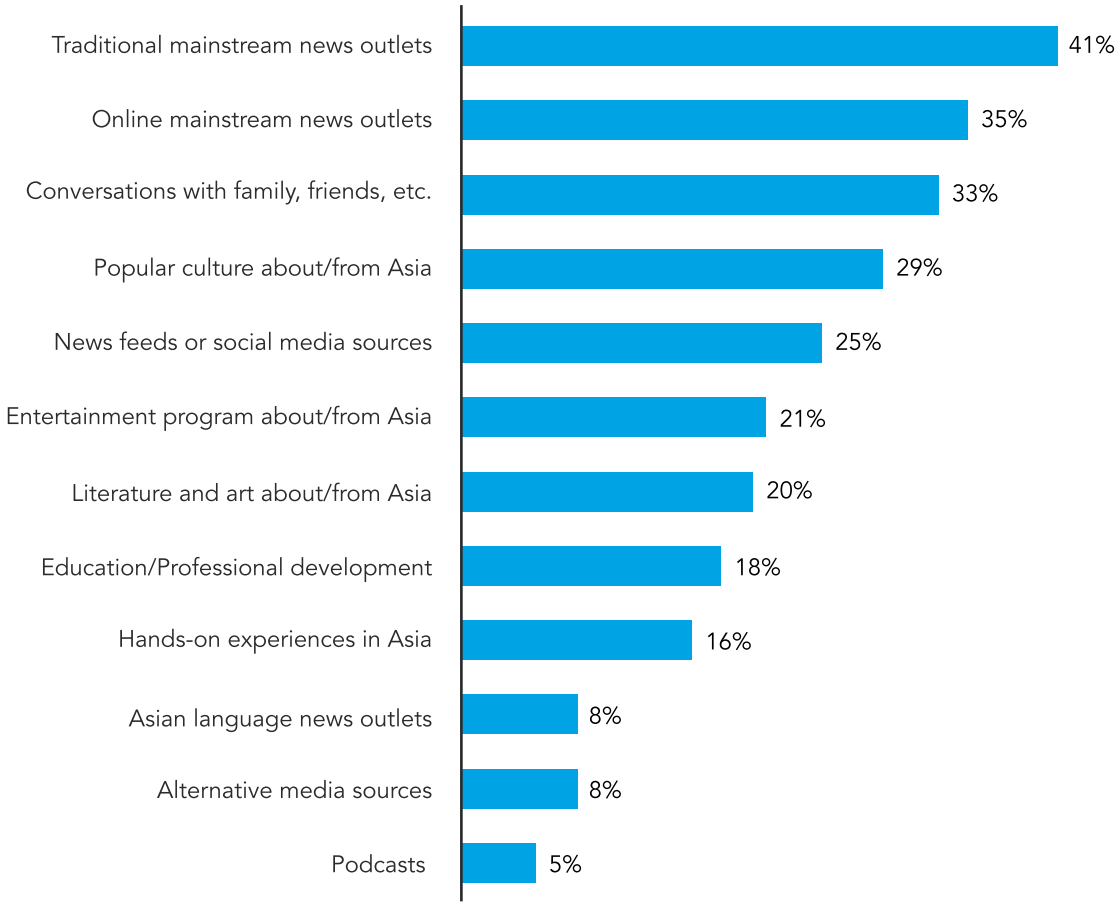
Sources of Information

Most Canadians acquire their knowledge about Asian history, culture, people, politics, current affairs from traditional mainstream news outlets such as television, newspapers, and radio.

FIGURE 17

Traditional mainstream news outlets top the list of sources for information about Asia and Asians

Q: Through which sources and channels have you acquired some knowledge and exposure to Asian history, culture, people, politics, and current affairs? Please select all that apply.



Base: All respondents (n=2,592)

Note: 17% of respondents said "not applicable to me" and 7% chose "other."

The source categories in this poll were expanded since our 2020 NOP to provide clarity about the medium of delivery. For example, online and social media sources were broken down by online mainstream news outlets and newsfeeds or social media sources. As a result, the data provides a more nuanced understanding of Canadians primary sources of knowledge about Asia, as seen in *Figure 17*.

TABLE 3

Sources of Information About Asia and Asians, by Generations

Question: Through which sources and channels have you acquired some knowledge and exposure to Asian history, culture, people, politics, and current affairs? Please select all that apply.

Sources of information	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Traditional mainstream news outlets (TV/radio/print)	41%	28%	31%	36%	52%
Online mainstream news outlets (e.g. CBC online, Globe and Mail online, etc.)	35%	31%	34%	35%	37%
Conversations with family, friends, and co-workers, in Canada/Asia	33%	39%	39%	34%	27%
Popular culture about/from Asia (e.g. music, movies, fashion, video games)	29%	45%	39%	31%	19%
News feeds or social media sources (e.g. Facebook, Twitter, etc.)	25%	38%	35%	28%	15%
Entertainment program about/ from Asia (e.g. talk show, drama, reality show)	21%	25%	24%	20%	19%
Literature and art about/from Asia (e.g. books, artworks)	20%	23%	23%	18%	20%
Education/professional development (e.g. research, courses, seminar, conference)	18%	31%	23%	18%	12%
Hands-on experiences in Asia (e.g. work, travel, student exchange, lived in Asia, etc.)	16%	11%	17%	16%	16%
Asian language news outlets (TV/print/digital)	8%	11%	13%	10%	2%
Alternative media sources (e.g. The Tyee, Democracy Now!, etc.)	8%	16%	14%	7%	3%
Podcasts	5%	7%	8%	7%	2%
Not applicable to me	17%	14%	14%	16%	19%

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002); All respondents (n=2,592)

Note: Generations that have a statistically significant difference in opinion from other generations have been highlighted

The source breakdown further helps to discern the differences across generations, particularly in terms of online sources and traditional media prevalence (*Table 3*). For Gen Z and Millennials, the top three sources of information are popular culture about or from Asia, conversations with family, friends, and co-workers, and news feeds and social media sources. Apart from the conversations with close social circles, the younger generations significantly differ from the two older generations, especially the Baby Boomers.

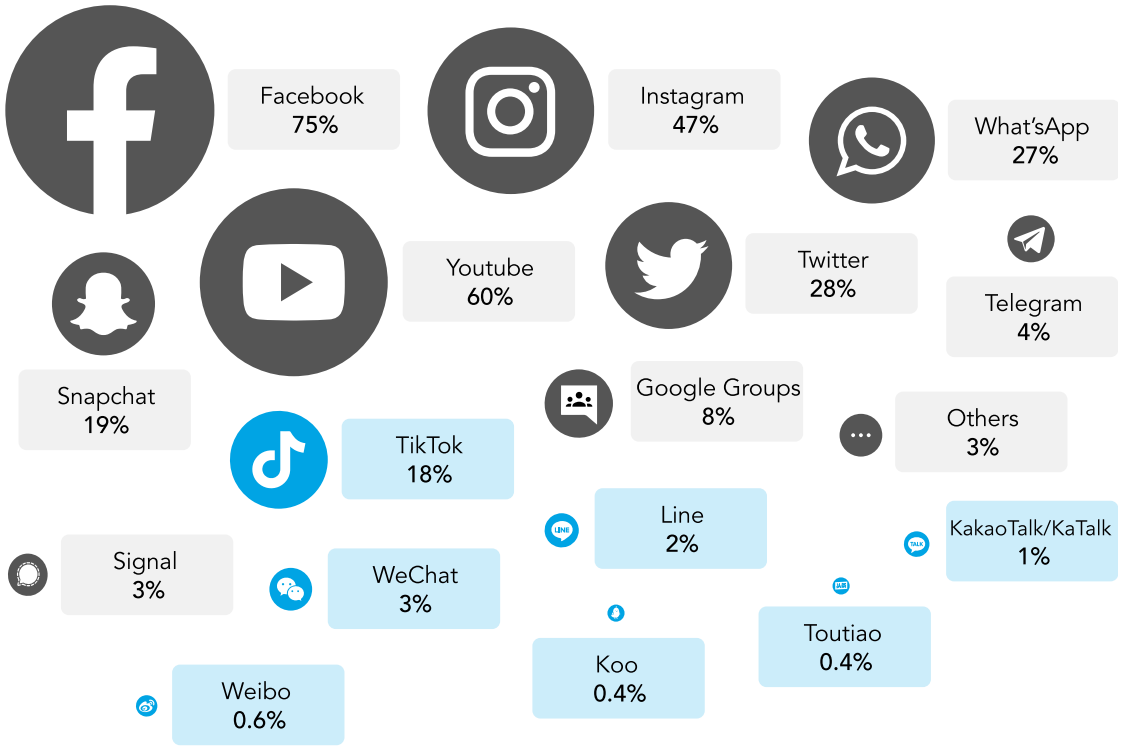
Arguably, Over-The-Top (OTT) platforms such as Netflix have made it easier for Asian popular culture to reach a broader audience. Furthermore, such Internet-based media are generally more appealing to the tech-savvy younger generations than their older counterparts.

While American platforms Facebook and YouTube top the list of social media applications used by Canadians today, Asian platforms such as TikTok also have a fair number of users, particularly among Gen Z.

FIGURE 18

Facebook and YouTube are some of the most used social media applications by Canadians today

Q: What are some of the social media applications that you are currently using? Please select all that apply.



Base: All respondents (n=2,592)

Note: (1) Asian social media applications are coloured blue; (2) 8% of respondents said they don't use social media.

"Newsfeeds and social media sources" emerged among the top five sources across all generations, except for Baby Boomers, underscoring the importance of social media platforms as a source of information for three Canadian generations.

While Facebook is the most popular social media platform with 75% of Canadians (*Figure 18*), it is interesting to note that 18% of Canadians say they use TikTok, a video-focused social networking service by a Beijing-based company. A majority of the respondents who are currently using the application are Gen Z and Millennials (*Table 4*).

Asia-Based Social Media Applications

The younger generations (below 54) and Canadians of Asian descent are more likely to use a diverse set of social media applications, including Asian applications such as Korea's KakaoTalk or KaTalk, Japan's Line, and China's WeChat and Weibo, compared to other Canadians.

TABLE 4

Top Seven Social Media Platforms by Generations

Q: What are some of the social media applications that you are currently using? Please select all that apply.

Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Instagram (80%)	Facebook (81%)	Facebook (80%)	Facebook (70%)
YouTube (73%)	Instagram (69%)	YouTube (62%)	YouTube (54%)
Facebook (71%)	YouTube (64%)	Instagram (51%)	Instagram (24%)
Snapchat (60%)	Snapchat (38%)	Twitter (33%)	Twitter (22%)
TikTok (46%)	WhatsApp (35%)	WhatsApp (32%)	WhatsApp (17%)
Twitter (36%)	**TikTok (33%)**	**TikTok (17%)**	Google Groups (9%)
WhatsApp (30%)	Twitter (26%)	Snapchat (14%)	**TikTok (6%)**
I don't use social media (2%)	I don't use social media (2%)	I don't use social media (5%)	I don't use social media (14%)

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002); All respondents (n=2,592)

Global media consumption across myriad international delivery and sharing platforms is on the rise among Canadians, especially young Canadians. This will be an area to watch, and more research will be required, as Canada looks to build policies to address data security and disinformation in the years ahead.

Barriers to Information Access

Most Canadians find "language barrier" to be a significant challenge to accessing information about Asian countries or Asia.

APF Canada's *2021 NOP* indicates that a majority of Canadians want to learn more about Asia, and many are dependent on media sources such as news, popular culture, and social media to gain more knowledge. As seen in *Figure 19*, language was identified as a key challenge by 41% of Canadians, more than information credibility (28%), availability (21%), and access (18%). "Language barrier" is a key challenge across all generations. For Baby Boomers, 31% also indicate that they don't look for more information about Asia or Asians. It marks a significant departure from the challenges expressed by Gen Z and Millennials.

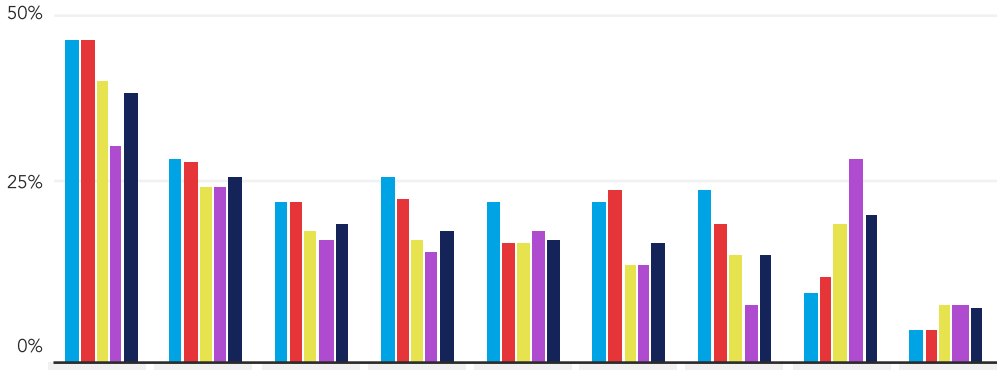
Barriers for Canadians of Asian and Non-Asian Descent

Language barrier and credibility of information are key challenges for at least three out of 10 Canadians of Asian descent. Of note, 21% also cite "lack of interest" and 15% said "lack of a personal connection." Among Canadians who did not identify as a person of Asian heritage, one in four say they "don't look for more information about Asia or Asians."

FIGURE 19

Challenges in accessing more information about Asia or Asians

Q: What are the key challenges you face when looking for more information about Asian countries or Asians? Please select all that apply.



	Language barrier	Credibility of information	Availability of information	Lack of interest or motivation	Lack of a personal connection	Access to information	Lack of opportunities to learn more	I don't look for more information about Asia or Asians	No challenges
Gen Z	49%	31%	24%	28%	24%	24%	26%	11%	5%
Millennials	49%	30%	24%	25%	18%	26%	21%	13%	5%
Gen X	43%	27%	20%	19%	18%	15%	16%	21%	9%
Baby Boomers	33%	27%	19%	17%	20%	15%	9%	31%	9%
All Respondents	41%	28%	21%	20%	19%	18%	16%	22%	8%

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002); All respondents (n=2,592)

Note: Generations that have a statistically significant difference in opinion from other generations have been highlighted.

Effective Methods to Build Awareness About Asia

Community engagement, increased emphasis on teaching about Asia in the education system, and more news media coverage were identified as the top three most effective methods to build Canadians' awareness about Asian countries or Asians.

TABLE 5

Generational Differences on Effective Methods to Build Awareness About Asia/Asians

Q: In your opinion, what are some of the most effective methods that can help build Canadian awareness about Asian countries or Asians? Please select your TOP THREE methods.

Methods to build awareness about Asia	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Engage in more community/social events and activities celebrating different Asian cultures	47%	43%	46%	45%	52%
Increase emphasis on teaching about Asia in the education system (e.g. history, culture, politics, economics)	46%	44%	44%	41%	55%
More news media coverage of current affairs in Asia	30%	22%	23%	28%	39%
Have Asian languages as optional foreign languages course at school	29%	36%	33%	32%	20%
More media coverage of Asian history, culture, and people	27%	22%	22%	24%	35%
Increase access to exchange programs as a student	27%	37%	28%	26%	22%

Methods to build awareness about Asia	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Increase access to exchange programs as working professionals	21%	22%	25%	26%	14%
Increase first-hand experiences of Asian culture through music, art and literature (e.g. live music by a K-pop band; Asian art exhibition)	19%	22%	26%	20%	13%
Exposure to social media channels about Asian culture, people, politics, etc.	13%	14%	13%	13%	13%

Base: 18 to 24 (n=191); 25 to 34 (n=292); 35 to 54 (n=515); 55+ (470); All respondents (n=1,468)

Note: (1) This question was asked to respondents who said they were "very" or "somewhat" interested to learn more about Asia in Section 2. (2) Generations that have a statistically significant difference in opinion from other generations have been highlighted.

More than half of Canadians surveyed expressed an interest in learning more about Asia, highlighting the need to build effective methods of disseminating information and building awareness, particularly given identified challenges, such as language. The respondents who expressed an interest in learning more about Asia were asked for their opinions on the best methods to enable Canadians to build awareness about Asian countries and Asians.

As seen in *Table 5*, there are differences between generations, particularly Baby Boomers, who are more likely to recommend changes such as increasing emphasis on teaching about Asia, community engagement, and media coverage of Asian current affairs and history than the younger generations. On the other side, the younger generations, especially Gen Z, are more likely to recommend increasing applied activities such as increasing access to student exchange programs, making Asian languages optional foreign languages in schools, and increasing first-hand experiences of Asian culture.

Effective Awareness-building Methods for Canadians of Asian and Non-Asian Descent

Among Canadians of Asian descent, 53% believe more community engagement and participation in diverse cultural activities can help build Canadians' awareness about Asia compared to 45% of Canadians who don't identify as a person of Asian heritage. Curiously, Canadians of Asian descent are less likely to recommend increased emphasis on teaching about Asia but more likely to encourage making Asian languages optional in schools, compared to other Canadians.

Canadian Perspectives on Education, Travel, and Social Network

Most Canadians feel they have had insufficient exposure to Asia in their high-school education.

Three out of 10 Canadians feel that they had "no exposure" to Asia in their high-school education (*Figure 20*). That feeling is consistent across almost all generations except for Baby Boomers, among whom 40% expressed they had "no exposure." Arguably, with growing diversity in Canadian society and increasing globalization, the education system is adapting to incorporate more knowledge about global cultures. However, a majority of Gen Z also indicate they had "too little" exposure to Asia in their high-school education – an important consideration as Canada prepares the future generation for the changing global dynamic and shifting Canadian demographics.

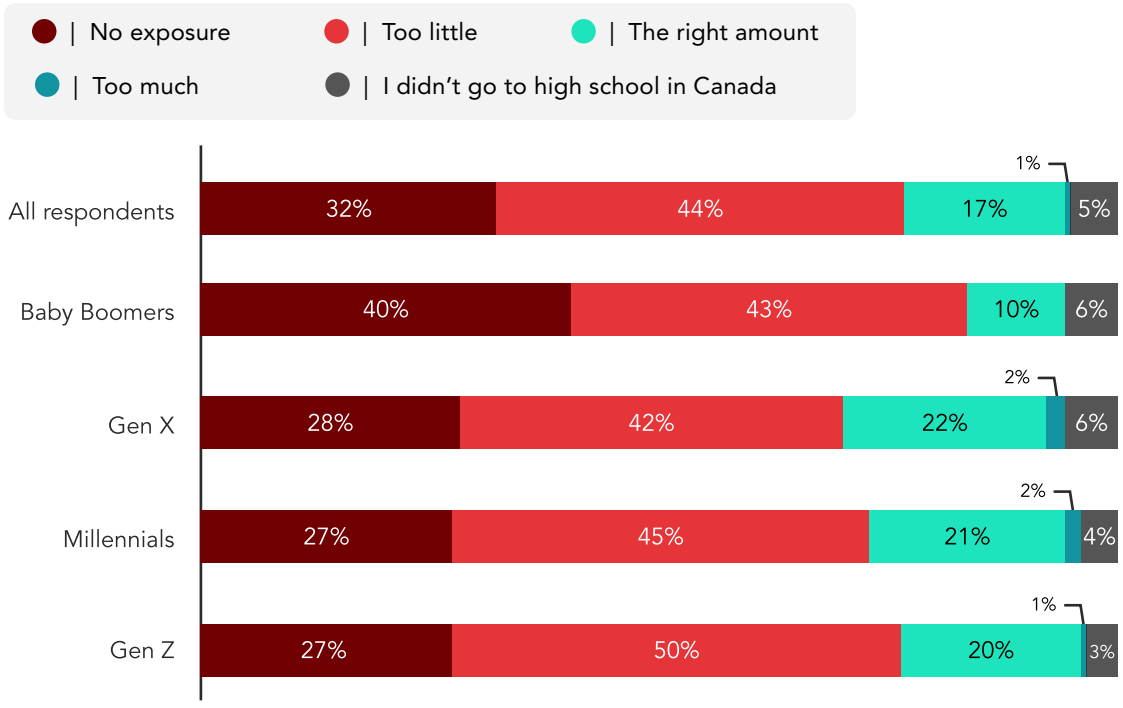
Canadians of Asian Descent Say Not Enough Exposure to Asia in Education

A vast majority of Canadians of Asian descent (80%) feel that their Canadian high school education was insufficient in terms of exposure to Asia. Meanwhile, 30% of Canadians of non-Asian descent feel their high school education provided the right amount of exposure to Asia.

FIGURE 20

All generations believe they have had none to very little exposure to Asia in their high school education

Q: When thinking about your high school education in Canada, how much exposure would you say you had to Asia (e.g. history, culture, geography, language, politics, etc.)?



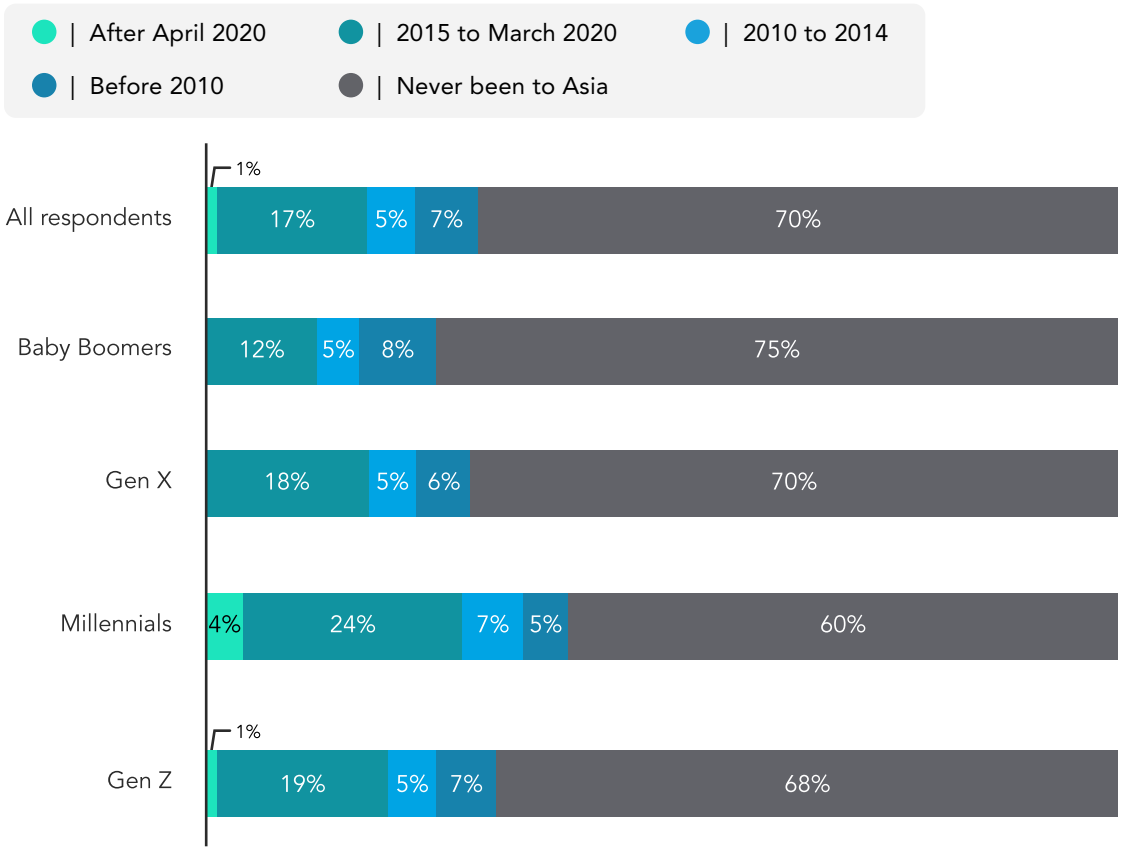
Base: 18 to 24 (n=282); 25 to 34 (n=425); 35 to 54 (n=884); 55+ (1,002); All respondents (n=2,592)

Two out of five Millennials have travelled to Asia, mostly for tourism and visiting family or friends

FIGURE 21

Millennials have travelled the most to Asia compared to other generations

Q: When was the last time you visited an Asian country?



Base: 18 to 24 (n=282); 25 to 34 (n=425); 35 to 54 (n=884); 55+ (1,002); All respondents (n=2,592)

Travel is another way to build awareness and knowledge about diverse cultures and people. A vast majority of Canadians have never been to Asia (*Figure 21*). Among the 30% who have been to Asia, most travelled in the past decade. Across generations, Millennials are the most well-travelled, with 4% travelling to Asia since Canada implemented travel restrictions to curb the impacts of COVID-19 in March 2020. Most Canadians travelled to Asia for tourism (62%), but 42% also went to visit family or friends, especially Gen Z, underlining Canada-Asia diasporic connections (*Table 6*).

Three out of 10 Canadians plan on travelling to Asia in the near future, and one-third of them want to visit Japan.

TABLE 6

Generational Differences in Reasons for Travelling to Asia

Q: Please choose [all that apply] among the following reasons for travelling to Asia. I travelled to Asia for…

Reasons for travelling to Asia	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Tourism	62%	45%	65%	63%	65%
Visiting family/friends	42%	65%	46%	47%	28%
I live or lived in Asia	15%	20%	20%	20%	7%
Visiting place of birth	13%	15%	15%	17%	6%
Work	12%	1%	12%	10%	19%
Education	4%	6%	5%	3%	2%
Volunteer work	3%	2%	3%	3%	3%
Other	3%	1%	1%	3%	4%

Base: 18 to 24 (n=89); 25 to 34 (n=170); 35 to 54 (n=263); 55+ (n=253); All respondents (n=775)

Note: This question was asked to respondents who said they have travelled to Asia.

Gen Z socializes more regularly with Asians or Canadians of Asian descent compared to Baby Boomers.

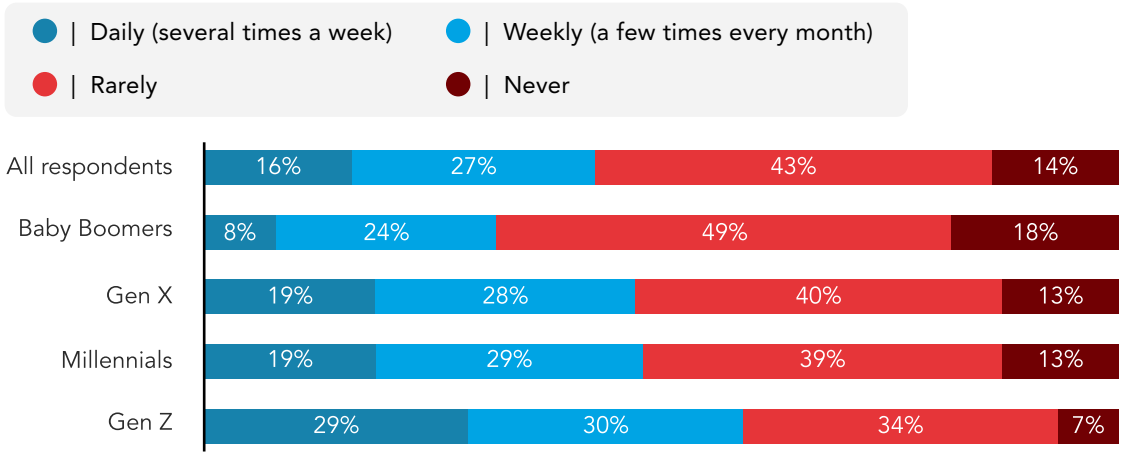
Most Canadians (57%) "rarely" or "never" socialize with Asians or Canadians of Asian descent (*Figure 22*). However, there are significant differences by generation, as 29% of Gen Z indicate they have daily interactions with Asians or Canadians of Asian descent, compared to 19% of Millennials and Gen X, and 8% of Baby Boomers. It is possible that the growing cultural diversity

in Canada due to a steady flow of newcomers from Asia and elsewhere over the past decade has led to increased diversification of social networks for the younger generations more than the older generations.

FIGURE 22

Generational differences in socialization with Canadians of Asian descent or Asians

Q: Aside from the limitations due to the COVID-19 pandemic, how often would you say you normally socialize with people from Asia or those who identify as Canadians of Asian descent/heritage (i.e. family, friends, peers, colleagues, neighbours, etc.)?



Base: 18 to 24 (n=282); 25 to 34 (n=425); 35 to 54 (n=884); 55+ (1,002); All respondents (n=2,592)

Section 4:

Perspectives on Asian Languages

KEY POINTS:

+ About one in five Canadian respondents mention one of 22 different Asian languages as their top choice of language to learn.

+ Gen Z and Millennials have more conversational fluency in Asian languages compared to older generations.

+ Cantonese and Mandarin are the top two Asian languages that Canadians can speak fluently, followed by Hindi.

+ Baby Boomers are the least likely to be encouraged to learn an Asian language.

Learning a New Language

Excluding English and French, one in five Canadians would choose to learn an Asian language if available for free.

If a language course was available and free, 95% of Canadians would like to learn a new language aside from Canada's official languages, and 47% chose Spanish (see *Figure 23*). Interestingly, 12% of Canadians chose either Mandarin, Cantonese, or mention 'Chinese' among their choices. Altogether, the respondents made 68 distinct choices when asked about languages, and 22% of Canadians mentioned an Asian language as their top choice (see box for all the language choices).

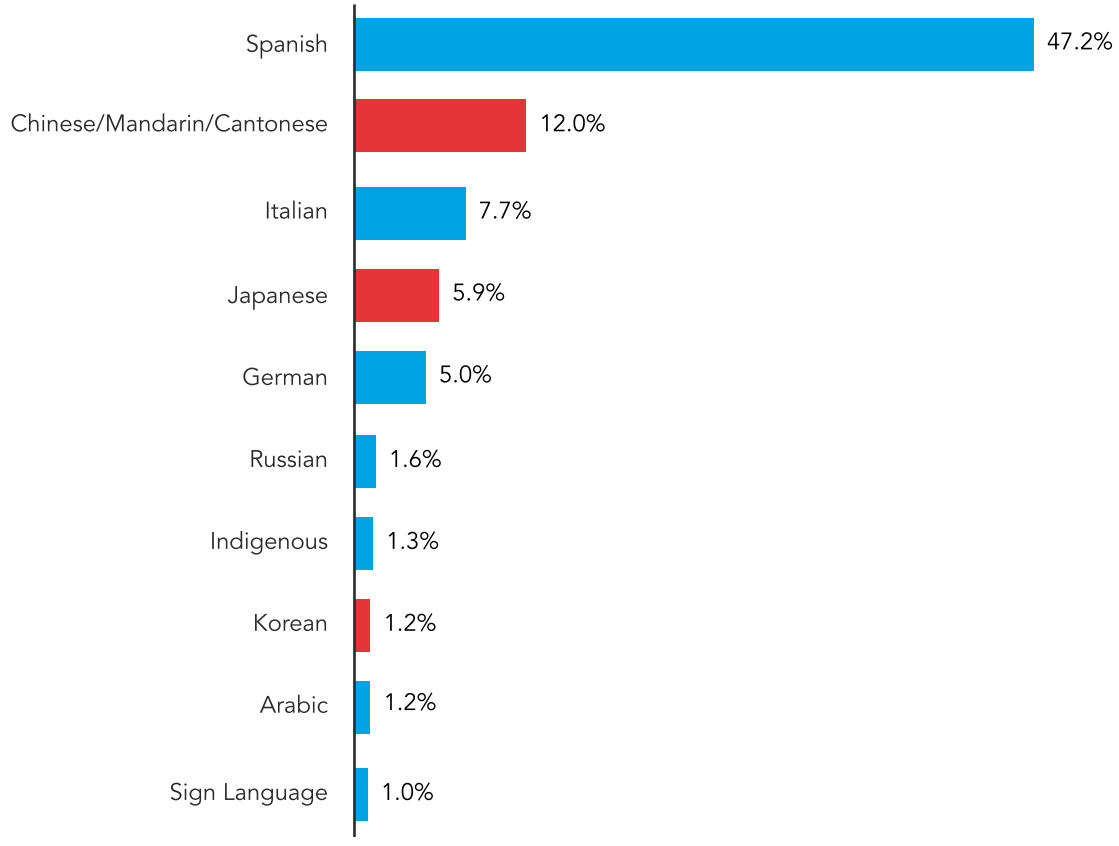
Canadians would like to learn these Asian Languages

Japanese, Mandarin, Chinese, Korean, Hindi, Tagalog, Cantonese, Vietnamese, Punjabi, Tamil, Farsi, Sinhala, East Indian, Thai, Urdu, Assamese, Bahasa, Bengali, Malay, Sanskrit, Cebuano, Taiwanese

FIGURE 23

Asian languages feature among Canadians top 10 choices of languages to learn

Q: Excluding Canada's official languages (English and French) what language would you most like to learn, assuming it was available and free?



Base: All respondents (n=2,592)

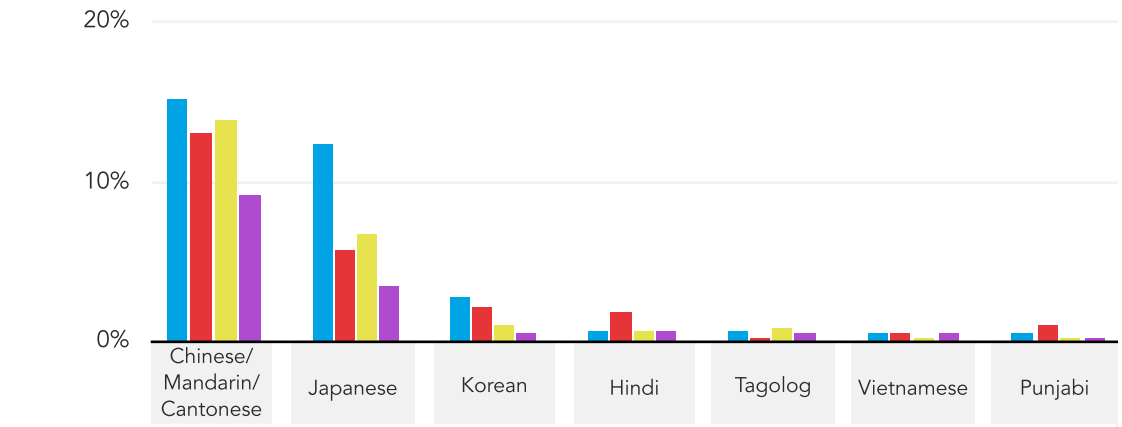
Note: (1) 3.8% of the respondents said "none"; (2) Combined into one category, 7.1% of respondents mention Mandarin, 3.6% mention Chinese, and 1.3% mentioned Cantonese; (3) Indigenous category includes respondents who specifically mentioned languages such as Ojibwe, Cree, Innu, Michif, Mohawk, Inuktitut, Mi'kmaq, among others.

Even across generations, Spanish remains the top choice. However, where 55% of Baby Boomers want to learn Spanish, only 34% of Gen Z do. While every other generation's top-three language choices are Spanish, Chinese (Mandarin/Cantonese), and Italian, for Gen Z, the choices are Spanish, Chinese (Mandarin/Cantonese), and Japanese. As seen in *Figure 24*, at least 15% of Gen Z respondents would like to learn Chinese (Mandarin/Cantonese) and 12% Japanese, more so than any other generation. Baby Boomers consistently show lower interest in Asian languages compared to other generations, and only 16% want to learn an Asian language, which is significantly lower than Gen X (24%), Millennials (26%), and Gen Z (33%).

FIGURE 24

Among Asian languages, Gen Z is keen on learning Mandarin, Cantonese, Japanese

Q: Excluding Canada's official languages (English and French) what language would you most like to learn, assuming it was available and free?



	Chinese/ Mandarin/ Cantonese	Japanese	Korean	Hindi	Tagolog	Vietnamese	Punjabi
Gen Z	15.1%	12.3%	2.8%	0.7%	0.7%	0.4%	0.4%
Millennials	13.0%	5.7%	2.1%	1.7%	0.2%	0.5%	0.9%
Gen X	13.7%	6.6%	1.0%	0.7%	0.8%	0.1%	0.1%
Baby Boomers	9.0%	3.5%	0.5%	0.7%	0.4%	0.5%	0.1%

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002)

Note: (1) Generations that have a statistically significant difference in opinion from other generations have been highlighted; (2) Due to very small proportions and differences, other Asian languages have been excluded from the figure.

Asian Language Fluency

Gen Z and Millennials are more likely to have conversational fluency in an Asian language compared to older generations.

In our 2021 NOP, 13% of Canadians say they can speak at least one Asian language fluently (*Figure 25*). In total, respondents with conversational fluency mentioned 22 different Asian

languages, with some respondents indicating they know multiple languages. Similar to the trend in respondents' interest to learn new Asian languages, the younger generations are more likely to have conversational fluency in an Asian language than Baby Boomers, especially Gen Z and Millennials. In the case of languages such as Chinese (Mandarin and Cantonese), Hindi, Punjabi, Gujarati, and Bengali, there are more Millennials than Gen Z who can speak the languages fluently.

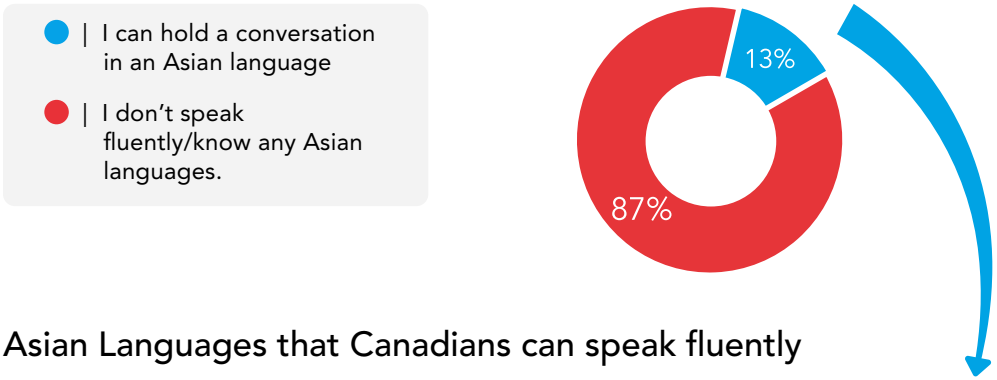
Asian Language and Identity

Among Canadians who can speak an Asian language, 83% identify as a Canadian of Asian descent. Meanwhile, among Canadians of non-Asian descent, Mandarin tops the list of spoken Asian languages, followed by Hindi, Punjabi, and Japanese.

FIGURE 25

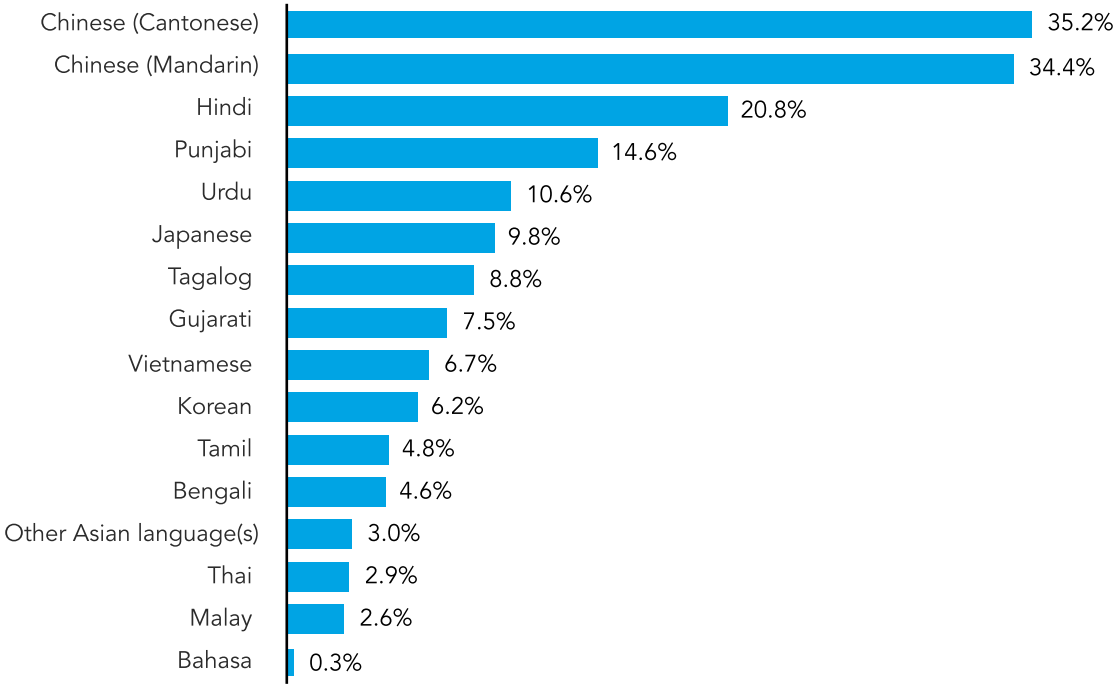
13% of Canadians can fluently converse in at least one Asian language

Q: Can you hold a conversation in any of the following Asian languages? Please select all that apply.



Base: All respondents (n=2,592)

Asian Languages that Canadians can speak fluently



Base: Respondents who can speak an Asian language (n=337)

Note: (1) Some respondents selected multiple languages; (2) "Other Asian language(s)" include Laotian, Malayalam, Marathi, Melanesian Pidgin, Nepali, Taiwanese.

Encouraging Learning of an Asian Language

Across all generations, travel and tourism is the main factor that would encourage Canadians to learn an Asian language.

Almost three in 10 Canadians consider a foreign language course for Asian languages to be one of the most effective methods to build awareness about Asia or Asians, particularly the younger generation. Meanwhile, 22% of Canadians would choose to learn an Asian language if a course was available and free. We asked Canadians what factors would further encourage them to learn an Asian language. For most Canadians, tourism is the primary reason. While the factors that would encourage people to learn a new language remain consistent across generations, the lack of interest varies – 37% of Baby Boomers say nothing would encourage them to learn an Asian language compared to only 7% of Gen Z.

TABLE 7

Factors to Encourage Learning an Asian Language, by Generations

Q: What factors would encourage you to learn an Asian language? Please select all that apply.

Factors to encourage learning an Asian language	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
If visiting an Asian country (tourism)	42%	54%	48%	43%	34%
If working/studying in an Asian country	31%	52%	43%	32%	20%
Family member(s) speaks the language	29%	46%	41%	28%	20%
Free class/course available to all	33%	43%	40%	36%	24%
If required by work	25%	40%	36%	27%	15%
An opportunity for professional advancement or development	21%	40%	34%	23%	8%
I like learning languages (personal development)	23%	39%	31%	23%	15%
Other reason	2%	2%	1%	1%	3%
Nothing would encourage me to learn an Asian language	24%	7%	10%	20%	37%

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002); All Respondents (n=2,592)

Note: Generations that have a statistically significant difference in opinion from other generations have been highlighted.

Section 5:

Impact of Asia on Canada

KEY POINTS:

+ Most Canadians believe stability and security issues and environmental issues in Asia can have a negative impact on Canada's future.

+ Younger generations are significantly more positive in their perception of Asia's impact on Canada than Baby Boomers.

+ While most Canadians across all generations agree on the importance of Canada-Asia collaborations in certain areas, there are generational divides on areas related to public health. Gen Z and Millennials prioritize the need for improving public health-care systems, while Baby Boomers emphasize the need for developing an international public health emergency preparedness system.

+ Finally, Gen Z is more likely to consider it important for Canadians to build Asia Competency in areas such as Asian society, culture, and etiquette for Canada's future economic and social growth, compared to older generations.

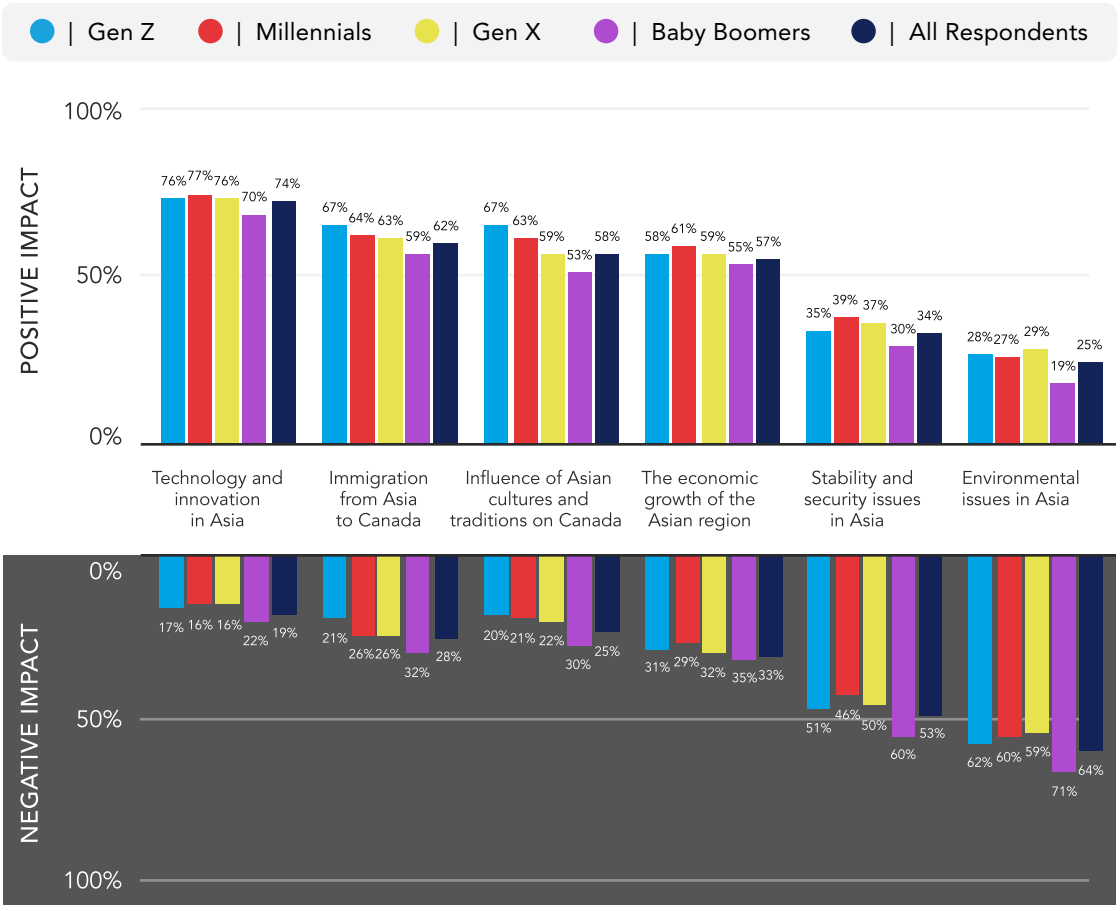
Perceived Impact of Asia on Canada's Future

A majority of Canadians believe that technology and innovation in Asia, immigration from Asia to Canada, influence of Asian culture and traditions on Canada, and the economic growth of Asia will have a positive impact on Canada in the next two decades.

FIGURE 26

Younger generations are generally more positive about Asia's impacts on Canada's near future

Q: What kind of impact do you think each of the following factors will have on Canada's future in the next 10–20 years?



Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002); All respondents (n=2,592)

Note: On average, 11% of all respondents believe the factors will have "no impact" on Canada's future.

Canadian perceptions of various factors related to Asia that can impact Canada's future varies by generations. Our polling data suggests that Baby Boomers are significantly more negative in their perceptions compared to the younger generations (*Figure 26*). Even for factors such as "stability and security issues" and "environmental issues" in Asia, where all generations have a more negative perception, Baby Boomers' negative perceptions stand out.

In line with results from past NOPs, in 2021 we find that Canadians across all generations perceive a positive impact of Asians migrating to Canada and in turn the influence of Asian cultures and traditions on Canada. Furthermore, 17% of the respondents indicate that Asian cultures and traditions will have "no impact" on Canada's future, compared to 12% or less Canadians who perceive the other factors (technology and innovation, economic growth, etc.) will have "no impact."

While the perception of Asia's importance to Canada is evident from Canadians' willingness to learn more about the region and the generally positive perception of the impact of Asian development, influence, and immigration on Canada's future, it is also important to understand how Canada-Asia relations can be strengthened, and in what areas.

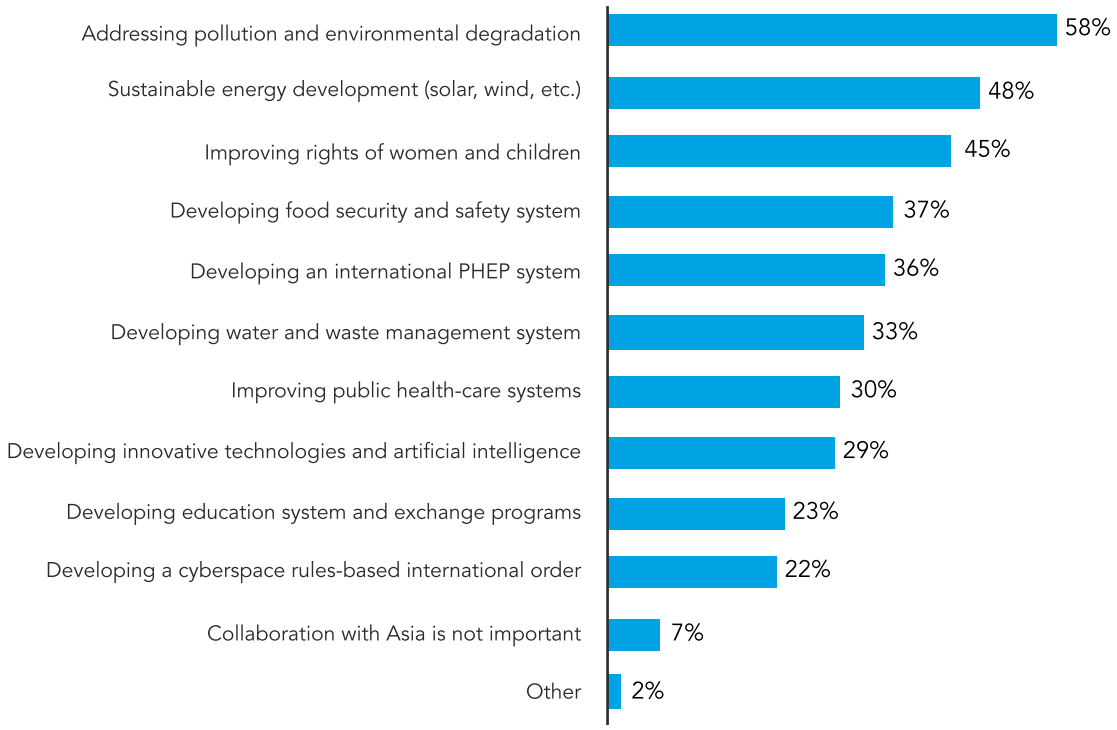
Canada-Asia Collaboration

Collaborations with Asia on sustainable development and environment and pollution management are of strategic importance for Canada.

FIGURE 27

Strategically important areas for Canada-Asia collaboration

Q: When thinking about the ways Canada can collaborate with Asian countries/partners, what areas do you think are the most strategically important for Canada? Please select up to five areas from the following list.



Base: All respondents (n=2,592)

In our *2021 NOP*, Canadians were specifically asked about areas of Canada-Asia collaboration that are of strategic importance for Canada. As shown in *Figure 27*, addressing pollution, sustainable energy development, and inclusive development (improve women and children's rights) are perceived as the most strategically important areas for collaboration, followed by developing food security and safety systems. Across generations, these four areas remain consistently among the top five. Interestingly, while slightly more respondents in the younger generations (Gen Z and Millennials) feel "improving public health-care systems" should be a priority area of collaboration, Baby Boomers place more emphasis on "developing an international public health crisis management and preparedness system" (*Table 8*).

TABLE 8

Generational Differences on Strategically Important Areas for Canada-Asia Collaboration

Q: When thinking about the ways Canada can collaborate with Asian countries/partners, what areas do you think are the most strategically important for Canada? Please select up to five areas from the following list.

Collaborative Areas	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Addressing pollution and environmental degradation	58%	58%	53%	51%	66%
Sustainable energy development (solar, wind, etc.)	48%	49%	50%	46%	50%
Improving rights of women and children	45%	44%	37%	40%	53%
Developing food security and safety system	37%	34%	34%	36%	41%
Developing an international PHEP system	36%	33%	30%	32%	43%
Developing water and waste management system	33%	32%	31%	31%	36%
Improving public health-care systems	30%	35%	33%	28%	30%
Developing innovative technologies and artificial intelligence	29%	28%	27%	32%	27%

Collaborative Areas	All Respondents	Gen Z (18-24)	Millennials (25-34)	Gen X (35-54)	Baby Boomers (55 +)
Developing education system and exchange programs	23%	31%	27%	22%	20%
Developing a cyberspace rules-based international order	22%	15%	17%	23%	26%
Collaboration with Asia is not important	7%	3%	7%	8%	7%
Other	2%	3%	1%	2%	3%

Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002)

Note: The factors that are different across generations and cited in the report's text have been highlighted in this table

Importance of Asia Competency

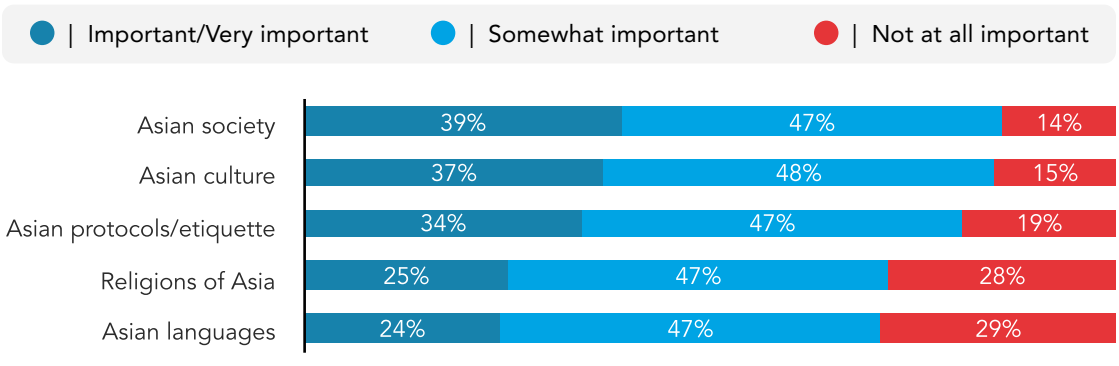
Most Canadians feel competency about Asian society, culture, and protocols will be important for Canada's future.

Although Asian language courses at schools are considered an effective method of building awareness about Asia and Asians by only three out of 10 Canadians, about two-thirds of Canadians think competency in Asian languages will be important for Canada's future economic growth and social diversity (*Figure 28*).

FIGURE 28

Canadians believe building competency about Asian society, culture, protocols are pertinent to Canada's future economic growth and social diversity

Q: Thinking about Canada's future economic growth and social diversity, how important do you think it is for Canadians to build competency about Asia in the following areas?



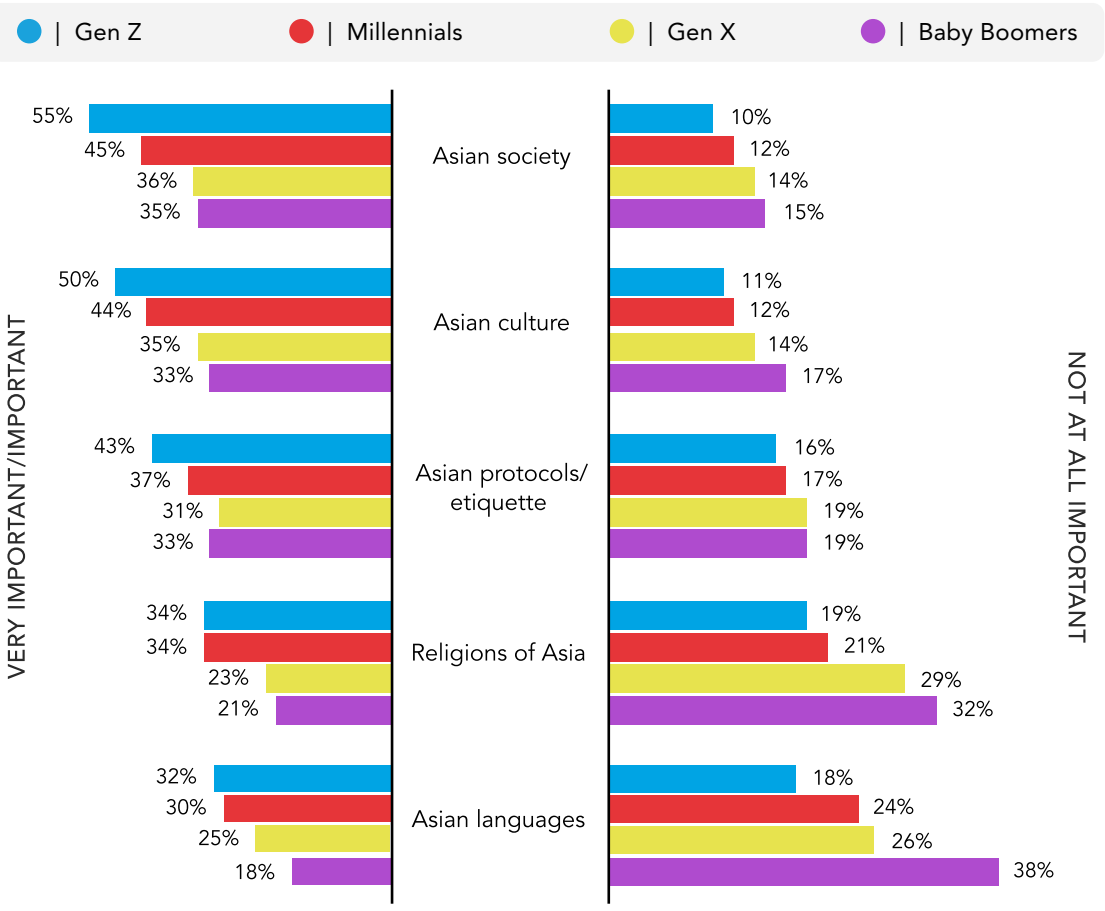
Base: All respondents (n=2,592)

When reviewing the generational divide, we find that 38% of Baby Boomers believe "Asian languages" is not an important area compared to about one-quarter or less of the other generations (*Figure 29*). Consistent with findings in previous sections of this poll, we notice that Baby Boomers are less likely to know an Asian language, be encouraged to learn an Asian language, or find it an effective method of building awareness about Asia or Asians. As a result, they are also less likely to consider language an important area for competency building for Canada's future growth and development.

FIGURE 29

Compared to older generations, Gen Z is more likely to find almost every Asia competency factor important or very important for Canada's future

Q: Thinking about Canada's future economic growth and social diversity, how important do you think it is for Canadians to build competency about Asia in the following areas?



Base: 18 to 24 years (n=282); 25 to 34 years (n=425); 35 to 54 years (n=884); 55+ (n=1002)

Note: Remaining respondents said "somewhat important."

Across all generations, more than four in five Canadians think it is at least somewhat important to build competency in the areas of Asian society, Asian culture, and Asian protocols/etiquette.

Conclusion

With the Asia Pacific's rapid economic growth, burgeoning young, middle-class population, and increasing political importance, countries worldwide are doubling down on their efforts to solidify their economic and political relations with the region. Canada is moving in the same direction and must compete with other countries for market share, attract students and high-skilled talent, and secure its seat in the region's multilateral institutions and forums. Meanwhile, the Canadian population continues to grow, and new immigrants, primarily from Asia, accounted for more than three-quarters of the country's total population growth from 2016 to 2020, which arguably impacts Canadians' perceptions of Asia and Asians and Canada's thinking on how to better engage with the economies comprising the world's most dynamic region.

In the Asia Pacific Foundation of Canada's *2021 National Opinion Poll: Canada's Generational Perspectives on Asia*, we find that 29% Gen Z and 21% of Millennials identify as Canadians of Asian descent, similar to the most recent population census. Against this backdrop, our NOP results show that China – Canada's leading trade partner in Asia and boasting the largest Asian diaspora in Canada – remains top-of-mind for Canadians when thinking about Asia. Compared with previous NOPs, we now see a growing share of Canadians thinking about Japan and India when considering Asia, indicating a shift in awareness about the region. Interestingly, despite heightened tensions in the bilateral relationship exacerbated by the Meng Wanzhou affair and the arbitrary detention of Canadians Michael Spavor and Michael Kovrig in China, we also find that Canadians' feelings toward China recovered in 2021 compared to a decade-low in 2020, reaching a near-neutral average feeling of 4.5 out of 10.

As one of APF Canada's cross-cutting research themes is education and Asia competency, we were also interested to poll Canadians, particularly young Canadians, on these topics. We find in 2021 that most Canadians perceive the positive implications of immigration from Asia on Canada's future, as well as the positive impacts of Asian technology and innovation, economic growth, and cultural influence on Canada. Coupled with Canadians' perceptions that building competency about Asia in the areas of society, culture, protocols, and etiquette is of significant importance to Canada's future economic growth and social diversity, this NOP highlights the need for building a framework that helps support Canadians who are interested in learning more about Asia.

In our 2021 poll, we also find that given an opportunity, 57% of Canadians would like to learn more about Asia and currently report limited knowledge about the region. While Canadians top sources of information about Asia vary by age, from mainstream news to popular culture,

education is not among the top sources. Indeed, Canadians of all ages recognize a lack of exposure to Asia during their high-school education, and they identify an increased emphasis on teaching about Asia as one of the most effective methods to build awareness about Asia.

Importantly, this NOP explores generational differences in Canadians' opinions about Asia to better inform policies and programs aimed at fostering engagement with the region. Younger generations, particularly Millennials, share warmer feelings toward Asian economies. Canada's younger generations also have more interest in learning about Asia, particularly Asian languages and culture. Compared to older generations, they are also more fluent in Asian languages and have a more positive perspective about Asia's impact on Canada's future.

Finally, Canadians across all generations agree on the importance of Canada-Asia collaboration, particularly in the areas of addressing pollution and environmental degradation, sustainable energy development, and improving rights of women and children, all significant factors for Canada's inclusive foreign policy goals and development work.

Methodology

The Asia Pacific Foundation of Canada's research team designed the survey instrument to gauge Canadians' awareness, opinions, and perspectives about the Asia Pacific. The research team built the survey items after careful and extensive research about Canada-Asia relations and ongoing efforts to build Asia competency. The team also consulted previous polls conducted by APF Canada and other polling firms and think-tanks such as Asia New Zealand Foundation, Environics Institute, Lowy Institute, and Pew Research Centre, among others.

APF Canada commissioned Leger to survey 2,592 Canadian adults (permanent residents and citizens 18 years and older). The survey was conducted from September 9 to September 20, 2021, using Leger's online research panel, LEO. The LEO panel includes more than 460,000 Canadian adults. A random stratified sample for this study was drawn from the panel database. All data were collected online. The average completion time for the survey was 22 minutes. To ensure the sample's representativeness, Leger has statistically weighted the results according to Canada's current census data on age, gender, and region. Discrepancies in or between totals are due to rounding.

A margin of error cannot be associated with a non-probability sample in a panel survey. For comparison purposes, a probability sample of this size would be +/- 1.93%, 19 times out of 20. The results presented in this study comply with the public opinion research standards and disclosure requirements of CRIC (the Canadian Research and Insights Council) and the global European Society for Opinion and Marketing Research (ESOMAR) network. Leger is a founding member of CRIC and is actively involved in raising quality standards in the survey industry. President Jean-Marc Leger is a member of the CRIC's Board of Directors and the Canadian representative of ESOMAR.

Statistically significant: Throughout the report, relations between variables are mentioned as statistically significant, or the difference between groups is statistically significant. In simple terms, statistical significance means that a relationship between two or more variables is most likely caused by something other than chance or sampling.

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ASIA PACIFIC FOUNDATION OF CANADA

FONDATION ASIE PACIFIQUE DU CANADA

INVESTMENT MONITOR 2021

Report on Post-COVID Recovery and Foreign Direct Investment Between Canada and the Asia Pacific

ASIA PACIFIC FOUNDATION OF CANADA
FONDATION ASIE PACIFIQUE DU CANADA

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ABOUT THE ASIA PACIFIC FOUNDATION OF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada. APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas: trade and investment, surveys and polling, regional security, digital technologies, domestic networks, sustainable development, and Asia Competency.

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, and a regular Asia Watch newsletter that together support these thematic areas.

APF Canada also works with business, government, and academic stakeholders to provide custom research, data, briefings and Asia Competency training for Canadian organizations. Consulting services are available by request. We would be pleased to work with you to meet your research and business intelligence needs.

Visit APF Canada at www.asiapacific.ca.

MESSAGE FROM THE PRESIDENT & CEO, ASIA PACIFIC FOUNDATION OF CANADA

Looking back now, more than one year after the World Health Organization declared the COVID-19 pandemic, 2020 served as a stark reminder of how interconnected the world economy has become. Despite the current economic challenges, the flow of capital and goods across borders continues to serve as the lifeblood of the global economy. As we slowly emerge from the current public health and economic crisis, now more than ever, Canada needs to consider how to strategically engage with the Asia Pacific region for its economic recovery in the post-COVID-19 environment.

Canada has been fortunate to benefit from the continuously strong trade and investment ties with its traditional economic partners, such as the United States and Europe. However, the pandemic has taught us that diversification should and will remain a key pillar for Canada's economic prosperity in the long term. The Asia Pacific's relative resiliency throughout the crisis has demonstrated the need for Canada to deepen and diversify its engagement within the region.

Since 2017, APF Canada has been publishing reports on the bilateral foreign direct investment (FDI) flows between Canada and the Asia Pacific, with the ultimate goal of facilitating evidence-based policy-making and public discourse on Canada's engagement with the region. In the fifth year of its iteration, the Investment Monitor continues to track the two-way investment ties at the national, provincial, and city levels between Canada and the Asia Pacific. Last year, the Investment Monitor Annual Report examined the connections between Canada's free trade agreements with Asia Pacific economies and FDI.

In 2021, the Investment Monitor turns its attention to the investment opportunities and challenges for Canadian companies in the Asia Pacific, particularly in digital, clean energy, and R&D-engaged industries. As recovery is on the horizon with the increasing availability of vaccines in the coming months, it is important to understand how the investment landscape is

shifting in the region and the potential implications for Canada. This report provides a timely analysis of the recovery strategies of South Korea, India, Singapore, and Australia and how they could present opportunities for Canadian companies.

On behalf of APF Canada, I would like to acknowledge the efforts of those involved in producing this report, especially our partner, The School of Public Policy at the University of Calgary, and our sponsors, Export Development Canada, the Government of British Columbia, and Invest in Canada. I would like to extend my appreciation to our Advisory Council Members for their valued feedback. I would also like to thank the many investment attraction agencies across Canada which have taken the time to speak with the research team and provide on-the-ground insights.

And finally, I would like to thank the members of our APF Canada research team who were responsible for writing and finalizing this report: Jeffrey Reeves, Vice President, Research; Charles Labrecque, Research Manager; Pauline Stern, Program Manager, Business Asia; Isaac Lo, Project Specialist, Trade and Investment; our Post-Graduate Research Scholar and Junior Research Scholars, Olivia Adams, Charlotte Atkins, and Rachelle Taheri; and, APF Canada's communications team for editing and designing the final publication, Michael Roberts, Communications Manager, and Jamie Curtis, Graphic Designer.

Stewart Beck,

President and CEO,
Asia Pacific Foundation of Canada

EXECUTIVE SUMMARY

The Asia Pacific region is home to a large number of the world's fastest-growing economies, making it an increasingly important investment relationship – both in terms of opportunities for Canadian companies in the Asia Pacific, and Asia Pacific investment in Canada.

However, despite the importance of the relationship between Canada and the Asia Pacific region, there is a lack of reliable, detailed public data on investments. APF Canada's Investment Monitor fills this gap and delves deeper into the investment relationship. The Investment Monitor aggregates data from the Asia Pacific Foundation of Canada's legacy data of investment deal announcements, along with third-party sources and metasearch engines (see methodology section for more details).

Each year the Investment Monitor Report has an annual theme. This year's focuses on Canada's investment opportunities in the Asia Pacific region post-COVID-19. Specifically, this report looks at the recovery plans of four select Asia Pacific economies, and examines what investment opportunities they may hold for Canadian companies in the digital, clean energy and R&D-engaged industries.

This annual report presents the following:

1. **General trends in the Canada–Asia Pacific foreign direct investment relationship, from 2003 to 2020;**

2. **The recovery plans of four select economies – South Korea, Australia, India and Singapore – and potential investment opportunities for Canadian companies;**

3. **Inbound and outbound investment relationships at the national, provincial and city levels.**

KEY TAKEAWAYS FROM THE REPORT

SOUTH KOREA, INDIA, AUSTRALIA, AND SINGAPORE HAVE INCORPORATED GOVERNMENT SPENDING PROGRAMS TO BOOST COMPETITIVENESS IN THEIR DIGITAL, CLEAN ENERGY AND R&D-RELATED INDUSTRIES. THESE PRESENT SIGNIFICANT INVESTMENT OPPORTUNITIES FOR CANADIAN COMPANIES IN THE POST-COVID CLIMATE.

Of the four economies examined, South Korea has the most ambitious clean energy and digital programming, with C$48B invested towards achieving carbon neutrality by 2050, and C$16.7B invested in the integration of 5G and AI in the private sector. India has the most ambitious R&D programming, with C$8.6B going towards the National Research Foundation.

OUT OF THE FOUR SELECTED ECONOMIES, AUSTRALIA RECEIVED THE HIGHEST CANADIAN OUTBOUND INVESTMENT IN DIGITAL, CLEAN ENERGY, AND R&D-RELATED INDUSTRIES.

Specifically, in the last 18 years, Canadian companies have invested C$3.7B in Australia's digital sector, C$2.4B in the clean energy sector, and C$795M in R&D-related investments. This is followed by India with C$6.2B invested in all three industries.

IN 2020, CANADA RECEIVED A TOTAL OF C$6.4B OF FOREIGN DIRECT INVESTMENT FROM THE ASIA PACIFIC REGION.

This marks the second consecutive year of decrease in the value of inward FDI from C$9B in the previous year. However, in the time period of 2018 to 2020, Asia Pacific investments into Canada totaled C$48.9B, having rebounded from the low-end of C$27.9B in the previous three-year period.

DESPITE THE DROP IN YEAR-ON-YEAR INBOUND INVESTMENT FLOW, ASIA PACIFIC INVESTMENT ACTIVITIES HAVE CONTINUED TO CLIMB, REACHING AN 18-YEAR RECORD WITH 181 DEALS.

The increasing investment activity is also reflected in the number of deals made on a three-year interval basis. From 2018 to 2020, Canada saw the number of deals reach an all-time high of 476, compared to other three-year periods. For example, from 2015 to 2017 there were 244 deals.

WHILE INBOUND CANADIAN FDI FLOW SAW A YEAR-ON-YEAR DECREASE IN 2020, OUTBOUND FLOW FROM CANADIAN COMPANIES TO THE ASIA PACIFIC REGION REMAINS HIGHLY RESILIENT DESPITE THE ECONOMIC HEADWIND.

In 2020, Canadian companies invested C$16.8B worth of capital in the region via 89 deals. Canada's outbound flow in 2020 represented a C$5.3B increase in value from 2019.

AT THE SUBNATIONAL LEVEL, ASIA PACIFIC INVESTMENTS INTO CANADA REMAIN HIGHLY CONCENTRATED IN THE FOUR MOST POPULOUS PROVINCES – ALBERTA, BRITISH COLUMBIA, ONTARIO, AND QUEBEC.

Together, the four provinces accounted for 94 per cent of Asia Pacific investment flow into Canada in the last 18 years. The two western provinces in particular – Alberta and British Columbia - alone account for 67 per cent of the total inbound flow.

THE BULK OF INBOUND INVESTMENT FROM THE REGION IN THE LAST 18 YEARS HAS BEEN DIRECTED TO CANADA'S LARGEST CITIES AND TOWNS, WITH URBAN INVESTMENTS ACCOUNTING FOR 79 PER CENT OF THE DOLLAR VALUE CANADA RECEIVED.

With that being said, 75 rural communities across Canada have also seen Asia Pacific investments, with C$42B worth of capital received from 2003 to 2020.

SINCE 2003, CANADIAN COMPANIES HAVE INVESTED IN 496 CITIES AND MUNICIPAL-LEVEL REGIONS ACROSS THE ASIA PACIFIC REGION, FROM LARGE URBAN CLUSTERS LIKE SYDNEY, BEIJING, MUMBAI, AND BENGALURU TO SMALLER COMMUNITIES, SUCH AS GOPALGANJ, REPRESENTING THE DEPTH AND BREADTH OF CANADIAN ECONOMIC ENGAGEMENT IN THE REGION.

While Australian cities – namely Sydney, Melbourne, and Perth – are among Canada's top investment destinations in the region, collectively having received C$51B in Canadian investments, Mumbai and Bengaluru are the rising stars. The two cities saw the highest amount of Canadian investment in 2020, with Mumbai receiving C$2.9B and Bengaluru C$2.6B.

INTRODUCTION
INVESTMENT TRENDS IN 2020

2020 was a year unlike any other. The spread of COVID-19, which accelerated in the early months of 2020, continues to pose a significant threat to economies worldwide. Globally, the disease has claimed more than 2.5 million lives at the time this report was written.[1] As public health authorities continue to battle the outbreak, the economic pain has been immediate and devastating. The World Bank's *Global Economic Prospects* estimated that global gross domestic product (GDP) in 2020 dropped by 4.3 per cent.[2] The pandemic-induced economic downturn also slashed global FDI flows. The latest data from the United Nations Conference on Trade and Development (UNCTAD), released in January 2021, showed that global FDI in 2020 declined by 42 per cent from the previous year.[3]

The first to be hit by the pandemic, the Asia Pacific region saw significant economic damage, with COVID-19 inducing the first region-wide economic contraction in nearly six decades.[4] Despite this, some Asia Pacific economies have proved resilient. The World Bank estimates that emerging economies in the East Asia and Pacific region maintained a positive year-on-year GDP growth rate in the past year at 0.9 per cent, with a forecasted rebound of 7.4 per cent in 2021. The region's economic resiliency is reflected in its FDI inflows. UNCTAD estimates that developing economies in Asia only saw a 4 per cent decrease in FDI inflow from 2019 to 2020, compared to the drastic drop of 46 per cent in North America.[5]

Notably, China overtook the United States as the world's largest FDI recipient economy in 2020, as it saw a 4 per cent increase in FDI inbound flow. And despite India's economy facing an estimated 9.6 per cent GDP contraction in the past year, inbound flow of FDI into the economy increased by 13 per cent. The Asia Pacific's economic resiliency points to the growing importance of Canada's economic engagement with the region, particularly in the context of post-COVID recovery.

While the Asia Pacific region still accounts for a relatively small share of Canada's overall FDI stock (see Box 1 for the definition of FDI stock), reflecting Canada's historical ties with Europe and the United States, its share has grown. From 2015

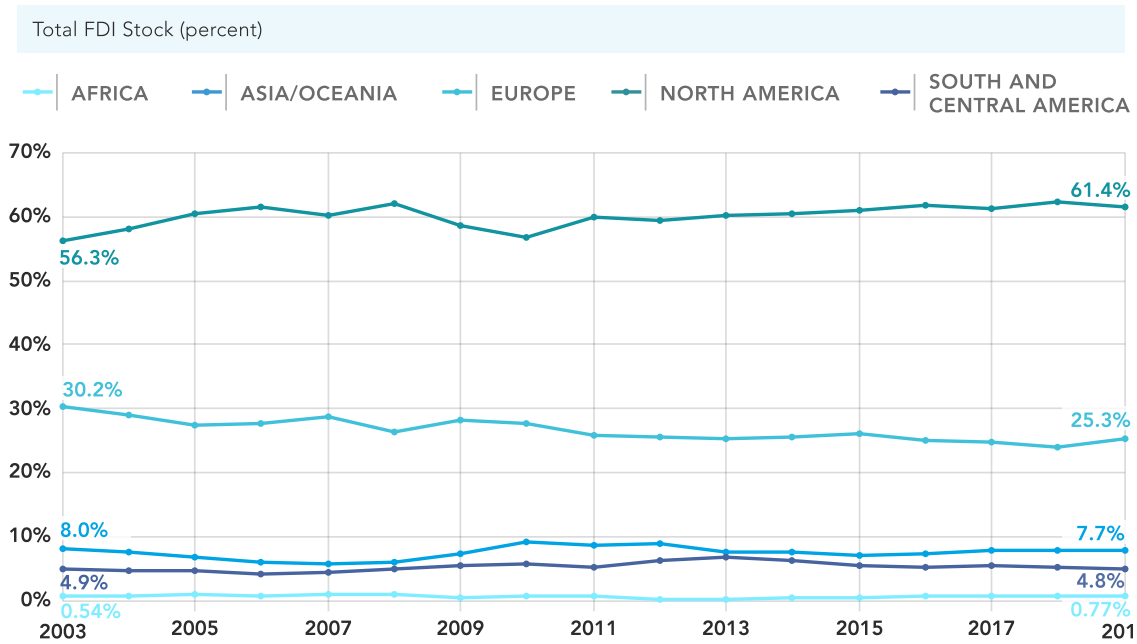
to 2019, the proportion of Canadian FDI stock in the region has increased from 8.8 per cent to 9.8 per cent and Asian investors' FDI stock in Canada has increased from 6.8 per cent to 7.7 per cent.

HOW CANADA STACKS UP IN ITS INVESTMENT RELATIONSHIP WITH THE ASIA PACIFIC

FDI is central to the Canadian economy. Statistics Canada, the country's national statistical agency, provides annual data on Canada's investment position vis-a-vis its economic partners at the national level. The latest official statistics show that Canadian investment in the Asia Pacific continues to comprise only a small percentage of total Canadian outbound FDI stock as well as the Asia Pacific's inbound FDI.

FIGURE 1

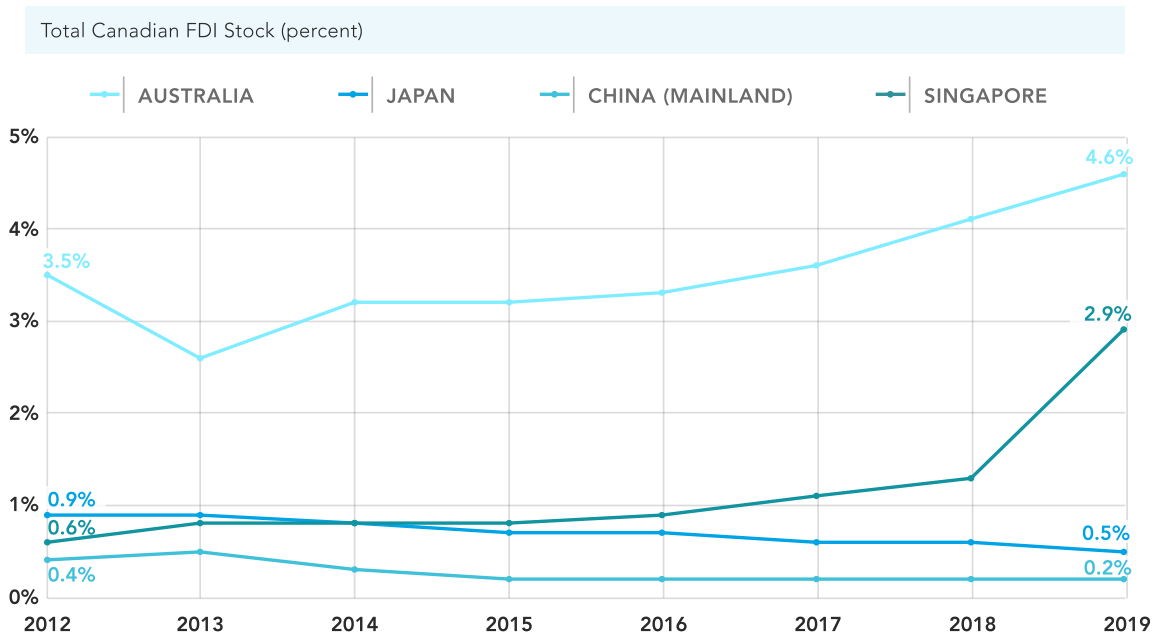
Official Statistics on Canadian FDI Stock Abroad, 2003-2019



Source: Statistics Canada, Table 36-10-0008-01 (accessed April 2021)

FIGURE 2

Canada's Market Share of Select Asia Pacific Economies' Inward FDI Stock, 2012-2019

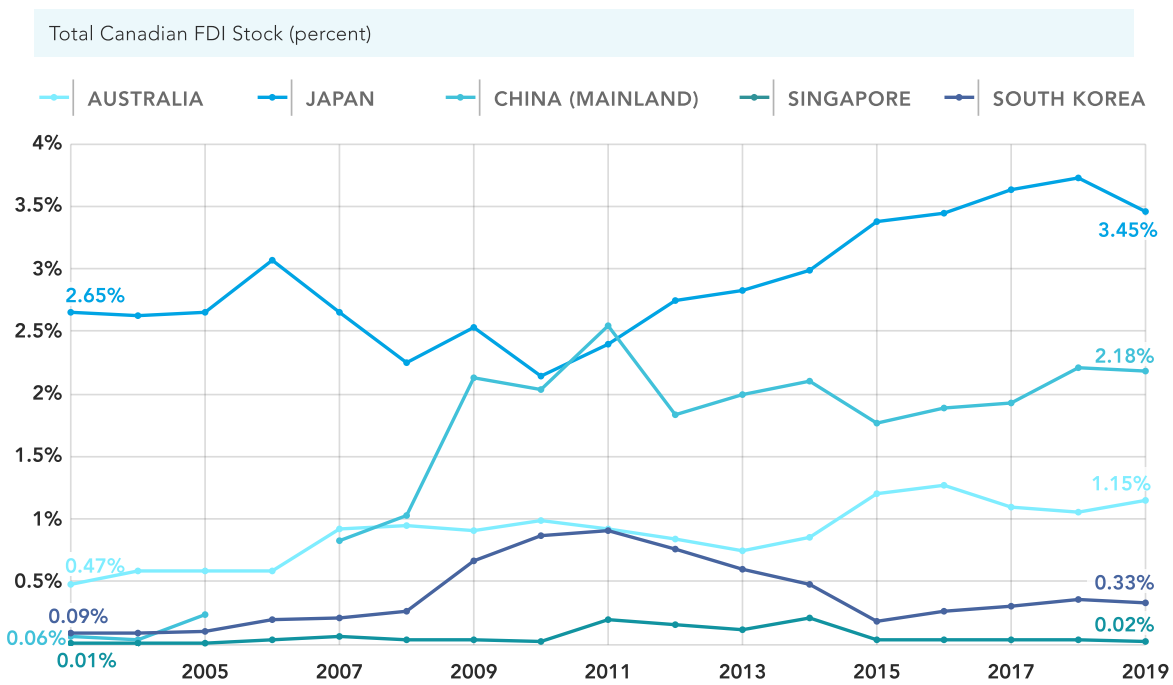


Source: Australian Bureau of Statistics, JETRO, National Bureau of Statistics of China, Department of Statistics Singapore (accessed April 2021)

Between 2003 and 2019, Canada's outward investment in the region as a percentage of total FDI peaked at 9.1 per cent in 2010 and has since fallen to approximately 7.7 per cent in 2019. The declining level of Canadian investment stock in the region is also reflected in Canada's low share of inbound investment stock from some Asia Pacific economies. China, Japan, Australia, Singapore, and South Korea remain among the largest recipients of Canadian FDI in the Asia Pacific. However, Canadian investment represents a relatively small proportion of their respective total inbound FDI stock, ranging from 0.2 per cent to a maximum of 4.6 per cent.

FIGURE 3

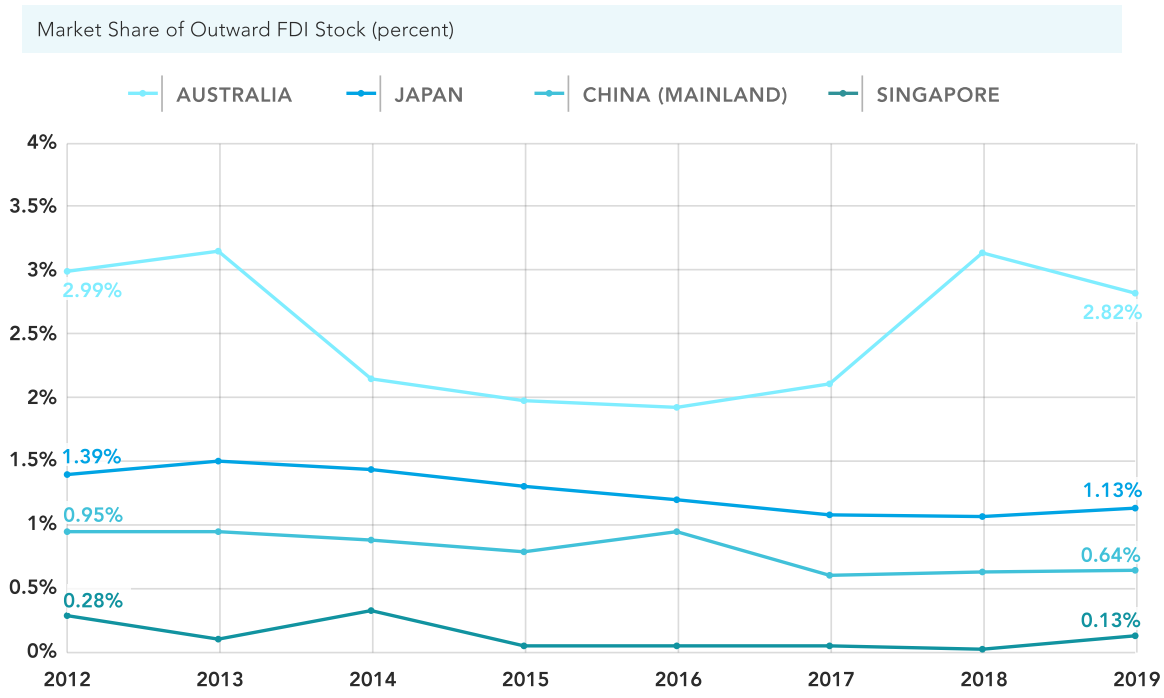
Official Statistics on Asia Pacific FDI Stock in Canada, 2003-2019



Source: Statistics Canada, Table 36-10-0008-01 (accessed April 2021)

FIGURE 4

Canada's Market Share of Select Asia Pacific Economies' Outward FDI Stock, 2012-2019



Source: Australian Bureau of Statistics, JETRO, National Bureau of Statistics of China, Department of Statistics Singapore (accessed April 2021)

Official statistics also reveal that Canada is not a large recipient of FDI from Asia Pacific economies. The largest Asia Pacific economies – including Australia, China, Japan, South Korea and Singapore – collectively made up only 7.1 per cent of total Canadian inward FDI stock in 2019. However, it is worth noting that inbound investment from key economies in the Asia Pacific is increasing. For example, Chinese investment in Canada increased by approximately C$1.6B between 2018 and 2019.

While Statistics Canada provides a comprehensive overview of Canada's investment relations with Asia Pacific economies, its data relies primarily upon its surveys of Canadian businesses, foreign firms, and reports from government bodies such as the Bank of Canada to generate national-level investment data. With the lack of transaction-specific information, the official statistics are unable to provide data that supports analyses of investment trends at the subnational-level, by sector and industry, or by ultimate source and destination. Therefore, the information published by Statistics Canada can provide a useful overview of the investment relationship between Canada and the largest Asia Pacific economies, but its data cannot be used to discover trends at the industry or regional levels.

THE APF CANADA INVESTMENT MONITOR SUPPLEMENTS OFFICIAL STATISTICS

The Asia Pacific is a dynamic economic region that plays a crucial role in the development of the global economy. However, official statistics do not necessarily offer Canadians a holistic view of Canada's investment ties with the Asia Pacific. The Asia Pacific Foundation of Canada (APF Canada) recognized this gap and began the Investment Monitor project. This project is uniquely able to provide a comprehensive understanding of Canada-Asia Pacific investment's scope and scale through its reliance on transaction-level data. APF Canada's Investment Monitor uses publicly available investment information, in addition to its own legacy data to provide records of investment that span almost two decades. The Investment Monitor Report is an effort by APF Canada to provide in-depth analysis and insights on Canada's investment relationship with Asia. This includes an overview of the major locations, investors, and sectors shaping Canadian engagement with the Asia Pacific region.

Box 1. Stock and Flow

When examining FDI, it is important to understand the difference between stock and flow. Stock refers to the total quantity of investment in an economy at a given time. Flow refers to movements of quantities in and out of the stock. There are two types of flows: an inflow marks an increase in the overall stock value, while an outflow marks a deduction. The difference between the two is referred to as net inflow. A positive net inflow indicates the stock is rising, whereas a negative net inflow indicates the stock is falling.

On the whole, FDI stock values show the overall presence of FDI in an economy, whereas FDI flows signal the economic developments and the attractiveness of a destination economy at a given time.[6] For example, due to the pessimistic market outlook of investors during the COVID-19 pandemic, many foreign investments have been withdrawn. These reversals represent FDI outflows. If FDI outflows were to eclipse FDI inflows in 2020, this would translate into a negative net inflow and thus a reduction in the overall level of FDI stock. Together, these indicators can help policymakers and investors gain a fuller picture of FDI trends as well as gaps and opportunities.

Box 2. Cross-Border Investment and FDI

Foreign investments can be divided into two major groups: 1) foreign portfolio investment (FPI) and 2) foreign direct investment (FDI). Both methods are essential to global economic development and trade, but FDI is considered to be a more stable form of investment with long-term benefits.

Foreign Portfolio Investment

FPI is a short-term investment by a resident or enterprise of one economy into a financial asset of another economy. FPI may take the form of equity, debt securities or loans but does not grant the investor a controlling stake in the enterprise. FPI investments are sometimes viewed as more volatile than FDI, since without a controlling stake or long-term interest in an asset, the investor can trade or liquidate the investment at any time for short-term return.

Foreign Direct Investment

FDI is a long-term or lasting-interest investment by a resident or enterprise of one economy into a tangible asset of another economy. An investment is considered to meet the threshold of FDI when it grants the investor at least 10 per cent of the equity or voting shares of the enterprise. Meeting this threshold is deemed to grant the investor a "controlling interest" in the foreign enterprise, and is what distinguishes FDI from FPI.

For the investor, direct investment is a long-term business undertaking with which comes more risk and commitment than foreign portfolio investments. This means that direct investment is not only a capital transfer, but also a transfer of technology, knowledge, management and organizational skills. There are two broad categories of FDI investments: greenfield, which refers to the establishment of new operations in a foreign company, and mergers and acquisitions, which happen when one company combines with another.

A "DIGITAL, SUSTAINABLE, AND INNOVATIVE ECONOMY": THE OPPORTUNITIES AND CHALLENGES FOR FDI IN A POST-COVID ECONOMY

KEY TAKEAWAYS:

- Canadian outbound FDI in the Asia Pacific region remains resilient despite the pandemic, having increased from C$11.5B in 2019 to C$16.7B in 2020, and it will be an important pillar for Canada's FDI recovery.
- Looking at select Asia Pacific economies' stimulus packages and budgets, there has been a focus on digital, green, and innovation-led recovery. This also aligns with the Canadian Industry Strategy Council's recovery vision, presenting potential investment opportunities in desired sectors of focus.
- This chapter specifically focuses on opportunities in South Korea, India, Australia, and Singapore. These respective governments are reigniting their economies via substantial investments in their digital and clean energy sectors, which may prove a promising investment opportunity for Canadian companies.
- Other than the digital and clean energy sectors, South Korea, India, Australia, and Singapore are also emerging innovation hubs. With robust government support in R&D capacity across sectors, these economies present opportunities for Canadian companies looking to expand their own R&D activities.
- Despite the opportunities, these economies have also implemented varying levels of protectionist measures, such as increased FDI screening and prioritization of domestic firms in government support programs. Canadian companies may also be exposed to greater regulatory risks, given the increase in public skepticism over foreign investments, particularly via mergers and acquisitions.

WHAT HAPPENS NEXT? FDI IN POST-RECESSION RECOVERIES

COVID-19 provided an economic nosedive unlike any we have seen in recent memory; in March 2020 economies across the world were at various stages of grinding to a halt. While it may appear that such an event is nothing like past recessions, one thing does remain constant: a crisis is also an investment opportunity. This chapter will discuss the rebound in inbound and outbound FDI that occurred in Canada after the financial crisis of 2008-09 and the commodities recession of 2015, and what they may tell us about the prospects for deal flow in 2021/22. Additionally, this chapter will outline which sectors both the government of Canada and governments across Asia have emphasized in their recoveries – hint green and tech are key pillars of many economic recovery packages.

In the past, FDI flows have decreased significantly during and immediately after an economic recession.[7] But evidence shows that inbound FDI plays a vital role in helping an economy recover post-recession. For example, in the 1997-98 Asian financial crisis, an influx of FDI helped stabilize the financial tailspin.[8] In fact, after most economic crises, FDI has been shown to boost economic resilience by providing employment income, increasing competition, and lowering consumer prices.[9]

FDI in 2020: looking up from the bottom of the hole

2020 was a devastating year for FDI both in Canada and across most of the globe. In Canada, Q2 of 2020 saw an overall 46.9 per cent decrease in inbound FDI flows compared to Q2 of 2019.[10] However, in Canada's case, the direction of FDI flows matters – looking at Canada's investment relationship with the Asia Pacific region, while inbound FDI decreased significantly, falling from C$9B in 2019 to $6.4 billion in 2020 (a 29 per cent decrease), outbound FDI actually increased from C$11.5B in 2019 to C$16.7B in 2020 (a 45 per cent increase).[11]

This increase in outbound FDI is partially due to some very substantial outbound deals that took place in 2020, such as Brookfield Asset Management's acquisition of RMZ Corp in India for C$2.6B, the Ontario Municipal Employees Retirement System's acquisition of Australia's TransGrid for C$1.7B, and the British Columbia Investment Management Corporation's

acquisition of a telecom tower company in India for C$1.2B. In terms of sectors, electricity was the most lucrative, accounting for C$4.3B; real estate investment and services came in second with C$3.6B; and technology services and equipment came in third with C$2.3B.

Comparatively, inbound investments were simply smaller. The single largest inbound deal in 2020, ByteDance's expansion into Canada, was valued at C$829M. The three most lucrative sectors were travel and leisure, coming in at C$2B; mining at C$900M; and media at C$830M.

Inbound FDI in recessions of yore

Defining a recession as occurring when there are two consecutive quarters of declining GDP, Canada has had two recessions in recent history: one in 2008-09 and one in 2015. Both of these recessions provide us with opportunities to understand how FDI into Canada has responded amid an economic decline.

Both periods saw a decrease in FDI between Canada and the Asia Pacific during the recession's onset and duration. However, immediately after the 2008-09 recession, inbound FDI from the Asia Pacific grew significantly, from C$8.2B in 2008 to C$17.2B in 2010 – an increase of over 50 per cent. And the 2015 technical recession exhibited roughly the same pattern – inbound FDI from the Asia Pacific grew significantly post-economic crisis, from C$5.7B in 2015 to C$11B in 2016.[12]

It is important to note that the impact of the COVID-19 recession on economic activity was uniquely severe. Accompanying the economic fallout, which occurred in part due to pandemic-related restrictions, have been financial safety nets unlike any we've seen in the past. So, while the recession will produce a significant opportunity to acquire distressed firms, government economic stimulus packages will also create resilience among firms that would otherwise have gone under months ago. Deal flow, particularly distressed deal flow, will be particularly impacted by this factor. Whereas in the 2008-09 crisis, we saw a large opportunity for distressed deal flow. While many firms are suffering greatly in this recession, others are receiving sufficient government stimulus and pivoting their businesses for success in the new post-COVID economy.

Outbound FDI – the resilient flow

While an increased inbound flow can contribute to Canada's post-recession recovery, emerging evidence also points to the potential economic benefits of outbound FDI.[13] Considering that Canada's outbound FDI is a) currently higher in value than our inbound FDI, with C$240B in investment value compared to the C$207B in inbound investment value and b) has increased in value during the COVID-19 pandemic, it is vital for Canada to understand the role outbound FDI is playing in its economic recovery and the strategic positioning outbound FDI plays in ensuring economic resiliency in a post-COVID economy.

UNESCAP has found that as companies begin to engage in outbound FDI, their activities produce returns that are transferred back to the home economy, such as higher export earnings, increased domestic output, increased productivity/innovation, higher employment and wages, and overall economic growth.[14]

Specifically in the Canadian context, Export Development Canada (EDC) conducted a study on outbound FDI, and found both micro- and macro-level benefits – on a micro scale, outbound FDI results in benefits for the company itself such as lower costs, increased productivity and increased efficiency in supply chains. Based on a survey EDC conducted of Canadian companies with foreign affiliates, after investing abroad 95 per cent reported increased revenue, 92 per cent cited increased competitiveness, and 74 per cent reported an increase in overall productivity.[15] On a macro scale, EDC found that outward FDI can result in positive economic effects for Canada as a whole by creating employment opportunities and strengthening domestic businesses.[16]

However, much like inward FDI, it is important to recognize that there are differing degrees of economic benefits of outbound FDI, based on factors such as the income level or business environment of the home country, the size of the investing company, and where the outbound FDI is going.[17] That being said, the benefits outlined above are significant and should be taken advantage of, especially considering Canada's already-strong outbound FDI.

Follow the Sector-Specific Growth

Looking at COVID-19 economic recovery plans across the Asia Pacific region, many Asian economies have chosen to implement green stimulus deals, focusing on clean tech, renewable energy and green finance, with the goal of

creating a "green recovery."[18] Examples include South Korea's New Green Deal, New Zealand's Focus on Environment and Jobs, and Indonesia's National Economic Recovery Plan.[19] These plans have emphasized that a focus on environment is especially important considering the potential negative effects of the "double disaster" that is both climate change and COVID-19. A green recovery is crucial for any economy that wants to "build back better."[20]

Other Asian economies – such as Singapore, Malaysia and China – have focused on digital stimulus packages, emphasizing digital innovations, IT and data.[21] This is largely because COVID-19 has demonstrated the importance of technology and digital infrastructure during times of crisis – and how digitization can help to build a more inclusive economic recovery.[22]

Looking at Canada's economic recovery plan, the Industry Strategy Council has published a post-COVID-19 growth plan aimed at building a "digital, sustainable and innovative economy."[23] The report focuses on four main pillars, including striving to become a "digital and data-driven economy," being the "environmental, social and governance (ESG) world leader in resources, clean energy and clean technology" and to "build innovative and high-value manufacturing where we can lead globally."[24]

The Industry Strategy Council focused on sustainability, innovation and digitization in its recovery plan for two main reasons: first, the Council believes that focusing on these sectors will help accelerate Canada's recovery, as they are key factors of economic growth; and second, Canada was facing challenges pre-COVID in terms of digitization and innovation, and shifting to focus on these areas post-COVID will help place Canada in a leadership position on the world stage.[25]

There are clear intersections between the Canadian growth plan and those of many Asian economies, with mutual interests in digital, clean energy, and R&D. With that in mind, this intersection could translate into various bilateral investment opportunities. This report will focus on outbound opportunities specifically as those have proven to be resilient during the COVID-19 pandemic, and will most likely continue to be important for Canadian companies going forward. This chapter focuses on outbound investment in those high-growth sectors and attempts to outline potential opportunities for Canadian companies.

ECONOMIC RECOVERY PLANS IN SELECT ASIA PACIFIC ECONOMIES

This chapter will analyze four major economies' COVID recovery strategies and how they may present investment opportunities for Canada. The economies covered in this chapter include South Korea, Singapore, Australia, and India. These economies are chosen for analysis not just because they have laid out an economic recovery strategy that aligns with Canada's "digital, sustainable, and innovative" recovery, but these partners could also align with the Canadian government's trade diversification objective.[26] This does not imply that Canada's investment opportunities in the region will exclusively be in these markets, as other major economies, such as China and Japan, are likely to remain critical partners to Canada's economic recovery. Rather, these four economies have the potential to elevate their existing investment relations with Canada in the post-COVID environment.

For the purposes of this report, APF Canada Investment Monitor combines the various sub-sectors in the modified industry classification benchmark (modified ICB) when identifying digital and clean energy investments. Below are the operational sectoral definitions:

- Digital industry includes companies engaged in computer services, internet, software, computer hardware, semiconductors, and telecommunication equipment.
- Clean energy industry includes renewable energy equipment manufacturers, alternative fuels developers and producers, and alternative electricity companies.

While these definitions may not holistically capture the digital and clean energy industries, narrow definitions allow us to focus on the key enablers in these industries as well as reduce the number of false-positive transactions.

APF Canada Investment Monitor also adopts the OECD's 2015 Fracasti Manual concepts and definitions (which Statistics Canada also employs) when identifying R&D-related investments. Accordingly, "R&D comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge."[27] While this definition would also

encompass work undertaken in the social sciences, humanities, and arts, given the sectoral focus of this report, we only capture investments associated with R&D activities in the natural sciences, engineering and technology, the medical and health sciences, and agricultural and veterinary sciences.[28] See methodology and data sources chapter on how APF Canada Investment Monitor identifies investments associated with R&D.

KOREA'S NEW DEAL: TRANSITIONING TOWARDS A SUSTAINABLE AND DIGITALIZED ECONOMY

South Korea announced C$128.5B (KRW$114.1T) worth of government recovery programming as part of a plan termed the 'Korean New Deal' (KND) in July 2020. The KND is part of the South Korean government's plan to accelerate South Korea's transition towards an inclusive, green, and digital economy. According to President Moon Jae-In, the KND will transform South Korea from a "fast follower" into a "leading" economy.[29] To achieve this vision, the Korean New Deal is structured in three major pillars: the Digital New Deal, Green New Deal, and Stronger Safety Nets. Underneath these pillars, KND lays out nine focus areas and 28 specific projects to be implemented by 2025. Taken together, the Korean government hopes to generate more than 1.9 million jobs through KND programming.[30]

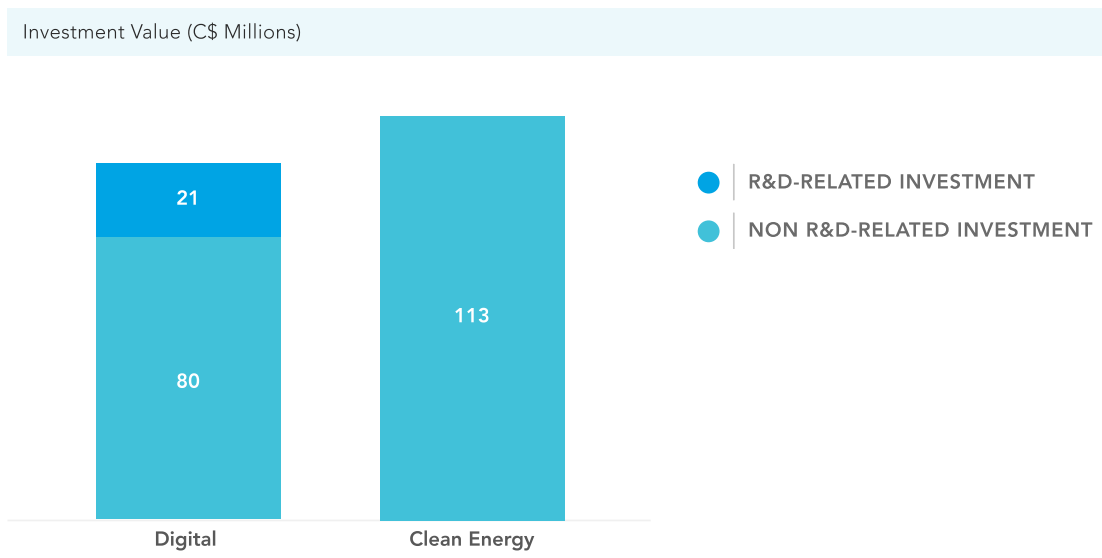
With C$97B (KRW$87.5T) in funding, digital and green account for most of the KND programming. On digital, the focus is on a more robust integration of data, network and artificial intelligence (DNA) throughout the Korean economy. Specifically, the government pledged to invest C$7.1B (KRW$6.4T) to develop a "data dam" that would enable and facilitate the collection, disclosure, and utilization of data throughout the economy.[31] To further reinforce Korea's digital advantage, the government is investing C$16.4B (KRW$14.8T) to expand the integration of 5G and AI in the private sector through initiatives such as providing AI solution vouchers to SMEs.

The Green New Deal is another significant component of the KND. With C$48B (KRW$42.7T) in pledged investments, the South Korean government seeks to transition its economy towards carbon neutrality by 2050.[32] The Green New Deal promises to invest in greening Korea's public infrastructures and expanding the use of sustainable and renewable energy throughout the economy. For instance, in one project, the government pledges to provide support for installing renewable energy equipment in 200,000 households.[33]

Lastly, the KND also lays out various programs across the three pillars to improve the economy's R&D capabilities. In the digital realm, the South Korean government promises to support research and development in delivery systems which utilize robotics, internet of things (IoT), and big data. KND also strives to leapfrog South Korea's research capacity in clean technologies. For instance, in one program, KND pledges to support the development of hydrogen technologies. KND further reinforces these R&D programs by committing C$1.2B (KRW$1.1T) to train 100,000 digital and 20,000 green talents by 2025.[34]

FIGURE 5

Canada's Digital, Clean Energy and R&D-related Investment in South Korea, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

While KND could present substantial opportunities to Canadian digital, renewable, and R&D sectors, Canadian outbound investments to Korea remain limited in these high-growth sectors. From 2003 to 2020, Canadian companies have invested C$5B into South Korea via 53 deals. Of the C$5B worth of Canadian investment in South Korea, the digital and clean energy sector only accounted for C$101M and C$113M, respectively. One notable transaction came in 2020 when NexOptic Technology Corp., a Vancouver-based artificial intelligence company, opened a new office in Seoul. In the clean energy realm, Kolon Hydrogenics, a joint venture between Kolon Water & Energy and the Mississauga-based Hydrogenics Corporation, invested C$113M to develop a 1-megawatt fuel cell power system in Seosan, a city located southwest of Seoul.

The APF Canada Investment Monitor also identified four Canadian R&D-related investments in South Korea amounting to C$21M. However, all identified R&D investments are in the digital sector. One notable transaction came in 2018 when the Montreal-based artificial intelligence firm Element AI invested an estimated C$2M to open a new office in Seoul. Element AI's 2018 investment was associated with a research collaboration agreement with Shinhan Financial Group to incorporate AI forecasting technology in its investment advisory platform.[35]

Potential Barriers for Entering the South Korea Market

While the KND could incentivize more significant Canadian investment to South Korea in the digital, clean energy, and R&D sectors, there remains potential barriers for Canadian companies to take advantage of KND-induced activities. Analysts have noted that KND's primary objective is to leapfrog South Korea's own domestic industries and to allow foreign participation may defeat such an objective.[36] In particular, some Korean firms are concerned that allowing foreign companies, which are perceived to be technologically superior, to bid for KND opportunities will threaten domestic players' opportunity to take advantage of the stimulus package. Given KND's policy objective and the potential public opposition to foreign participation, the South Korean government may favour domestic companies over foreign bidders in KND programs, impeding Canadian investment opportunities.

Furthermore, skepticism over foreign investment could heighten depending on the method of entry. According to a 2019 study by the Pew Research Center, while most South Korean respondents welcomed foreign greenfield investments, 71 per cent had a negative perception of foreign companies' acquisition of Korean firms.[37] The public's negative view of foreign purchases of Korean firms could pressure the Korean government to strengthen its regulations around foreign acquisitions, particularly in sectors that see a high level of government investment.

In fact, South Korea has been introducing more stringent measures to safeguard its own technological advantage and national security. Like many advanced economies, South Korean policymakers have been concerned about the leak of core technologies, which may undermine economic competitiveness and national security. While such concern predates the

pandemic, policymakers may introduce more measures to safeguard emerging technologies in the digital and green sectors, which are expected to set the course for South Korea's economic recovery. According to UNCTAD's Investment Policy Monitor, South Korea recently amended the Enforcement Decree of the Foreign Investment Promotion Act in August 2020.[38] The amendment enables officials to request a review of foreign investments where there is a strong likelihood of leakage of core national technologies. These measures may add regulatory risks, or at least compliance cost, for Canadian companies intending to invest in KND-associated high-growth sectors.

AUSTRALIA'S 2020-2021 BUDGET AND RECOVERY PLAN

Australia released its 2020-2021 Budget in October 2020, which consists of C$92.2B (AUD$98B) for response and recovery support – of that, C$23.5B (AUD$25B) is the COVID-19 Response Package, and C$69.6B (AUD$74B) is the JobMaker Plan. The budget is largely focused on increasing incomes for households and businesses, boosting manufacturing and infrastructure investment, and decreasing the unemployment rate by creating jobs.[39] The plan involves a variety of different sectors and priorities, but of particular interest for this report is the recovery plan's actions on R&D, clean energy and digitization.

First, Australia's recovery plan committed an additional C$1.9B (AUD$2B) over the next four years to its pre-existing Research and Development Tax Incentive. The R&D tax incentive is meant to encourage businesses to conduct R&D activities, by offsetting the cost. There are two main parts of this tax incentive: a 43.5 per cent refundable tax offset for eligible entities with aggregated turnovers of less than C$18.8M (AUD$20M) per year; and a 38.5 per cent non-refundable tax offset for any other eligible entity.[40] Canadian entities can be eligible for this tax benefit if they set up: a permanent establishment in Australia; an Australian resident company; a corporation that is an Australian resident for tax purposes.[41] The Australian government has stated that it focused on R&D because it drives technological innovation, which in turn leads to increased productivity and increased economic growth.

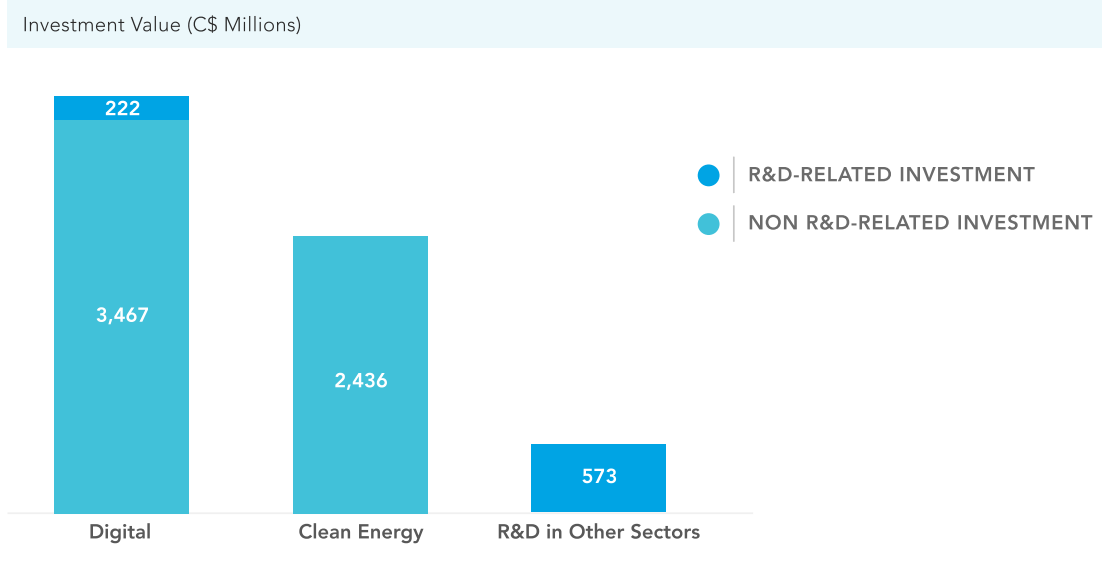
The budget also includes the government's Digital Business Plan. The plan emphasizes that COVID-19 has sped up the adoption of digital technologies by

both Australian businesses and consumers, showcasing the growing importance of prioritizing digitalization going forward. The Digital Business plan involves a C$764M (AUD$800M) investment "to enable businesses to take advantage of digital technologies to grow their businesses and create jobs as part of our economic recovery plan."[42] For example, the plan includes a C$27.9M (AUD$29.2M) investment in the rollout of 5G; C$21.2M (AUD$22.2M) to expand the Australian Small Business Advisory Service, which includes the Digital Solutions program, the Digital Directors Training Package and the Digital Readiness Assessment; and C$9.1M (AUD$9.6M) for fintech companies to export financial services and attract inbound FDI.[43] According to the plan, a focus on digital transformation will create jobs and increase productivity.

Finally, the government has also focused on clean energies. The recovery plan includes an investment in new energy technologies, with the intention to create jobs and boost economic growth. The investment is C$1.81B (AUD$1.9B) to lower emissions and improve the sustainability of Australia's energy supply. The investment includes C$47.7M (AUD$50M) towards the Carbon Capture Use and Storage Development Fund, C$67.1M (AUD$70.2M) toward a hydrogen export hub, and C$64M (AUD$67M) toward microgrids to deliver sustainable and reliable power to remote communities. There will also be an additional C$1.54B (AUD$1.62B) made available for the Australian Renewable Energy Agency (ARENA) to invest in new technologies that lower emissions.

FIGURE 6

Canada's Digital, Clean Energy and R&D-related Investment in Australia, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

According to APF's Investment Monitor, Australia is the largest destination in the Asia Pacific region for Canadian investors – from 2003 to 2020, Canadian investment in Australia totalled C$74.7B. With this, the Australian government's focus and investment in the areas of R&D, clean energy and digitization can provide significant opportunities for Canadian companies, especially considering Canada's own focus on those sectors post-COVID-19.

The digital sector is among the top sectors for Canadian investors in Australia, with C$1.3B invested in software and computer services, and C$2.4B invested in technology hardware and equipment from 2003 to 2020, totalling C$3.7B. The Ontario Teachers' Pension Plan board accounts for the majority of those investments in terms of value, having invested C$2.2B in Australia's digital sector since 2003. Their largest deal occurred in 2013, when the board acquired 70 per cent of three Australian telecommunications companies – Nextgen Networks, Metronode and Infoplex – from Australia-based Leighton Holdings Limited. The acquisition was valued at C$1.05B.

Turning to clean energy, there were 16 Canadian outbound deals to Australia from 2003 to 2020, totalling C$2.4B. Of those deals, 12 were in alternative electricity, totalling C$2.4B, and four were in alternative energy, totalling C$49.3M. Canadian Solar Inc has been especially active in this sector, having conducted seven deals between 2003 and 2020 totalling C$1.2B. The majority of these investments occurred in 2018, when Canadian Solar purchased five large solar power projects in New South Wales. Another recent notable deal is McCain's investment of C$345M, to add an 8.2-megawatt biogas energy facility to its site in Ballarat, Australia. The project will utilize a combination of solar and co-generation technology, and the electricity produced will supply the company's food processing plant. The new system is expected to reduce the facility's overall energy consumption by 39 per cent.[44]

Finally, other sectors in Australia also saw Canadian R&D-associated investments. APF's Investment Monitor identified 16 Canadian R&D-related investments into Australia, totalling C$795M. The majority of deals were in in the pharmaceuticals sector (seven deals). Recent notable deals include Cronos Group's subsidiary Cronos Australia opening a research and development centre in 2019 in Victoria, Australia, with a C$30.6M investment. Cronos Australia is a medicinal cannabis company, and the establishment of this R&D centre is expected to create approximately 120 new jobs.

Barriers to Investment?

Despite the opportunities these sectors can provide for Canadian companies, there are still barriers to investing in Australia. In March 2020, the government introduced temporary measures which required that all foreign investment into Australia be approved by the Foreign Investment Review Board (FIRB), regardless of the amount, sector or investor.[45] This new screening also meant that FIRB could take up to six months to approve an FDI proposal – compared with the 30 days it took before these new measures.

In December 2020, some of these regulations became permanent, coming into effect as of January 2021. Australia's Parliament reformed the Foreign Acquisitions and Takeover Act of 1975, now requiring all foreign investors to have approval for any investment "that is sensitive to national security, regardless of value."[46] They also hold that investors can be subject to "enhanced monitoring and investigation powers, as well as stronger and more flexible enforcement options and penalties," and must also "continue bearing the costs of administering the foreign investment regime."[47] It is expected that these new security-based regulations will most strongly affect telecommunication, energy and utilities investments, and some technology, services and infrastructure investments.[48] These new screening measures could be a deterrent for certain Canadian companies, due to time constraints and potential additional costs.

There are also domestic political pushbacks. The Lowy Institute Poll in 2019 found that 39 per cent of Australians believe that foreign investment in Australia is a "critical threat," and 51 per cent of Australians believe that it is "an important but not critical threat."[49] The Australian public seems to be especially against investments in Australia's agricultural sector.[50] Another Lowy Institute poll conducted in 2016 found that 63 per cent of respondents were strongly against the Australian government allowing foreign companies to buy Australian farmland.[51] Negative perception over foreign investment could also pose regulatory uncertainty to Canadian companies intending to invest in Australia.

ASEAN AND SINGAPORE: A REGIONALLY CONNECTED RECOVERY

If ASEAN were one economy, it would be the sixth-largest in the world, and one of the fastest growing.[52] The regional intergovernmental organization and trading bloc comprises Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. As was the case in the 2008-09 recession, ASEAN is projected to make another impressive recovery going into 2021, with real GDP forecasted to rise by six per cent.[53] The resumption of growth is in one part fueled by the economic recovery spending and rollout of vaccines by member nations, and in another by their regional integration, coordination and sectoral strengths. In November, ASEAN put forward the ASEAN Comprehensive Recovery Framework (ACRF), which focuses on accelerating digital transformation and achieving sustainability.[54]

For its part, Canada has been eyeing a free trade agreement with ASEAN for years, having published a joint-feasibility study to assess the possibility.[55] Furthermore, as ASEAN deepens its engagement with Australia, China, Japan, South Korea and New Zealand through RCEP's recent entry into force, seizing opportunities will be of particular importance for securing competitive advantages in the region.

Canada's current outbound investment flow to ASEAN is led by Vietnam, the Philippines and Singapore, respectively, accounting for over 65 per cent of investment into the bloc. But in the digital, clean energy and R&D sectors, Singapore dominates in all categories. This section thus focuses on opportunities and risks in Singapore's recovery plan and how the city-state can be used as a bridge to ASEAN's market.

Singapore's Budget 2021: "Emerging Together Stronger"

The 2021 "Emerging Together Stronger" budget announced over C$95B in stimulus and support spending. Half of the budget is allocated to social development and special transfer expenditures, primarily focused on supporting businesses, workers and jobseekers during the crisis.[56] Another 26 per cent is earmarked for economic development, with the focus on moving from "containment to restructuring" to equip "businesses and workers with deep and future-ready capabilities."[57] In this aspect, the government is seeking

to support transformation by "helping [businesses] digitalize, adopt new technology, innovate, collaborate and gain access to global markets."[58] Finally, Budget 2021 unveiled Singapore's Green Plan 2030. Accordingly, Budget 2021 includes a variety of measures around the digital, clean energy and R&D sectors.

Budget 2021 leverages a variety of "capital tools to co-fund transformation," with the primary focus on digital transformation.[59] The new Emerging Technology Programme co-funds the costs of trials and adoption of next-frontier technologies like 5G, AI and trust technologies.[60] With COVID-19 having accelerated the digitization wave worldwide, the programme is designed to speed up the commercialization of digital innovation, proactively setting Singaporean businesses up to seize up on global investment opportunities as they arise.[61] This is just one of many programs aiming to speed digital transformation through either co-funding or connecting businesses with strategic advice from consultancies, such as the new CTO-as-Service program for SMEs and the Digital Leaders programme. With digitization as a top priority, opportunity is ripe for Canadian companies looking to tap into the market.

Digitization is likewise emphasized as a priority area within the government's new innovation and R&D measures, which aim to establish Singapore as "Asia's Silicone Valley."[62] Singapore's Open Innovation Platform, established in 2018, matches "problem solvers" (innovative companies) with "problem owners" (sector agencies and Trade Associations and Chambers), co-funding the prototyping and deployment of solutions.[63] Another big-ticket-item is the enhancement of the Global Innovation Alliance (GIA). GIA connects businesses with global innovation hubs for co-innovation and market expansion. The programme co-funds the costs up to 70 per cent and Budget 2021 promises to expand the network of overseas partners, which could unlock opportunities for engagement with Canadian firms.

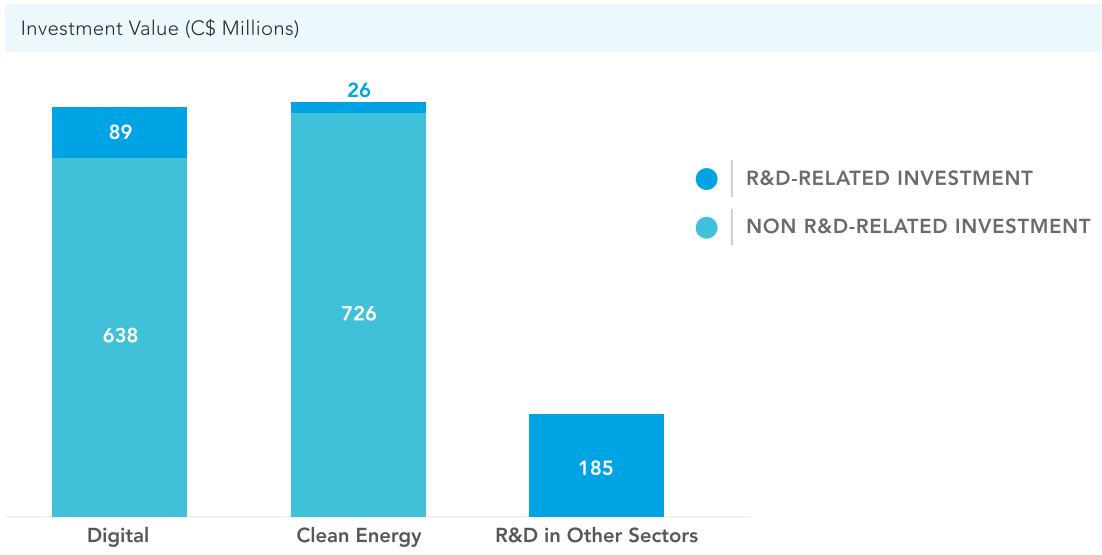
Finally, with Green Plan 2030, Singapore has joined the ranks of many other Asia Pacific economies aiming for a "green recovery".[64] The first goal under the Energy Reset pillar of the plan is to phase out internal combustion vehicles and switch to cleaner energy vehicles by 2040.[65] Toward this end, the government has earmarked C$28 million over the next five years and introduced a host of

incentives to encourage the transition.[66] The Energy Reset also aims to increase the use of solar energy fivefold by 2030.[67] To achieve its solar targets, the plan intends to tap into clean energy sources from ASEAN and globally by upping electricity imports.[68] Lastly, the government has announced $19B of public sector green bonds, which it projects will catalyze "green issuers, capital, and investors to (its) financial centre."[69]

An overarching principle of the budget, particularly around the business measures, is internationalization. A Double Tax Deduction for Internationalization allows Singaporean businesses a 200 per cent tax deduction on market expansion and investment development expenses, of up to C$142,000 (S$150,000). Furthermore, Heng announced in his budget speech that Singapore would continue to work with ASEAN partners on sustainability and digitization through the ASEAN Smart Cities Network and the Southeast Asia Manufacturing Alliance, with the goal of the latter being to "promote a network of industrial parks to manufacturers who are looking to invest in Singapore and the region."[70]

FIGURE 7

Canada's Digital, Clean Energy and R&D-related Investment in Singapore, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Since 2003, Singapore has been the eighth-largest recipient of Canadian outbound FDI in the Asia Pacific, with C$6.9B invested through 109 deals. Among ASEAN economies, Singapore is the third-largest recipient of Canadian FDI, following Vietnam and the Philippines. But turning to the digital, clean energy and R&D sectors, Singapore ranks first in outbound investment value among all ASEAN economies. These sectors together represent 24 per cent of

Canada's FDI investments into Singapore. Budget 2021 presents opportunities to further strengthen investment relations with Singapore in these high-growth sectors.

Collectively, Canadian companies have invested C$727M into Singapore's digital sectors through 37 deals since 2003. In 2020, APF Canada's Investment Monitor recorded its largest ever Canadian investment in Singapore's digital sector. Ontario Teacher's Pension Plan (OTPP) made a C$300M greenfield investment in Princeton Digital Group, one of Asia's leading data centre companies. In the clean energy sector, there have only been three outbound deals recorded since 2003, but these represent C$752M in value. The largest deal was once again made by OTPP in 2020 through a C$545M greenfield investment in Equis Development Pte Ltd (EDL). EDL develops and operates renewable energy infrastructure in Australia, Japan and South Korea.[71] Ben Chan, OTPP regional managing director for the Asia-Pacific, said, "We see data centres as a compelling investment opportunity given their essential role in the rapid digitalization and growth of data occurring in Asia and around the world."[72]

APF Canada also identified seven R&D outbound investments, totalling C$300M. A recent notable deal was Hydro Quebec's C$46M investment in the opening of a laboratory focused on developing new nanomaterials and nanotechnologies for electric vehicles. This supports Green Plan 2030's target of transitioning to cleaner energy in transportation. The lab was opened jointly with the Agency for Science, Technology and Research (A*STAR), another government initiative that has been enhanced under Budget 2021. Through the A*STAR Partner Centre at Suzhou Industrial Park, companies can draw on the expertise and advanced facilities of A*STAR before getting their products ready for entry into the Chinese market.[73] This program could provide a launching pad for other Canadian companies looking to do the same.

For its part, the Canadian government has taken notice of the potential and has set up the Southeast Asia Cleantech Canadian Technology Accelerator. The program offers Canadian companies potential investment, partnerships and guidance to enter the markets of Singapore, Vietnam, Malaysia and the Philippines.[74] Further, with Canada's entry into CPTPP alongside Singapore, Canadian companies investing in Singapore will enjoy competitive advantages

against non-members. While CPTPP includes four of 10 ASEAN members (Singapore, Brunei, Malaysia and Vietnam), investing into Singapore can provide Canadian companies with export access to the whole of ASEAN.

Soft Barriers to Investment

Singapore enjoys a strong international business reputation, ranking second among 190 economies for ease of doing business by the World Bank.[75] However, investors should be aware of potential barriers to investment as well. On the human capital front, the government has introduced measures to partially subsidize the cost of recruiting Singaporean workers, to reduce the ratio of Singaporean to foreign workers.[76] Another potential barrier is that of competition with monopolies of government-related enterprises in sectors such as financial services, professional services, media, and telecommunications.[77] Furthermore, in terms of regional reach, companies looking to set up headquarters in Singapore with the goal of establishing subsidiaries in ASEAN nations may face a degree of regional uncertainty in their investments due to ongoing political turmoil in Thailand and Myanmar.

INDIA'S RECOVERY PLANS: DEVELOPING ECONOMIC SELF-RELIANCE

In February 2021, Indian Finance Minister Nirmala Sitharaman announced the allocation of C$95.5B (Rs5,540 crore) for the 2021-2022 fiscal year to achieve the government's goal of a "self-reliant" India and support the country's economic recovery.[78] The push for self-reliance is evidenced by the budget's focus on domestic growth. Sitharaman's budget speech emphasized skill development, education, and infrastructure projects as the main paths to achieving self-reliance. Overall, the budget is divided into six major pillars: health and wellbeing, physical and financial capital and infrastructure, inclusive development, reinvigorating human capital, innovation and R&D, and lastly, minimum government and maximum governance. The focus of this report will be the pillars related to R&D, clean energy, and digitization initiatives.

The Union Budget 2021 plans to facilitate innovation and R&D through the establishment of a National Research Foundation (NRF). C$8.6B (Rs50,000 crore) has been allocated for the creation of the NRF over the course of the next five years. The aim of this "Glue Grant" is to promote cross-institution

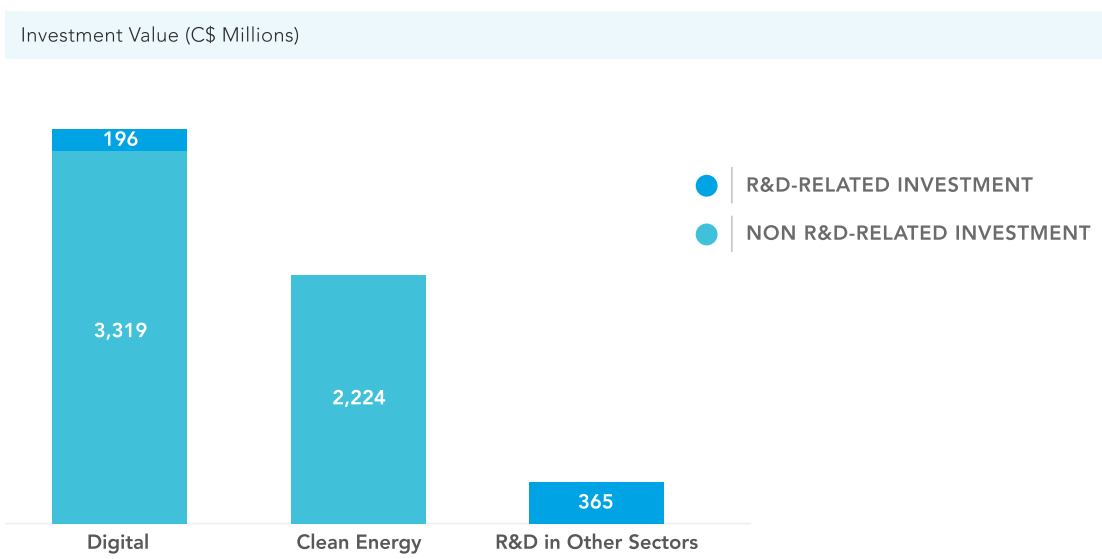
collaboration that will spur innovation and R&D. The current plans suggest that the NRF will be a formal institution used to connect and strengthen research institutions across nine major cities. The NRF will also encourage projects that are focused on areas that the government considers a priority.

The Indian government recognizes the importance of the renewable energy sector and has pledged C$172M (Rs1,000 crore) to the Solar Energy Corporation of India and an additional C$259M (Rs1,500 crore) to the Indian Renewable Energy Development Agency. In the 2015 Paris Climate Agreement, India agreed that by 2030 it would reduce greenhouse gas emissions by 33 per cent. A large-scale movement towards reliance on renewable energy would significantly increase India's ability to meet this goal. The finance minister also announced that the National Hydrogen Energy Mission would be launched in the coming year, focused on developing green hydrogen energy, and the Ministry of New and Renewable Energy was allotted C$4.3M (Rs25 crore) to encourage the research and development of hydrogen technologies.

Finally, the budget identified two initiatives that will further India's digitalization process. The first is an allocation of C$259M (Rs1,500 crore) for the promotion of digital payments using financial incentives. In addition, the government plans to support fintech start-ups and provide them with access to a global market by establishing a fintech hub in Gandhinagar Gujarat International Finance Tec (GIFT) City, India's first smart city. The hub is also expected to create up to 150,000 jobs and spur R&D and innovation in the fintech field.[79]

FIGURE 8

Canada's Digital, Clean Energy and R&D-related Investment in India, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

While the Indian government is focused on increasing the country's self-reliance in 2021, the R&D, digital, and renewable energy sectors could provide opportunities for Canadian investors. India is already a popular destination for Canadian investment. Since 2003, investment in India has reached a total of C$32.8B, through 260 transactions. This makes it the third largest recipient of Canadian FDI, after Australia and China.

Investment Monitor data suggests that the clean energy and digital industries are already sought after by Canadians, as the telecommunications and alternative electricity sectors are both in the top five sectors for Canadian investment. In total, the clean energy and digital industries have received C$2.2B and C$3.5B, respectively. Of the C$2.2B invested in India's clean energy sector, C$1.9B has been invested in alternative electricity, and C$277M was invested in renewable energy equipment. Toronto-based SkyPower Global, a solar power development company, is responsible for the majority of the investment in alternative electricity, having invested C$848M to build and operate 200-megawatt solar energy projects in Telangana through two transactions, one in 2015 and the other in 2016.

Investments in the digital sector are more diverse, spanning the computer services, semiconductor, software and telecommunications equipment industries. In the software sector C$800M was invested through 39 transactions, the largest number of deals for any sector related to digital technology. However, the telecommunications equipment industry has received the largest total investment value, with C$2.5B invested between 2003 and 2020. The largest outward investment in India's telecommunications sector was the C$2B acquisition of a telecommunications tower company by British Columbia Investment Management Corporation and Brookfield Infrastructure Partners. This transaction occurred in 2020, although there has been a fairly equal distribution of deals across all years since 2003.

Outside of the digital and clean energy industries, other sectors have also received R&D-related investments. C$561M worth of Canadian investments into India could be associated with R&D activities between 2003 and 2020, through 18 transactions. These investments are largely concentrated in the biotechnology and pharmaceuticals sectors, with over C$157M invested in these two sectors via 4 deals. One notable transaction is a 2018 R&D-

associated investment in the healthcare sector. The Canadian pharmaceutical company Jamp Pharma Corporation invested C$46M to establish its biggest centre of excellence for R&D and manufacturing drugs in Hyderabad. The project is expected to create 2,000 jobs once the centre has been completed.[80]

Potential Barriers to Investment

India's COVID-19 recovery plan could provide Canadians with more opportunities to invest, as the government plans to expand the fintech sector and give tech start-ups access to the global market through the establishment of a fintech hub. However, the emphasis in the budget on "self-reliance" might present a barrier to investment in industries that India wants to further develop domestically.

One example of this type of barrier is the Indian government's decision to support the domestic production of solar panels and solar cells by increasing the duties on solar inverters and solar lanterns from the current 5 per cent to 20 per cent and 15 per cent, respectively. This will likely affect exports more than investment, though the general trend towards "self-reliance" may have a negative impact on India's ability to integrate into global value chains.[81] The increase in emphasis on buying local could be concerning for foreign companies. This could have adverse effects on the investment environment, such as increased restrictions on market access.[82]

In addition, the results of recent polls suggest that the attitudes of Indians towards foreign investment have cooled in the last few years. A 2020 report by the Pew Research Centre found that there was a 13 percentage points decrease in support for the acquisition of domestic companies by foreign entities from 2014 to 2019.[83] The most recent data revealed that in 2019, 47 per cent of respondents said that they were opposed to foreign acquisitions.[84] While attitudes towards greenfield investments are more positive, the negative attitudes towards foreign acquisitions may pressure the government to further regulate the sale of domestic companies to foreign entities.

Box 3. An R&D Recovery: The Fuse that Lights Transformation

The long-term ripple effects of R&D investment become of elevated importance during recessionary periods. Looking back to the 2008 recession, Booz & Company's (today Strategy& of PwC) "Global Innovation 1000" survey of the heaviest R&D spenders showed that over 90 per cent of company executive respondents saw that innovation spending was critical to growth for the upturn.[85] Accordingly, the Industry Strategy Council's recovery plan emphasizes the need to support private investment in R&D and attract key global investments in Canada's "areas of strength."[86]

Asia Pacific economies too have put R&D on their recovery agendas, and FDI cross-engagement could prove mutually beneficial. APF Canada has recorded C$5B of R&D-associated investments from the Asia Pacific region since 2003. Canada's top four Asia-Pacific sources of R&D-associated investments are Japan (C$2B), China (C$1.4B), South Korea (C$707M) and India (C$477M). Together, these account for 90 per cent of all inbound R&D-associated investments.

Sectorally, Asia Pacific partners have cumulatively invested the most in biotechnology (C$1.4B), technology and hardware equipment (C$1.2B), pharmaceuticals (C$924M), software and computer services (C$842M), and aerospace and defence (C$204M). And in the last three years, alternative energy has joined the pack, outplacing pharmaceuticals. These sectors are well-aligned with those "areas of strength" identified by the Industry Strategy Council.

Biotechnology is a sector identified by the Council as ripe for growth. Even before the pandemic, Canada's biotech sector was booming with investment, and as a result of that momentum many Canadian biotechs have been at the forefront of COVID-19 therapeutics and vaccine development efforts.[87] The largest R&D-associated biotechnology Asia Pacific investment came from Japan in 2016. Sunovion Pharmaceuticals, a wholly-owned subsidiary of Osaka-based Sumitomo Dainippon Pharma Co., acquired Toronto-based Cynapsus Therapeutics for C$900M, a specialty biotech company developing a drug to treat the motor symptoms of late-stage Parkinson's disease.[88]

Another key sector identified by the Council is aerospace, which was hard-hit by the pandemic, but in which Canada has stood as a top five global leader.[89] The aerospace sector injects innovation into the Canadian economy, with R&D intensity that is five times higher than the rest of the manufacturing sector.[90] The sector is increasingly prioritizing

decarbonization efforts, which require significant R&D to develop cutting-edge green technology and systems engineering. Promoting the sector's innovation efforts could have multiplier effects for the digital and clean energy aspects of Canada's economic recovery and help drive investment.

Japan, again, dominated the R&D-related investment in the aerospace sector with Mitsubishi Aircraft Corporation's 2019 C$204M greenfield establishment of a SpaceJet Center in Montreal to carry out engineering, development, and product certification.[xc] Key pull factors for Mitsubishi include the presence of a skilled workforce and a healthy innovation system. Canada's workforce is one of the most highly educated in the world. Nearly two-thirds of adults have post-secondary education, which is 16 per cent above the OECD average.[91] The company's chief development officer stated, "Quebec is the hub for some of the most sophisticated and advanced talent in the aerospace industry".[92]

The government also offers programs and incentives to spur R&D spending. The largest is the scientific research and experimental development tax incentive, which provides over C$3B in credits and deductions annually. However, the Industry Strategy Council identified a lack of growth capital and commercialization incentives as pain points for Canadian sectors and recommended easing access to R&D incentives to attract FDI.[93]

THE NATIONAL PICTURE

KEY SECTION TAKEAWAYS:

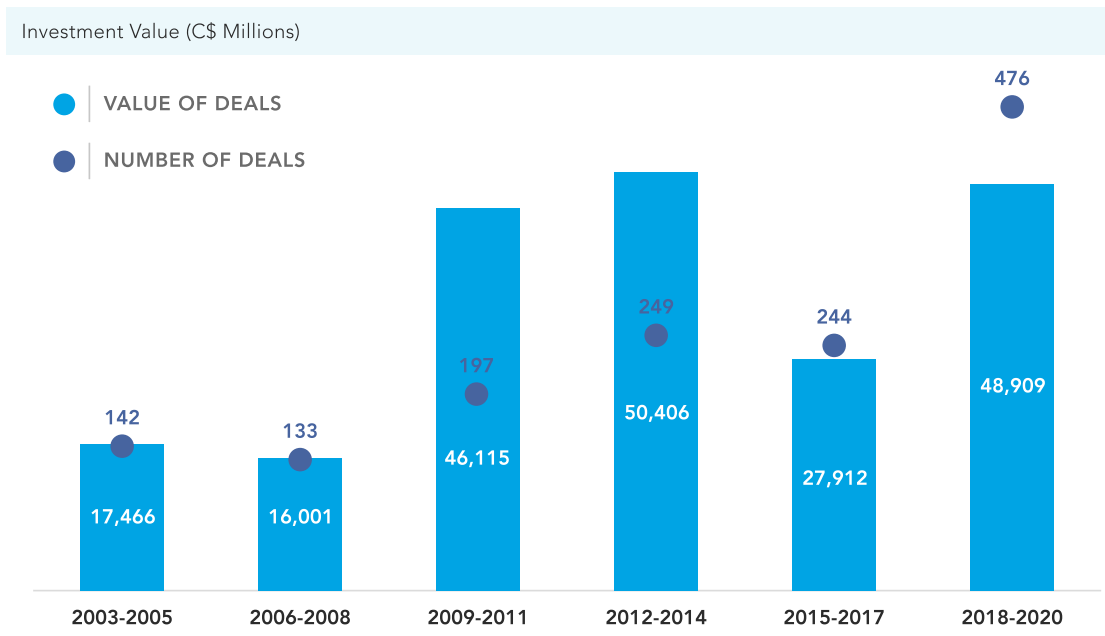
- 2020 marks the second consecutive year of decrease in the value of inward FDI, from C$9B in 2019 to C$6.4B in 2020. However, the number of transactions has increased since 2019, from 164 to 181.
- The natural resources sector continues to receive the majority of the investment flow. In 2020, the mining industry was the largest recipient of FDI with C$1.1B invested through 13 deals, though the oil and gas sector has received the most investment overall.
- State Owned Enterprises (SOEs) emerged as the largest contributors of inward FDI. The cumulative investment from Asia Pacific SOEs between 2003 and 2020 totals C$107.5B.
- Australia, China, and India have been the overall top three destinations for Canadian investments since 2003, accounting for C$74.7B, C46B and C$32.8B of the outbound flow, respectively.
- The top three sectors for outbound investment in 2020 were electricity, with C$4.3B; real estate investment and services, with C$3.6B; and technology hardware and equipment, with C$2.3B.

DEAL ACTIVITIES CONTINUE TO REACH NEW HEIGHTS

The total value of Canadian inward foreign direct investment decreased in 2020, relative to 2019 levels, marking the second consecutive year of decrease in total FDI. In 2020, Canada received C$6.4B in investment, C$2.7B less than the total value of inbound investment in 2019. However, in 2020, the total number of deals increased by more than 11 per cent as compared with 2019 levels. The past year saw 180 transactions, setting a new annual record and continuing the trend of the number of deals increasing over time, which began in 2017.

FIGURE 9

Asia Pacific Investment into Canada, 2003-2020



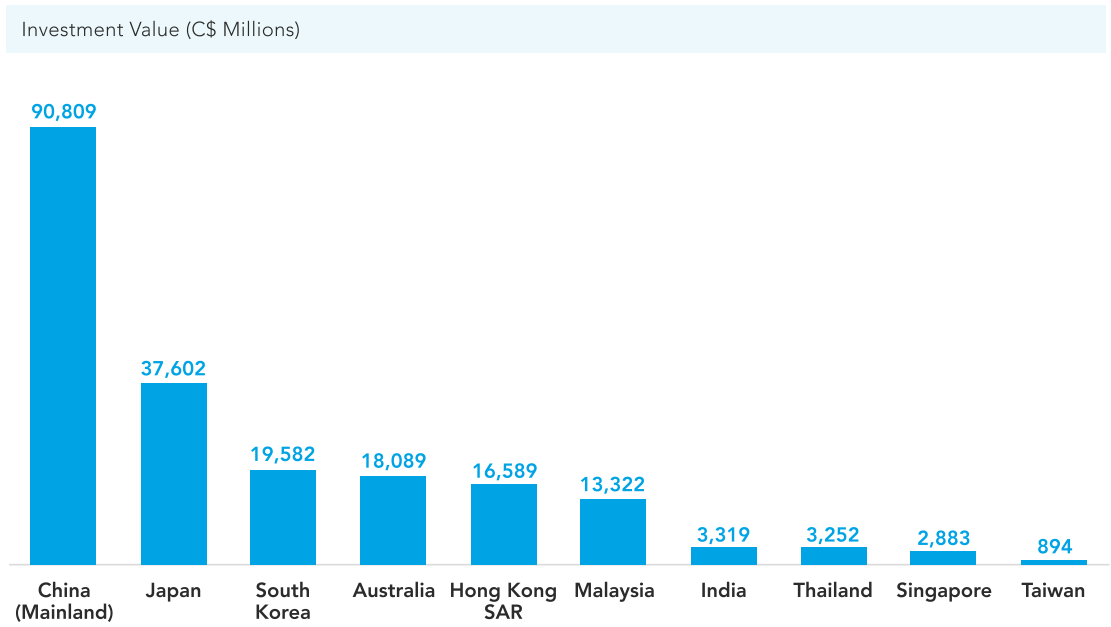
Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

The increase in deal count is also apparent when examining the most recent three-year period. As Figure 7 shows, between 2018 and 2020, the number of deals reached a record high with 476 transactions. During this period, Canada received C$48.9B in investment from Asia Pacific economies, a close second to the historic high of C$50.4B in inbound investment seen from 2012 to 2014. When compared with the previous three-year period, 2015 to 2017, the inbound investment value from 2018 to 2020 increased by C$20.9B, or 75 per cent.

APF Canada's Investment Monitor has captured C$207B in inbound FDI through 1,441 deals from Asia Pacific economies since 2003. The majority of the investment flow has been generated in the past nine years, accounting for almost 61 per cent of total investment value. Over time however, the value of investment seems to share a less direct relationship with deal count. In the 2000s and early 2010s, the years that saw the most investment flows also had the largest number of deals. However, in the second half of the 2010s, a large number of deals did not necessarily generate a similarly large investment value. Between 2012 and 2014, the average amount invested per deal was C$202M, but this average has dropped to C$103M in the most recent three-year period. This demonstrates that the recent increase in deal count outpaces the increase in investment value, which in turn drives down the dollar invested per deal – decreasing the overall average.

FIGURE 10

Asia Pacific Investment into Canada by Major Source Economy, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Asia Pacific investment in Canada continues to be highly concentrated with a select few source economies. China, Japan, South Korea, and Australia alone have accounted for 80 per cent of total inbound investment since 2003. China remains the top source of FDI investment in Canada, with C$90.8B through 407 deals since 2003. Japan comes in second with C$37.6B in investment and 320 deals, followed by South Korea with C$19.6B through 95 deals, and finally Australia with C$18B through 200 deals.

Although China has been an engine of investment in Canada, inbound investment flow has seen ups and downs throughout the years. For instance, Chinese inbound investment reached a high of C$29.6B in the 2012 to 2014 period, only to drop by 63 per cent in the following period to C$11B. Some of that loss was recovered in the 2018 to 2020 period, with C$15.8B invested. The growth, however, was in large part attributable to a C$6.2B Chinese joint-venture investment in the liquified natural gas (LNG) export facility at Kitimat in 2018.

Japan is Canada's second-largest source of investment in the region. Inbound investment from Japan reached an all-time high in the three-year period of 2018 to 2020 at C$10B. Similar to China, the high investment value was fuelled by Japan's C$6.2B joint-venture investment in the LNG project by Mitsubishi Corporation.

In the most recent three-year period, Australia recovered much of the lost investment flow from the 2015 to 2017 period, in which investment values fell

dramatically from previous periods to just C$221M. In the 2018 to 2020 period, Australian investment recovered to C$3.4B, largely through deals in the mining sector in British Columbia, Ontario, and Nova Scotia.

Although Canada's traditional economic partners continue to comprise a large share of inward investment, in recent years non-traditional partners have made significant investment footprints in Canada. In 2020 specifically, Singapore emerged as the top source of investment dollars with C$2.1B invested. This was largely fuelled by a series of investments from Parks Bottom Co Real Estate Holdings Inc., an indirectly wholly owned entity of the Singaporean GIC Private Ltd., in an assortment of luxury hotels across western Canada.

Box 4. Canada's Investment Attraction in Times of Crisis

The COVID-19 pandemic has wreaked havoc on economies around the world, as policy makers impose strict public health measures to save lives. With decreased global demand, disrupted supply chains, and a pessimistic market outlook, foreign direct investments have been expected to sharply decline this year.[94] Developed economies are among the hardest hit. The United Nations Conference of Trade and Development (UNCTAD) recently estimated that foreign direct investment flows to North America declined by 46 per cent in 2020.[95]

Canada, like many other economies, has been facing an uphill battle in FDI attraction from the Asia Pacific region. APF Canada's Investment Monitor has captured C$6.4B worth of investment from the Asia Pacific economies in 2020. Compared to the previous year, investment flow from the Asia Pacific region has decreased by 29 per cent, or C$2.6B. Source economies, such as China, Japan, and Australia, saw a significantly lower level of investment flow into Canada. For instance, Chinese investments into Canada dropped from C$4.1B in 2019 to C$1.5B in 2020, a 64 per cent drop, while Japanese investments into Canada saw a decrease of 38 per cent (C$488M).

Looking back, inbound investments into Canada from the Asia Pacific have been comparatively resilient in past recessions. During the 2008 Financial Crisis, Asia Pacific companies channelled C$8.2B of investments into Canada, a 76 per cent growth from C$4.6B in the previous year. One of the biggest Asia Pacific investments recorded that year came when Chinese refiner Sinopec International Petroleum Exploration and Production Corp acquired Tanganyika Oil Co. for C$2B. Another big-ticket investment came when Toyota Motor invested C$1B in an auto assembly plant in Woodstock, Ontario.

Even in the 2015 technical recession when Canada saw investments from the Asia Pacific region decline by 52 per cent year-on-year with only C$5.7B, a sharp rebound quickly ensued in the following year. In 2016, Asia Pacific companies channeled C$11.1B of investments, just C$861M short of the 2014 level. The rebound was primarily driven by Chinese investments into Canada, which saw a C$4.3B jump in investment flow from 2015 to 2016. The real estate investment and services and oil and gas producers sectors saw the biggest jump of Chinese investments with a C$1.4B and C$1.2B increase from 2015 to 2016. One of the highest valued transactions in 2016 was Anbang Insurance Group's C$1.1B acquisition of four towers at Bentall Centre in downtown Vancouver.

How quickly Asia Pacific investments into Canada can recover will likely depend on when COVID-19 can be contained in both regions. However, Canadian policy makers have been quick to highlight why Canada is an ideal place for investment in the post-COVID world. Invest in Canada's FDI Report 2019 emphasized that Canada brings four major advantages to foreign investors: ease of doing business, cost effectiveness, strong innovation and start-up programs, and preferential market access to more than 50 free trade partners.[96]

Box 5. 50th Anniversary of Canada-China Relations: A Recap of Bilateral Investment Relations

October 13th, 2020 marked the 50th anniversary of the establishment of diplomatic relations between Canada and China. Since 1970, the two countries have engaged in extensive trade and investment, and developed their cultural and personal ties through immigration and travel. However, the celebration of the half-century of political, cultural, and economic exchange between Canada and China was marred by recent tensions between the two countries. The arrest of Meng Wanzhou, an executive of Huawei Technologies Co., in December 2018 has led to an increasingly strained political relationship. Two Canadian citizens, Michael Kovrig and Michael Spavor, were arrested in China shortly after the executive's detention.

Despite the political turmoil in the past few years, investment ties between Canada and China remain an important aspect of the bilateral relationship. Since 2003, China has become one of Canada's top sources of FDI. Inward investment from China between 2003 and 2020 reached over

C$90.8B, almost twice the C$45.7B of outward investment from Canada to China in the same period. Alberta has received the vast majority of the C$90.8B, with C$51.8B invested in the province between 2003 and 2020, largely due to oil and gas investments. However, in the past two time periods, 2015-2017 and 2018-2020, Chinese FDI in British Columbia has outpaced investment in Alberta. In 2015 to 2017, British Columbia saw C$4.3B in Chinese FDI compared to Alberta's C$3.7B. From 2018 to 2020, the difference was even more pronounced, with British Columbia receiving C$9.9B compared to Alberta's C$461M.

Where Chinese investments in Canada have been focusing on natural resources, Canadian investment in China has been largely concentrated in the real estate sector. The sector saw C$6B worth of investment between 2003 and 2020. The sectors that received the second and third most investment are the financial services and industrial transportation industries, with C$4.6B and C$4.5B invested respectively.

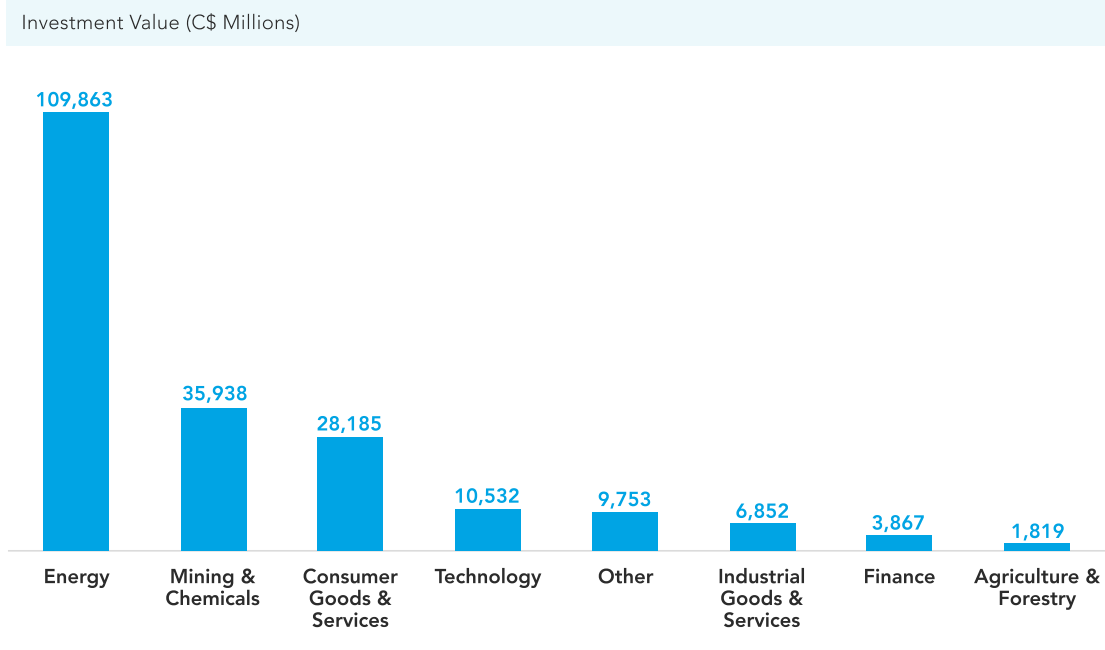
Interestingly, China's alternative energy emerged as the top sector for Canadian investment from 2015 to 2017. This is primarily due to a transaction between Fulcrum Environmental Solutions Inc., a clean technology producer based in Edmonton, and DGF Shandong Industries Corporation, a China-based electrical company. Fulcrum agreed to deploy its technology to support DGF Shandong's new thermal clean coal power plant for an investment of C$1.1B from DGF Shandong.

China will remain an economic power in the post-COVID world, and as conditions normalize in the next few years China's economy will likely grow at unprecedented rates. China-Canada economic relations will continue to be important to both economies and the strong ties forged through investment will encourage the economic growth of each.

ASIA PACIFIC INVESTMENTS IN CANADA'S SECTORS: NATURAL RESOURCES CONTINUE TO DOMINATE

FIGURE 11

Asia Pacific Investment into Canada by Industry, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Inbound investments remain concentrated in Canada's investment mainstay, natural resources. Since 2003, 71 per cent of investments from the Asia Pacific have been in natural resources, comprised of the energy, mining and chemicals, and agriculture and forestry industries. Among these industries, energy made up 52 per cent of total inbound investment, at C$109B, followed by the mining sector at 17 per cent, with C$35.9B, and agriculture at 0.8 per cent, with C$1.8B. However, consistent with declining investment trends worldwide due to the COVID-19 pandemic, the amount of investment flow in the natural resources sectors decreased considerably from C$6B in 2019 to C$1.2B in 2020.

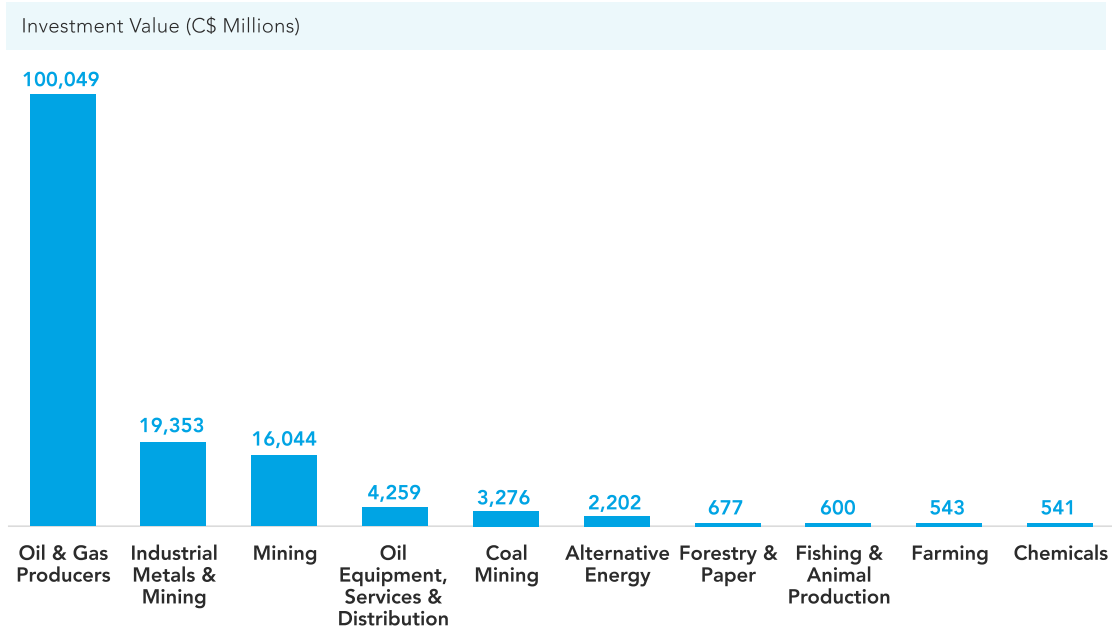
Among the new investments in 2020, the largest deal was the C$495M acquisition of Ontario-based Red Lake Gold Mine by Australian company Evolution Mining Gold Operations Ltd. The second-largest deal was the C$323M acquisition of Guyana Goldfields Inc. and Aranka Gold Inc. by China-based Zijin Mining Group Co. Ltd.

In terms of new investments in 2020, the mining industry comprised the vast majority both in terms of investment value, at C$1.13B, and deal count, at 13. This represents 14 per cent of the total inbound flow from the Asia Pacific region in 2020. There was also one 2020 deal in the energy industry, when

Tokyo-based Hitachi ABB's C$87M greenfield investment in the creation of an R&D presence in Montreal, which will be focused on addressing the challenges in the energy industry related to AI, machine learning and cybersecurity.

FIGURE 12

Asia Pacific Investment into Canadian Natural Resources by Sector, 2003-2020

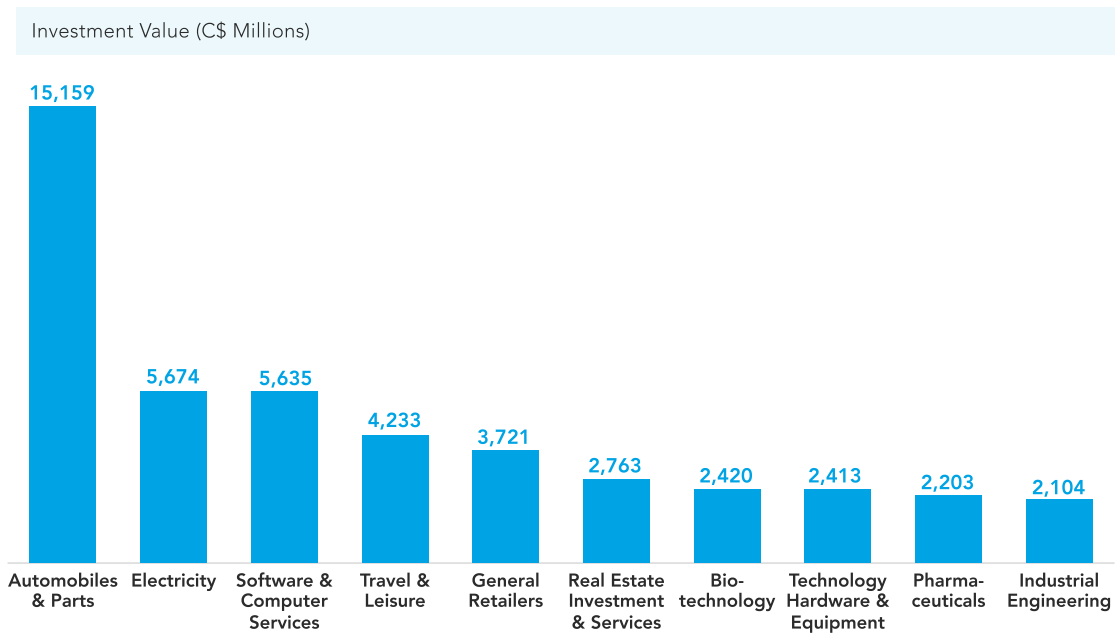


Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Among investments into Canadian natural resources, oil and gas production has led as a sector since 2003, totalling C$100B in inbound investments. From 2018 to 2020, oil and gas production continued to lead natural resources investments at C$25.3B, recovering some of the lost sectoral growth of the 2015 to 2017 period, during which investment only reached C$7B. In the 2018 to 2020 period, Malaysia emerged as the top investor in the sector, with C$10.3B invested, followed by China (C$6.6B) and Japan (C$6.2B). The mining sectors also saw considerable growth, with C$9.3B in investments from 2018 to 2020, compared to C$703M in 2015 to 2017. China led the way in mining investments from 2018 to 2020 with C$6.5B, while Australia emerged as another major investor in the sector, with C$2.8B invested.

FIGURE 13

Asia Pacific Investment into Canadian Non-Natural Resources by Sector, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

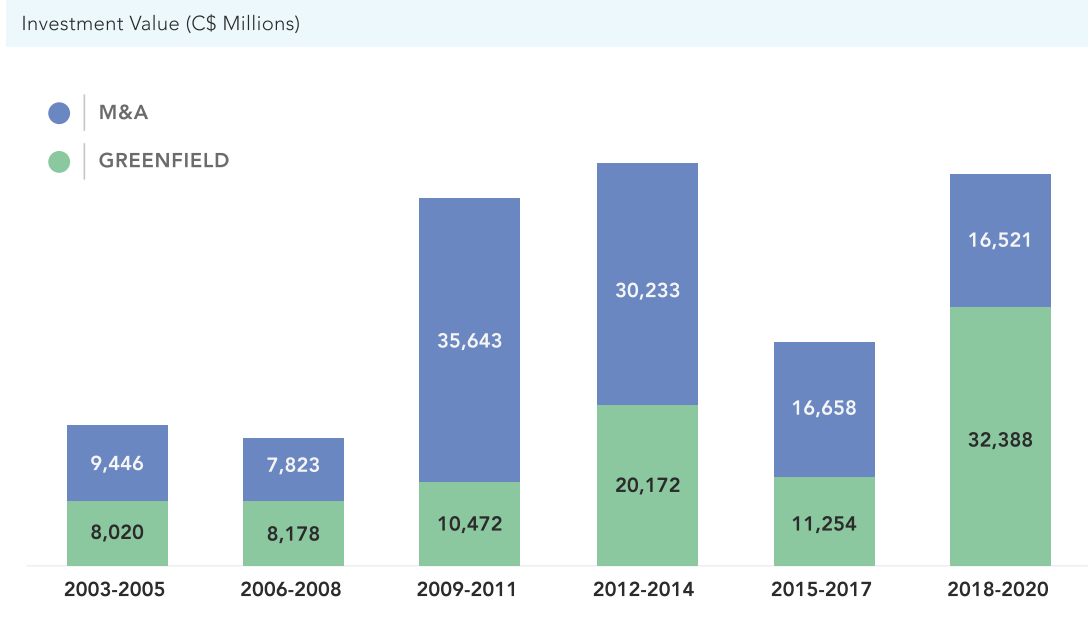
While Canada's natural resources attract the most investment from the Asia Pacific, there is also significant investment going into other sectors. At the top of the list is the automobiles and parts sector, with C$15.2B invested since 2003. Japan has long been a driver of investments into the sector, and continued to lead the way in the 2018-2020 period. This investment relationship could be even further strengthened by the Comprehensive Progressive Trans-Pacific Partnership (CPTPP) agreement, which Canada and Japan entered into in 2018. However, recently other Asia Pacific economies have made important investments into the automobiles & parts industry as well. For example, in 2019, APAG Elektronik Corp., an indirect subsidiary of India-based Vardhan Ltd., invested C$29M to establish a production facility in Windsor, Ontario. Investment into the automobile and parts sector is followed by the electricity sector at C$5.7B.

Another sector which has seen growth in recent years is software and computer services sector. Since 2003, Canada's software and computer services sector has received C$5.6B of Asia Pacific investments. Of the C$5.6B, C$2.1B came in the period of 2018 to 2020. The investment value between 2018 and 2020 also represented C$270M increase from the previous three-year period. One high-value transaction came in 2019 when India-based HCL technologies invested C$215M to open a new office in Moncton, New Brunswick.

INVESTMENT TYPE: GREENFIELD SURPASSES MERGER & ACQUISITION

FIGURE 14

Asia Pacific Economies' Greenfield and M&A Investment into Canada, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

In the most recent three-year period, 2018 to 2020, greenfield investments have been the preferred method of entry for Asia Pacific companies investing in the Canadian market. Canada received 122 new greenfield investments in 2020, compared to 93 in 2019. This means that the number of new greenfield transactions increased from 2019 levels by 31 per cent.

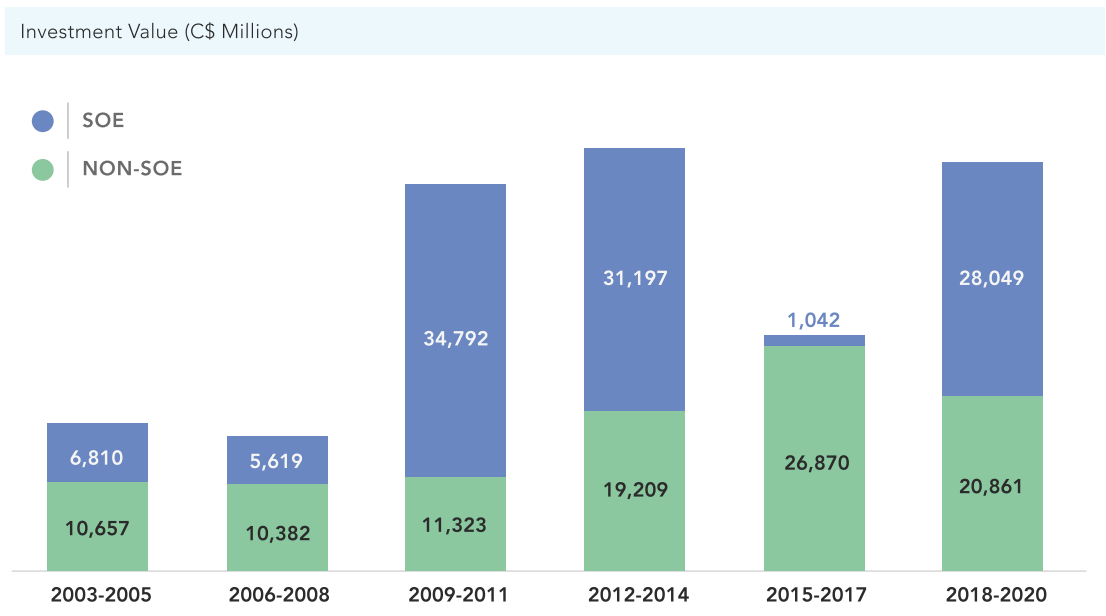
As Figure 12 displays, greenfield investment accounted for over C$32B between 2018 and 2020. This is the first period since 2006 to 2008 that the investment value in greenfield transactions has been greater than investment in mergers and acquisitions. However, the surge in greenfield investments is due primarily to a large influx in 2018, totalling over C$28B in value. The 2018 surge, the largest annual greenfield inbound flow between 2003 and 2020, is primarily the result of the LNG Canada joint venture by several Asia Pacific companies, which contributed over C$24.5B to the Canadian inbound FDI in 2018.

Since 2003, M&A investments have accounted for over C$116.3B investment flow in Canada, compared to the C$90.5B invested through greenfield transactions. However, over the last 18 years, greenfield investments have accounted for 833 of the 1441 total inbound investment deals, whereas M&A transactions have accounted for 608. Therefore, although M&A investments yield larger investment values, greenfield investments are more numerous.

STATE-OWNED ENTERPRISES IN CANADA: RETURN OF THE SOES

FIGURE 15

Value of Asia Pacific Economies' SOE Investment into Canada, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

After a three-year slump in investment from Asia Pacific state-owned enterprises (SOEs) between 2015 and 2017 with only C$1B in inbound investment, SOEs are once more the largest contributors of inward FDI. In the most recent three-year period, SOE investment values increased by C$27B compared to the 2015 to 2017 period. In contrast, non-SOE investment has shrunk slightly in the past three years in terms of value. Non-SOE inbound investment peaked between 2015 and 2017, with C$26.8B in investment value. From 2018 to 2020, non-SOE investment value dipped to C$20.9B. However, despite the dip in investment value, the number of non-SOE deals increased from 223 in the 2015-2017 period to 436 in the 2018 to 2020 period. This suggests that from 2018 to 2020, there were more non-SOE investments with lower investment values compared to the 2015-2017 period.

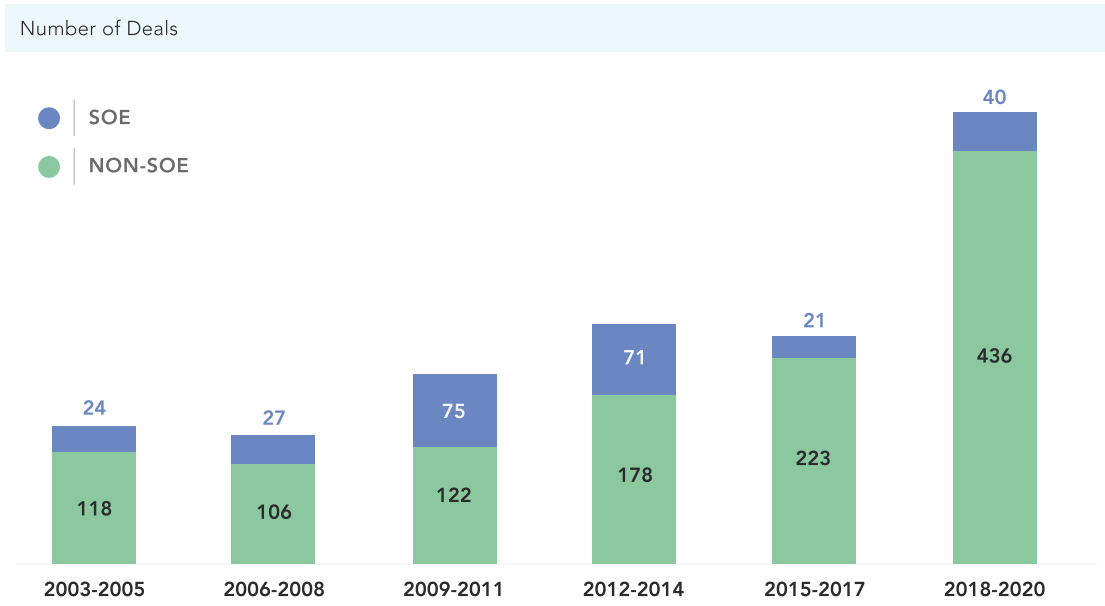
SOEs from China, Malaysia and South Korea were responsible for investing the most capital in the Canadian economy between 2018 and 2020. The investment from SOEs in these economies totalled C$26B over the three-year period. In the same period, non-SOEs from Japan, Australia and South Korea invested the most in Canada, with C$16.4B.

The LNG Canada project and Parks Bottom Co Real Estate were the two largest sources of SOE investment between 2018 and 2020. LNG Canada is a joint

venture project that has received investment from three Asia Pacific SOEs; PETRONAS, China National Petroleum Corp., and the Korea Gas Corporation. Together, these SOEs invested over C$18.5B in the LNG Canada project to build a LNG export facility in Kitimat, British Columbia. Parks Bottom Co Real Estate, a subsidiary of Singapore-based SOE GIC Private Ltd., another significant SOE investor in this period, paid C$2B to acquire several luxury hotels in Alberta and British Columbia.

FIGURE 16

Number of Asia Pacific Economies' SOE Investment Deals into Canada, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

As displayed in Figure 16, the number of inbound investments from Asia Pacific SOEs has fluctuated since 2003. The largest increase in the number of SOE investment deals in this period occurred immediately after the 2008 financial recession. There were 75 inbound investments from Asia Pacific SOEs between 2009 and 2011. During 2012-2014, both the SOE investment deal count and value shrank from the preceding three-year period to 71 deals worth C$31.2B. This was followed by a steeper drop in the 2015-2017 period with 21 deals at C$1B. Compared to the 2012-2014 period, the number of deals in the 2015-2017 period decreased by 70 per cent.

Box. 6 Oil and Gas Sector Continues to Dominate Asia Pacific SOE Investments into Canada

In December 2020, the Canadian government blocked the acquisition of a gold mine in Nunavut by a Chinese SOE, Shandong Gold Mining. The company had made an offer of C$230M for the purchase of TMAC Resources, but the proposal was denied due to national security concerns.[97] The decision came as the Canadian government announced in April 2020 that it would screen all inbound SOE investments, regardless of their value. These developments point to the government's growing concern over foreign SOEs investment in Canada, especially in the context of the current economic environment. Therefore, a sector-based review of Asia Pacific SOE investment in Canada is particularly timely.

In terms of the number of deals, SOEs make up 18 per cent of all Asia Pacific investment activities in Canada since 2003. However, these transactions have generated over 51 per cent of the total inward investment value, with C$107.5B invested in Canada in the past 18 years. This asymmetry between number of deals and investment value highlights the fact that SOEs are much more likely than non-SOEs to make high-value investments.

The natural resources sectors attract the vast majority of inward Asian SOE investment. The oil and gas producer sector, in particular, has accounted for 72 per cent of the total inbound SOE investment value in the last 18 years. The largest transaction came from the China National Offshore Oil Corporation (CNOOC), a state-owned entity. In 2013, the company acquired Nexen Inc., a Calgary-based oil and gas company, for over C$17B. This is the single largest investment in the Canadian oil and gas sector between 2003 and 2020. According to CNOOC's press release, the investment value represented a premium of 66 per cent on Nexen's common share.[98]

CNOOC's willingness to invest large amounts of capital in the foreign oil and gas sector reflects, in part, China's growing demand for oil and natural gas production. In 2013, Chinese oil consumption reached 10.7 million barrels per day, but China was only able to produce 4.5 million barrels per day from its oil fields.[99] By September 2013, China surpassed the U.S. and became the largest importer of crude oil.[100] As the Chinese economy grew at unprecedented rates, its oil demand increased. SOEs from other countries, such as Malaysia, South Korea, and Japan, have also invested heavily in Canada's oil and gas sector since 2003. Petronas, a Malaysian SOE, has invested over C$12.5B in crude oil and liquified

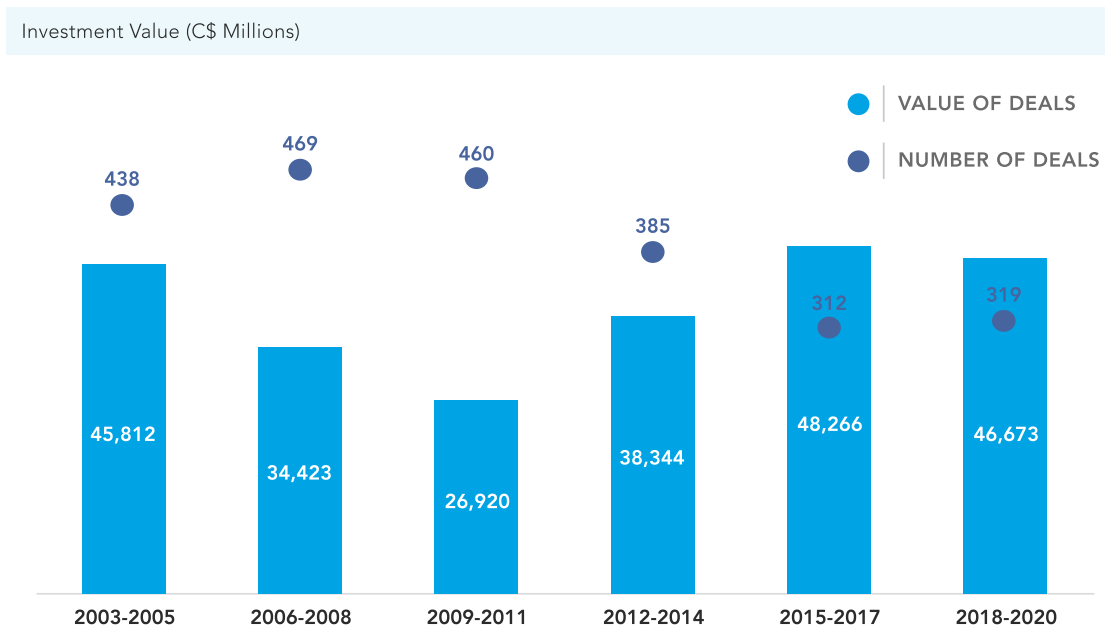
natural gas projects in Alberta and British Columbia. The Korea National Oil Corporation, a South Korean SOE, made one of the single largest investments in Canada's oil and gas sector in 2009 when it invested C$4.8B to purchase Canada's energy company Harvest Energy Trust.

However, Chinese SOEs are far from alone, as the Canadian oil and gas sector also saw SOE investments from other economies. In 2012, Japan Petroleum Exploration Co. Ltd. invested over C$1.1B in the Hangingstone project in the northern Alberta oil sands to increase the plant's capacity to 30,000 barrels of crude oil a day. At the time of the investment the project was yielding only 6,000-7,000 barrels a day.[101] The Japanese SOE chose to increase its investment to attempt to meet U.S. demands for fuel.[102]

While oil and gas continues to dominate Asia Pacific SOEs' investment into Canada, other sectors also saw substantial investments in the most recent three-year period. This includes, among other sectors, C$6.4B in mining and C$2B in travel & leisure. Interestingly, the Canadian alternative energy sector also saw some recent SOE investments. For instance, in 2018, Chinese SOEs invested over C$381M through two deals; one with British Columbia's Ballard Corp. for the production of fuel cells, and the other a greenfield investment by China Longyuan Power Group for the construction of a new wind farm.

FIGURE 17

Canadian Investment into the Asia Pacific, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

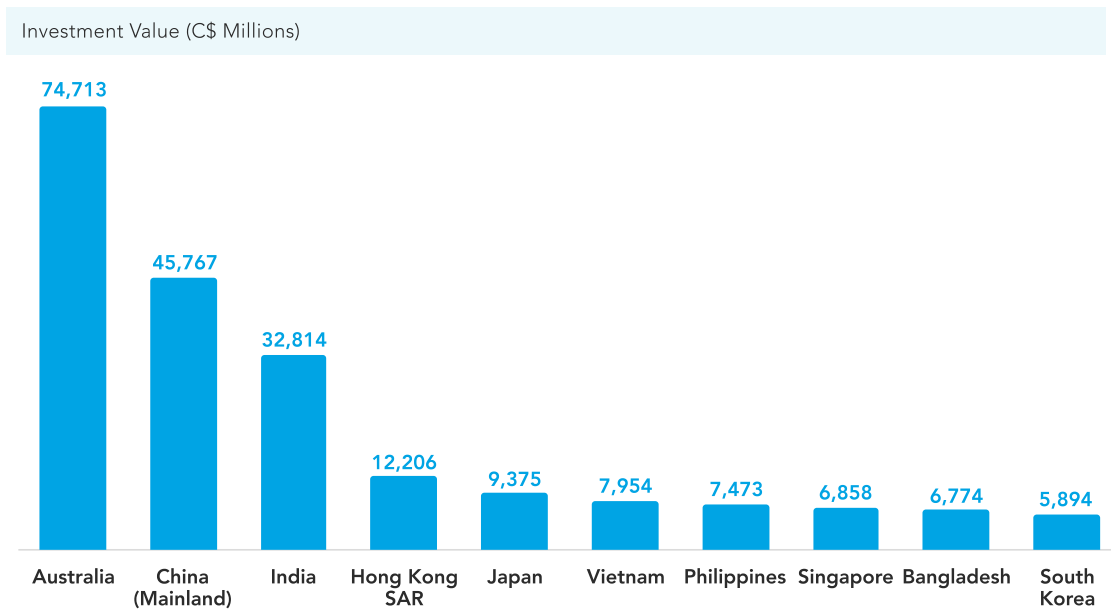
Despite the ongoing challenges in the global economy, Canadian investment activities in the Asia Pacific region were highly active in the past year. In 2020, Canadian companies invested C$16.8B worth of capital in the region via 89 deals. Canada's outbound flow in 2020 represented a C$5.3B year-on-year increase in value from 2019, but a slight dip in the deal count – one less than the previous year.

Looking back over the course of the past 18 years, Canadians have invested over C$240B in the Asia Pacific region through a total of 2,385 transactions. The total values of Asia Pacific-bound Canadian investments from 2015 onwards are greater than the investment values of the preceding time periods. Despite the overall growth, outbound investment to the region has seen a slight drop in the most recent three-year period. From 2018 to 2020, Canada invested C$46.7B in the region, C$1.6B less than the investment flows seen in 2015-2017.

Canada's overall growing investment flows to the region since 2012 are contrasted with a decline in deal count. Between 2003 and 2014, while the region saw some of the highest number of Canadian investment activities, their corresponding investment values were comparatively smaller than the two most recent three-year periods. For example, between 2006 and 2008 investment deals reached a record high of 469 but the total value of these transactions was only C$34B, which was the second-lowest total investment value of any period in the past 18 years. This is compared to 312 deals but with C$48.3B worth of flow in the 2015-2017 period.

FIGURE 18

Canadian Investment into the Asia Pacific by Major Destination, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Australia, China, and India have been the most popular destinations for Canadian FDI between 2003 and 2020. Outbound investment to Australia far outpaces investment in other Asia Pacific economies. Australia has seen over C$74.7B in investment flow over the years. This is almost 40 per cent greater than outbound investment to China, the second-largest recipient of Canadian outbound FDI flows in the region, accounting for C$45.7B. Together, Australia, China, and India account for 73 per cent of total Canadian investment in the Asia Pacific region.

Of Canada's outbound partners, India has seen the largest increase in Canadian outbound FDI flow in recent years. From 2018 to 2020, Canada channelled C$10.2B worth of capital to the South Asian economic giant, a C$4B jump from the C$6B of outbound flow seen in the 2015-2017 period. Growing Canadian investment interest in India was also reflected in the past year, as the economy emerged as the largest recipient of Canadian FDI in 2020 with C$5.6B invested.

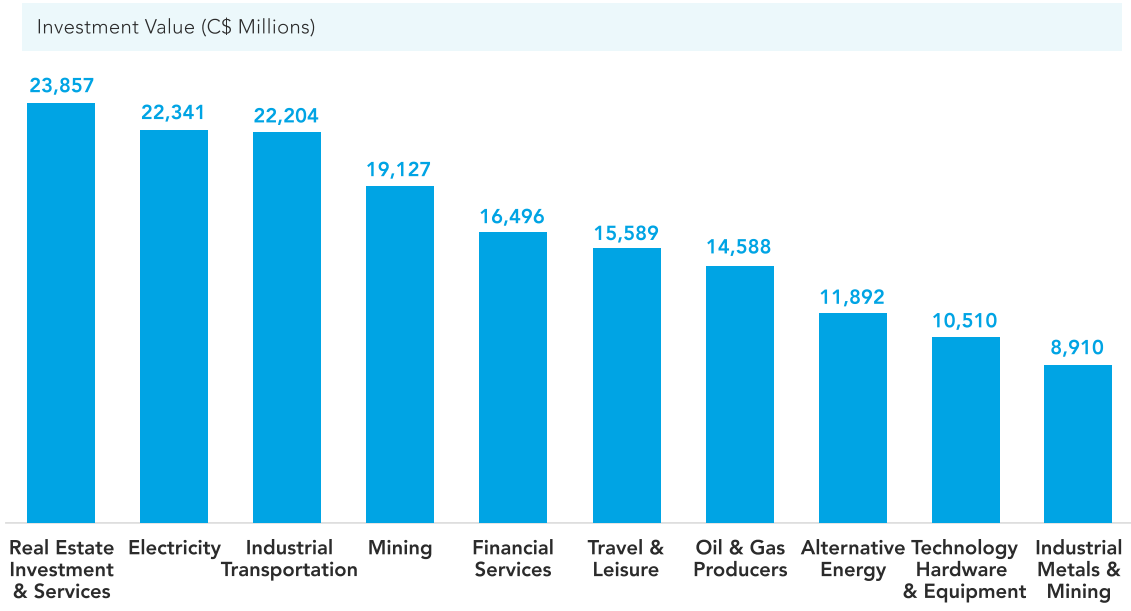
Interestingly, while Canadian outbound FDI to Japan has decreased in the latest three-year period, its dollar value ranking among FDI recipients in the region has risen. Japan became the fourth-highest recipient of investment in the latest three-year period, up from sixth place in 2015-2017. Canada invested C$2.5B in Japan from 2018 to 2020, a C$900M dip from C$3.4B in the preceding three-year period. However, Canadian outbound FDI flows to Hong Kong and Bangladesh saw more significant declines in this period – C$2.9B and C$6.6B, respectively. With this, Japan's relatively smaller decline pushed up its dollar value ranking.

Despite the decline in outbound flows, Japan saw some notable Canadian investments in the past year. For instance, BentallGreenOak, an alternative asset management subsidiary of Sun Life Financial, made a C$844M acquisition of the Avex building in Tokyo from Avex Group. Commenting on the real estate market, the head of BentallGreenOak's Japanese division said that "near term there will be some softening in Tokyo due to COVID-19, presenting some very good opportunities over a five-year hold period."[103] The acquisition also coincided with the company's October announcement that it was launching a C$15.9B investment plan over the next few years in the Japanese real estate market.[104]

CANADIAN INVESTMENT IN ASIA PACIFIC BY SECTORS: BROAD-BASED ECONOMIC ENGAGEMENT

FIGURE 19

Canadian Investment into the Asia Pacific by Sector, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

As Figure 19 illustrates, Canadian investment in the region continues to be concentrated in the real estate investment and services, electricity, and industrial transportation sectors. Each of these sectors has garnered over C$22B in investment value since 2003. The real estate investment and services sector accounts for nearly 10 per cent of all outbound Canadian investment flow in the Asia Pacific with C$23.9B invested. The real estate sector is followed by the electricity sector with C$22.3B outbound flow, and industrial transportation sector with C$22.2B.

In the most recent three-year period, the real estate sector remains the top sectoral destination for Canadian investors, with C$9.9B in investment value. However, the electricity sector outpaced the industrial transportation sector as the second-most invested in sector in dollar terms. This is because Canadian outbound FDI flow in the industrial transportation sector has been more than halved, from C$12.3B in 2015 to 2017 to C$5.6B in the most recent three-year period. This is compared to a smaller C$553M decline seen in the electricity sector in the same time period, from C$7.1B to C$6.6B.

For 2020 specifically, electricity emerged as the top sectoral destination for Canadian outbound FDI to the Asia Pacific region. The sector saw C$4.4B of Canadian investment in the past year, overtaking real estate investment and

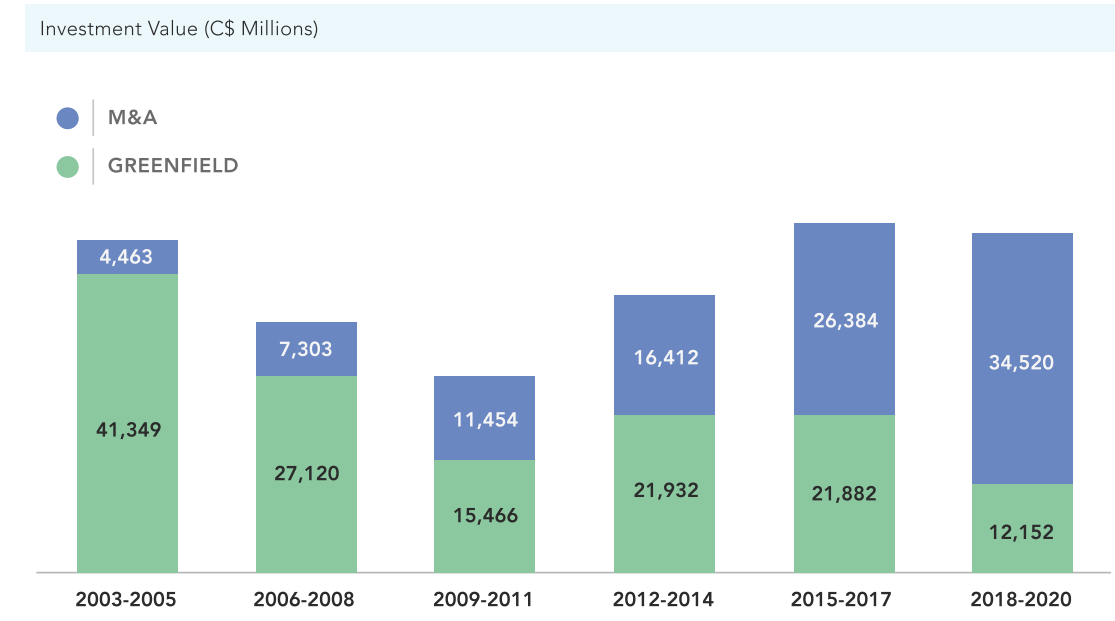
services, which saw C$3.6B in investment. The surge in Canadian investment in the electricity sector was in part attributable to Caisse de Depot et Placement du Québec's (CDPQ) C$1.7B acquisition of an over 50 per cent stake of the Greater Changhua offshore wind farm in Taiwan.

Another active investor in the region's electricity sector is the Ontario-based Canadian Solar Inc. The company has invested over C$518M in Japanese and Malaysian solar electricity markets through six transactions in 2020. The majority of the value invested is the result of Canadian Solar's commitment to build two solar power plants in the Ibaraki and Gunma regions of Japan, each project culminating in an investment of C$214M.

OUTBOUND CANADIAN INVESTMENTS BY METHOD OF ENTRY: MERGER & ACQUISITION OUTPACES GREENFIELD

FIGURE 20

Canada's Greenfield and M&A Investment into the Asia Pacific, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

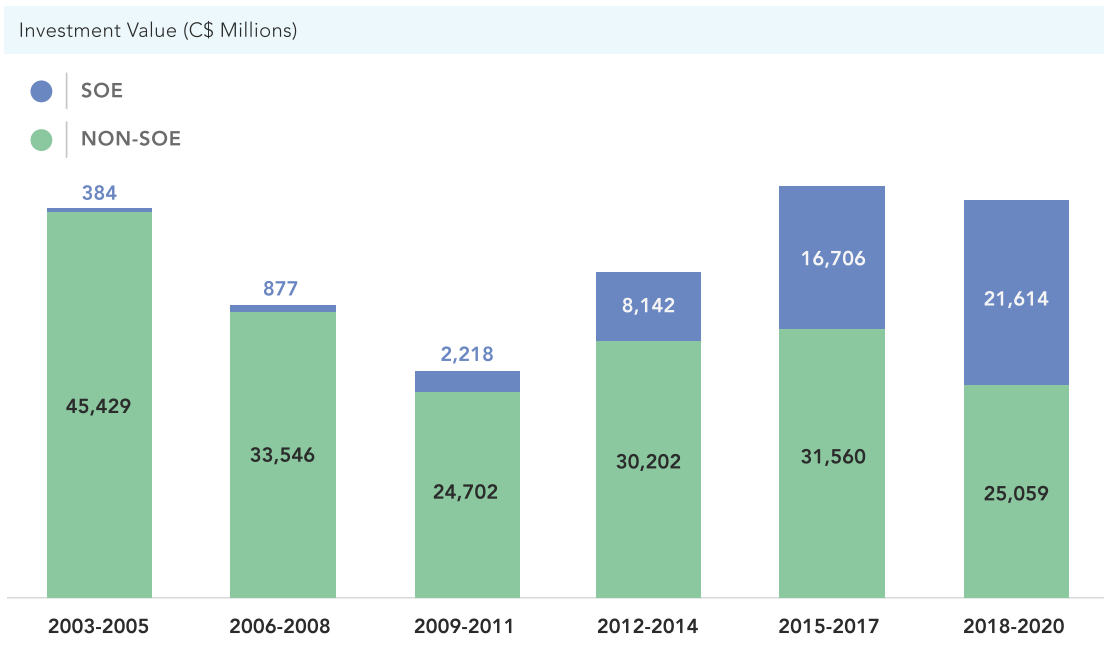
From 2003 to 2020, greenfield has largely been the preferred method of entry of Canadian firms investing in the Asia Pacific region, accounting for 58 per cent of outbound flow in this period. However, over the years, the percentage of greenfield to overall investment flow has been slowly decreasing. In the second half of the last decade, M&A investments have captured larger shares of investment flow. The 2015 to 2017 period marked the first in which M&A investments surpassed greenfield by a margin of nine percentage points. In the 2018-2020 period, M&A came to dominate greenfield investment by an unprecedented margin of 48 percentage points.

Despite the growing value proportion of M&A, greenfield investment accounts for the majority of the outbound investment activities. From 2003 to 2020, Canada has engaged in 1,659 greenfield and 724 M&A investments in the region. Even as M&A investments outpaced greenfield in dollar value between 2015 and 2017, Canadian greenfield investments accounted for 69 per cent of the deal count. In the most recent three-year period, while the proportion of greenfield investment activities has dropped, it continued to make up the majority (55 per cent) of Canadian outbound investment deals in the region.

CANADA'S SOE INVESTMENT SURGES IN THE ASIA PACIFIC

FIGURE 21

Value of Canadian SOE Investment into the Asia Pacific, 2003-2020

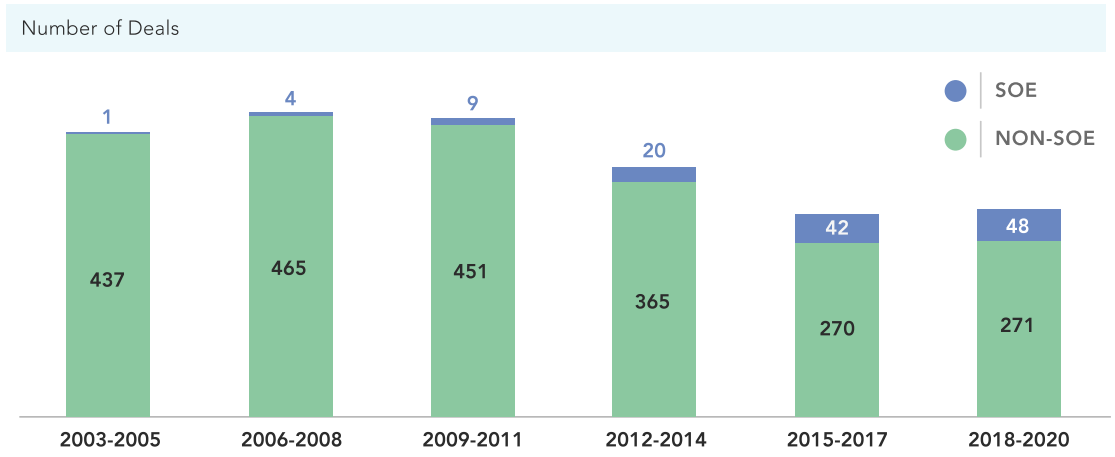


Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

APF Canada's National Opinion Poll in 2019 showed concern among Canadians towards Asia Pacific investments in Canadian high-tech sectors.[105] Despite this, Canadian SOEs' investments in the region have been on the rise in terms of both investment value and deal count. In the 2003 to 2005 period, Canadian SOEs comprised less than one per cent of outbound investment dollars, at C$384M. That share has increased steadily since then, and almost converged with non-SOE investment in the most recent time period. Between 2018 and 2020, SOE investments captured 46 per cent (C$21B) of the overall C$46.7B in outward investment flow.

FIGURE 22

Number of Canadian SOE Investment Deals into the Asia Pacific, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Canadian SOEs' share of the number of deals in the Asia Pacific region has also risen since 2003, from less than one per cent between 2003 and 2005 to 17 per cent between 2018 and 2020. Despite Canadian SOEs comprising only 17 per cent of investment deals from 2018 to 2020, these deals accounted for 50 per cent of investment value during the same period, suggesting that when SOEs do invest, they invest heavily.

The Canada Pension Plan Investment Board (CPPIB) remains one of the most active Canadian SOEs in the Asia Pacific region. Out of the 53 outbound SOE deals recorded between 2018 and 2020, CPPIB accounted for 19, at an investment value of C$9.3B. A notable deal of the past year was the C$130M acquisition of a stake of Hutchison China MediTech, a Hong Kong-based biotechnology company and a subsidiary of CK Hutchison Holdings. Chi-Med focuses on the discovery and development of therapies for the treatment of cancer and immunological disease.[106]

The second-most active Canadian SOE investor is the Ontario Municipal Employees Retirement System (OMERS) in the most recent three-year period. From 2018 to 2020, OMERS made seven deals with an investment value of C$5.3B. This included the largest outbound SOE deal of 2020, the C$1.7B acquisition of a 20 per cent stake of TransGrid, an electricity company based in Sydney, Australia.

Box. 7 Maple Revolutionaries – Canada's Pension Funds

Heralded by *The Economist* as the "Maple Revolutionaries" in 2012, Canada's pension plans have become a globally recognized force. They are recognized for their unique and cost-saving direct investment approach, managing their investments internally rather than outsourcing to external managers. They are some of the world's heaviest investors in real estate and infrastructure, believing these yield higher returns over the long term than publicly traded stocks and bonds.[107] And with predictable retirement contributions and benefits payouts, pension plans also have the advantages of liquidity certainty and a longer investment horizon than private equity firms, particularly in the context of the current economic downturn.[108] With over 1.5 trillion in assets under management and sizeable investments into the digital, clean and R&D sectors, Canadian pension funds have become a cornerstone of Canada's global investment brand and a powerhouse for our recovery.[109]

In 2020, Canadian SOE investment flow into the Asia Pacific increased by 60 per cent to C$6.5B against 2019. The growth was driven primarily by pension funds. Sectoral concentration in the 2018-2020 period followed a pattern that was similar to previous years. Real estate garnered C$6.1B in investment, followed by electricity at C$4.6B, and industrial transportation at C$4B.

OMERS' significant C$1.7B acquisition of the Australia-based electricity company Transgrid is a recent example of an infrastructure investment, a signature of the Canadian pension investment model. This mirrors recent comments by former CPPIB chief Mark Machin, who foresees a "wall of money" headed to infrastructure and real estate investments, especially in markets like India, Australia and Indonesia, where toll traffic and consumer spending have rebounded.[110] OMERS CEO Michael Latimer likewise signalled in June that infrastructure investments tend to be the most resilient during recessionary periods as the government tends to create favourable conditions for investment.[111]

These statements follow the release of a November joint statement by the CEOs of Canada's top eight pension funds calling on companies and investors to put "sustainability and inclusive growth at the centre of economic recovery" through their planning, operations and reporting.[112] They further state their commitment to integrate Environmental, Social and Governance (ESG) factors into their own investment decisions and strategies.[113]

The statement is of particular significance in 2020, as global and Canadian ESG momentum is escalating.[114] ESG refers to a set of criteria used to assess a company's performance on environmental, social and governance factors.[115] This form of sustainable finance has grown rapidly in recent years, and has received increasing recognition as having not only ethical, but financially material implications for investors. Given the recent statements from the top eight pension funds, the implementation of ESG risk screening by Canadian pension funds will be something to keep an eye on over the coming years.

A recent example of a sustainable investment, and the second-largest Canadian SOE deal of 2020, is Caisse de dépôt et placement du Québec's (CDPQ) C$1.7B acquisition of a 50 per cent stake of the Greater Changhua 1 Offshore Wind Farm in Taiwan from Orsted, the Danish developer. Emmanuel Jaclot, executive vice-president and head of infrastructure of CDPQ, said the investment would allow the pension to diversify its presence in Asia and contribute to the transition toward a low-carbon economy.116 The wind farm project is expected to generate power for 650,000 Taiwanese households.

As sustainable finance continues to grow in prominence, pension funds are well-positioned to play a leading role by their very nature as long-term investors. 117 Further, the unique investment approach of Canada's "Maple Revolutionaries" into recession-resilient assets like infrastructure will be of importance to Canada's economic recovery. Canada's pension plans will thus continue to be of global importance going into 2021.

THE PROVINCIAL & CITY PICTURE

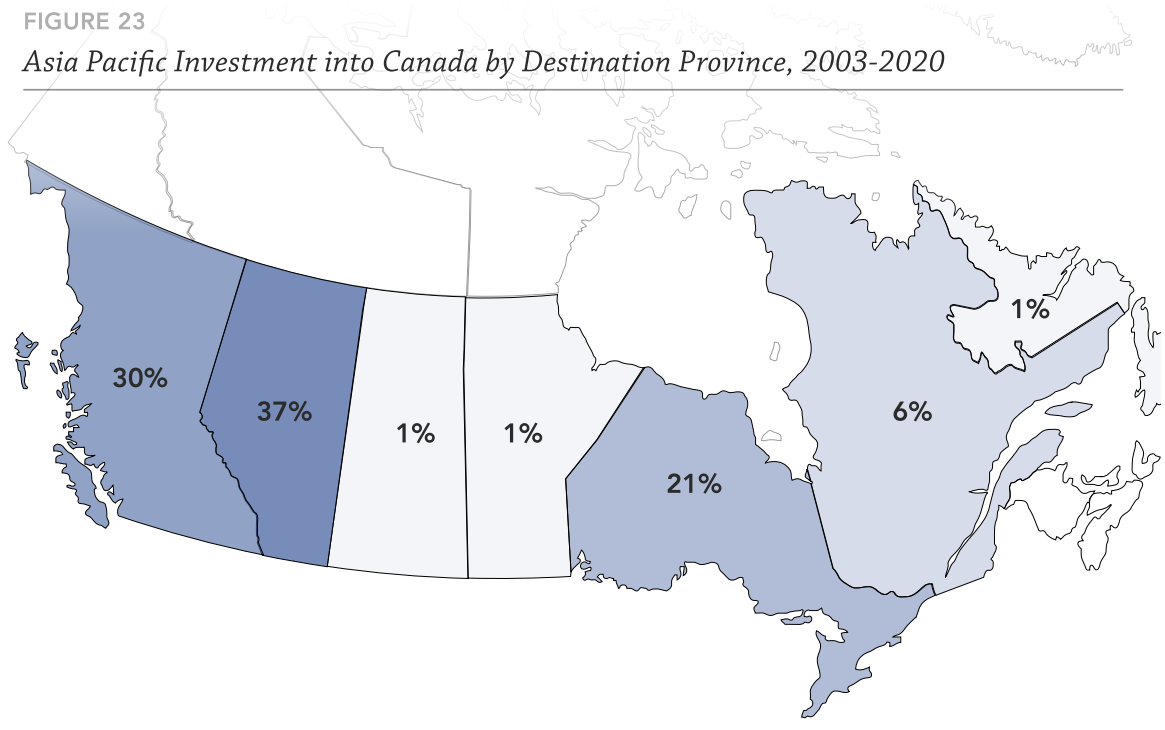
KEY SECTION TAKEAWAYS:

- In 2020, Ontario was the province that saw the highest amount out of inbound investment from the Asia Pacific with C$2.6B, of which Toronto accounted for C$1.9B.
- From 2003 to 2020, British Columbia saw the greatest amount of rural investment at C$29.6B, compared to Alberta which came in second at C$4.7B and Ontario which came in third at C$2.9B.
- Calgary remained the top investment destination city for Asia Pacific firms. The city has seen C$60.8B of inbound flow since 2003. However, Calgary's inbound flow has decreased in the latest three-year period, while Edmonton emerged as the top destination city for Alberta, with C$813M invested in the latest time period.
- Since 2003, British Columbia has received C$61.8B worth of inbound flow. While Kitimat accounted for most of the investment flow with C$27B, due to the Asia Pacific C$24.8B joint venture in the LNG Canada project, Vancouver had most of the deal count – 260 out of 394.
- Asia Pacific investments in Quebec remain concentrated in Montreal. The city has made up 54 per cent of the province's inbound flow.
- Mumbai emerges as the top city for Canadian investment in 2020 with C$2.9B invested, followed by Bengaluru at C$2.6B and Sydney at C$1.9B.

PROVINCES AND CITIES: ASIA PACIFIC INVESTMENT FOOTPRINTS ACROSS CANADA

FIGURE 23

Asia Pacific Investment into Canada by Destination Province, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Note: The remaining 3 per cent of investment not represented in the graph is distributed across Nunavut, Yukon, Prince Edward Island, New Brunswick, Nova Scotia, and the Northwest Territories.

Four provinces, Alberta, British Columbia, Ontario, and Quebec, account for 94 per cent of Asia Pacific investment flow into Canada from 2003 to 2020. The two western provinces, Alberta and British Columbia, alone account for 67 per cent of the total inbound flow. Overall, Alberta saw the most investment from the Asia Pacific region from 2003 to 2020, at C$75.7B. British Columbia follows closely at C$61.8B, and Ontario at C$44B. In terms of total number of deals, Ontario has seen the highest number of inbound deals from the Asia Pacific with 542, followed by British Columbia with 394 deals and Alberta with 181.

From 2018 to 2020, British Columbia saw the highest amount of inbound investment from the Asia Pacific, at C$30.7B. However, C$24.7B of that investment is due to the substantial LNG Canada project in Kitimat. Excluding the LNG project, British Columbia saw C$6B worth of inbound investment from 2018 to 2020.

Ontario saw C$10B in investment from the Asia Pacific from 2018 to 2020 – while Ontario technically ranks second in inbound investment during this time period, without the LNG Project in Kitimat inbound investment in Ontario

surpasses inbound investment in B.C. by C$4B. Alberta ranks third in terms of inbound investment from 2018 to 2020, at C$2.9B.

Out of the top four provinces for inbound investment, only British Columbia has not seen a decrease in total inbound investment flow over the last six years. With C$30.7B inbound flow in the latest three-year period, the province saw a C$24.5B jump from 2015 to 2017. Alberta's inbound investment decreased most significantly, from C$4.2B in 2015-2017 to C$2.9B in the most recent three-year period. Inbound flow to Quebec decreased slightly from C$2.6B to C$2.5B, while Ontario also saw a marginal decline, from C$1.03B to C$1.01B.

FIGURE 24

Top Canadian Destination Cities for Asia Pacific Investment, 2003-2020

Rank	City	Investment Value (C$ Millions)	Number of deals
1	Calgary, Alberta	60,795	116
2	Kitimat, British Columbia	27,056	8
3	Vancouver, British Columbia	25,590	260
4	Toronto, Ontario	17,273	242
5	Fort McMurray, Alberta	7,742	4
6	Montreal, Quebec	6,215	81
7	Woodstock, Ontario	5,262	13
8	Dawson Creek, British Columbia	3,427	2
9	Cambridge, Ontario	3,085	9
10	Duvernay, Alberta	2,463	1
11	St. John's, Newfoundland and Labrador	2,310	3
12	Alliston, Ontario	2,295	5
13	Aurora, Ontario	1,891	4
14	Edmonton, Alberta	1,871	28
15	Mississauga, Ontario	1,592	42

Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Since 2003, 223 cities and city-level regions in Canada have received investments from the Asia Pacific region. Regions receiving investment ranged from populous cities such as Toronto and Vancouver, to small rural communities such as Kitimat and Duvernay. In this same time period, 198 cities and city-level regions in the Asia Pacific region have made economic footprints in Canada, with investors ranging from Shanghai to Oguchi. This city-to-city network of investment relationships demonstrates the depth and breadth of the Asia Pacific region's investment relationship with Canada.

Calgary continues to rank as the top city in Canada for Asia Pacific investment in terms of investment value, at C$60.8B. This is not surprising considering the

amount of capital-heavy oil and gas investments that occur in Calgary – out of the C$60B in inbound investment into Calgary, the oil and gas sector accounts for C$51.8B. Calgary is followed by Kitimat, largely due to the ongoing C$40B LNG Canada Project, of which Asia Pacific companies invested C$24.8B. Vancouver and Toronto are right behind in terms of inbound investment value, at C$25.6B and C$17.3B, respectively.

During the 2018-2020 period, Kitimat ranked first for investment from the Asia Pacific, with C$24.7B. Toronto ranked second with C$5.9B. The mining sector was most prominent for inbound investment in Toronto, accounting for C$3.5B of the C$5.9B invested. The largest mining investments in Toronto during the time period came from China in 2019, with Zijin Mining Group acquiring Canada's Continental Gold for C$1.3B, and Jiangxi Copper Corporation buying equity interest in PIM Cupric Holdings amounting to C$1.4B.

Mining sector investments also dominated inbound investment in Vancouver during the 2018 to 2020 period. Vancouver ranked third in terms of investment from the Asia Pacific region from 2018 to 2020, with C$4.7B. The mining sector accounted for the majority of that investment, attracting C$4.4B of the C$4.7B. China's Zijin Mining Group was responsible for one of the largest mining investments in Vancouver, similar to Toronto. In 2018, Zijin Mining acquired Vancouver-based Nevsun Resources for C$1.9B. Australia was also a large investor in Vancouver's mining sector during this time period, with a C$1.1B investment in British Columbia's Red Chris mine.

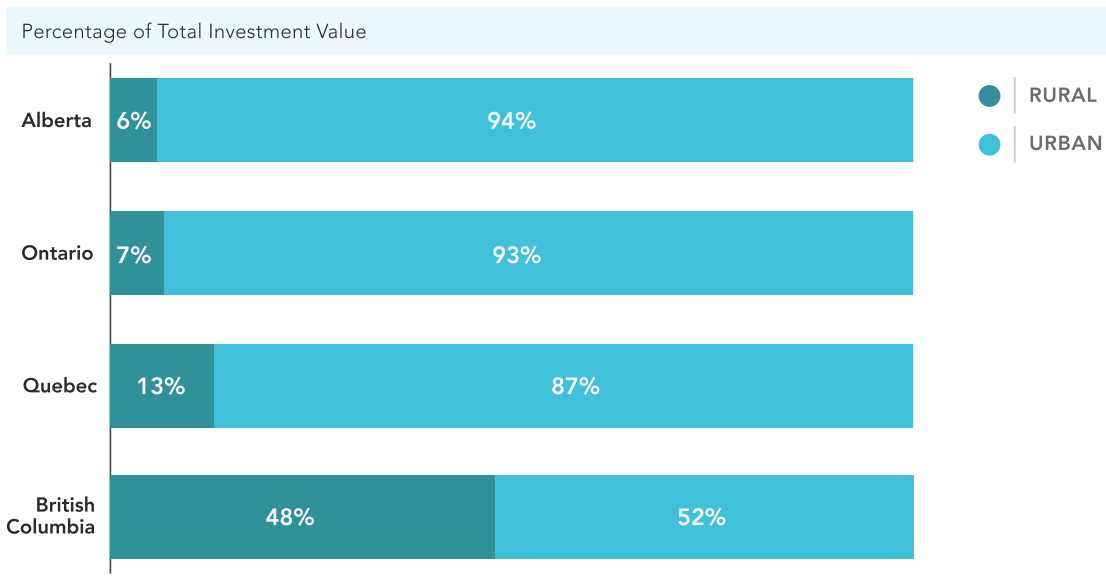
It should be noted that Calgary's inbound investment fell significantly behind between 2018 and 2020, with only C$179M worth of inbound investment. While in the past Calgary has seen large, capital-heavy oil and gas investments, the 2018-2020 period only saw C$132.6M in inbound oil and gas investments.

Excluding Kitimat, which saw unusually high-value investments, Calgary, Vancouver and Toronto are generally the top three cities for inbound investment from the Asia Pacific region, with all three having held the number one position in recent time periods. Overall, while Vancouver and Toronto's inbound investments are generally following an upward trend, Calgary's are seeing a steep decline.

THE RURAL-URBAN DIVIDE: THE GROWING IMPORTANCE OF RURAL INVESTMENTS

FIGURE 25

Asia Pacific Investment into Select Canadian Provinces by Rural and Urban Locales, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

The majority of inbound investment from the Asia Pacific region is directed towards Canada's largest cities and towns. The APF Investment Monitor finds that 79 per cent of all inbound investment flow from 2003 to 2020 goes towards urban areas.[118] Among the urban locales, the largest number of deals have occurred in Vancouver (260), Toronto (242) and Calgary (116).

However, rural communities still account for a significant proportion of investment – since 2003, the Asia Pacific region has invested C$42B in 75 rural communities in Canada. A large proportion of that rural investment is due to the ongoing C$24.8B worth of investment in the LNG Canada project in Kitimat. This is the reason why British Columbia has seen more rural investment – 48 per cent of its total inbound investment – than any other province.

Other provinces have seen significant rural investments as well. For example, 13 per cent of Quebec's inbound investment has flowed into rural communities. A notable deal occurred in 2013, with a C$616M investment from South Korea into Quebec's Fermont, a community with a population of 2,474. The investment was made by South Korea's Pohang Iron and Steel Company Limited (POSCO), which acquired ArcelorMittal's Fermont iron ore mining and infrastructure assets.

Ontario has seen significant rural investments as well. Ontario's rural investments in the past 18 years account for a lower percentage of overall inbound flow compared to Quebec's. Ontario saw seven per cent of its inbound investment flow into rural locales, compared to Quebec's 13 per cent. However, in dollar terms, investment in Ontario's rural communities has been higher than Quebec's – Ontario has seen C$2.9B invested in its rural communities compared to Quebec's C$1.4B. A recent notable rural investment in Ontario is Australia's investment in Red Lake, a small community of only 4,107 people. Australia's Evolution Mining Gold Operations acquired Red Lake Gold Mine for C$494M in 2020.

Finally, Alberta has the smallest overall percentage of rural investment, yet the second-highest investment value, at C$4.7B for the last 18 years. In 2020, Singapore's GIC (Realty) Private Limited acquired Fairmont Banff Springs, Fairmont Chateau Lake Louise and Fairmont Jasper Park Lodge for C$1.5B.

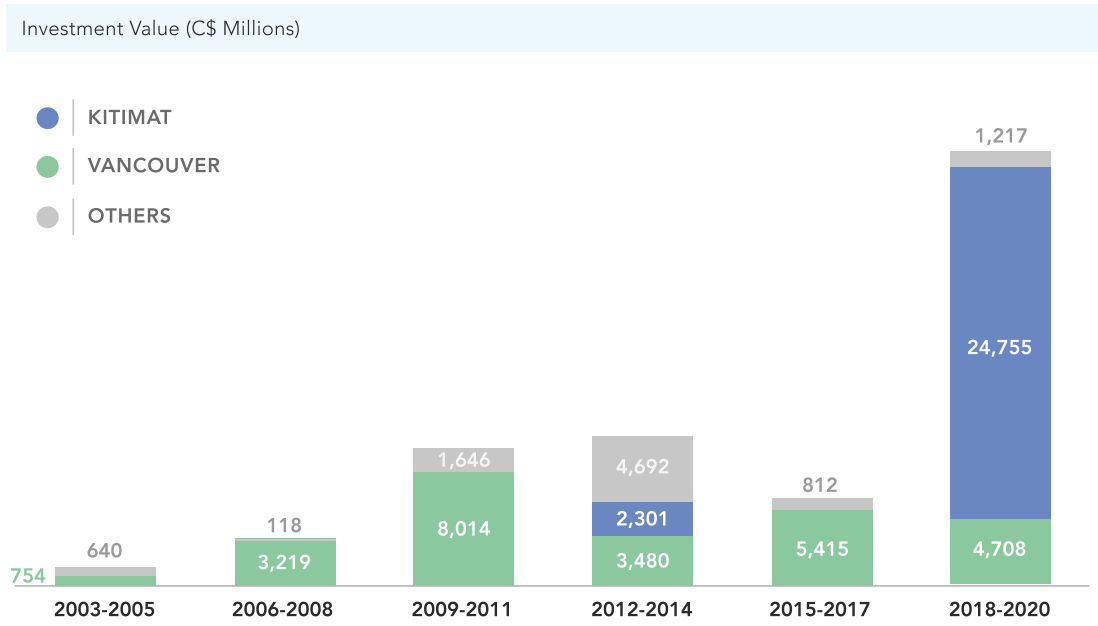
In the most recent three-year period, C$27.3B of investment from the Asia Pacific was directed towards rural communities in Canada. The majority of that – C$24.8B – was due to the LNG Canada Project in Kitimat. Comparatively, from 2015 to 2017, C$2.2B was invested in rural communities. Even without the LNG Canada Project, Canada would still have seen an uptick in rural investments from 2015-2017 to 2018-2020.

BRITISH COLUMBIA: VANCOUVER DRIVES INVESTMENT ACTIVITIES

Since 2003, the Asia Pacific region has invested in 41 municipal locales in British Columbia via 394 deals, worth C$61.8B. The amount of investment flowing into British Columbia has varied over the years. However, B.C.-bound investment from the region reached an all-time high of C$30.7B in the 2018-2020 period.

FIGURE 26

Asia Pacific Investment into British Columbia, 2003-2020

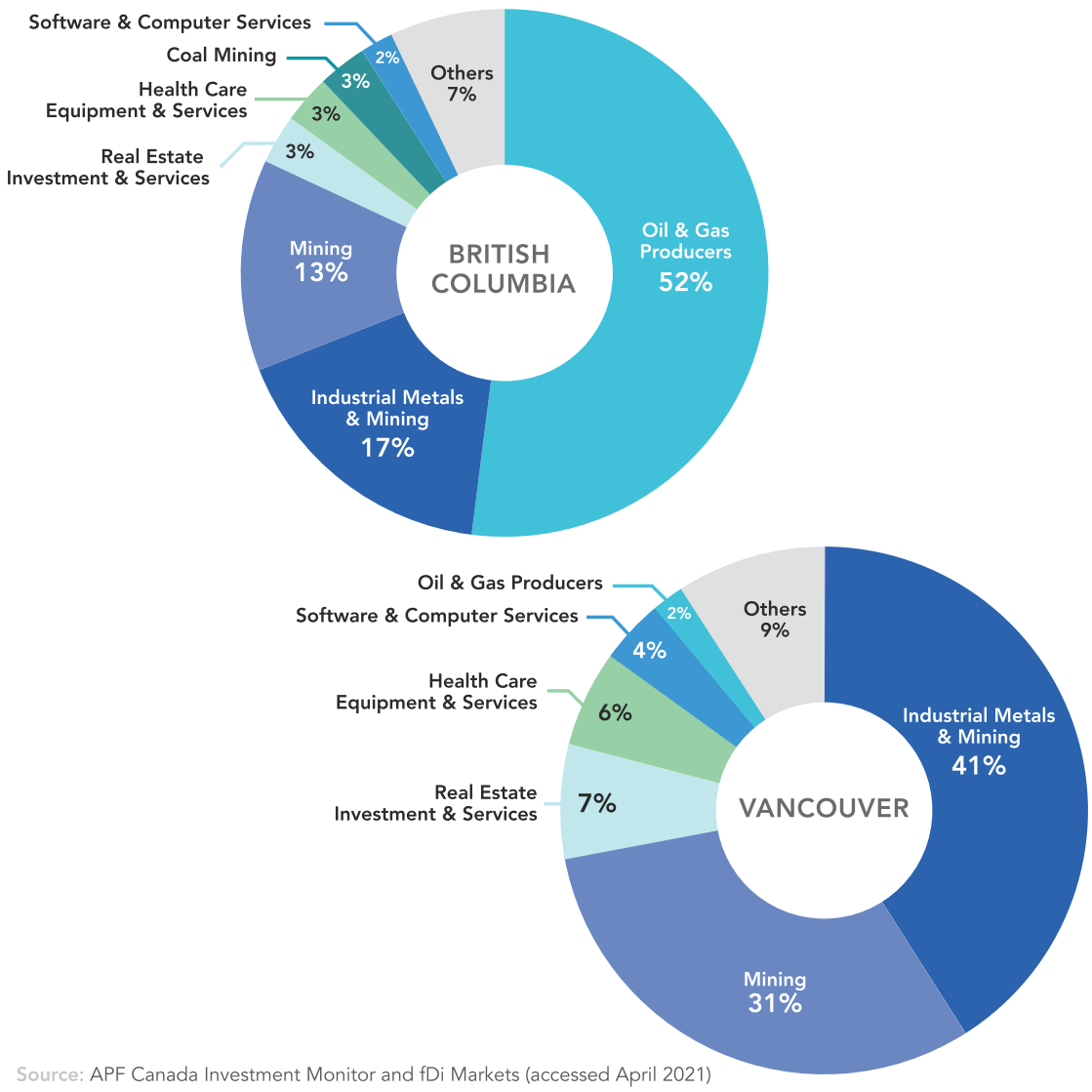


Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Excluding Kitimat, which saw a large inflow from the LNG Canada project, Vancouver has been the top destination in British Columbia for investment from the Asia Pacific region, having seen 260 deals worth C$25.6B from 2003 to 2020. The amount of investment flowing into Vancouver has fluctuated over the years. Reaching its peak in the 2009-2011 period at C$8B, inbound flow to Vancouver dropped to C$3.4B in the 2012-2014 period and rebounded to C$5.4B from 2015 to 2017. In the 2018-2020 period, Asia Pacific investment flow to Vancouver dipped once again to only C$4.7B.

FIGURE 27

Sectoral Composition of British Columbia and Vancouver's Inbound Investment, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Vancouver's sectoral make-up is similar to B.C.'s when the oil and gas sector is excluded. Vancouver's top inbound investment sectors – industrial metal and mining – accounted for a significant proportion of B.C.'s inbound investment at 30 per cent. The similar sectoral make-up between city and province is due to the fact that Vancouver is responsible for most of British Columbia's inbound investment, accounting for 260 out of 394 deals (approximately 65 per cent).

The industrial metals & mining sector, ranked second among British Columbia's inbound sectors, has accounted for the most investment into Vancouver. From 2003 to 2020, there were 45 deals worth C$10.4B – approximately 41 per cent of Vancouver's total inbound flow. The mining sector saw the second highest amount of investment, with 36 deals at C$7.9B – approximately 31 per cent of Vancouver's inbound investment. Together, these two sectors have made up 72 per cent of all of Vancouver's inbound investment since 2003.

In the most recent three-year period, Vancouver's software and computer services sector saw the highest number of deals, at 24 transactions. However,

the investment value of the mining sector still outperformed the software and computer services sector during this same time period. Vancouver's mining sector saw only seven deals, but with a C$4.4B investment value, compared to the software and computer services sector investments, which totalled C$38M. This is largely due to recent high-value mining investments into Vancouver. For example, Australia's Newcrest Mining Limited acquisition of the Red Chris Mine in 2019 for C$1B, as well as China's Zijin Mining Group acquisition of Nevsun Resources in 2018 for C$1.8B.

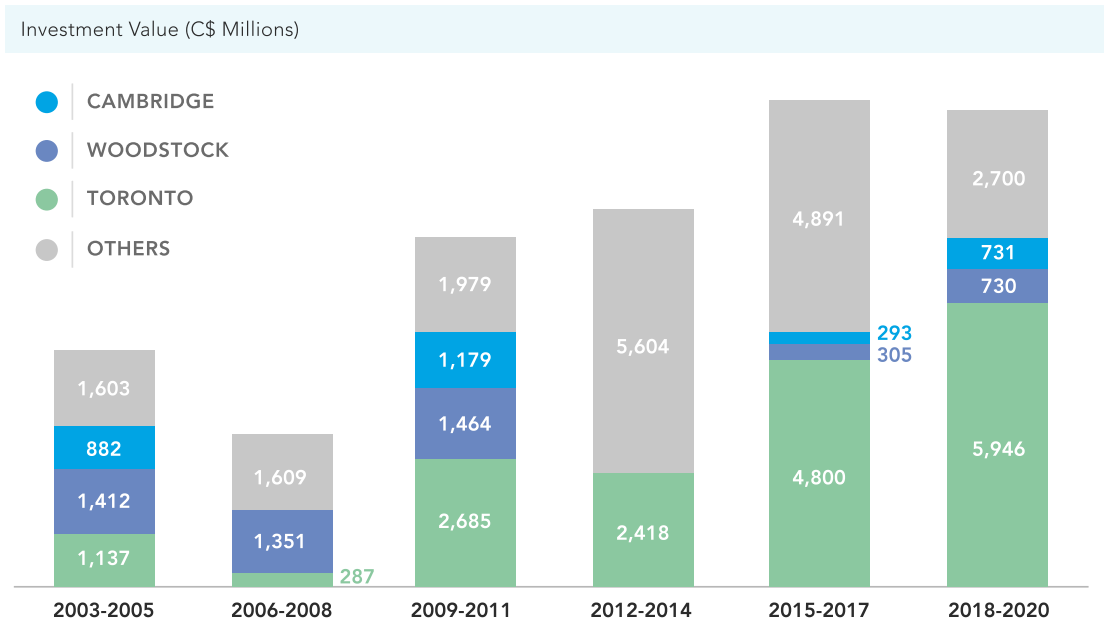
Outside of Vancouver, British Columbia's oil and gas sector makes up the majority of the province's inbound investment flows in the last 18 years, at 52 per cent. In value terms, the sector saw C$32.3B worth of Asia Pacific capital. Despite the high investment value, this only corresponds to 22 deals. Much of the investment flow in this sector is attributed to the C$27B worth Asia Pacific companies' investments in Kitimat.

ONTARIO: TORONTO AS AN INVESTMENT GROWTH ENGINE

In the last 18 years, Asia Pacific companies have brought more than C$44B of capital investments across 70 cities and city-level regions in Ontario. Toronto, Canada's and Ontario's premier economic hub, has been a key driver for inbound Asia Pacific investments in this period. From 2003 to 2020, firms from the region channeled C$17.3B of investments into the city, accounting for 39 per cent of Ontario's total inbound FDI flow. Beyond the value of investment flow, Toronto also accounted for 242 of the 515 (47 per cent) Ontario-bound investment deals.

FIGURE 28

Asia Pacific Investment into Ontario, 2003-2020

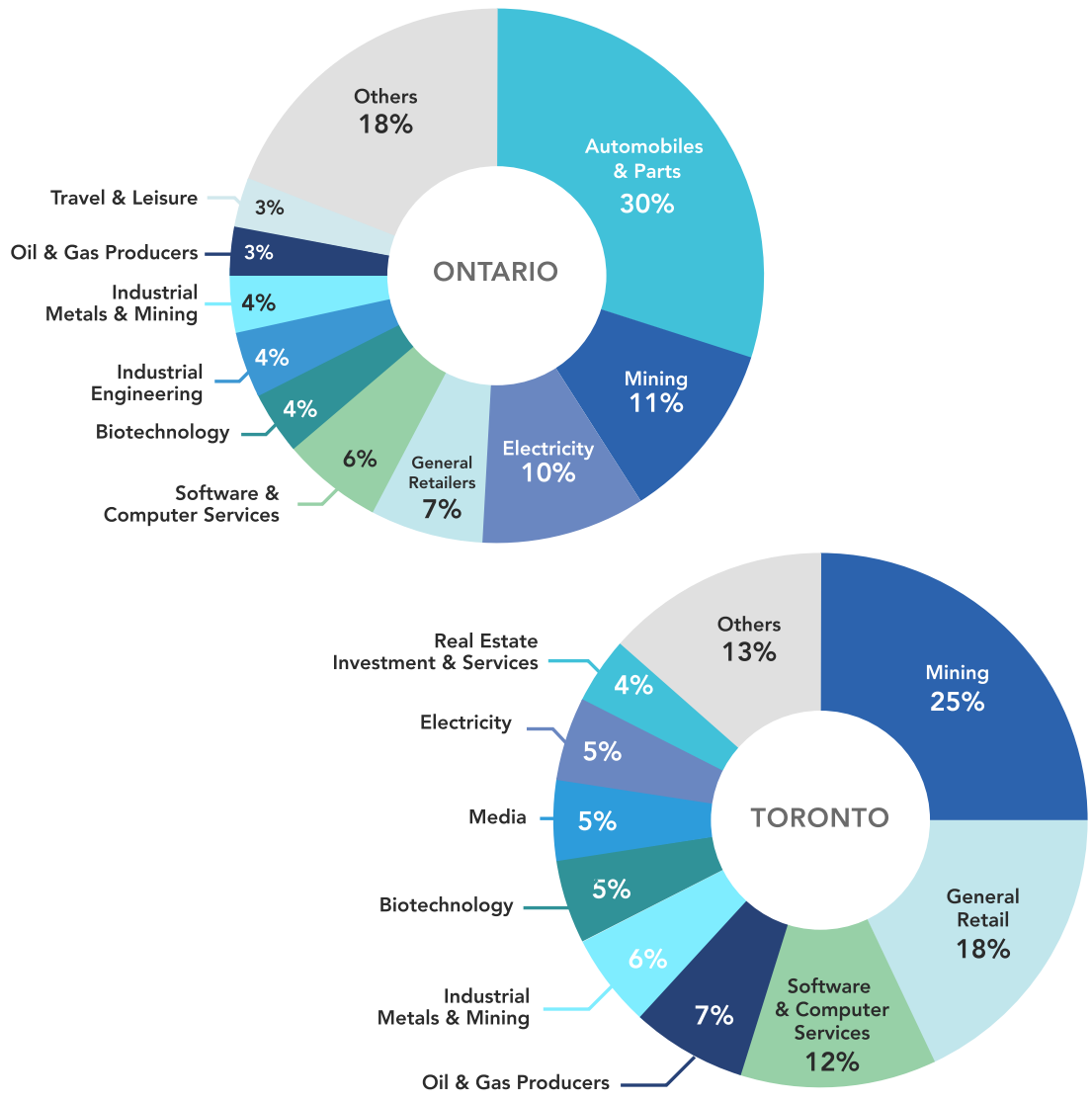


Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

As Figure 28 shows, in the last 12 years, Asia Pacific investments in Toronto have been rapidly growing. In the latest three-year period, Toronto saw C$5.9B worth of investment flow, a C$3.5B increase from the period of 2012 to 2014. From 2018 to 2020, the city also accounted for a growing proportion of Ontario-bound investment flow from the Asia Pacific region, from 30 per cent in 2012 to 2014 to 59 per cent in the latest three-year period. Ontario's growing value and proportion of Toronto-bound investments in the last 12 years suggests that Asia Pacific firms are increasingly seeking investment opportunities within Canada's largest metropolitan centre.

FIGURE 29

Sectoral Composition of Ontario and Toronto's Inbound Investment, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Despite Toronto's prominence in Ontario's Asia Pacific investment attraction, the sector composition of the inbound investment value of the two jurisdictions remains quite different. As Figure 29 shows, while the automobile and parts sector is Ontario's top sectoral destination for investment with C$13.3B worth of FDI flow from the region in the last 18 years, the sector is not as represented in Toronto's inbound flow. This is because the bulk of automobile investments landed in municipalities outside of Toronto, primarily Woodstock, Cambridge, and Alliston. The three municipalities accounted for C$10.6B of the C$13.3B (80 per cent) invested by Asia Pacific companies in Ontario's auto sector. Japanese auto giants Toyota Group and Honda were the most active investors in the three municipalities. Toyota Group invested C$3B and C$5.2B into Cambridge and Woodstock, respectively, while Honda injected C$2.2B into Alliston.

While the mining sector only constituted 11 per cent of Ontario's inbound investment, mining was the top Toronto sector that attracted Asia Pacific capital. From 2003 to 2020, Asia Pacific companies injected C$4.3B into Toronto's mining sector via 18 deals. The investment flow represented 25 per cent of the value of Asia Pacific investments into Toronto. More than half of the investment value came in 2019 when Chinese SOE Jianxi Cooper and Zijing Mining acquired PIM Curic Holdings and Continental Gold, respectively. The combined value of the two transactions accounted for C$2.8B of the C$4.3B, or 65 per cent, of inbound flow into Toronto's mining sector.

With easy access to consumers, Asia Pacific investments into Ontario's general retailers sector naturally gravitate towards Toronto, Canada's most populous urban centre. From 2003 to 2020, Asia Pacific investors channelled C$3.1B worth of capital into Toronto's general retailer sector, making up 18 per cent of the city's inbound investment value. The biggest transaction came in 2017 when CKP Canada, a division of the Hong Kong-based CK Asset Holdings Limited, acquired the heating and cooling system provider Reliance Home Comfort for C$2.9B. Outside of Toronto, only Barrie, Markham, Vaughan, and Mississauga saw retail investments. The four municipalities collectively saw C$116M worth of Asia Pacific retail investments in the last 18 years.

Box. 8 Cities and Hubs of Innovation: A Bottom-up View of Inbound R&D-Associated Investments

Canada is increasingly focused on becoming a global innovation hub, and a worldwide leader in innovation.[119] The increasing focus on innovation and R&D in Canada seems to have had an impact on inbound R&D-related deals in Canada, with the number of deals rising from four between 2003 and 2005, to 31 between 2018 and 2020. This clearly showcases the increasing importance of R&D in Canada's inbound investments.

However, innovation is about more than the national picture – oftentimes, the progress is most clear when looking towards city-level investments. Since 2003, 21 city-level regions in Canada have received R&D-associated investment from the Asia Pacific.

In terms of innovation hubs in Canada, Toronto saw the greatest number of inbound investments related to R&D from 2003 to 2020, with 18 deals. Toronto is followed by Vancouver, with 13 deals. In terms of investment value, Toronto remains in the top position with C$1.6B in R&D-related inbound investment. However, Quebec City replaces Vancouver in second place with C$783M – this is due to large deals such as Mitsubishi's acquisition of Medicago for C$399M in 2013, and Medicago's subsequent opening of a research and vaccine production facility for C$323M in 2015.

Provincially, from 2003 to 2020, Ontario saw the greatest amount of R&D-related deals, with a total of 40 and C$2.9B in investment value. British Columbia followed in terms of deals with 16, but not in terms of investment value, which stands at C$100M. Quebec comes in third in terms of number of deals with 11 deals, but second in terms of investment value at C$1.1B.

In Ontario specifically, the biotechnology sector saw the most R&D-related investment from 2003 to 2020 at C$925M, followed by software and computer services at C$718M. Most of the biotechnology investment in Ontario is due to Japan's Sunovion Pharmaceuticals' acquisition of Cynapsus Therapeutics Inc. in 2016, for C$900M. Comparatively, the software and computer services sector saw a higher number of deals, but with less investment value. For example, in 2018, China's Didi Chuxing Technology created a new artificial intelligence research laboratory in Toronto for C$122M. Jun Yu, senior vice president of DiDi, said the firm chose Toronto as a location due to its "inclusive environment for innovation and entrepreneurship."[120]

In British Columbia, the most prominent sector for R&D-related investment was biotechnology, at C$28B, followed closely by pharmaceuticals at C$27B.

For example, last year India's Sun Pharmaceutical Industries acquired Aquinox Pharmaceuticals for C$11M. Quebec saw the most R&D-related investment in pharmaceuticals with C$727M, followed by aerospace and defence with C$204M. Quebec's pharmaceutical sector only saw three deals between 2003 and 2020, but they were significant ones: as mentioned above, Mitsubishi's acquisition of Medicago and the subsequent vaccine production facility amounted to C$722M.

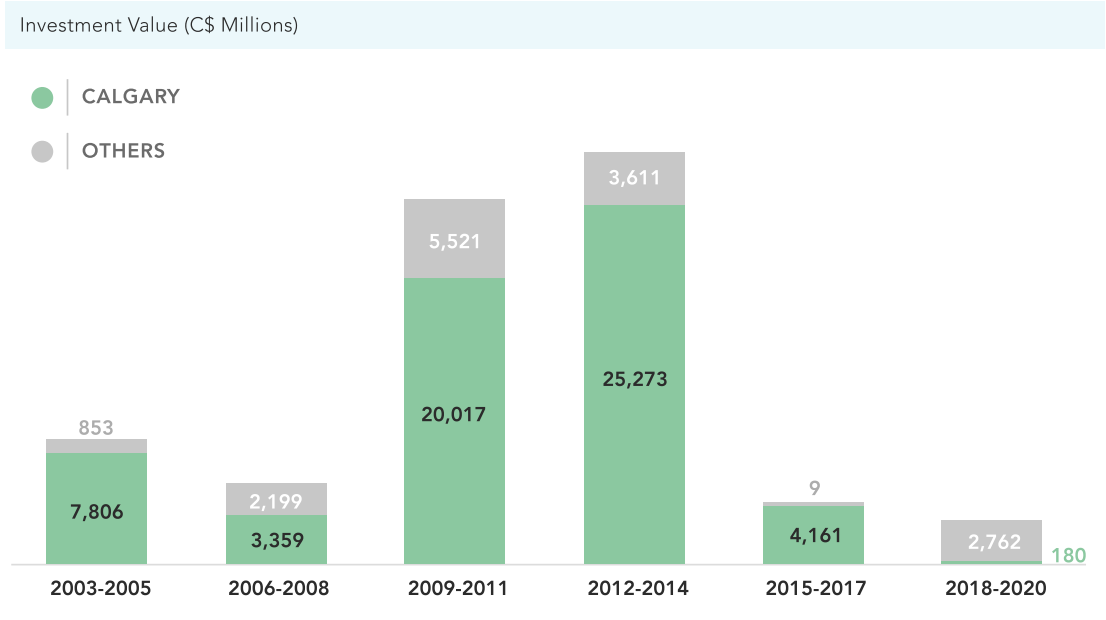
The provinces are continuing to make R&D a priority, by setting up various incentive programs. Ontario, for example, offers the Ontario business-research institute tax credit (OBRITC), among other programs. The OBRITC can cover up to 20 per cent of qualified expenditures on scientific research and experimental development for corporations with establishments in Ontario, under eligible contracts with research institutes. Similarly, Alberta, British Columbia, Manitoba, and Saskatchewan also provide tax credits to incentivize R&D activities.[121] These programs are likely to be even more important in the post-COVID context, as provinces strive to spur innovation-led recovery.

ALBERTA: CALGARY MAKES UP MAJORITY OF INBOUND FLOW

From 2003 to 2020, 23 cities and city-level locales in Alberta saw investments from the Asia Pacific region, as the province received C$75.8B worth of capital from Asia Pacific companies via 181 deals. As the province's economic capital, Calgary plays a significant role in attracting Asia Pacific investments into Alberta. From 2003 to 2020, the city brought C$60.8B worth of Asia Pacific investments into Alberta, accounting for 79 per cent of the province's total inbound flow.

FIGURE 30

Asia Pacific Investment into Alberta, 2003-2020

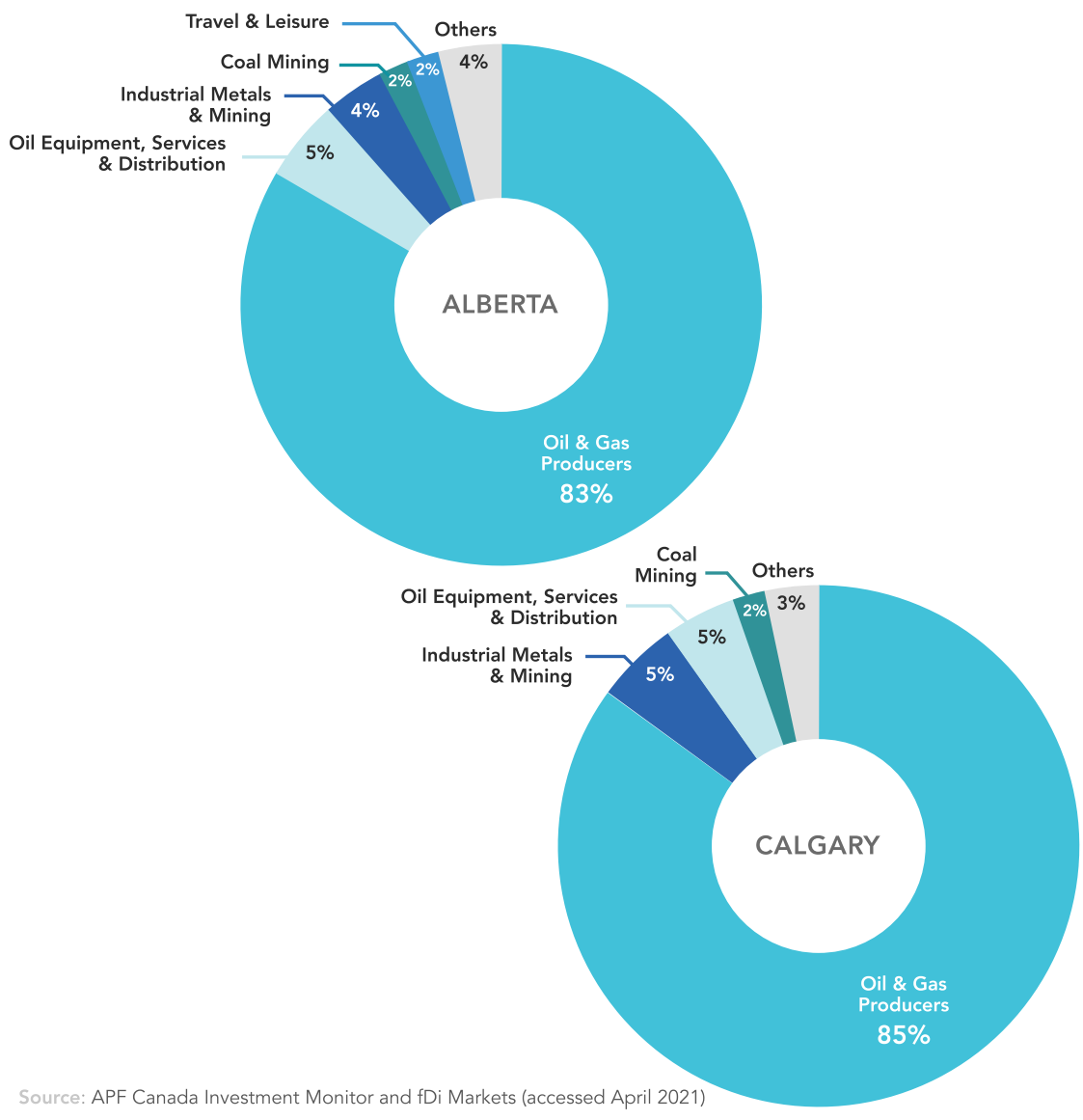


Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

The bulk of Calgary-bound investments came between 2012 and 2014, when Asia Pacific investors injected C$25B worth of capital into the city via 31 deals. However, after the 2015 technical recession, triggered by falling commodity prices, Asia Pacific investments into Calgary collapsed. Asia Pacific investment flow to Calgary dropped to C$4B in the 2015-2017 period, and it decreased further to C$180M in the most recent three-year period. In the latest period, Edmonton became an emerging hub for inbound investments, as Asia Pacific companies injected C$813M worth of capital in the city.

FIGURE 31

Sectoral Composition of Alberta and Calgary's Inbound Investment, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Given Calgary's role for attracting Asia Pacific oil and gas investments, the city effectively shapes Alberta's inbound investment's sector composition. As figure 27 shows, oil & gas is the top inbound sector for Alberta and Calgary in attracting Asia Pacific investments. The sector accounted for 81 per cent and 85 per cent of the total inbound investment value for Alberta and Calgary, respectively. In dollar terms, the oil & gas sector attracted C$62B in inbound investments into Alberta and C$52B into Calgary.

The biggest investment in the oil sector came in 2013, when Chinese National Offshore Oil Corporation (CNOOC), acquired the Calgary-based Nexen Energy for C$17B. Nexsen's acquisition alone contributed to 28 per cent of Calgary's inbound investment flow in the last 18 years. Other than CNOOC, other Asia Pacific state-owned enterprises have also gotten a piece of the action in the province. For instance, in 2009, Korea National Oil Corporation acquired the Calgary-based Harvest Energy for C$4B. In the following year, PTT Public Company Limited, a Bangkok-based SOE, invested C$2.3B to buy a 40 per cent stake in the Norway-based Stateoil's oil sands project in Alberta. PTT's acquisition was reportedly the biggest offshore investment by a Thai company at the time.[122]

In the last three years, the oil & gas sector has remained the city's top sector for attracting Asia Pacific investments. However, inbound investment flow in the sector had dropped significantly. From 2018 to 2020, Calgary only saw C$137M worth of inbound oil and gas investment, a drop of C$2.6B from the period of 2015 to 2017. While the city saw relatively marginal gains in its support services sector (C$8M) and technology, hardware and equipment sector (C$7.7M), they remained insufficient to overcome the decline in the oil and gas sector.

While Asia Pacific investments into Calgary declined in the last three-year period, Alberta saw gains in some non-natural resources sectors elsewhere in the province. While travel and leisure accounted for only two per cent of Alberta's inbound investment in the last 18 years, it emerged as the province's top sector from 2018 to 2020. In this period, the province saw C$1.5B of investment into its travel and leisure sector. However, this was exclusively driven by Singapore's sovereign wealth fund GIC Private Limited's acquisition of three Oxford Fairmont hotels in Jasper, Lake Louise, and Banff.

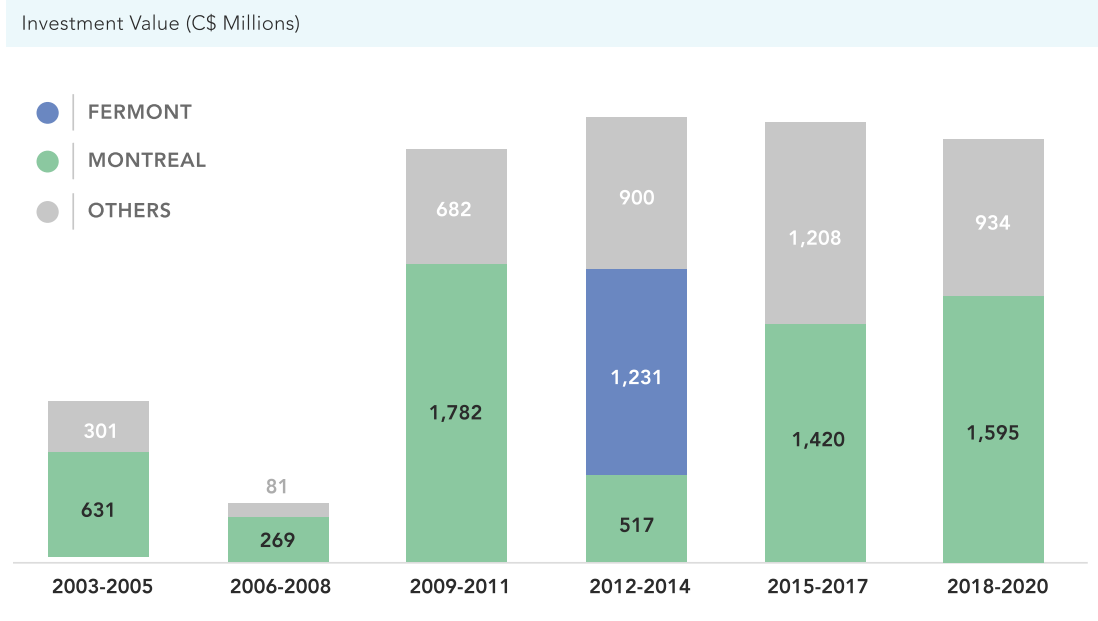
QUEBEC: MONTREAL'S INBOUND FLOW SEES GREATER TRACTION

Asia Pacific investors have channeled C$11.6B of investments across 34 Quebecois municipalities from 2003 to 2020. Montreal, in particular, has been Quebec's key driver of inbound investment. In this period, Montreal saw C$6.2B worth of Asia Pacific investments, accounting for 54 per cent of

Quebec's inbound flow value. In deal count, Montreal represents little more than half (81 of 158) of Quebec's inbound investment deals.

FIGURE 32

Asia Pacific Investment into Quebec, 2003-2020



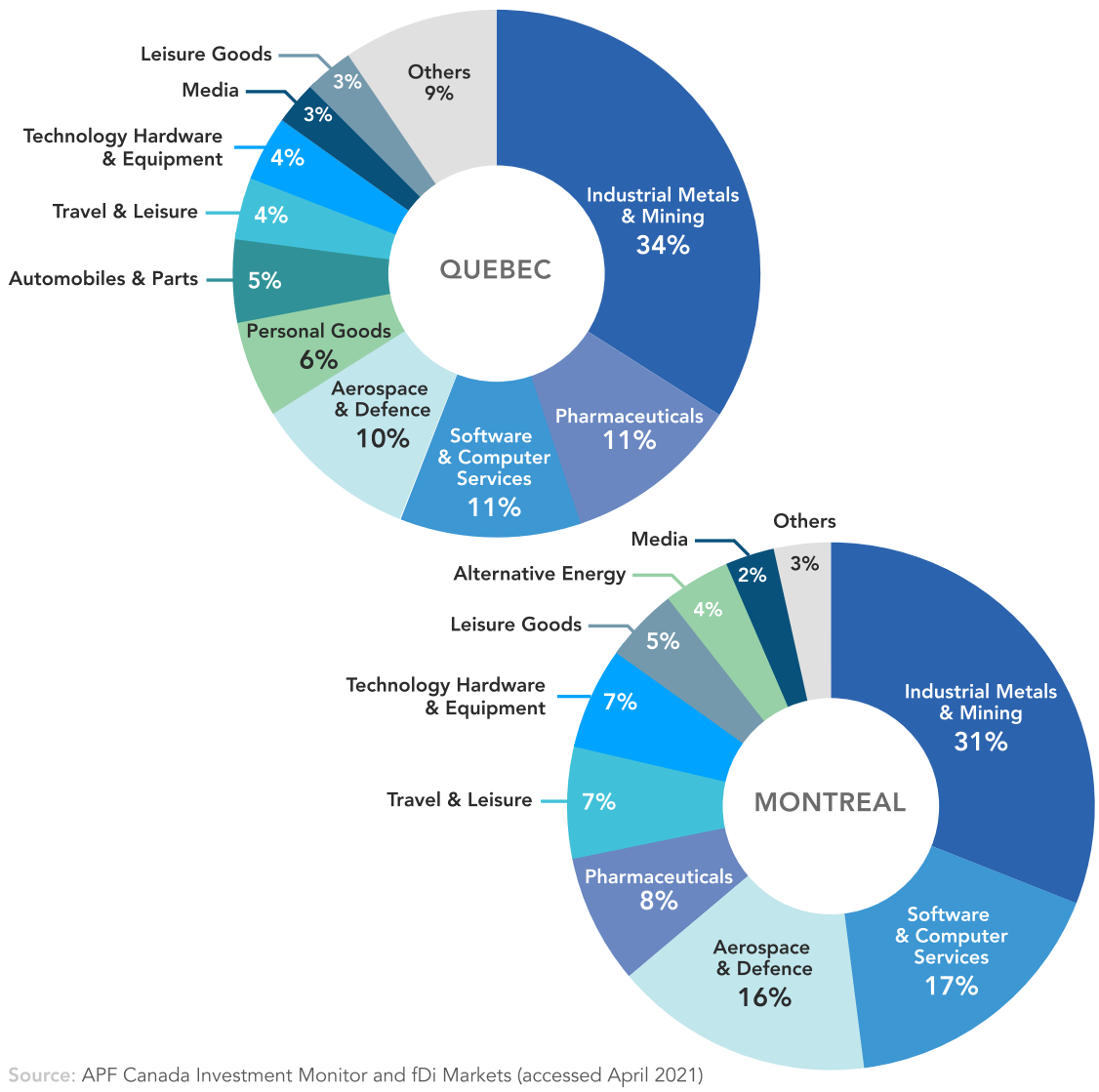
Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

As Figure 32 shows, a significant chunk of Quebec's inbound investment flow has been driven by Asia Pacific investments in Montreal. Other than the period of 2012 to 2014, Montreal has made up more than half (54 to 77 per cent) of Quebec's inbound investment value in the last 18 years. Since 2012, the city has also seen growing investment flow from the region. The value of Asia Pacific investment in Montreal has increased from the C$517M in the period of 2012 to 2014 to the C$1.6B in the latest three-year period, an over 200 per cent increase (C$1.1B).

While inbound investment value in Montreal has been steadily increasing in the last nine years, Asia Pacific investments in other municipalities in Quebec have been declining. At their peak, non-Montreal bound investments reached C$2.1B in value in the 2012-2014 period. Since then, Asia Pacific investments into other municipalities in the province dropped to C$1.2B in the 2015-2017 period, and declined further to C$934M in the latest three-year period.

FIGURE 33

Sectoral Composition of Quebec and Montreal's Inbound Investment, 2003-2020



Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Despite Montreal's significant impact in driving Quebec's inward investments, the sectoral composition of investment flow varies to some degree between the two levels of jurisdiction. Such divergence indicates that some sectors are concentrated in Montreal, while others are driven by investments in other parts of Quebec.

The software and computer services sector is a clear example of the high concentration of Montreal-bound investment. Since 2003, Quebec has seen C$1.2B worth of software and computer services inbound investments. Of that C$1.2B investment flow, Montreal accounts for C$1.1B (88 per cent). In terms of deal count, Montreal represents 27 of the total 34 deals in Quebec's software and computer services inbound investment. This showcases the city's reputation and wealth of human capital in the sector.

Some recent investments in the city also highlight Montreal's edge in computer and software services. In 2019, China's NetEase, headquartered in Hangzhou, opened a new video game studio in the city with C$132M of investment. According to the company's CEO, Montreal presents an attractive investment destination due to its reputation as a "world-leading video game and entertainment content production hub, with rich resources in talent and technologies."[123] Other than video game design, the city also saw Japan's DENSO and Korea's Samsung set up artificial intelligence labs in 2018 and 2019.

While industrial metal and mining is the top sectoral destination for both Quebec and Montreal, inbound investment flow has been more geographically dispersed. From 2003 to 2020, Quebec's industrial metal and mining saw C$3.9B worth of Asia Pacific investments, of which Montreal accounted for C$1.9B. Other municipalities accounted for C$2B (50 per cent) of Quebec's inbound industrial metal and mining investments. However, a significant portion of the investment flow was driven by an acquisition in 2013. Taiwan-headquartered China Steel Corporation and Korean POSCO International jointly purchased a 15 per cent interest in Arcelor Mittal's iron ore mining and infrastructure asset in Fermont for C$1.1B.

OUTBOUND: ASIA PACIFIC DESTINATION CITIES FOR CANADIAN INVESTMENTS

FIGURE 34

Top Asia Pacific Destination Cities for Canadian Investment, 2003-2020

Rank	City	Investment Value (C$ Millions)	Number of deals
1	Sydney, Australia	21,828	105
2	Melbourne, Australia	19,481	78
3	Hong Kong SAR, China	12,206	118
4	Perth, Australia	10,034	58
5	Bengaluru, India	9,620	38
6	Mumbai, India	9,112	62
7	Shanghai, China	7,919	116
8	Beijing, China	6,944	118
9	Singapore	6,858	109
10	Gopalganj, Bangladesh	6,178	1

Source: APF Canada Investment Monitor and fDi Markets (accessed April 2021)

Mapping out Canadian investments in the region at the city level allows for greater understanding of the markets that Canadian companies have found opportunities in. This is particularly important in the context of the COVID-19

pandemic, as the economic recovery in the region is likely to vary depending on the local status of pandemic control. These unique local conditions, in turn, will affect Canadian companies' operating climate and investment opportunities in the region.[124]

Since 2003, Canadian companies have invested in 496 cities and municipal-level regions across the Asia Pacific region. However, these investment flows are relatively concentrated. The top 10 city destinations cumulatively saw C$110B of Canadian investments in the last 18 years, making up 46 per cent of the outbound investment value in the region.

Particularly, three Australian cities – Sydney, Melbourne, and Perth – are featured in the top 10 destinations for Canadian investment. The three cities respectively received C$22B, C$19B, and C$10B of Canadian investments in the last 18 years. The three cities alone account for 24 per cent of Canadian outbound investment flow in the Asia Pacific. Interestingly, even though the three Australian cities are featured at the top of the chart for Canadian investment value, the number of Canadian investments in these cities is relatively lower than other destinations, such as Hong Kong, Beijing, and Shanghai.

The mismatch between investment value and deal count rankings suggests that, on average, Canadian investments in Australian cities are higher in value than other destinations. This is particularly the case for Perth, for example, which placed fourth on the list in terms of highest investment value. Perth, accounting for C$10B, saw a little less than half the deal count compared to Beijing, but C$3B more in investment value.

While Australian cities have been the most attractive investment destinations for Canadian firms in the last 18 years, Mumbai led the race in 2020, and received the largest amount of Canadian investment – C$2.9B. One notable investment in Mumbai was British Columbia Investment Corporation and Brookfield Infrastructure Partners acquiring a C$2B telecom company from Reliance Industrial Investments and Holdings Limited. The Ontario Teachers' Pension Plan (OTPP) also saw opportunities in the city's financial service sector, as the company channeled C$463B of investment to Edelweiss Alternative Asset Advisor. Through this investment, OTPP aimed to focus on performing and distressed private credit investment opportunities as well as broadly expanding its presence in the market.

Bengaluru emerged as another winner in 2020. Located in southern India, the city received C$2.6B worth of investment from Canadian companies this year, making it the second-most attractive investment destination in 2020. Canadian investment flow to the city was entirely attributable to a single deal when Brookfield Asset Management Inc spent C$2.6B and acquired 12.5 million square feet of real estate assets from RMZ Corp, a realty developer. According to RMZ Corp's press release, the deal marked the largest-ever investment deal in the Indian real estate industry to date.[125]

CONCLUSIONS

Despite the economic downturn that the world experienced in 2020 due to COVID-19, both inbound and outbound investment between Canada and the Asia Pacific region continued throughout the year – proving the resiliency of the investment relationship. Since 2003, economies in the Asia Pacific region have grown rapidly, and Canada's investment into the Asia Pacific continues to be crucial for our trade diversification strategy. As the world recovers from the COVID-19 pandemic, maintaining and growing the investment relationship between Canada and the Asia Pacific will be key for both regions.

This report has outlined that opportunities will likely arise in digital, clean energy and R&D-related industries. Various economic recovery plans – both in the Asia Pacific region, and in Canada – focus on those particular sectors. Canadian companies should be aware of these opportunities and keep them in mind going forward in the post-COVID-19 economic recovery.

Despite the importance of the relationship between Canada and the Asia Pacific, many Canadians have limited access to the necessary resources to understand the depth and breadth of the investment relationship. This is especially true on a detailed and micro level, such as for investment trends at the city and sector level. APF Canada's Investment Monitor fills this gap by providing this level of information to the public.

In doing so, the APF Canada Investment Monitor can help inform discussions and debates regarding the Canada-Asia Pacific investment relationship within their broader bilateral economic engagement. The Investment Monitor provides the necessary data and analysis for evidenced-based decision-making, both for policy-makers and for relevant stakeholders in the Canadian public.

METHODOLOGY AND DATA

The APF Canada Investment Monitor tracks foreign direct investment announcements at the firm level, taking a bottom-up approach rather than reviewing the balance of payments in Canada's national accounts.

To generate the APF Canada Investment Monitor data, APF Canada uses its own unique legacy data, third-party data sources, metasearch engines, and other search tools to aggregate data obtained from public sources including media reports, company documents, industry associations, and investment promotion agencies. Investment announcements that are entered in the database include greenfield investments, asset purchases, equity investment, mergers, acquisitions, joint ventures, and so on.

The APF Canada Investment Monitor sources its investment stories primarily from its decades-long archive of announcements on deals, trade missions, memorandums of understanding (MOUs), and other developments of note in the Canada-Asia relationship. Such a vast archive allows the APF Canada Investment Monitor to build a strong foundation on which to track deal flow both historically and going forward. Each deal announcement is recorded, catalogued, and added to our database. Deals are recorded using 30 different observations, ranging from parent company to destination city. Key to this cataloguing of investments for trend analysis is the use of a user-friendly sector classification system. Whereas deals catalogued with the widely used North American Industry Classification System (NAICS) often hide key trends in budding industries, the APF Canada Investment Monitor's use of the modified Industrial Classification Benchmark (Modified ICB) allows it to clearly see growth in areas such as the digital and clean energy sectors.

Unique to this year's report, APF Canada also employs a series of keyword search strings to identify investments associated with research and development activities. This list is further refined by a manual data validation process to ensure that the establishment identified engaged in activities which satisfy the OECD's five core criteria for R&D: novel, creative, uncertain, systematic, and transferable and/or reproducible.

Dollar values for the APF Canada Investment Monitor are obtained through a thorough investigation of the deal value and, barring an official value, the best publicly available estimate. This methodology allows for the avoidance of errors that occur in databases that estimate deal value using proprietary algorithms.

LIST OF ABBREVIATIONS

ABBREVIATION/ TERM	MEANING	DEFINITION
AI	Artificial Intelligence	AI refers to the simulation of human intelligence in technology.
Biotech	Biotechnology	Biotechnology refers to the scientific use of organic and molecular biology to produce medical therapeutics.
APF Canada	Asia Pacific Foundation of Canada	The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia.
ASEAN	Association of Southeast Asian Nations	ASEAN is a regional grouping that promotes economic, political, and security co-operation among its 10 members: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
CNOOC	China National Offshore Oil Corporation	CNOOC is a Chinese state-owned enterprise, and one of the largest national oil companies in China.
Cleantech	Clean technology	Clean technology is defined as any process, product, or service that reduces environmental impacts.
CDPQ	Caisse de Dépôt et Placement du Québec	The CDPQ is an institutional investor that manages several public and partly public pension plans and insurance programs in Quebec.
CPPIB	Canada Pension Plan Investment Board	The CPPIB is a Canadian Crown corporation established to manage and invest funds held by the Canada Pension Plan.
CPTPP	Comprehensive and Progressive Trans-Pacific Partnership	The CPTPP is a free trade agreement between Canada and 10 other countries in the Asia Pacific region: Australia, Brunei, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, and Vietnam.
ESG	Environmental and Social Governance	ESG refers to a set of criteria that are used to screen investments according to performance along environmental, social and governance indicators.
EDC	Export Development Canada	EDC is a Canadian Crown corporation and export credit agency supporting Canadian export potential.
FDI	Foreign direct investment	Foreign direct investment is a long-term investment by a resident or enterprise from one economy into a tangible asset in another economy. This investment can involve either a greenfield investment or acquisition consisting of at least 10 per cent of the equity or voting shares of a firm. FDI in this report is reported as inbound and outbound. Inbound FDI refers to investments made by companies from the Asia Pacific into Canada, and outbound FDI refers to investments made by Canadian firms into the Asia Pacific region.
Flow		Flow refers to the movement of capital for the purpose of investment, adding to or removing from an economy's stock.
FPI	Foreign portfolio investment	Foreign portfolio investment refers to investing in the financial assets of a foreign country, such as stocks or bonds available on an exchange.
FTA	Free trade agreement	A free trade agreement is a treaty between two or more countries to facilitate trade and eliminate trade barriers.
GDP	Gross domestic product	GDP is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period.

Greenfield		Greenfield investments typically consist of firms' establishment or expansions of their subsidiaries in a different economy. For example, this can involve investments into new offices or company branches.
ICB	Industrial Classification Benchmark	The Industrial Classification Benchmark is a global standard for the categorization and comparison of companies by industry and sector. This report uses a modified ICB, where certain investment activities have been classified differently to fit the needs of the Investment Monitor.
Industry		An industry is a broad classification of companies that are related based on their primary business activities.
Joint venture		A joint venture is a business arrangement in which two or more parties agree to pool their resources for the purpose of accomplishing a specific task.
KND	Korean New Deal	The Korean New Deal is South Korea's economic plan, focused on stimulating rapid recovery from the COVID-19 recession and accelerating digital transformation and adaptation.
LNG Canada	Liquefied Natural Gas, Canada	LNG Canada is a joint venture among Shell, PETRONAS, PetroChina, Mitsubishi, and KOGAS.
M&A	Mergers and acquisitions	Mergers and acquisitions are a type of investment wherein the partial or full ownership of companies is either consolidated with or transferred to other firms.
NAICS	North American Industrial Classification System	NAICS was developed by the statistical agencies of Canada, Mexico, and the United States. This report uses the NAICS Canada 2017 Version 3.0.
NOP	National Opinion Poll	Since 2004, the Asia Pacific Foundation of Canada has been conducting regular nationwide surveys to assess Canadians' attitudes toward countries in the Asia Pacific, and their perceptions of Canada-Asia relations. Unique in its construction and its objectives, APF Canada's National Opinion Poll has been instrumental in drawing a portrait of Canadians' perspectives on Asia and the region's increasing relevance to Canada's prosperity.
OECD	Organization for Economic Cooperation and Development	The OECD is an intergovernmental economic organization with 37 members, most of which are high-income economies, including Canada.
OMERS	Ontario Municipal Employees Retirement System	OMERS is an Ontario government pension fund for local government employees in the province.
Privately owned enterprise		A privately owned enterprise is a commercial enterprise owned by private investors, shareholders, or owners. Also referred to as non-SOE.
R&D	Research and Development	According to the Frascati Manual by which APF identifies R&D transactions, R&D comprises "creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge."
Sector		A sector is a classification of businesses and economic activities that share the same or a related product or service. Under the ICB, these sectors are clustered together under industries.
SOE	State-owned enterprise	A state-owned enterprise is a commercial enterprise owned by a government.
Stock		A stock, in contrast to flow, is a quantity of capital and money that is measurable at a particular point of time.
StatCan	Statistics Canada	Statistics Canada is Canada's national statistical agency, providing economic, social, and census data.
UNCTAD	United Nations Conference on Trade and Development	UNCTAD is the main UN body dealing with trade, investment, and development issues.

PARTNERS AND SPONSORS

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ADVISORY COUNCIL

In addition to our sponsors and partner, we would like to especially thank their representatives who sit on the APF Canada Investment Monitor Advisory Council, whose input and guidance from the conception to the launch this project proved invaluable.

- **Sarah Albrecht**, Director, Partnership Strategy, Invest in Canada.
- **Dr. Eugene Beaulieu**, Professor of Economics and Program Director, International Economics, The School of Public Policy, University of Calgary.
- **Dr. Jeff Reeves**, Vice-President, Research, Asia Pacific Foundation of Canada.
- **Siobian Smith**, Senior Manager, Business Intelligence, British Columbia Ministry of Jobs, Economic Recovery and Innovation.
- **Dr. Stephen Tapp**, Deputy Chief Economist and Director, Research Department, Export Development Canada.

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ADVANCING INCLUSIVE GROWTH IN THE APEC REGION:

CHALLENGES AND POLICY SOLUTIONS FOR MSMES

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ABOUT THE ASIA PACIFIC FOUNDATION OF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is dedicated to strengthening ties between Canada and Asia, with a focus on expanding economic relations through trade, investment, and innovation; promoting Canada's expertise in offering solutions to Asia's climate change, energy, food security, and natural resource management challenges; building Asia skills and competencies among Canadians, including young Canadians; and improving Canadians' general understanding of Asia and its growing global influence.

The Foundation is well known for its annual national opinion polls of Canadian attitudes regarding relations with Asia, including Asian foreign investment in Canada and Canada's trade with Asia. The Foundation places an emphasis on China, India, Japan, and South Korea while also developing expertise in emerging markets in the region, particularly economies within the Association of Southeast Asian Nations (ASEAN).

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ABOUT THE APEC–CANADA GROWING BUSINESS PARTNERSHIP

The APEC-Canada Growing Business Partnership is a four-year initiative jointly implemented by APF Canada and the Asia-Pacific Economic Cooperation (APEC) Secretariat. Funded by Global Affairs Canada, this initiative helps build the potential of MSMEs to promote poverty reduction and sustainable economic growth in the APEC region.

The Partnership offers best practice tools, ideas, knowledge, and critical connections derived from Canadian experience, tailored to the local markets of APEC countries. The current economies of focus are Indonesia, Peru, the Philippines, and Vietnam. The focus areas of the Partnership aim to address key challenges faced by MSMEs and aspiring entrepreneurs from APEC developing economies in the areas of technology and innovation, market access, human capital, and social entrepreneurship, with an emphasis on the crosscutting themes of women, youth, governance, and the environment.

Visit the APEC-Canada Business Partnership at https://apfcanada-msme.ca/.

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EXECUTIVE SUMMARY

From 2016 to 2021, the APEC-Canada Growing Business Partnership (the "Partnership") has sought to build the capacity of micro, small and medium enterprises (MSMEs) in developing economies in the Asia-Pacific Economic Cooperation (APEC) region. The goal of the Partnership is to build the capacity of MSMEs toward an ultimate goal of promoting poverty reduction and sustainable economic growth in the APEC region. The Partnership recognizes the central role of MSMEs in directly providing economic opportunities to local populations in APEC economies, while also contributing to overall economic growth in the region. APF Canada has implemented a four-year program focusing on research, training, and mentorship of MSMEs with the end goal of offering best-practice tools, ideas, knowledge around fostering economic growth and poverty reduction.

While MSMEs have immense potential to achieve these goals, these smaller businesses face a number of challenges to their growth and success. The Partnership has endeavoured to build the MSMEs' capacity in four main thematic areas: technology and innovation, human capital, market access, and social entrepreneurship. Now in its final year of implementation, as MSMEs in the APEC region grapple with the short-term and long-lasting impacts of the COVID-19 pandemic, the Partnership is further examining the on-the-ground research and activities that have been undertaken in Indonesia, Peru, the Philippines and Vietnam, with the goal of illustrating the pre-pandemic challenges that MSMEs have faced, and identifying the gaps and priorities for the "new normal" era during the COVID-19 pandemic. In this report, the Partnership has compiled its best practices and lessons that it has learned in its on-the-ground activities and working with various project stakeholders including governments, entrepreneurial networks, academia and most of all, MSMEs themselves.

This capstone policy paper highlights the key policy findings and recommendations from throughout the Partnership's implementation cycle in response to six key thematic areas featured in the project's capstone conference. These themes are as follows:

1. Promoting Inclusive Growth
2. Supporting Women and Youth Entrepreneurs
3. Aiding MSMEs' Digital Transformation
4. Securing MSMEs' Access to Financing
5. Ensuring Access to MSME Support Services
6. Encouraging Broader Market Access

In responding to these themes, this paper features findings from the Partnership's on-the-ground implementation experience in Indonesia, Peru, the Philippines, Vietnam, and a cross-national analysis of the project's national survey datasets. This paper aims to draw comparisons between entrepreneurs' experiences of running an MSME in the Partnership's four focus economies, and the landscapes that they operate in. In doing so, this paper provides policy recommendations for MSME capacity building moving forward, during and beyond the COVID-19 pandemic.

The policy recommendations in this report are based on qualitative and quantitative evidence taken from the Partnership's on-the-ground activities and national survey datasets. These recommendations are guided by regional MSME policy visions and frameworks, particularly the APEC SMEWG Strategic Plan for 2020-2025 and Putrajaya Vision 2040.

The main policy recommendations provided by this report include the following:

1. Promoting Inclusive Growth: Dialogue between governments, MSMEs and other key stakeholders is critical for achieving an inclusive crisis response and sustainable routes to recovery. Governments must ensure that the needs of small businesses are addressed through action plans that work toward long-term economic recovery.

2. Supporting Women and Youth Entrepreneurs: Further capacity building, knowledge networks and collection of disaggregated data are needed to address systemic barriers that limit the economic empowerment of women and youth.

3. Aiding MSMEs' Digital Transformation: Policymakers must assess the existing efforts of MSMEs to incorporate a digital strategy into their business model, and provide additional support for digitalization, such as stronger ICT infrastructure and upskilling in social media usage.

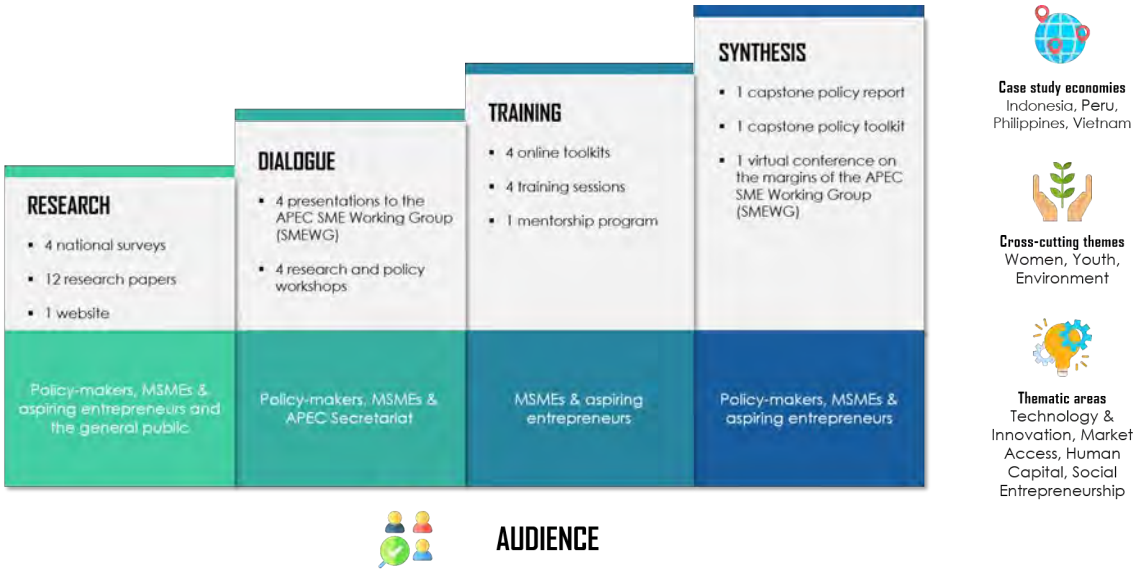
4. Securing Access to Funding: Governments must make access to finance and various funding mechanisms well-known, accessible, as well as targeted to the distinct needs of MSMEs and entrepreneurs (e.g., by enterprise size, industry, gender and age). These needs can be assessed through data collection.

5. Ensuring Access to MSME Support Services: Governments are encouraged invest more resources in the marketing and information distribution of MSME support programs and services, and targeting these resources to women and youth entrepreneurs.

6. Encouraging Broader Market Access: Entrepreneurs and MSMEs must be supported by government actors in gaining international market experience and expanding their markets overseas. This includes investing in clear promotion of international opportunities, and in entrepreneurs' upskilling to participate in international markets.

MSMES IN THE APEC REGION

As part of the APEC-Canada Growing Business Partnership's goal to drive sustainable and inclusive growth across the APEC region, micro, small and medium enterprises (MSMEs) have been a key analytical focus for the Partnership's research, training and mentorship programs. Tailored to four focus APEC economies – Indonesia, Peru, the Philippines, and Vietnam – the Partnership has fostered the best-practice tools, ideas, and knowledge that are critical to fostering economic growth and reducing poverty. The Partnership has supported efforts to propel the MSME sectors of APEC economies forward, drawing from both local and Canadian best-practice experiences, and translating these recommendations to support MSME and entrepreneurial-friendly policies within the region.



MSMEs are well known as the backbone of economies in the Asia-Pacific Economic Cooperation (APEC) region. These enterprises typically comprise the vast majority of businesses in each economy, and provide crucial economic opportunities to the local populace, especially for women, youth, and rural communities. In the APEC region as a whole, MSMEs make up 97 per cent of all businesses, and provide employment to over half of the regional workforce. As a result, MSMEs are among the key drivers of economic growth, innovation, and opportunity in the region.

The recent COVID-19 pandemic has posed an existential crisis to these small businesses. Due to domestic and international restrictions on movement, many MSMEs have experienced a sudden and drastic reduction in physical business traffic. As a result of the ongoing pandemic, MSMEs have had to proactively explore new opportunities to transition their traditional in-person businesses into online platforms. Digitalization, or the transition of an in-person business model to a digital one, has fast

become the new priority for MSMEs, governments across the APEC region and large corporations. While businesses have incorporated digital business practices prior to the pandemic, such as e-commerce platforms and digital communications, these have now become a requirement for MSMEs' survival in the so-called "new normal." Borderless e-commerce has opened opportunities for MSMEs to reach larger regional value chains, increasing exposure of these MSMEs, but still brings many logistical challenges to deliver goods and services through digital platforms.

While the pandemic and its restriction on physical movement poses a new challenge to MSMEs, many other issues that MSMEs are facing stem from before the pandemic. These issues, including access to financing, usage of MSME support services, and efforts to increase market access, are prior challenges that are now exacerbated by the present health and economic crisis.

POLICY FINDINGS AND RECOMMENDATIONS IN THEMATIC AREAS

To provide high-level policy recommendations and actions pertaining to specific areas of MSME capacity building, a combination of both qualitative and quantitative data is used from the Partnership's implementation experiences and are based on various national surveys, training events, policy directions and goals of relevant partner organizations on-the-ground.

The recommendations in each of the six following areas are targeted toward APEC policymakers in order to further understand entrepreneurs, their current capacity to operate, and optimizing these lessons for post-pandemic growth. The six thematic themes covered by this paper include the following:

AIDING MSMES' DIGITAL TRANSFORMATION

While "digital entrepreneurship" was already being encouraged prior to the pandemic, the current crisis has made it a requirement for MSMEs to survive the economic downturn. In order to have a successful transition to the digital economy, the Partnership recommends that entrepreneurs receive training and mentorship on the effective usage of digital tools like social media. Moreover, the Partnership recommends that policymakers take account of businesses' existing usage of digital tools, and create responsive policies that build MSMEs' capacity from this baseline.

Main Recommendation: Policymakers must assess the existing efforts of MSMEs to incorporate a digital strategy into their business model, and provide additional support for digitalization

Policy actions for supporting MSMEs' digital transformation include the following:

1. Build and maintain a robust internet infrastructure in a given economy, to ensure that all entrepreneurs, regardless of location (e.g., urban vs rural-based businesses) have a consistent and financially accessible internet connection.

2. Collect data on MSMEs' usage of social media, websites, and other digital tools, toward informing support programs and policies for MSME digitalization, and target such initiatives to their needs.

3. Encourage information sharing and partnerships between government and large corporations to provide knowledge and training to MSMEs on creating a digital strategy, and how various online platforms can be used to entrepreneurs' advantage

DIGITALIZATION AND DIGITAL TRANSFORMATION

Digitalization refers to an MSME's transition of existing business operations, such as communications and payment methods, to online platforms and software. Oftentimes, this transition will involve a mix of physical and digital processes, depending on a given business' needs. One example is the transition of in-person payment methods to e-wallets and mobile commerce, where consumers are now able to pay for goods and services using their mobile devices.

Digital Transformation then refers to an MSME's overall transition to a digital business model, with the goal of entering the digital economy.

Photo by NASA on Unsplash

To provide context to its recommendations, this section will discuss how MSMEs and entrepreneurs have implemented and used digital business tools thus far. In particular, it will highlight the use of company websites, social media and online learning applications entrepreneurs, and the barriers that they may face in MSME digitalization.

POLICY AREA 1: INTERNET ACCESS AND ICT INFRASTRUCTURE

The foundational component of MSMEs' digital transformation is robust, affordable, and sustainable access to the internet. As more businesses shift to online and digital platforms, governments and telecom providers must ensure that all their residents have reliable access to the internet. **This factor is a critical step towards determining MSMEs' ability to digitalize and participate in the digital economy. Moreover, a lack of internet connection can significantly limit MSMEs' ability to reach broader markets and consumers.**

The Partnership's research has previously emphasized internet access, and more broadly ICT infrastructure, as a crucial building block that enables MSME capacity and further unlocks their potential.

ICT, or information and communications technology infrastructure, refers to the equipment, software and systems that are required to facilitate digital business processes. This encompasses access to the internet, personal computers, workplace software, e-commerce platforms, and others.

In Vietnam, the Partnership's research emphasized that "reliable and future-ready ICT infrastructure" can be a foundation for MSME innovation and market expansion.[1] Similarly, in Indonesia and the Philippines, investment into ICT-related infrastructure was emphasized as a necessary support for MSMEs to enhance their human capital and market access. Meanwhile, in Peru, the topic of internet access was discussed in relation to MSME support services, and enhancing the accessibility of information on various types of MSME support.

[1] Lan H. Phan, Hieu M. Tu and Thomas Borgert, *Innovation Policy to Promote MSME Growth: Best Practices and Implications for Vietnam and Other APEC Developing Economies* (Vancouver: Asia Pacific Foundation of Canada, 2018), 42.

A strong ICT infrastructure is critical to the successful digital transformation of MSMEs, and entrepreneurs' resulting participation in the digital economy. Given this, how robust is their access to the internet? In the Partnership's national surveys, entrepreneurs were asked about whether ICT, or technical infrastructure, is a barrier for their MSME.[2]

In each of the focus economies, at least a fifth of the survey population said that technical infrastructure was either a barrier or high barrier to their MSME's success. The highest rate was in the Philippines, where 34 per cent of surveyed Filipino entrepreneurs said that internet connection is one of the problems for their business. Meanwhile, this number was 27 per cent in Indonesia, 23 per cent in Vietnam, and 22 per cent in Peru.

It is vital that no entrepreneurs and MSMEs are left behind in terms of internet access.

POLICY AREA 2: DIGITAL TOOLS – SOCIAL MEDIA AND WEBSITES

The pandemic has significantly restricted in-person business, and has pushed business interactions with consumers into online spaces. MSMEs therefore need the resources and support to help them optimize their usage of social media and websites, among other tools, to conduct and promote their business.

One key component of MSMEs' digital transformation is their engagement through social media and company websites. The ubiquity and wide accessibility of social media makes it a highly impactful tool in the digital economy. Social media also provides businesses with the ability to disseminate information to a wide and targeted audience, facilitate interactions with consumers, and even shape consumers' preferences. Most of all, social media is a low-cost tool, and is typically available for free to businesses.

[2] Technical infrastructure here refers to internet reliability and accessibility, and if survey respondents experience unreliable, inaccessible, or too costly internet access.

Photo by camilo jimenez on Unsplash

Another important component of MSMEs' digital presence is a company website. This digital tool is often the primary form of engagement that a business has with its consumers, and provides key information about a company to clients, such as a business' list of goods/services and contact details. In turn, having a website can add credibility to a business by showing that it has an established presence online.

It is crucial to support entrepreneurs in the effective use of digital business tools, such as social media and websites. It would be beneficial for APEC governments and large corporations to assist MSMEs with information-sharing and provide them with training in digital strategy development, as well as how to use platforms to entrepreneurs' advantage. Moreover, data on MSMEs' use of social media will be especially crucial for informing policies and initiatives to assist enterprises in digitalization, and thereby targeting initiatives according to MSMEs' needs.

The importance of digital business tools was especially emphasized in the Partnerships' research in Indonesia and the Philippines toward expanding market access. In a research study by the Asian Institute of Management on the importance of SME Business Associations, the authors emphasize that "although the use of internet-based sales platforms may require significant investments from SMEs as well as notably different skill sets and marketing expertise, SMEs lose out on a significantly growing market if they do not engage in online product distribution and display."[3] Moreover, the authors suggest that business associations can help MSMEs engage in the digital economy by providing them with resources and support.

The Partnership's research on MSMEs in Indonesia's digital economy also explores the role of policymakers. Here, the author argues that policymakers should ideally focus on "increasing mobile device penetration and infrastructure, supporting existing and nascent e-commerce platforms with the rollout of digital wallets" and their accompanying regulation and enforcement mechanisms. In doing so, the ubiquity and accessibility of these digital tools can become more widespread for entrepreneurs.

In understanding the wide variety of digital tools available, the digitalization of MSMEs will also create new challenges for MSMEs, including encountering new regulations and security concerns on online platforms The Partnership's research in the Philippines has recommended that government agencies and business organizations can help MSMEs navigate the digital economy by conducting compliance training and information seminars on the usage of digital tools. APEC governments will also need to consider appropriate regulatory frameworks for data protection and security.[4] It is important that governments

[3] Jamil Paolo Francisco and Tristan Canare, *The Challenges to SME Market Access in the Philippines and the Role of Business Associations* (Vancouver: Asia Pacific Foundation of Canada, 2019), 34.

[4] In the latter example, interoperability, or the ability of different computerized systems to connect, communicate and interface with one another will be key as digital payment systems will become a dominant method of payment compared to cash or other traditional forms of payment typically used by informal enterprises.

create policies that ensure MSMEs and entrepreneurs are equipped with the digital literacy to access new technologies, as well as ensure that there are transparency standards and adequate disclosure of digital rights.[5]

In addition, MSMEs will furthermore need to learn and adapt to conducting their traditional businesses in virtual spaces. The Partnership's national survey data assesses entrepreneurs' existing usage of social media and company websites prior to the pandemic. How did businesses utilize social media before the pandemic, and how can this existing usage be optimized for the new business environment during the pandemic?

The Partnership's national survey data assesses entrepreneurs existing usage of social media and company websites prior to the pandemic. **The highest rate of social media usage was in Peru**, where almost three-quarters of surveyed entrepreneurs said that they used at least one social media application for their MSME. In comparison, 60 per cent of Vietnamese respondents said the same, while this number is almost 50 per cent for Filipino respondents and a third of Indonesian respondents.

In terms of platforms, Facebook is the most popular social media platform. The majority of respondents in Peru (64 per cent), Vietnam (60 per cent) and the Philippines (44 per cent) said their business was active on Facebook. Usage of Facebook in these economies outpaces other platforms like Twitter or Instagram, showing the ubiquity and wide usage of Facebook among entrepreneurs. In contrast, **the majority of Indonesian respondents (29 per cent) said they use WhatsApp for their enterprise**.[6]

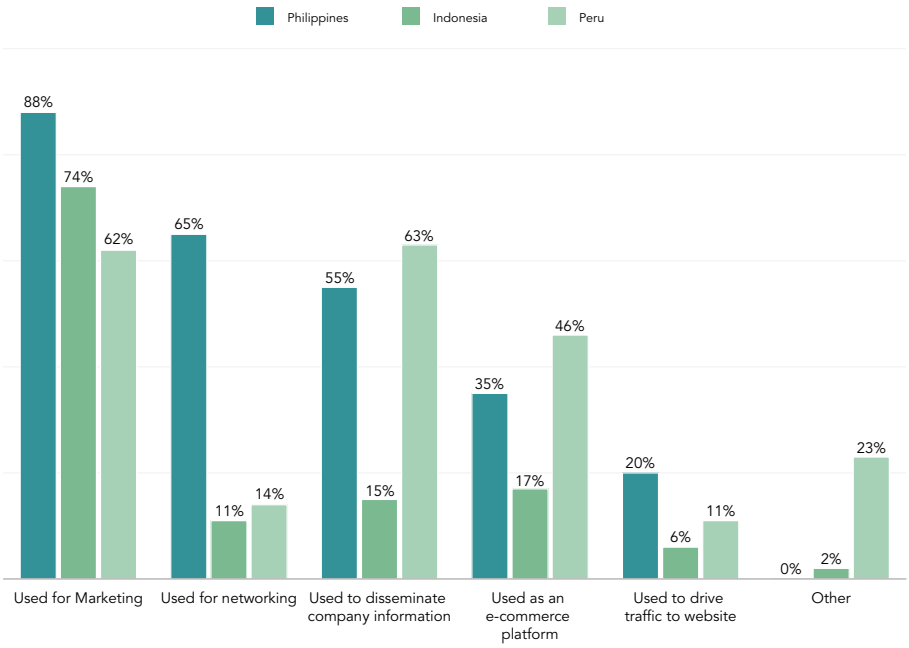
The most widely cited reason for social media usage is for marketing.[7] Only a minority of users said they use social media platforms for e-commerce.

[5] Global Partnership for Financial Inclusion and *G20, G20 Policy Guide: Digitisation and Informality - Harnessing Digital Financial Inclusion for Individuals and MSMEs in The Informal Economy*, Global Partnership for Financial Inclusion, 2018.

[6] WhatsApp here is classified as 'Other', given that the platform was not commonly asked about across the three economies, and only in Indonesia and Peru.

[7] This question was not asked in the national survey in Vietnam.

FIGURE 1. Purposes for Using Social Media Applications



Considering entrepreneurs' usage of websites, in contrast to social media, this is very low. Almost all Indonesian respondents said their MSME does not have a website, while this number is 66 per cent for Philippine respondents, 59 per cent in Vietnam, and 56 per cent in Peru.

For the few that do utilize websites, the most widely mentioned reason for having one is to provide the company's contact information for clients. While these results may have changed since the time of each national survey, this finding still demonstrates the overall low usage of websites by enterprises.[8]

Altogether, this data demonstrates that social media and website usage in MSMEs' digital strategies can be optimized for the digital "new normal" mode of business during the pandemic. It is critical that entrepreneurs and MSMEs receive support and training according to their needs to build their capacity in digital business strategies.

[8] The Partnership conducted the national survey in Vietnam in 2017, in the Philippines in 2018, and in Peru in 2019.

POLICY AREA 3: DIGITAL UPSKILLING AND ONLINE LEARNING APPLICATIONS

The topic of online learning applications was also discussed throughout the Partnership's work in the focus economies. Even prior to the pandemic, online learning applications already played a substantial role in business development and employee upskilling. For example:

- In Indonesia, the Partnership's research argued that "Indonesia's national, regional, and local governmental institutions need to increase the amount of access to online educational resources regarding business management and digital skills" in order to effectively build MSME capacity in the digital economy.[9]
- In Peru, the Partnership's national survey report recommended that MSMEs would benefit from expanded online courses provided through existing platforms such as Emprendedor Peruano, provided by the Ministry of Production of Peru for MSME support services.
- In the Philippines, the Partnership's research specifically noted the wide discrepancy in usage of online learning applications between men and women, as well as older and younger entrepreneurs. This report recommended that the Philippine government "improve [accessibility to] online learning applications (ranging from mentor matching to platforms about accessing markets) [for] aspiring women and older entrepreneurs."[10]

An important consideration in digital upskilling is the question of service providers, and which actors are responsible in MSMEs' digital training. The Partnership's research has especially highlighted the role of governments in ensuring the availability and accessibility of online resources and services for entrepreneurs through existing and well-known platforms. It is crucial that governments, in addition to these efforts, also work with local partners, including business associations, educational institutions, and social media companies to enhance knowledge and availability of digital upskilling opportunities.

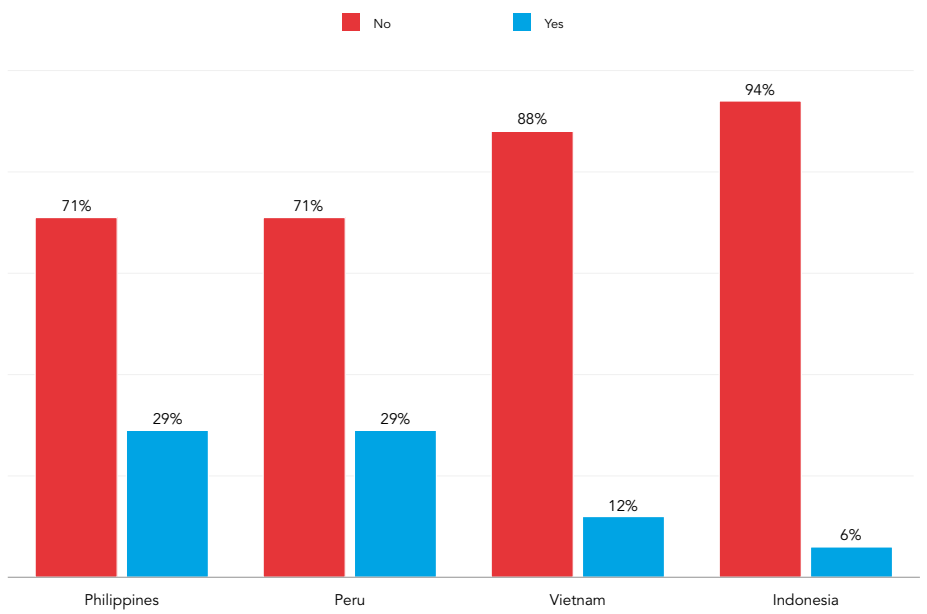
Given these previous findings, how did entrepreneurs utilize these online learning applications before the pandemic, and what gaps or priorities in online learning do pre-pandemic trends reveal?

Overall, the usage of online applications for business training is not widespread among surveyed entrepreneurs. While a considerable number of survey respondents said they have used online learning applications in Peru and the Philippines, there is a consistently low usage of these platforms in all four economies (see graph below).

[9] Alex Capri, *Micro and Small Businesses in Indonesia's Digital Economy*, (Vancouver: Asia Pacific Foundation of Canada, 2019), 27.

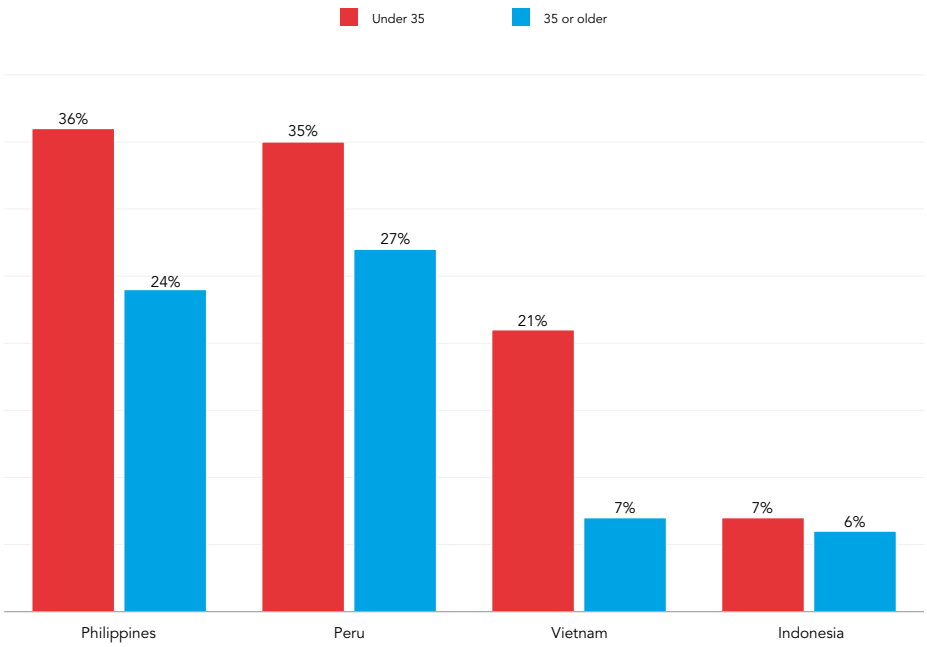
[10] 2018 *National Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs through Market Access* (Vancouver: Asia Pacific Foundation of Canada, 2018), 2.

FIGURE 2. Share of Entrepreneurs that Used Online Applications to Learn New Business Skills



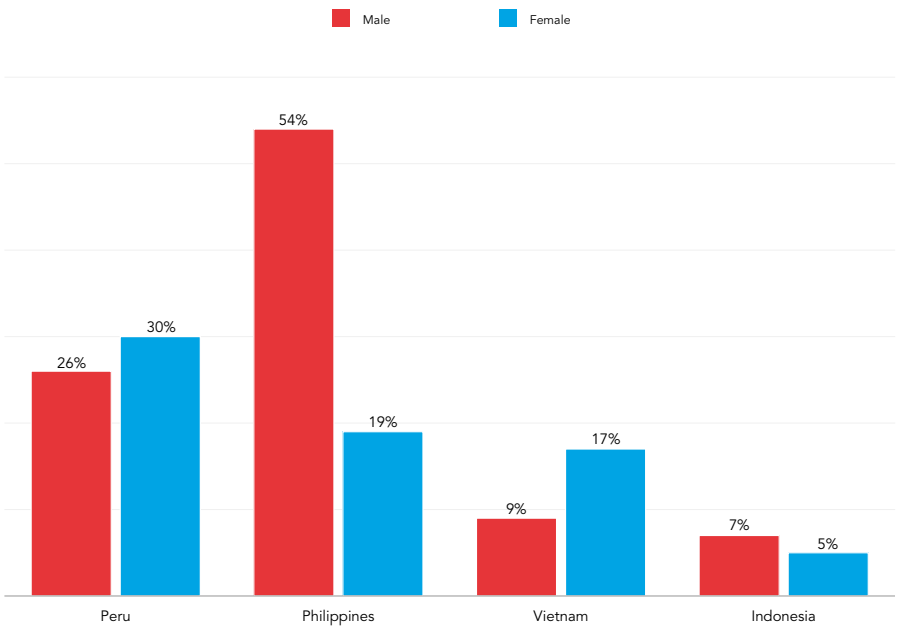
Age appears to be a major driver of the usage of online learning applications. In the Partnership's surveys, a consistently higher number of respondents under the age of 35 years old said they used online applications to learn, in comparison with their older counterparts. In thinking about expanding the reach of online applications, both access to online courses as well as the technical knowledge to use these platforms should be taken into consideration, with further help required for those who need additional technical assistance.

FIGURE 3. Use of Online Learning Applications, by Age



On the other hand, in terms of gender, the results are more varied. In the Philippines, men were more likely to say that they have used online applications to learn when compared with women (54 per cent compared to 19 per cent). In contrast, in Peru and Vietnam, slightly more women than men said they used online applications to learn and upskill.

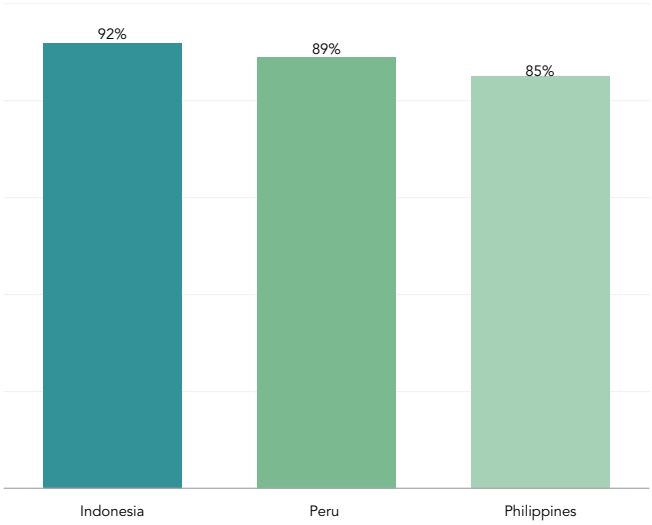
FIGURE 4. Use of Online Learning Applications, by Gender



As for what entrepreneurs learned, the majority of respondents in Indonesia and the Philippines (74 per cent and 71 per cent, respectively) said they used online learning applications to learn about marketing.

Moreover, while only a minority of survey respondents have used online learning applications, the majority of users said that these had a positive impact on their business practices. This indicates that investing in online learning applications will likely reap benefits for MSMEs.

FIGURE 5. Online Learning had a Positive Impact on Business Practises for Most Users



Note: Only includes respondents who said they used online applications to learn new business skills

It is crucial that during the pandemic and its limitations on in-person business, entrepreneurs are made aware of the resources and benefits of having a digital business strategy. It is important that entrepreneurs and MSMEs receive help transitioning to online platforms such as social media, and clear information about the benefits of these platforms for their businesses and clients.

SECURING MSMES' ACCESS TO FINANCING

Securing sufficient and sustainable financing is an ongoing challenge for many MSMEs. The Partnership's on-the-ground research in Indonesia, Peru, the Philippines and Vietnam has consistently noted financing as the main barrier to success for MSMEs. Over half of surveyed entrepreneurs in each economy noted financing as either a "barrier" or "high barrier" to their enterprise's success. The Partnership's research has in turn highlighted that financing is linked to many other issues in MSME capacity building. Without sufficient funds or access to financing, entrepreneurs are unable to expand their markets, improve human capital, and undertake digital transformation, among other areas.

Now during the COVID-19 pandemic, as restrictions have significantly limited in-person business, MSMEs are especially in need of funding to survive and maintain their business operations. The long-term goals of post-pandemic recovery policies should ensure that funding is sustainable so that MSMEs can thrive during and after the pandemic.

Main recommendation: Governments must ensure that finance and various funding mechanisms are accessible and targeted to the distinct needs of MSMEs and entrepreneurs (e.g., by enterprise size, industry, gender and age). These needs can be assessed through data collection.

Policy actions regarding financing include the following:

1. Facilitate more favourable terms for bank loans and other forms of formal financing, to accommodate the small resource base of many MSMEs that, as a result, may be risk averse to acquiring loans.

2. Ensure that entrepreneurs are aware of and understand the various types of financing available, as well as their benefits. This includes sufficient promotion of financing options, including government grants and financial services, through partnerships with MSME business associations, banks and investors.

Photo by Obi Onyeador on Unsplash

3. Work with banks, investors and MSME business associations to provide targeted forms of funding according to different MSMEs' needs and capacity (e.g., blended financing structure with public and private funding).

The following section will focus on the number of entrepreneurs seeking financing for their MSME, and the types of funding that they want to obtain.

POLICY AREA 1: SEEKING FINANCING

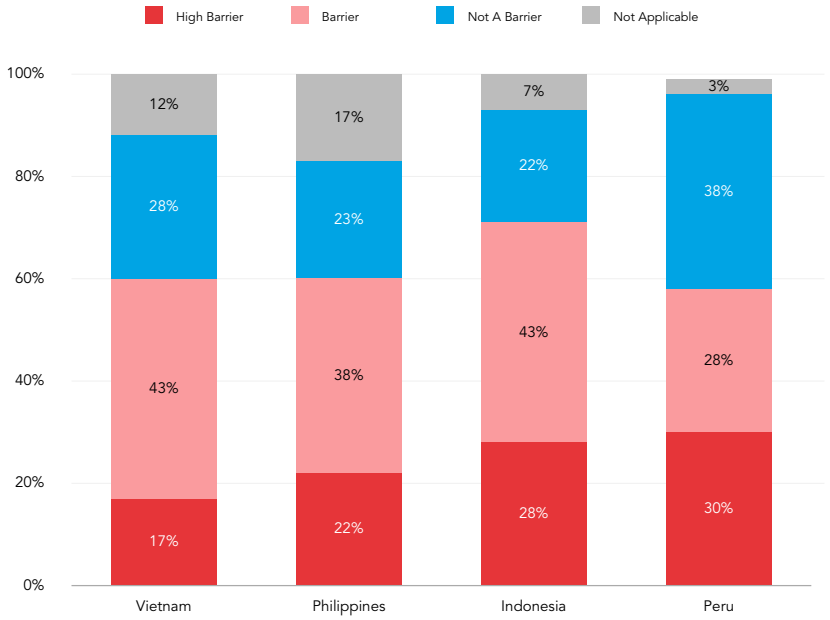
According to the International Finance Cooperation, approximately 40 per cent of MSMEs in developing economies have a combined financing need of US$5.2 trillion every year.[11] Compared to large corporations, the small scale and early-stage status of many MSMEs can make access to bank loans difficult. For example, in Peru, only about six per cent of registered MSMEs are able to access the regulated financial system. Moreover, many MSMEs are risk-averse and face high lending rates for bank loans, further making this funding inaccessible to entrepreneurs. As a result, many MSMEs depend on informal funding for their business operations, with many entrepreneurs self-financing their operations.

Similarly, the issue of financing is persistently mentioned in the Partnership's national survey as a barrier for MSME success. In all four economies, financing is reported as the most common barrier to MSMEs. However, the majority of respondents say they were not seeking financing at the time the survey was taken. For example, in Indonesia, although 70 per cent of survey respondents noted financing as a barrier, only 23 per cent of respondents said they were seeking financing. The national survey report argues that this discrepancy indicates respondents' reliance on self-financing and family loans, and that obtaining formal financing is seen as a "secondary option with high barriers."[12] **Overall, accessing formal financing through banking institutions is a fundamental challenge for MSMEs, hindering enterprises from further building their capacity in human capital, market access, or otherwise.**

[11] World Bank, "Small and Medium Enterprises (SMEs) Finance" https://www.worldbank.org/en/topic/smefinance.

[12] *2018 National Survey of Entrepreneurs and MSMEs in Indonesia: Building the Capacity of MSMEs Through Human Capital* (Vancouver: Asia Pacific Foundation of Canada, 2018), 15.

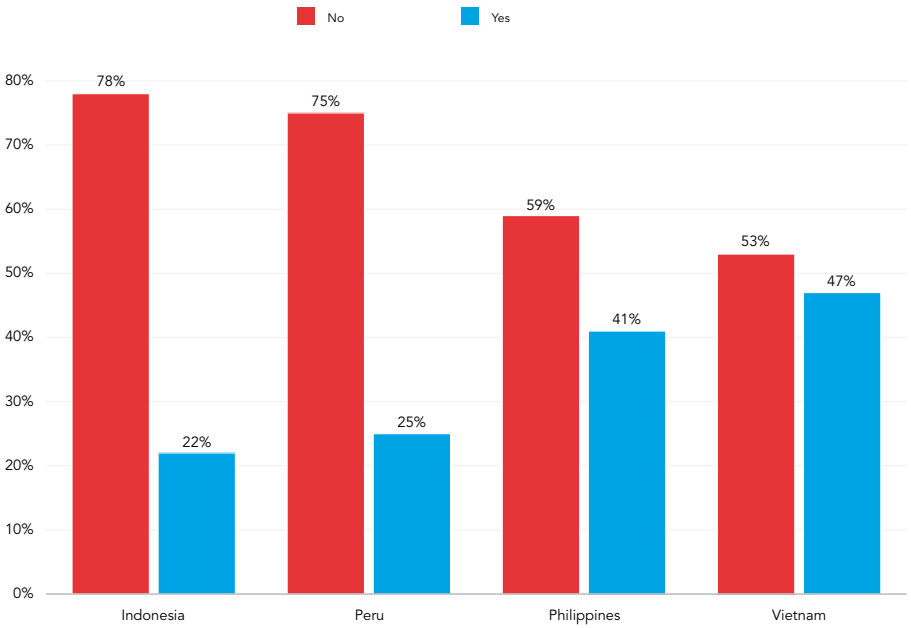
FIGURE 6. Financing as a Barrier for MSMEs



The Partnership's survey data presents pre-pandemic numbers on several issues, namely how many surveyed entrepreneurs are seeking formal financing at the time of the survey, and the key demographic factors that appear to influence these numbers. Considering this data, how do entrepreneurs view the availability and importance of financing for their MSME?

As mentioned, the majority of respondents across the four economies said they were not seeking financing at the time of the survey. Less than half of the survey population in each economy said they were seeking financing, with the lowest number seen in Indonesia.

FIGURE 7. Share of Companies Seeking Financing



Despite this result, there is a consistent and substantial portion of the survey population who reported that they were seeking financing. At least a fifth of survey respondents in each economy said this, with the highest number seen in the Vietnam survey population (47 per cent).

More entrepreneurs in micro-enterprises said their business was not seeking financing, compared with those in small and medium enterprises. While the difference is small, this finding still poses the need for targeted outreach to micro-enterprises, which have far fewer resources and human capital.

Gender appears to be a significant factor in financing. Across all focus economies, more male respondents reported that their MSME was seeking financing than women. This trend can especially be seen in the national surveys in Vietnam and the Philippines. In Vietnam, 53 per cent of male respondents said they were seeking financing, compared to 39 per cent of women. Similarly, in the Philippines, these numbers are 51 per cent of men and 37 per cent of women.

Additionally, more respondents with post-secondary education said their enterprise was looking for funding than those without higher education. This gap is particularly visible in the Philippines and Peru. In the Philippines, 53 per cent of entrepreneurs with post-secondary education said they were seeking financing compared to 32 per cent of respondents without. In Peru, these numbers are 28 per cent of respondents with higher education and nine per cent of without.

Overall, it is crucial that the benefits of formal financing are highlighted, to address entrepreneurs' concerns and thereby give them the financial tools needed to build up their enterprise. The benefit of formal funding must especially be highlighted to micro-enterprises, women entrepreneurs, and entrepreneurs without higher education.

POLICY AREA 2: TYPES OF FINANCING

MSME financing can come from a variety of sources, including bank loans, loans from nonbanking financial companies, microfinance institutions, venture capital, government grants, informal financing (e.g., family loan), and an entrepreneur's own funds. As mentioned, though MSMEs may have a variety of financing options, a large number of these enterprises depend on self-financing or funds from friends and family. This is especially true of early-stage MSMEs that do not yet have a robust resource base. Moreover, MSMEs are less likely to obtain private sector investment compared to large enterprises, due to their size, high lending interest rates, and a lack of investor trust.

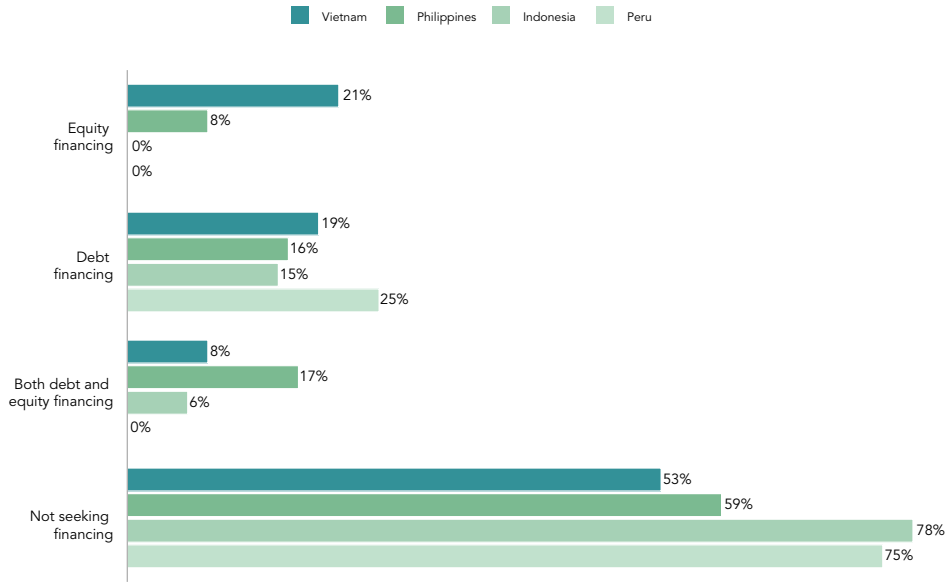
The availability of financing for MSMEs is also shown to vary considerably in the Partnership's focus economies. Evidence of this can be seen in data from the Global Entrepreneurship Monitor (GEM) on Entrepreneurial Framework Conditions in each economy. Financing in GEM data considers the availability of sufficient funds for MSMEs including sources such as bank loans and government grants.

According to this data, there is a relatively higher level of financing in Indonesia, which has a score of 3.24 out of a scale of one (highly insufficient) to five (highly sufficient).[13] In contrast, there is a relatively lower level of financing in Peru, which has a score of 2.18.[14] In between these two scores, the Philippines has a score of 3.09[15] while Vietnam sits at 2.27.[16] Overall, this data indicates that in addition to MSMEs' hesitance to seek formal financing, there may not be sufficient financing for them to access to begin with.

In the Partnership's national surveys, respondents were specifically asked about two types of funding, including debt financing and equity financing.[17] Debt financing refers to when companies sell debt instruments, such as bonds, to investors to raise funds. On the other hand, equity financing refers to companies issuing stock shares for the same purpose.

There is a notable preference for debt financing among survey respondents. For respondents in Peru and Indonesia that indicated that they were seeking financing, most said they were seeking debt financing. In contrast, respondents in Vietnam said they were mostly seeking equity financing, while respondents in the Philippines wanted both debt and equity forms of financing.

FIGURE 8. Types of Funding that Companies are Seeking



[13] Global Entrepreneurship Monitor, "Entrepreneurial Framework Conditions – Government Programs," Accessed March 30, 2021, https://www.gemconsortium.org/data.

[14] Global Entrepreneurship Monitor, "Entrepreneurial Framework Conditions – Government Programs," Accessed March 30, 2021, https://www.gemconsortium.org/data.

[15] Global Entrepreneurship Monitor, "Entrepreneurial Framework Conditions – Government Programs," Accessed March 30, 2021, https://www.gemconsortium.org/data.

[16] Global Entrepreneurship Monitor, "Entrepreneurial Framework Conditions – Government Programs," Accessed March 30, 2021, https://www.gemconsortium.org/data.

[17] Peruvian respondents were also asked about capital financing, impact investments, grants and subsidies, donations or charitable contributions, and non-traditional funding sources (e.g.: angel investors, crowd-funding, etc.).

More recently in the Partnership's national survey in Peru, survey respondents were asked about other types of funding, including capital financing, non-traditional funding sources such as angel investors or crowd funding, and impact investment. The most cited options include debt financing (17 per cent of respondents), capital financing (15 per cent), and impact investments (four per cent). Still, the majority of the survey population (57 per cent) said they were not seeking financing.

Taking these results into account, it is crucial to note that different types of MSMEs require targeted forms of funding. The type of funding that enterprises require may be best determined by the maturity of the MSME (e.g., early stage or established), the business model and mandate, and entrepreneurs' knowledge and networks.

The need for targeted funding is best demonstrated in the Partnership's research on financing structures for Peruvian social enterprises. Social enterprises are broadly defined as businesses with a social, environmental, or community-driven objective. In the Peruvian context, Kunan Peru, a local social entrepreneurship hub, specifically defines social enterprises as businesses with four key characteristics: an explicit social or environmental mission, a sustainable business model, an innovative and systemic solution, and a method to measure its impact.[18]

In contrast to other MSMEs, social enterprises must balance profit generation with their progress toward a social or environmental goal, and ensure success in both areas. The specific mission of social enterprises thus requires specific financial support. In the research study *Financing for Social Enterprises in Peru,* Carl Black notes the types of financial support that would best support Peruvian social entrepreneurship.

Black argues that access to financing is limited for social enterprises, particularly those in their early stages. Social entrepreneurs have a high degree of reliance on self-financing and funds from friends and family to start up their enterprise. Additionally, there is limited government support for start-ups and innovation in Peru, and their early-stage status dissuades ecosystem investors. In turn, social entrepreneurs feel restricted by investors' high interest lending rates.

To ameliorate these conditions, Black argues that social enterprises would benefit from blended finance that supplements existing public financing mechanisms with private sector funding. These blended financing structures could be implemented through direct contracts with public and private sector intermediaries, such as through government grants and angel investors. Furthermore, impact investment structures, where funding strategies are linked to a social or environmental impact, are essential and effective mechanisms for social enterprises.

[18] Alexandra Ames Brachowicz and Carla Grados Villamar, *The Existing Landscape of Social Entrepreneurship in Peru* (Vancouver: Asia Pacific Foundation of Canada, 2020), 6.

However, these financing mechanisms do not exist in a vacuum. Black emphasizes that these financing instruments must also be complemented with government promotion and support for entrepreneurship and social enterprises.

Overall, this section emphasizes that greater awareness of types and benefits of various funding options is needed to increase MSMEs' access to financing. Promotion of financing options must specifically include information on requirements for obtaining different types of funding, the specific benefits of each option, and the fit of financing options to enterprises' needs and capacity. In tandem with this, this section suggests that MSMEs would benefit from more targeted forms of funding, according to their size and business model, among other factors. For example, MSMEs that operate as social enterprises would benefit from impact investment, which ties funding to the enterprise's social or environmental impact.

ENSURING ACCESS TO MSME SUPPORT

MSME support, such as business advisory services and government policy support, can greatly mitigate the impact of barriers to MSMEs' success. The Partnership's survey research has shown that in addition to financing and resources, entrepreneurs can greatly benefit from support services and programs that help them determine their business needs, identify potential solutions and resources required to address these needs, and strategize for new business opportunities. Moreover, the Partnership's research notes that this support can help build MSME capacity by helping entrepreneurs expand their entrepreneurial network and pointing them toward accessible financial resources, among other needs. MSME support has become crucially important during the COVID-19 pandemic, as MSMEs grapple with a reduction in their sales, resources and ability to conduct business.

Main recommendation: Governments are encouraged to invest more resources in the marketing and information distribution of MSME support programs and services, and targeting these resources to women and youth entrepreneurs.

Policy actions regarding MSME support include the following:

1. Review the marketing, promotion and accessibility of support initiatives to ensure that more MSMEs are aware of the support and resources available to them.

2. Ensure that the promotion of support services is targeted, first toward specific demographic groups that are less likely to seek out or receive this information, such as women and youth entrepreneurs, and second toward entrepreneurs in specific industries, with information on the fit of MSME support to their MSME.

3. Incorporate plans and investment for MSME support services into national industry support plans, which could save government resources and reduce policy overlap for more efficient delivery of services.

This section will consider the pre-pandemic accessibility and usage of MSME support, namely general business support services (e.g., networking, market intelligence), and the support programs, policies and initiatives provided by APEC governments that are targeted toward MSMEs (e.g., export incentives, incubator programs).

POLICY AREA 1: BUSINESS SUPPORT SERVICES

One vital component of MSME support is business support services, which provide a variety of resources and information to entrepreneurs in areas such as networking and financing. In the Partnership's surveys, entrepreneurs are asked about their usage of several business support services, including in-person

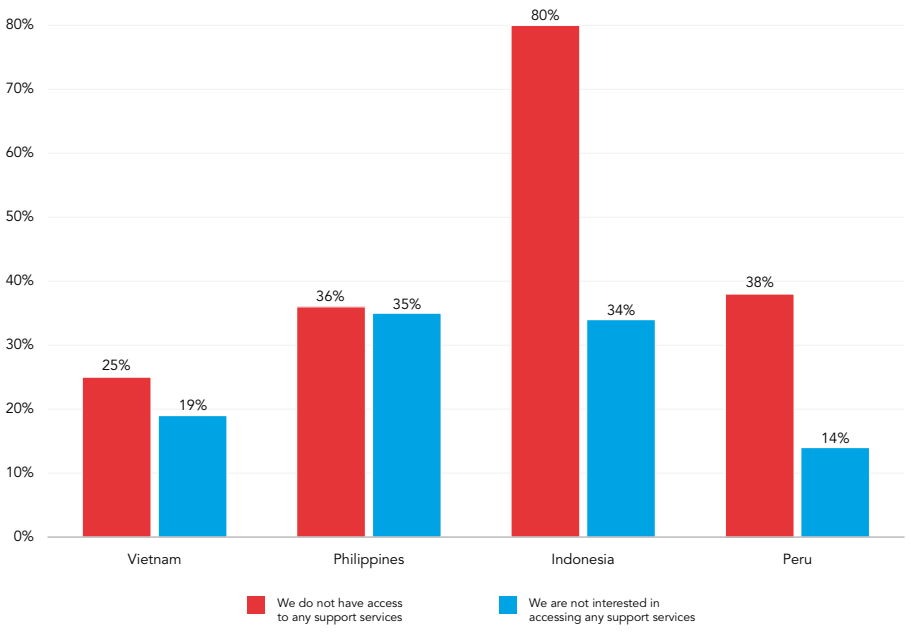
business advisory services (e.g.: mentorship, business strategy guidance, etc.), online business advisory services (e.g.: virtual mentorship), research and technology development services (e.g.: patent advice), networking services (e.g.: peer network events), financial support services (e.g.: advice on sourcing and securing funding or financing), and market information (e.g.: information pertaining to the demand for your company's product or service).

Throughout the Partnership's research in all four focus economies, the lack of access and awareness of MSME business support services is consistently discussed. The national survey reports in turn have issued recommendations for governments of APEC economies and their business communities to invest in increasing the awareness of these services for MSMEs. Some key recommendations contained in these reports include building and maintaining strong coordination between governments and business communities to help MSMEs utilize existing services, and showing entrepreneurs the benefits of accessing these often free or low-cost resources to build their MSME's capacity.

Overall, at least a quarter of survey respondents in each focus economy said that they did not have access to support services. This number ranges from 25 per cent of respondents in Vietnam to a substantial 80 per cent of respondents in Indonesia.

On the other hand, a significant number of respondents in each focus economy also said they were not interested in accessing these services. This number ranges from 14 per cent in Peru to 35 per cent in the Philippines. This finding prompts further investigation into the reasons why MSMEs may not perceive a need to improve their access to support services.

FIGURE 9. Lack of Access to Support Services



For MSMEs that did use support services, the most commonly accessed one is in-person advisory services, particularly for respondents in Vietnam, the Philippines and Indonesia. This demonstrates that survey respondents from these economies are more accustomed to physical appointments and offices, which may pose an issue in the transition to online advisory services.

In terms of online business advisory services, the highest usage of these services can be found in the Vietnam survey population (21 per cent). This number is especially significant given that the survey was taken in 2017, and there is potential for an increase in usage since that time. **However, the low usage of online advisory services in other economies prompts consideration of how to make the transition to these services accessible and effective during the pandemic.**

Looking at tackling the issue of financing, specific services to help MSMEs find new sources of financing are utilized by just a minority of respondents. At least 15 per cent of the survey population in Peru, the Philippines and Vietnam reporting using financial support services. However, close to no respondents in Indonesia said they used these services.

POLICY AREA 2: GOVERNMENT PROGRAMS AND POLICY INITIATIVES

In addition to business support services, governments have also provided support programs, policies and support for entrepreneurship, such as wage subsidies, tax deferrals, lending credits, incentives for exporting and R&D, and digitalization services. These more specific forms of support can complement general business services by targeting the specific needs of MSMEs in areas like expansion to international markets and business innovation. Moreover, government programs may expand accessibility of MSME support for entrepreneurs, such as by providing free online courses for entrepreneurs to upskill in the area of their choice, and grants for financing that do not require entrepreneurs to take on financial risk. When comparing the availability of government support programs in the four focus economies, GEM data on this aspect shows that Indonesia has a relatively higher level of government support for entrepreneurship. Indonesia is then followed by the Philippines, Peru and Vietnam.[19]

In the Partnership's national surveys, entrepreneurs are asked about whether they accessed government-provided support programs and initiatives. In Indonesia, Peru, and the Philippines, respondents were asked about government programs that support various areas of entrepreneurship.[20] Filipino respondents were also asked about specific laws and international agreements related to market access and exporting.

[19] Global Entrepreneurship Monitor, "Entrepreneurial Framework Conditions – Government Programs", retrieved from: https://www.gemconsortium.org/data#

[20] A complete list of these policies can be found in the Appendix of this paper.

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Overall, there is also a consistently low level of awareness among surveyed entrepreneurs of the types of government-provided support for MSMEs.

In the Philippines, at least a third of respondents said they were unaware of the various policies, laws and international agreements that support entrepreneurship, as well as international business expansion. For example, over a third of respondents said they were unaware of the Go Negosyo Act, a key piece of legislation that established "Go Negosyo Centers" that provide entrepreneurs with a one-stop shop for business support services.[21]

A similar situation can be seen in Peru. Over half of respondents said they were unaware of the majority of MSME support programs mentioned in the survey. Crucial online platforms that serve as information and applications hubs for various government-provided support services, like Produce Virtual and the Digital Kit, are underutilized by Peruvian entrepreneurs.[22]

In contrast, relatively more Indonesian respondents said they were aware of government support programs. The most well-known is the Entrepreneur Program provided by the Ministry of Cooperatives and MSMEs. However, despite the seeming widespread knowledge of this program, just three per cent of respondents utilized it, while three quarters said it was not relevant to their program.[23]

The Partnership's pre-pandemic findings appear to be reflected in more current findings on MSMEs' usage of government-provided support in response to the COVID-19 pandemic. In its October 2020 report on the economic status of East Asia and the Pacific, the World Bank found that the majority of firms did not receive policy support provided by governments in response to the pandemic.[24] A significant number

[21] Asia Pacific Foundation of Canada, *2018 Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs Through Market Access*, (Vancouver: Asia Pacific Foundation of Canada, 2018), 29.

[22] *2020 National Survey of Entrepreneurs and MSMEs in Peru: Building the Capacity of MSMEs through Social Entrepreneurship* (Vancouver: Asia Pacific Foundation of Canada, 2020), 38-39.

[23] Asia Pacific Foundation of Canada, *2018 Survey of Entrepreneurs and MSMEs in Indonesia: Building the Capacity of MSMEs Through Human Capital*, (Vancouver: Asia Pacific Foundation of Canada, 2018), 25.

[24] The World Bank, From Containment to Recovery: Economic Update for East Asia and the Pacific, (Washington, DC: October 2020), retrieved from: https://www.worldbank.org/en/region/eap/publication/east-asia-pacific-economic-update

of firms in this study said that they were unaware of this support: in Indonesia, over half of survey respondents said they were unaware of policy support for entrepreneurs, while 27 per cent in Vietnam and a fifth in Philippines said the same.

It is imperative that relevant APEC economies increase awareness of support programs, policies and initiatives intended for MSMEs and entrepreneurs, to maximize the impact of this support. Governments must especially target promotion of this support toward women and youth entrepreneurs and their MSMEs. In addition to raising awareness, it is vital that governments incorporate a review process with entrepreneurs of the initiatives that it provides, in order to ensure that these programs meet and address the needs of entrepreneurs in MSMEs.

Another important consideration for APEC governments is how to reach MSMEs in the informal sectors, and how support can be extended to informal and unregistered enterprises. The Partnership's work has so far focused on formalized MSMEs, which limits the applicability of its research to registered businesses. In order to extend support to informal enterprises, and ensure that their unregistered status is not an overbearing obstacle for them to access services, APEC economies, as well as MSME capacity-building projects like the Partnership, need to target informal enterprises and have access to networks of informal enterprises.

Overall, the effectiveness of MSME support available in APEC economies is undercut by the lack of awareness and accessibility to these services and programs. The Partnership's national surveys consistently found an underutilization of key support services and initiatives by survey respondents, prompting several recommendations on increasing promotion of these services for entrepreneurs. This section also emphasizes that MSME business associations and entrepreneurial networks play a vital role in spreading information about these resources for MSMEs. In addition, there may be some preference for in-person advisory services, which prompts considerations of how to successfully transition services onto online platforms that are easily accessible to entrepreneurs.

ENCOURAGING BROADER MARKET ACCESS

Given their size, MSMEs may primarily see themselves as a local business serving their community. It is important that MSMEs and entrepreneurs are encouraged to see themselves as having the potential of becoming regional and global businesses, beyond their local or national market.

However, the Partnership's research has shown that the majority of MSMEs do not have aspirations to expand abroad. In order to expand into new markets, MSMEs need robust resources and operations, and assistance from their government and business community. The Partnership's research recommends that first, MSMEs need the necessary building blocks of sufficient funding, knowledge and support on how to effectively utilize their resources, and a cohesive online presence. Once MSMEs have these components, they will then have more capacity to expand their markets. Second, given their size and limited resources, the Partnership's research has argued that MSMEs need help from business associations, government actors, and other entrepreneurial actors to gain international experience, become familiar with foreign markets and exporting regulations, and build new networks in their target markets.

Main recommendation: Entrepreneurs and MSMEs must be supported by government actors in gaining international market experience and expanding their markets overseas. This includes investing in clear promotion of international opportunities, and in entrepreneurs' upskilling to participate in international markets.

Policy actions to encourage broader market access include the following:

1. Clear communication of the benefits of market expansion, done in collaboration with the local business community, MSME business associations, and other relevant stakeholder/partner organizations
2. Provide clear and updated information to entrepreneurs on the requirements and regulations of overseas market expansion and exporting
3. Invest in MSMEs' experience for market expansion, such as encouraging entrepreneurs to gain international work experience or foreign education or training credentials, and including MSMEs in international opportunities such as trade missions or conferences.
4. Ensure that entrepreneurs are aware of support programs and incentives for exporting and market expansion, as well as the requirements needed to utilize this support.

This section will focus on two aspects of entrepreneurs' potential to expand their markets. In order to effectively encourage MSMEs to expand their markets, two important factors must be considered: (1) their existing international experience, and (2) their intentions to export their goods and services.

POLICY AREA 1: GAINING INTERNATIONAL EXPERIENCE

In order to effectively expand MSME's reach to international markets, entrepreneurs must first gain international experience. This experience would ideally familiarize entrepreneurs with regional and international markets, and equip them with the skills and requirements needed to expand their MSME's reach, including entrepreneurial networks and exporting regulations. Entrepreneurs can gain their international experience in various ways, such as obtaining work or study experience abroad, participating in international mentorship or exchange programs for entrepreneurs, and joining in-person or virtual trade missions organized by their host government.

Having international experience can have multiple benefits for MSMEs. First, entrepreneurs will be able to see opportunities beyond their local market, and assess the feasibility of these for their MSME. Second, by gaining experience abroad, entrepreneurs will be able to understand their new markets first-hand by interacting with potential partners and consumers. Though in-person interactions are currently restricted due to the pandemic, networking and mentorship can be transitioned to virtual meetings. In doing so, however, access to internet and ICT technologies must be taken into consideration in relevant policies. Moreover, by gaining international experience, entrepreneurs will be able to network and exchange ideas with new partners, and gain new insights on how to innovate their MSME.

Investing in entrepreneurs' international experience can have several long-term benefits for APEC economies as well. By investing in MSMEs' international experience, governments build the groundwork for their future and sustained representation in international delegations, trade missions, trade expos, relevant international business development conferences, workshops and other opportunities.[25] The sustained inclusion of MSMEs in relevant international entrepreneurial forums can make this become commonplace, and an integral part of government engagement on trade and investment. The presence of

[25] Asia Pacific Foundation of Canada, *2018 Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs Through Market Access*, (Vancouver: Asia Pacific Foundation of Canada, 2018).

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MSMEs in these forums can allow them to directly contribute to and inform discussions that are relevant to them, with regards to international trade.

Yet another potential beneficiary is the local business community, including higher education institutions. By encouraging entrepreneurs to gain international experience, through exchanges, internships, education and training abroad, business communities in Canada and the Asia Pacific can foster more knowledge exchange, innovation and growth. The Partnership has previously recommended that large corporations and business communities more broadly facilitate cross-Pacific exchanges and networking, namely between accelerators and incubators in Canada and other Asia Pacific economies. For example, this could be achieved through sister start-ups designing "ongoing, mutually beneficial arrangements to share resources, local market intelligence, training, and senior leadership strategy sessions"; university entrepreneurship programs creating internships for young entrepreneurs; and generally, building "cross-Pacific employee and working-team exchanges to enhance institutional and cross-cultural knowledge."[26]

Moreover, the Partnership has recommended that "big business sponsor content area experts – in finance, hiring, sales, manufacturing, IP, and so on – to serve as limited-time mentors to startups" in Canada and the Asia Pacific.[27] Implementation of these recommendations can contribute to more cross-Pacific engagement and partnerships, and most importantly, opportunities for local entrepreneurs.

However, the majority of MSMEs and entrepreneurs still do not have international experience. **In the Partnership's national surveys, only a minority of surveyed entrepreneurs said they have studied, worked, or participated in training outside of their home economy.** Forty-seven per cent of entrepreneurs in all the Partnership's focus economies said that none of their company's employees have studied or worked outside of their home economy.

It is vital that APEC governments and business communities both continue to help and encourage MSMEs and entrepreneurs gain international experience. Moreover, as more opportunities to gain this experience shift to online delivery methods, it is important that policymakers consider the lack of access to internet and ICT technologies as a potential barrier in this area.

POLICY AREA 2: PARTICIPATION IN INTERNATIONAL MARKETS

When entrepreneurs have gained some international experience, their MSMEs can then have the opportunity to participate in international markets. There are several ways for their MSMEs to take part in overseas markets, including through exports, participation in supply chains, and through government

[26] Elizabeth Newton, Jonathan Berkowitz, Alexandra Mann and Charlie Shi, *Fuelling High-Tech Startups: Building the Capacity of MSMEs through Technology and Innovation*, (Vancouver: Asia Pacific Foundation of Canada, 2018), 51.

[27] Ibid.

procurement. This section will particularly focus on exporting, namely entrepreneurs' intentions to export their goods and services, and the barriers they face in this area.

On average, MSMEs account for less than 35 per cent of annual global exports. Due to their small size and typically local base, micro- and small enterprises in particular, do not have the sufficient infrastructure or resources to engage in export. Some of the main challenges for MSMEs in exporting include access to market information, marketing and branding constraints, access to finance, infrastructure and proximity of markets, inability to compete with competitors, difficulties in complying with international standards and government policies, human resource constraints, and inadequacies in business operations.[28] Research from the Partnership shows that "the most recurrent challenge to expanding markets identified by SMEs is business operation inadequacies" including aspects such as business facilities and access to technologies.[29]

Indeed, the majority of surveyed entrepreneurs across the Partnership's four economies had no plans to extend their businesses abroad and export. Ninety-eight per cent of Indonesian entrepreneurs said that they had no plans for exporting, while this number was 87 per cent of respondents in Vietnam, 70 per cent in Peru, and 63 per cent in the Philippines.

In addition to these high numbers of MSMEs who have no intention to export, respondents in each economy noted varying barriers to expanding their market access abroad. In Vietnam, 41 per cent of respondents said that successful expansion of market access was a barrier or high barrier to their MSME's success.

The national survey in the Philippines goes into greater detail about the barriers that entrepreneurs face in market access, as well as their knowledge of trade agreements and related programs to help them access international markets. **This survey data shows that finance is one of the most persistent barriers to exporting reported by 44 per cent of respondents, followed closely by a lack of market knowledge (40 per cent). The lack of capacity to export is also reflected in the lack of awareness of trade agreements, regulations and related programs for entrepreneurs.** At least a third of Filipino respondents said they were unaware of the various options they were asked about, including the Philippines' Export Development Act of 1994, the ASEAN Free Trade Area, and APEC itself.

Similarly, in Indonesia and Peru, only a minority of respondents were aware of and used export promotion programs provided by their governments. For example, in Indonesia, only one per cent of

[28] Jamil Paolo Francisco and Tristan Canare, *The Challenges to SME Market Access in the Philippines and the Role of Business Associations*, (Vancouver: Asia Pacific Foundation of Canada, 2019), 17-20.

[29] Ibid.

Photo by Peter Livesey on Unsplash

respondents used the smallholders export-oriented credit scheme. Meanwhile, in Peru, half of the survey population said they were unaware of the Peruvian government's export promotion program.

One effective way to tackle the lack of interest, knowledge and capacity to export is MSMEs' participation in an industry or business association. The Partnership's research on MSMEs' membership in business associations in the Philippines suggests there is a positive relationship between this membership and an MSME's inclination to export. Membership can be very beneficial for MSMEs because business associations can provide information and networking opportunities to its members, as well as provide clarification to government regulations and mechanisms for exporting. In other words, these associations can serve as a useful hub of information on exporting requirements and regulations, among other pertinent issues like financing for MSMEs.

More targeted outreach and promotion is required to share the benefits of gaining international experience. Moreover, in light of the pandemic and restrictions on travel, some of the most effective ways to gain international experience must be promoted through online opportunities, such as upskilling through online courses and webinars, and participation in virtual trade missions, mentorship and networking opportunities. As more of these opportunities shift to online delivery methods, it also becomes vital to ensure that access to internet and ICT technologies is also taken into consideration in promoting MSMEs' internationalization. Additionally, as digitalization continues to open new opportunities for MSMEs to internationalize, sufficient training and education will be required to help MSMEs adopt a global mindset, ensuring that they regard themselves not only as domestically oriented businesses, but also internationally oriented due to the new opportunities that digital technologies create in the speed and scale by which MSMEs can access global markets. There is ample opportunity for governments to begin through the actions outlined in the Boracay Action Agenda to Globalize MSMEs, which emphasizes enhancing regulation, financial and institutional support for MSMEs in supply chains, to encourage their expansion.

GENERAL LESSONS AND RECOMMENDATIONS FROM THE PARTNERSHIP

SUPPORTING WOMEN AND YOUTH ENTREPRENEURS

Gender equality and inclusive growth for women and youth have been a crucial cross-cutting theme of the Partnership. In including this specific focus in the Partnership, it is important to note the overall significance of integrating gender-inclusive and intersectional policy responses to ensure equitable access to funding, support services, digitalization, and other areas in MSME capacity building.

The Partnership's survey and on-the-ground research has shown that women and youth have distinct concerns in entrepreneurship. For example, the Partnership's work on youth entrepreneurs in Indonesia, Peru, the Philippines and Vietnam shows that their top concerns include insufficient cash flow to maintain their business, losing money, and insufficient and wasted time.

To this end, the Partnership has incorporated both a feminist and gender-based analytical approach to its MSME capacity building and all levels of its work, from the planning to implementation of all project activities, including its programming and research. These strategies are guided by Canada's FIAP and APEC PPWE's Gender Inclusion Guidelines, which recognize that investing in the economic inclusion and participation of women and youth can drive strong, sustainable economic growth, and that this is an effective method to reduce poverty and inequality.

Main recommendation: Further capacity building, knowledge networks and the collection of disaggregated data are needed to address systemic barriers that limit the economic empowerment of women and youth.

Policy actions for supporting women and youth entrepreneurs include the following:

1. Provide women- and youth-led MSMEs with new or improved policies focused on skills development and capacity building targeted toward their specific needs particularly for MSME digitalization.

2. Invest in entrepreneurial support networks for women and youth, mainly to improve their participation in the workforce, in leadership positions and in all levels of decision-making. Provided there is mentorship and resources invested into these networks, women and youth can more effectively use technology, gain financial literacy, and take advantage of opportunities for interaction and the sharing of best practices.

3. Advance women and youth economic empowerment through disaggregated data collection, language accessibility and locally contextualized information, as integral components of policymaking and research projects.

POLICY AREA 1: PROVIDING MENTORSHIP AND SKILLS DEVELOPMENT

Knowledge sharing and dialogue is key in advancing gender equality and youth participation. There is a need in particular for women and youth entrepreneurs to receive mentorship and upskilling opportunities. For instance, the Partnership's research has emphasized the need for policy-makers to focus capacity-building efforts toward the following areas:

1. Promotion of digital literacy programs for girls, starting in primary schools,
2. Creation of equal opportunity laws and employment programs targeting female students and employees and,
3. Support of collaborative partnerships with NGOs, businesses, academic institutions and governments that provide women with digital upskilling opportunities, and funding for women-owned businesses.[30]

To better understand these challenges, a vital component of MSME growth is an increased understanding of the lived realities and needs of local MSMEs. In particular, the Partnership has emphasized the importance of capacity building through mentorship programs as an effective method of offering unique opportunities for women entrepreneurs to boost their confidence, build business skills, improve business performance and expand their professional networks of knowledge.

In collaboration with the Cherie Blair Foundation for Women (CBF), the Partnership sponsored women entrepreneurs from Indonesia, Peru, Philippines and Vietnam for one-year mentorship programs with a Canadian mentor. Held back by barriers such as lack of access to business skills, technology, networks and finance, mentorship provides an opportunity for further economic empowerment of women and youth by building skills in these areas and boosting their confidence as entrepreneurs. Likewise, mentorship also provides a tremendous learning and growth opportunity for the professionals who serve as mentors, which feeds back into and inspires their work at their own companies.

The Partnership developed a specific mentorship program for women entrepreneurs that boosts confidence, builds business skills, improves business performance, expands networks, and enables women entrepreneurs to build sustainable, successful businesses.[31] The program gave participants the

[30] Alex Capri. *Micro and Small Businesses in Indonesia's Digital Economy*. (Vancouver: Asia Pacific Foundation of Canada, 2019), 30.

[31] Cherie Blair Foundation for Women, *Mentoring Women in Business Programme: Final Report on the 2018 Asia Pacific Foundation Canada Mentees*, (London: Cherie Blair Foundation for Women, 2018).

opportunity to gain skills in various areas such as marketing, finance and IT, as well as a platform where they could build their confidence, decision-making skills, leadership skills, and other important areas. As a result, the mentorship program provided crucial support for women to grow their businesses and create employment opportunities for others. For example, as the CBF's survey of its mentorship participants revealed, several women became entrepreneurs to become financially independent, which in turn can have long-term impacts, including greater control over their own lives and businesses. Economic security also gives women a more influential role in tackling injustice and discrimination in their communities and wider society. Overall, providing women with the tools and support they need to gain financial independence, among other qualities, can generate lasting impacts, as research shows that women tend to invest 90 per cent of their income back into their families and communities.[32]

One critical ingredient of successful mentorship programs is the matching process between mentors and mentees, and in turn, the frequent and regular check-ins that provide a structured and tailored mentorship environment. Successful matching between mentors and mentees ensures that mentees receive the tailored advice that they need for their businesses. Many mentees in the Partnership's mentorship program gave positive feedback on their relationship with their mentor, and the benefits of having this tailored advice and guidance. A successful mentorship experience then often engenders a pay-it-forward attitude whereby mentees move on to become mentors. This type of result can bring long-term sustainability and replicability of a mentorship program and its resulting benefits.

Another crucial component of the mentorship program is its virtual format. Having a virtual component of the mentorship program provides much-needed flexibility to mentees and mentors to conduct meetings and training according to their own schedules. This is particularly pertinent against the backdrop of the COVID-19 pandemic, which has disproportionately affected in-person interactions due

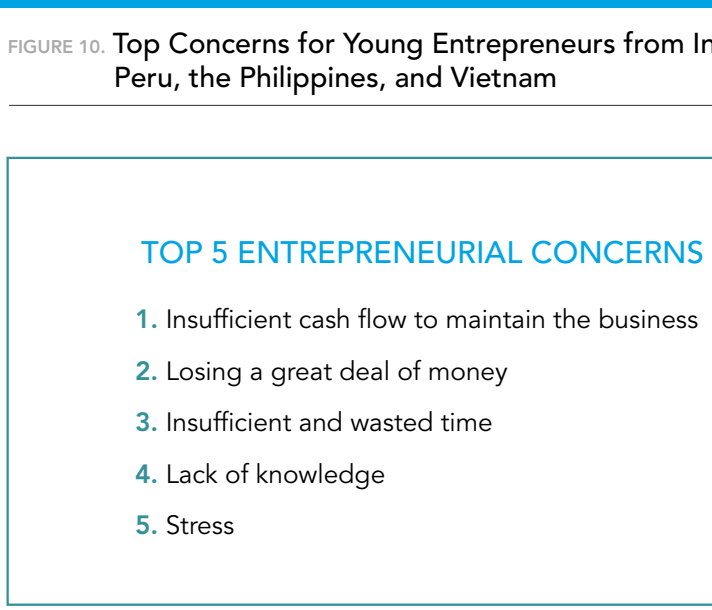
[32] International Finance Corporation, *IFC Jobs Study: Assessing Private Sector Contributions to Job Creation and Poverty Reduction*, (Washington DC: International Finance Corporation, 2013), 1.

Photo by Christina @ wocintechchat.com on Unsplash

to social distancing and lockdowns. Setting a precedent for a virtual mentorship program also raises the prospect for such programs in the post-pandemic era.

In addition to catering to the needs of women entrepreneurs, the Partnership's mentorship program also featured many youth entrepreneurs (below the age of 35 years old). In a post-pandemic world, there are a number of skills development initiatives that would be particularly important for youth entrepreneurs. As previous Partnership research studies have indicated, building more active ties and exchanges between university entrepreneurship programs in Canada and other Asia Pacific countries, such as Indonesia, Peru, the Philippines, and Vietnam is a necessary ingredient for fostering innovation and the capacity of youth-led MSMEs.

FIGURE 10. Top Concerns for Young Entrepreneurs from Indonesia, Peru, the Philippines, and Vietnam



Adapted from *Fuelling High-Tech Startups: Building the Capacity of MSMEs through Technology and Innovation*

For instance, Newton – based on her four economy research with Jonathan Berkowitz – suggests that students can be exposed to more real-time, Asia Pacific venture case studies in the classroom through case competitions, which have been vetted by the relevant business communities or work with students in cross-country teams. These opportunities can help build hands-on experiences that can help youth further develop cross-cultural professional relationships, as well as entrepreneurial skills across different linguistic and cultural differences. Eventually, these initiatives could be scaled up with these young entrepreneurs to work with local and Asia Pacific start-up communities to offer internship or work experiences that teach students what it really takes to be Silicon Valley-ready with their pitches.

Similar programs exist in Canada, such as Canada Accelerator and Incubator Program (CAIP), Mitacs, Start-up Visa, Going Global Innovation (GGI), and Canadian International Innovation Program (CIIP). In the Canada-Asia Pacific context, support for existing hubs of knowledge and searching for opportunities to partner with institutions across the Asia Pacific can lead to the further resource sharing and collaborations, toward helping youth-led start-ups test their potential to internationalize their market access and enter foreign markets. Overall, such exercises offer students practical skills across the entrepreneurial life cycle, from ideation to execution, growth, and exit.

POLICY AREA 2: IMPROVING NETWORKS OF KNOWLEDGE

Prevailing norms produce systemic gender inequalities and it is important to recognize the diversity of the role that women play in regional MSME ecosystems. Already, the work has begun to shift existing policies to government interventions to focus more on business skills development and sustainable capacity building for women and youth in MSMEs in addition to traditional funding and resource approaches. Policy makers must not only provide material support to empower women to start MSMEs, but also emphasize principles of inclusion and gender mainstreaming as the core of national innovation agendas.

In the Partnership's programming, interactions with local stakeholders through research and training workshops have created a dialogue between the diversity of actors within the MSME policy space. Importantly, these workshops not only connect MSMEs and underrepresented groups, such as women and youth entrepreneurs, to decision makers and support networks, but also informs policy recommendations driven by the lived realities and needs of local MSMEs.

The need to create gender-focused efforts to connect women entrepreneurs must come from grassroots efforts by a wide range of civil society stakeholders. This includes connections to existing government support services, online learning applications for entrepreneurs established by innovation hubs, and business support networks. In particular, the need for support networks to help women entrepreneurs more effectively use technology, respond to security concerns, gain financial literacy, and take advantage of opportunities for the sharing of best practices were notably mentioned.

For youth, government programs that seek to benefit MSMEs are not being disseminated properly. They are the most disadvantaged in terms of resources, access to the internet and other factors. Therefore, it is necessary to have targeted policies so that government programs help to close the social gaps and contribute effectively to sustainable economic development.

One avenue for growth is to strengthen cross-Pacific bonds between women and youth entrepreneurs by actively perusing partnerships between governments, business communities, and universities. To do this, policymakers must create the conditions to build more active ties between

accelerators and incubators in Canada and in other Asia Pacific economies, such as Indonesia, Peru, the Philippines, and Vietnam. Within existing education systems, there are further opportunities to tap into youth talent pools by enhancing global internships and/or exchanges for entrepreneurially focused youth, including those that are outside of traditional college and university education systems. As another Partnership research paper suggests, further coordination between ecosystem players, such as university entrepreneurship programs and accelerators/incubators can be used as existing building blocks to further support youth entrepreneurs in Canada. In this process, it is vital to cultivate and foster more active ties between accelerators and incubators on both sides of the Pacific.[33]

Finally, a vital part of inclusive growth and effective support networks relies on building the capacity of all members of the MSME ecosystem to advance gender equality. In the Partnership's previous training sessions, workshops were tailored to provide gender-sensitive capacity building and knowledge-exchange open spaces for women researchers and entrepreneurs to address issues and contribute solutions. This gender-inclusive sensitivity training is led by feminist practitioners for entrepreneurs and other local partners. The Partnership has learned that gender-inclusive sensitivity training is an effective and sustainable way to tackle the issues that women entrepreneurs face, by directly confronting entrepreneurs' gender biases and incorporating gender-inclusive strategies into their MSMEs' business models. Following entrepreneurs' positive feedback of this session, among others, we recommend for similar training sessions to be conducted in conjunction with gender-inclusive policies and projects.

POLICY AREA 3: STRENGTHENING DISAGGREGATED DATA COLLECTION

Through surveys, research, and stakeholder engagement, the Partnership found that women and youth entrepreneurs were the most engaged yet underserved. In an attempt to close this gap, the Partnership targets and addresses the barriers specific to women entrepreneurs through the compilation and analysis of gender-disaggregated data in our surveys. In doing so, the Partnership provides evidence-based recommendations, and information that then informs the platforms it endeavours to create for feminist entrepreneurial researchers and trainers, consultation with government ministries focused on women and youth, and the active involvement of women in business networks.

The Partnership follows Canada's Gender-Based Analysis Plus (GBA+) approach, which ensures that the information it collects is gender-disaggregated, in order to capture and reflect the specific experiences of women entrepreneurs in APEC economies. Prior research suggests women are typically marginalized in entrepreneurship. The Partnership sought to better understand the specific challenges that these MSMEs and entrepreneurs face, as well as the opportunities they receive and create for

[33] Ibid, 50.

themselves in their respective economy. In this effort, it is crucial to collect gender-disaggregated information, feedback, and testimonies from women entrepreneurs.

Beyond connecting with these partners, the Partnership strongly suggests that the input and feedback of these stakeholders are directly included in outputs. Where possible, the Partnership sought consultation with policymakers in ministries that are directly involved in women's economic empowerment. For example, in Peru, the Ministry of Women and Vulnerable Populations provided key assistance on the national survey content and questions in order to ensure capturing issues that are pertinent to women entrepreneurs. These types of collaborations are essential in working towards gender equality and the advance consultation with in-country government representatives and ministries focused specifically on women's empowerment.

Collaborations played an important role in two main aspects based on the Partnership's implementation experience by:

1. Ensuring a full landscape of national gender issues was understood before planning and undertaking activities, such as using the focus theme of human capital to draw attention to efforts to eliminate violence and issues of sexual harassment in the workplace.

2. Fostering discussions that are guided by and for women entrepreneurs about the existing resources and support networks available for women entrepreneurs, and how they can be expanded on and complemented by project activities.

Overall, collecting disaggregated data serves an important need for both women and youth entrepreneurs in identifying what types of support are required in areas such as funding acquisitions, human capital improvement, and business development. In order to assist MSMEs to expand out of their early-stage phase, a comprehensive understanding of their needs and goals is required. The Partnership recommends that such disaggregated data is then used by municipal level or subnational governments for further investigation into existing social enterprise legislation – with the aim of further co-ordinating policies and legislation between different levels of government for women and youth.

As new initiatives continue to adapt and prioritize gender and youth issues, it is important to target support and resources according to these demographic groups' specific entrepreneurship needs. Overarching frameworks such as Canada's FIAP, or APEC's Policy Partnership on Women and the Economy (PPWE) and the La Serena Roadmap for Women and Inclusive Growth can also inform disaggregated data and research that places gender, long-term trends and challenges to gender equality and diversity as key points of examination when considering social, economic, and cultural conditions and norms.

PROMOTING INCLUSIVE GROWTH

The Partnership's research has provided important context on the opportunities and challenges that MSMEs and entrepreneurs face, including digitalization, financing, support services and market expansion. Governments around the world have so far responded by creating fiscal and monetary policies to provide resources for MSMEs. Moving forward, as the COVID-19 pandemic continues to affect the region, dialogue between government and business actors will play a crucial role in achieving an inclusive crisis response and sustainable routes to recovery that involve MSMEs.

The effects of the pandemic among MSMEs, however, have also been extremely uneven. Women and youth entrepreneurs have particularly been impacted, deepening the gap that already existed for them in entrepreneurship. MSMEs in certain sectors, such as tourism, textiles and construction, came to a halt as lockdowns stopped their operations and interrupted global value chains. Lastly, micro- and small enterprises have especially been challenged, as they have less resources to withstand economic hardship compared with medium enterprises.

Main recommendation: Dialogue between governments, MSMEs and other key stakeholders is critical for achieving an inclusive crisis response and sustainable routes to recovery. Governments must ensure that the needs of small businesses are addressed through action plans that work toward long-term economic recovery.

Policy actions for supporting inclusive and sustainable growth of MSMEs include the following:

1. Disaggregated data must be maintained and expanded to better understand the nuanced impacts on MSMEs, including the varying impact according to differing industries, enterprise sizes, and the formal or informal nature of enterprises.

2. To ensure a level playing field, all MSMEs must have access to physical infrastructures and support services, including those in rural or remote geographical areas, and in informal or unregulated industries.

3. Create inclusive business models which allow MSMEs to transition to a post-pandemic economy through innovation, adaptation and entrepreneurship. As the main drivers of the APEC region's growth, sustainable long-term practices (e.g.: gender- and youth-inclusive strategies) in MSME business strategies are crucial.

POLICY AREA 1: CREATING MORE TARGETED GROWTH SOLUTIONS

It is vital to have sustained collection, analysis and reporting of disaggregated data, in order to create more targeted policies that promote inclusive growth. This data must particularly capture women and

youth, and others who are disadvantaged in entrepreneurship, and have also been particularly impacted by the pandemic.

Collecting disaggregated data sheds light on the distinct needs of different entrepreneurs. As previously mentioned, gender disaggregated data was collected by the Partnership to identify what types of support women, youth, and other groups require in areas such as funding acquisitions, human capital improvement, and business.[34]

Disaggregated data also helps make sense of the differences among MSMEs, according to their size, scale, sector and industry. For instance, differences exist among enterprises according to their size, not only in the technical definitions created by each respective economy, but also in the ability of these enterprises to access capital, formalize and absorb fluctuations in the economy. For example, the Partnership's work in Peru found that just five per cent of micro-enterprises can access the regulated financial system, compared to 46 per cent and 62 per cent of small and medium enterprises respectively. In turn, entrepreneurs in micro-enterprises also have less resources compared to those in small and medium enterprises.

Further surveys and documentation of MSMEs can provide important areas of consideration when providing support services and training. For example, government and business actors should survey opportunities for MSMEs to seek professional development, training on mobile applications, and use government support services. Together with disaggregated data, these indicators can provide more tailored training and feedback based on the needs of each of these subgroups.

The Partnership recommends that such disaggregated data is securely kept and effectively utilized by all levels of government, with the aim of making inclusive policies and legislation regarding MSMEs. As the road to recovery from the pandemic is expected to take place over the coming years, such data will be useful for governments and policymakers to better focus on sectors and areas of the population which are most vulnerable and drastically affected by the pandemic.

POLICY AREA 2: EXPANDING INFRASTRUCTURE AND CAPACITY BUILDING

In order to address disparities in entrepreneurship, for women, youth, micro-enterprises and others, and place inclusive ecosystems as part of a solution, crucial foundations such as infrastructure and capacity-building activities must be expanded to meet their distinct needs.

Access to infrastructure is a persistent issue, and the availability and quality of infrastructure have been widely regarded as the key determinants of development for MSMEs. As digitalization

[34] Asia Pacific Foundation of Canada, *2017 Survey of Entrepreneurs and MSMEs in Vietnam: Building the Capacity of MSMEs Through Technology and Innovation*, (Vancouver: Asia Pacific Foundation of Canada, 2017), 26.

Photo by Afif Kusuma on Unsplash

of MSMEs will likely become a new norm in a post-pandemic world, this raises questions regarding access to the internet, technology and software that are required to conduct online businesses. Weak digital infrastructure can not only weaken connectivity, but can also cause greater divides between urban centres, which are typically well equipped with the resources to digitalize compared to rural or remote areas. Geography, logistical considerations as well as time and resources to equip rural areas for digitalization remains a much larger issue. For instance, in Peru, the Partnership's work highlighted the resource difference between urban centres and rural areas. To counter increasing regional disparities that may emerge, policymakers must ensure the equitable distribution of resources to areas outside of urban centres, by investing in upgrades in public services.

Such access to infrastructure and related MSME support must also ensure equitable access for different groups. Previous surveys conducted by the Partnership indicated that a significant proportion of the survey population reported that their business does not have access to any support services, with further results suggesting that women entrepreneurs may have a harder time accessing such services than their male counterparts.

Additionally, for capacity building including MSME support programs and training platforms, governments need to give further consideration to include MSMEs in rural or remote communities.

This in particular also highlights another important group that must be acknowledged, that the inclusion of indigenous peoples and ensuring the growth of indigenous MSMEs and entrepreneurs as a dynamic sector of growth.

There are opportunities for governments to centralize information on available infrastructure and support programs through existing platforms that are already utilized by entrepreneurs, such as the Negosyo Centres in the Philippines and Emprendedor Peruano in Peru. Moreover, governments must consider the clarity and accessibility of regulations to better foster a more inclusive and participatory regulatory environment that MSMEs can more easily navigate.

POLICY AREA 3: ACHIEVING SUSTAINABLE GROWTH AT THE GRASS-ROOTS LEVEL

A necessary component of inclusive growth is the intentional partnerships and collaboration between government and local entrepreneurial actors dedicated to MSME economic empowerment. This collaboration is crucial, as it ensures that policies, research, programming and other work is informed by local actors and is sustainable in the long-term.

This collaboration can help governments adopt forward-looking policies that support MSMEs. This can include promoting sustainable business practices that provide MSMEs with the tools and training to achieve sustainable growth at a grassroots level. These practises can include funding and grants based on sustainability benchmarks and best-practices, sustainability training programs, collaborative ecosystems, and crowd-sourcing of apps and platforms that facilitate sustainable practice

Environmental sustainability is an important component of inclusive growth. MSMEs must organize their logistics, distribution, and other business operations accordingly. The Partnership's survey data shows that women and youth entrepreneurs are more inclined to incorporate environmentally sustainable business practises. Across the four focus economies, these groups consistently say that environmental sustainability is among the top three priorities for their MSME, compared to their counterparts. This finding suggests that increased resources, through investment, networking, knowledge sharing and others, would increase MSMEs' incentive and capacity to form sustainable business practises.

FIGURE 11. Environmental Sustainability as a Top 3 Priority, by Gender

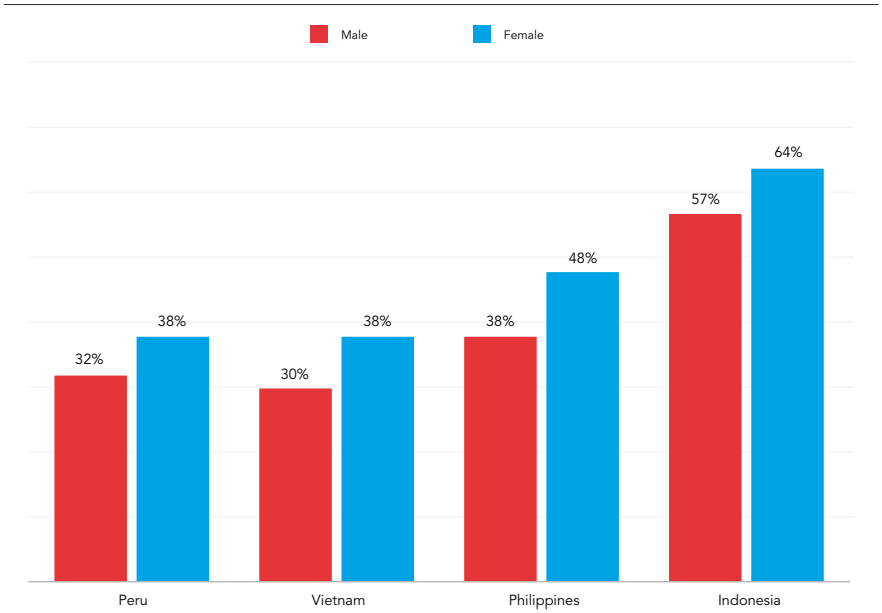
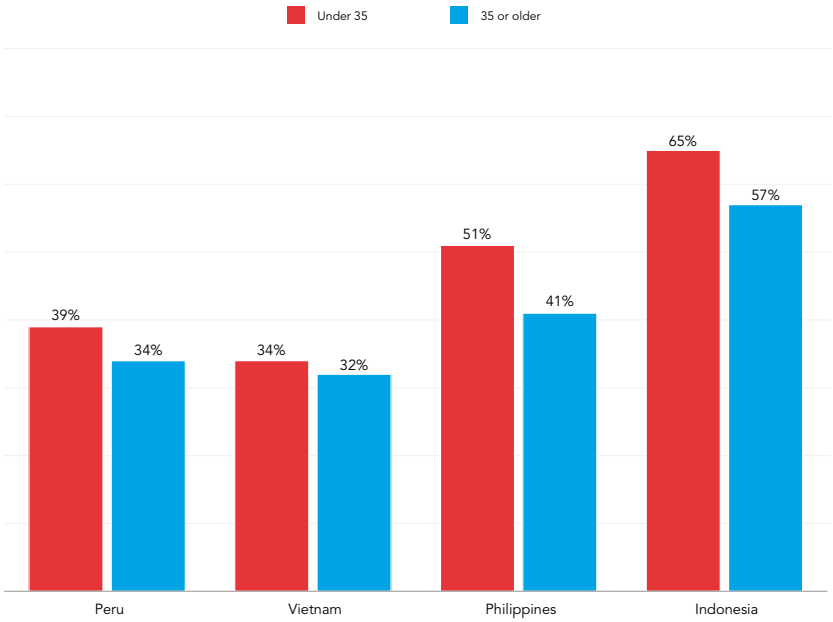


FIGURE 12. Environmental Sustainability as a Top 3 Priority, by Age



Thus, creating networks and hubs of knowledge sharing and resource mobilization to engender sustainable growth must be further highlighted. For example, governments and business actors can invest in sustainability-focused start-ups, with the aim of generating interest and ideas for innovative and sustainable growth in the region. In Indonesia, the Partnership profiled Evoware, a startup focused on developing alternative plastic materials from seaweed. The Partnership recommends that similar examples are used to inform entrepreneurs of various possibilities of incorporating environmental sustainability into business practices. Moreover, startups like Evoware can act as mentors to newer MSMEs, particularly social enterprises, that want to engage in similar work. This mentorship can point similarly-minded entrepreneurs toward crucial contacts, funding, and other resources that they need.

In the long term, governments should focus on recovery and expansion of business operations. In this process, governments should also consider policies that facilitate build-back-better. Rather than focusing on bringing the economy to pre-pandemic growth, policies should be geared towards incentivizing the greening of business operations and products. Thus, the action agenda should frame equitable recovery as a joint search for solutions between governments, civil society actors and MSMEs.

FUTURE RESEARCH AND AREAS OF CONSIDERATION

The APEC-Canada Growing Business Partnership's research in Indonesia, Peru, the Philippines and Vietnam has highlighted the barriers that MSME and entrepreneurs face, as well as the distinct challenges for women and youth entrepreneurs. As the APEC region continues on the road to recovery from the effects of COVID-19, one of the priorities moving forward must be to alleviate the extraordinary burden placed upon MSMEs, which continue to navigate uncharted territory as the global health crisis continues to impact economic stability and job security.

The Partnership's work has identified areas of MSME capacity building that should be addressed through both short-term actions and long-term strategies. The recommendations from this report are also guided by existing recommendations from APEC and other international bodies, such as the SMEWG Strategic Plan for 2021-2024.

As this report has emphasized, the long-term implementation plans must promote inclusive post-pandemic growth and supporting women and youth entrepreneurs with the technical assistance for MSMEs and entrepreneurs taking the form of providing assistance in digital transformation, ensuring opportunities to access financing and support services, while ultimately encouraging MSMEs to shift from being domestically-oriented to becoming more internationally oriented by increasing their global market access.

This research has already cited a number of regional SME policy visions and frameworks, particularly the APEC SMEWG Strategic Plan for 2021-2024 and Putrajaya Vision 2040. Aligned with these action plans, further research is warranted in a number of emerging areas in order to expand knowledge about the particular strategic needs and desires of MSMEs. Such areas include the following:

1. **Digital Entrepreneurship:** As COVID-19 continues to catalyze digital transformation, the acceleration of new technological systems will give rise to digital entrepreneurs who will have new market opportunities, due to the expanded ability to access international markets. If the digital economy can enhance the ability of traditionally marginalized groups to participate in these borderless digital markets, this greater economic participation not only has the potential to drive inclusive growth, but can allow entrepreneurs to access new talent and opportunities beyond their traditional physical borders.[35] However, in addition to new opportunities, new concerns will also emerge, including consumer protection and data

[35] Brian A. Wong, "How Digital Entrepreneurs Will Help Shape the World after the COVID-19 Pandemic," Accessed April 3, 2021, https://www.weforum.org/agenda/2020/06/entrepreneurs-must-embrace-digital-during-pandemic-for-society.

privacy. Further research will be required to better understand how digital technologies may impact entrepreneurship and how the effects of the pandemic may create new digital markets for MSMEs. Based on previous research conducted by the Partnership on technology and innovation, it recommends that future research specifically focus on digital entrepreneurship, and the technologies, software, platforms and other components that enable MSMEs to expand their markets, consumer base and business through digital business spaces.

2. **SME Growth and Inclusive Ecosystems:** According to the United Nations Conference on Trade and Development (UNCTAD), the pandemic poses a risk of losing the gains made in the areas of gender equality and equal participation of marginalized groups in the workforce.[36] In thinking about post-pandemic recovery, governments should continue to support the diversification of the MSME workforce, especially through gender-diversity, access and opportunities for rural-based MSMEs where technological infrastructure may be more difficult to access, as well as policies that ensure that the digital divide does not exclude women, youth, and other groups from receiving adequate training and education on tech and digital literacy. Building on the Partnerships' previous research on gender equality and sustainability, it is crucial that economies heed the recommendations of initiatives such as the APEC Putrajaya Vision 2040. They make explicit references to ensuring "strong, balanced, secure, sustainable and inclusive growth" through "inclusive human resource development as well as economic and technical cooperation" and comprehensive policies that will address "climate change, extreme weather and natural disasters." Policy responses will need to be studied further to assess their effectiveness.

3. **MSME Competitiveness and Access to International Markets:** As new opportunities in digital borderless markets continue to open up for MSMEs, it is vital that these enterprises are given the necessary support to not only expand into these markets, but to be competitive with other MSMEs and larger corporations. As such, policies and discussions of market expansion must place a large emphasis on digital markets, and the accompanying requirements and barriers to entry for MSMEs in these markets. This includes digital upskilling, such as the effective usage of digital business strategies on social media, and education on the distinct regulations and requirements in these digital markets. In addition to this support, governments, business associations and local ecosystem actors must assist MSMEs to move from domestic to internally-focused enterprises, and encourage a change in mindset to see their potential in expanding to international markets. This change in mindset can be

[36] United Nations Conference on Trade and Development, "Global Initiative towards post-Covid-19 resurgence of the MSME sector," Accessed March 20, 2021, https://unctad.org/project/global-initiative-towards-post-covid-19-resurgence-msme-sector.

reinforced through mentorship with MSMEs that have successfully expanded abroad, and training courses on market expansion. Lastly, it is vital that there is effective government to business interaction, particularly in the area of exports. Governments must provide MSMEs with accessible and clear information on regulations and requirements to expand markets abroad. Moreover, governments can assist MSMEs in market expansion through procurement practices, and inclusion in international trade missions. Overall, work in this area further complements the Partnership's research on market access and further recommends, given the context of COVID-19, revisiting initiatives such as the Boracay Action Agenda to Globalize MSMEs, which emphasizes that "by fostering cultures of regulatory transparency in [APEC] economies, [APEC] will provide greater opportunities for MSMEs to comment on new regulations, regulatory reviews, and regulatory impact assessments, regardless of their geographic location."

4. **Innovation for Micro-enterprises and Start-ups:** One of the priority areas in the APEC SMEWG Strategic Plan 2021-2024 is "entrepreneurship, innovation, and start-ups." It focuses on improving the business environment for start-ups, fostering innovation, developing opportunities for women and youth, and promoting social entrepreneurship. In line with this priority area, the Partnership recommends that governments address the distinct needs of MSMEs according to their level of maturity and size. While the Partnership's work has so far analyzed general trends for MSMEs as an overall group, especially in the area of technology and innovation, it is clear that specific types of enterprises require targeted solutions. Micro-enterprises, early-stage MSMEs and start-ups have distinct needs compared to established enterprises, typically involving a lack of access to capital, lack of entrepreneurial networks and contacts, and lack of investor confidence. First, due to their size, micro-enterprises typically need more support to access funds, upskilling and human capital, and markets, compared to small and medium enterprises.[37] It is important that governments give specific support to entrepreneurs in micro-enterprises. Second, start-ups require a supportive local innovation ecosystem, to foster their potential for growth, as well as contribute to national economic recovery. There is an opportunity to build on APEC's existing work, such as the APEC Initiative on Promoting Innovative Start-Ups, which emphasizes that governments should provide institutional support and invest resources in the local innovation system, such as through financing and grants, facilitating partnerships between the public sector and SME sector with competitive opportunities, and support for digitalization.

[37] Giulia Ajmone Marsan and Lina Maulidina Sabrina, *ASEAN MSMEs in a COVID-19 World: Innovation and Skills for the Post-Pandemic Recovery – Lessons from ERIA MSMEs Talks 6–10*, (Jakarta: Economic Research Institute for ASEAN and East Asia, 2021): 13.

Photo by Peter Hammer on Unsplash

5. **Informal Markets, Urban vs. Rural vs. Remote Communities:** The Partnership's work has also revealed that MSMEs' needs and capacity are determined according to their formal or informal status, and their geographic location in their economy. These two factors can act as defining aspects of MSME experiences, and act as structural barriers to enterprises' success. Moreover, these two factors determine the opportunities and challenges that MSMEs face, such as accessing support services and having robust digital infrastructure. Considering the issue of MSME support, informal or unregistered MSMEs often fall between the cracks in economies' COVID-19 support measures, due to their ineligibility to receive such benefits. As a result, many enterprises who may desperately need support are unable to access it. The informality of MSMEs must be addressed through streamlined ways to register businesses, and demonstrating the benefits of formalization. On the latter issue of robust digital infrastructure, geography can determine the resources and networks that MSMEs have access to, creating a structural barrier to their successful entry into the digital economy, and more generally barring rural-based entrepreneurs from market expansion. Policymakers must ensure the equitable distribution of resources to areas outside of urban centres, by investing in upgrades in public services, in order to ensure that all MSMEs can benefit from digitalization and the digital economy.

In the long-term, APEC's Putrajaya Vision 2040 has stated a regional commitment towards (1) trade and investment, (2) innovation and digitalization, and (3) strong, balanced, secure, sustainable and inclusive growth at the forefront of the agenda for APEC's 21 member economies. As planning and development of post-pandemic growth priorities is underway, APEC economies will benefit from further coordination of action agendas and implementation timelines, in order to ensure timely deliverables. Collaboration, cooperation and communication between APEC members, and more broadly, all Asia Pacific economies, will be needed to share best practices, and translating on-the-ground research into MSME and entrepreneurial-friendly policies across the APEC region. It is vital that APEC members learn from one another's successes, as economies strive to emerge from the pandemic with equitable outcomes for all populations.

Moreover, APEC members must continue to base their work on existing frameworks and recommendations provided by the organization, including the La Serena Roadmap for Women and Inclusive Growth and the Boracay Action Agenda to Globalize MSMEs. Meanwhile, other regional frameworks exist, such as the ASEAN Strategic Action Plan for SME Development 2016-2025, which provide views complementary to the initiatives addressed in this report. Adhering to these existing frameworks will assist in implementation and tracking progress, by providing a common basis and guidelines for all economies in the region. Research and programming from initiatives like the APEC-Canada Growing Business Partnership also play a critical role, by working with existing on-the-ground partners and facilitating direct relationships with MSMEs through the training events and mentorship program. In the short term, such initiatives are a commitment towards a path of inclusive, sustainable, and quick economic recovery from the COVID-19 pandemic. In the long term, they will also help sustain long-term growth in the region by minimizing barriers to employment, providing assistance to local communities, and building the capacity of MSMEs that ultimately strengthen economies.

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APPENDICES

APPENDIX A: CONCEPTUAL FRAMEWORK AND METHODOLOGY

CONCEPTUAL FRAMEWORK

Aligned with the literature that has sought to improve the implementation results of development projects, the Partnership has emphasized client and stakeholder participation in the design and implementation of policy recommendations and the implementation of local activities. For instance, the implementation literature on international development projects highlights various road maps that incorporate various stakeholders into the policy decision-making process. Such literature has emphasized broad public participation from a range of stakeholders and actors, from the beginning to end implementation of international development projects.[38]

In response to this literature, the Partnership has endeavoured to assess and tackle these issues through on-the-ground research, data collection, and capacity-building activities including training sessions, policy workshops, and a mentorship program for women entrepreneurs. In doing so, the Partnership aims to provide additional empirical information on the challenges that MSMEs and entrepreneurs face, including disaggregated findings by gender and age.

As other studies have emphasized, broad public participation and the coordination of policy development and implementation are required, especially when "changes are involved" and "people must be given opportunities to develop share meanings and appreciations that will further the implementation of policy goals."[39] Acting as a knowledge mobilization hub, the Partnership has disseminated its work through a two-pronged approach. On one hand, the Partnership provides local policy and training workshops with the goal of localization and translating the recommendations for the local day-to-day context in which these MSMEs operate. On the other, it also provides these recommendations to larger multilateral organizations, such as APEC's Small, Medium Enterprise Working Group (SMEWG). Together, this collaborative stakeholder process has included cross-collaboration and dialogue through the different aspects of the project, including stakeholders and participants early on in the design process and feeding into a "research-action-dialogue" model which has streamlined stakeholder participation as well as the formulation of gender-inclusive policies.

[38] Monteze Snyder, Fran Berry and Paul Mavima, "Gender policy in development assistance: Improving implementation results," *World Development*, Vol. 24(9), (1996): 1489.

[39] Ibid.

GUIDING FRAMEWORKS FOR THE PARTNERSHIP

The Partnership in aligns itself with the vision and priorities of the APEC Small and Medium Enterprises Working Group (SMEWG), which provides a regional forum for policymakers to convene and discuss the challenges and policy interventions toward helping entrepreneurs. In October 2020, having hosted its first entirely virtual meeting, the APEC SMEWG passed its new strategic plan for 2021-2024, to highlight and tackle the challenges that MSMEs are facing during the pandemic. The priority areas in this plan include the following:

- Entrepreneurship, innovation, and start-ups;
- SME access to international markets and global value chains (GVCs);
- Inclusive capability development towards digitalization;
- Access to finance and alternative financial solutions; and
- Government to business interaction.

In line with these priorities, the results of the Partnership do provide indicators of alignment with many of the existing initiatives, but also add rich experiences from MSMEs as well as survey data which further illuminate the on-the-ground realities that MSMEs face.

Over the course of the Partnership's implementation, the Partnership has also aligned its values with other existing APEC initiatives. In particular, the Partnership has sought to lead a gender-inclusive agenda, tapping into the economic potential of women and youth. APEC's Policy Partnership on Women and the Economy (PPWE) has emphasized the importance of women's economic empowerment in five core areas including: access to capital, access to market, skills and capacity building, women's leadership and agency, and innovation and technology. More recently, in 2019, through the initiative and leadership of Chile, The La Serena Roadmap for Women and Inclusive Growth (2019-2030) has also provided a forum for information sharing and capacity building.

These approaches are further reinforced by Canada's own Feminist International Assistance Policy, which also echoes the importance of women and girls to reach their full potential so that their full economic participation is possible. Guided by Gender-based Analysis Plus (GBA+) has also worked closely to collect gender-disaggregated data. This approach further reinforces the importance of disaggregated data and research in examining various social, economic, and cultural conditions and norms. All of these initiatives mentioned above are a further complement to overarching international frameworks, including the United Nations Sustainable Development Goal 5 on gender equality, which emphasizes that the economic empowerment of women and girls is not only crucial for a sustainable future, but that large inequalities between men and women still exist, especially in the labour market.

In addition to knowledge and data collected from the Partnership's four years of implementation, the recommendations featured in the following sections are particularly guided by a number of international roadmaps, including the APEC SMEWG Strategic Plan for 2020-2025, Policy Partnership on Women and the Economy, the La Serena Roadmap for Women and Inclusive Growth (2019-2030) and Putrajaya Vision 2040.

METHODOLOGY AND AREAS OF ANALYTICAL FOCUS

This capstone paper will explore six thematic areas that comprise its main areas of analytical focus. These themes are based upon research conducted by the partnership (elaborated further upon below) as well as additional secondary researched conducted to provide an overall context to MSME capacity building during the COVID-19 pandemic.

ON-THE-GROUND RESEARCH:

This paper was conducted through the Partnership's on-the-ground capacity-building activities, research, and programming with entrepreneurs and MSMEs. This will include a review of the Partnership's research studies, annual national survey reports, on-the-ground event programming, and outcomes from the mentorship program for women entrepreneurs.

NATIONAL SURVEY DATA:

Survey data of entrepreneurs and MSMEs was collected through national surveys conducted in each focus economy. From 2017 to 2019, the Partnership surveyed over 1,800 MSME founders and employees on a number of issues and policies related to MSMEs and their growth. Each dataset was collected in separate years, coinciding with the Partnership's on-the-ground activities in each economy.

CAVEATS:

Notably, the Partnership's programming and survey work was conducted prior to the COVID-19 pandemic. As a result, the Partnership's current research and data is unable to directly comment on the state of affairs for MSMEs during the pandemic. Recognizing this limitation, this paper utilizes the Partnership's research and survey data to illustrate the pre-pandemic landscape and challenges in each of the thematic areas, to identify important policy areas in MSME capacity building moving forward.

It is also important to note that the Partnership's survey data reflects particular demographics of entrepreneurs and MSMEs in the four focus economies. The survey data largely features the views of entrepreneurs who are in a micro-sized enterprise, who founded their own MSME, and who are located in the urban centres of their respective economies.

Moreover, the survey data was collected in each economy in different years.[40] As a result, there are substantial differences in individual and company demographics between the four datasets. The data comparison in this paper takes these caveats into account, and primarily compares descriptive findings in the four datasets to provide context in each thematic area.

[40] The Partnership conducted its national survey in Vietnam in 2017, in Indonesia and the Philippines in 2018, and in Peru in 2019.

APPENDIX B: LIST OF ACTIVITIES OF THE APEC-CANADA GROWING BUSINESS PARTNERSHIP

VIETNAM – TECHNOLOGY & INNOVATION

RESEARCH & POLICY

- 2017 Survey of Entrepreneurs and MSMEs in Vietnam: Building the Capacity of MSMEs Through Technology and Innovation
- Micro, Small, and Medium Enterprises in Agri-Food: A Study of the Philippines, Vietnam and Peru
- Innovation Policy to Promote MSME Growth: Best Practices and Implications for Vietnam and Other APEC Developing Economies
- Fueling High-Tech Startups: Building the Capacity of MSMEs through Technology and Innovation
- ABACx: The APEC-Canada Growing Business Partnership Symposium on Technology and Innovation - July 25, 2017, Toronto, Ontario
- Symposium on Innovative and Dynamic Startups and MSMEs – September 11, 2017, Ho Chi Minh City, Vietnam

MSME TOOLKIT & TRAINING

- Vietnam Toolkit for Entrepreneurs and MSMEs: Technology and Innovation
- Technology and Innovation Training Session - November 10, 2017, Da Nang, Vietnam

PHILIPPINES – MARKET ACCESS

RESEARCH & POLICY

- 2018 Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs Through Market Access
- The Case of Using Blockchain Transactional Technology to Provide Democratization and Transparency for Philippine Coffee Growers
- The Role of Business Associations and Chambers of Commerce on SME Development and Market Access

- Entrepreneurial Drivers of AgTech in Southeast Asia: Development Implications for Regional SMEs and Pathways for Canada
- Breaking Through: Market Access Potential for MSMEs in the Philippines - July 3, 2018, Manila, Philippines

MSME TOOLKIT & TRAINING

- Philippines Toolkit for Entrepreneurs and MSMEs: Market Access
- Angat Negosyo: Growing Local and International Filipino MSMEs - November 17, 2018, Manila, Philippines

INDONESIA – HUMAN CAPITAL

RESEARCH & POLICY

- 2018 Survey of Entrepreneurs and MSMEs in Indonesia: Building the Capacity of MSMEs Through Human Capital
- Gender Roles in Small and Micro Business Development in Indonesia: A Firm-level Analysis
- Micro and Small Businesses in Indonesia's Digital Economy
- Human Capital for Micro, Small, and Medium-sized Enterprises (MSMEs) in Indonesia: Interactive Effects of Individual-Level Factors and Institutional Conditions
- Skilling Up: Fostering a Robust MSME Workforce in Indonesia – July 5, 2018, Jakarta, Indonesia

MSME TOOLKIT & TRAINING

- Indonesia Toolkit for Entrepreneurs and MSMEs: Human Capital
- #TRAININGDAY Helping Your Small Business Grow in Indonesia – November 21, 2018, Jakarta, Indonesia

PERU – SOCIAL ENTREPRENEURSHIP

RESEARCH & POLICY

- 2020 Survey of Entrepreneurs and MSMEs in Peru: Social Entrepreneurship
- The Existing Landscape of Social Entrepreneurship in Peru
- Micro, Small, and Medium Enterprises and Social Entrepreneurship in the Context of Peru:

Considerations for APEC Mining Economies

- Financing for Social Entrepreneurship in Peru
- Change Makers: Supporting Social Enterprises in Peru – May 15, 2019, Lima, Peru

MSME TOOLKIT & TRAINING

- Peru Toolkit for Entrepreneurs and MSMEs: Social Entrepreneurship
- MSME, Competitiveness, and Social Innovation Training Day in Peru – September 14, 2019, Lima, Peru
- MSME, Competitiveness, and Social Innovation Training Day in Peru – September 14, 2019, Lima, Peru
- Scaling up MSMEs and Social Entrepreneurship in Peru: A Virtual Roundtable – October 14, 2020, Virtual Event.

APPENDIX C: DEFINITIONS OF MSMES BY ECONOMY

Economy	Micro enterprise	Small enterprise	Medium enterprise
Canada	Businesses with 1-5 employees	Businesses with 1-99 employees (cut off may vary by sector, e.g.: for goods-producing firms, less than 100 employees, and for service-producing firms, up to 50 employees)	Businesses with 100-499 employees
Vietnam	Fewer than or equal to 10 employees	Between 11 and 50 employees for trade and services industries or between 11 and 100 employees for any other industry	Between 51 and 100 employees for trade and services industries or between 101 and 200 employees for any other industry
Indonesia	Annual revenue less than IDR300M	Annual revenue between IDR300M to IDR2.5B	Annual revenue more than IDR2.5B
The Philippines	Fewer than 10 employees	Between 10 and 99 employees	Between 100 and 199 employees
Peru	Fewer than or equal to 10 employees with annual sales limit of 150 UIT	Between one and 100 employees with annual sales limit of 1700 UIT	Annual sales limit of 2300 UIT

APPENDIX D: POLICY RECOMMENDATION MATRIX EXCERPT

Policy Recommendation	Audience	Source
Aiding Digital Transformation		
Reliable and future-ready ICT infrastructure can be a foundation for MSME innovation and market expansion	Government	Innovation Policy to Promote MSME Growth: Best Practices and Implications for Vietnam and Other APEC Developing Economies
Invest in information and communications technology (ICT) infrastructure to support MSMEs to reach online resources and tools, as well as potential employees outside of their personal networks	Government	2018 Survey of Entrepreneurs and MSMEs in Indonesia: Building the Capacity of MSMEs through Human Capital
Improve online learning applications (ranging from mentor matching to platforms about accessing markets) to be more accessible to aspiring women and older entrepreneurs	Business Community	2018 Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs through Market Access
Business associations can provide information and support to help SMEs engage in online sales. For newer SMEs, this support includes introducing them to online sites where retailers can sell their products. For more established businesses, this includes providing training for online marketing and running an online sales platform. If operating a website is too expensive for one SME, business organizations can pool similar SMEs together and help them establish a common online platform where everyone can sell their products. This may also not only be done by business associations but by the government as well.	Government, Business Community	The Challenges to SME Market Access in the Philippines and the Role of Business Associations

Policy Recommendation	Audience	Source
Policy-makers are encouraged to focus on increasing mobile device penetration and infrastructure, supporting existing and nascent e-commerce platforms with the rollout of digital wallets, engaging outside subject-matter expertise and professional services firms around capacity-building efforts, and building trust by increasing dispute resolution and enforcement mechanisms	Government	Micro and Small Businesses in Indonesia's Digital Economy
Indonesia's national, regional, and local governmental institutions need to increase the amount of access to online educational resources regarding business management and digital skills	Government	Micro and Small Businesses in Indonesia's Digital Economy
International experience can be further encouraged through online courses on platforms like Peruvian Entrepreneur that would highlight the advantages of going abroad.	Government	2020 Survey of Entrepreneurs and MSMEs in Peru: Building the Capacity of MSMEs Through Social Entrepreneurship
Securing MSMEs' Access to Financing		
Financing challenges for social enterprises are most acute for early-stage companies that are no longer startups but are not yet ready to scale with debt. Bank financing is risk averse and profitability is an important consideration. In this regard, consideration could be given to corporate income tax exemptions or other incentives for social enterprises (a term that would also need to be legally defined). The case for differentiated tax treatment is compelling in cases where social enterprises are filling public service provision gaps. In addition, rules could be established to mitigate the exacerbating impact on working capital needs of payment of value-added tax in advance of receipt of payment by clients.	Government, Business Community	Financing for Social Entrepreneurship in Peru

Policy Recommendation	Audience	Source
Social enterprises in Peru receive public sector support during the startup phase and have started to attract international impact debt during the growth phase. However, there is a "missing middle" of early-stage companies that lack financing options. Angel investor networks in Peru are not focused on social enterprises to meet this need. The public sector could consider new funding mechanisms to meet this need, including direct financing of social enterprises and indirect financing through investment in funds or fund managers in Peru. Blended finance investment structures that include first-loss capital or pay-for-performance could be incorporated into the new instruments.	Government, Business Community	Financing for Social Entrepreneurship in Peru
Ensuring MSMEs' Access to Support Services		
Improve public accessibility and awareness of existing government led support services (such as Go Negosyo Centers) in order to reach entrepreneurs trying to grow their MSMEs	Government	2018 Survey of Entrepreneurs and MSMEs in the Philippines: Building the Capacity of MSMEs Through Market Access

ASIA PACIFIC FOUNDATION OF CANADA
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ASIA PACIFIC FOUNDATION OF CANADA
FONDATION ASIE PACIFIQUE DU CANADA

NAVIGATING A NEW NORMAL:

A Multi-Pronged Approach to Inclusive Growth for MSMEs

EXECUTIVE SUMMARY

After 18 months of navigating the global pandemic, social distancing and periodic lockdowns are the new norms as vaccinations compete with emerging variants of COVID-19. This scenario is a stark contrast to the situation only 18 months ago, when the COVID-19 pandemic brought unprecedented economic and social challenges to economies around the world. Micro, small and medium-sized enterprises (MSMEs) have experienced the brunt of the pandemic's impact, with businesses forced to close or drastically reduce their capacity. Government efforts toward inclusive, post-pandemic growth must prioritize MSMEs, which comprise 97 per cent of all businesses in the APEC region, and occupy a central role in their economies.

Charting Asia-Pacific Economic Cooperation (APEC) economies' path out of the pandemic over the next stage of recovery will require a rethinking of our strategies to support MSMEs as the world attempts to reopen. To ensure inclusive growth for MSMEs and entrepreneurs, the APEC-Canada Growing Business Partnership recommends that governments and businesses adopt a multi-pronged approach that addresses fundamental areas in MSME development. These areas include MSMEs' shift to online markets, expanding their market access, accessible financing and funding structures, and support programs and services. This approach must be cognizant of the various challenges for MSMEs based on their size, level of maturity, industry, and types of entrepreneurs (e.g. women, youth, and Indigenous). Moreover, the importance of digital business tools for MSMEs to survive and thrive after the pandemic makes digital entrepreneurship a key priority in MSME development. Overall, as economies continue to open and dependency switches from domestic to international markets, MSMEs of differing sizes and capabilities will experience new and unique challenges adjusting to the new norms created by the pandemic.

This policy brief will focus on how APEC economies can achieve a multi-pronged approach by discussing four thematic areas: digital entrepreneurship, MSME competitiveness and access to international markets, MSME growth and inclusive ecosystems, and innovation for micro-enterprises and startups. Drawing on Canadian best practices and on-the-ground research in Indonesia, Peru, the Philippines, and Vietnam through the APEC-Canada Growing Business Partnership, this policy brief highlights key actions and recommendations for the next stage of global recovery for MSMEs.

KEY RECOMMENDATIONS

1. Implement policies and programs for advancing inclusive growth for MSMEs that address multiple areas of MSME development in co-ordination with various stakeholders in the MSME ecosystem, including but not limited to government, business associations, and entrepreneurs.

2. Prioritize upskilling and opportunities in digital entrepreneurship that can give entrepreneurs more capacity to upscale, innovate, and expand to international markets.

3. Ensure the robust collection of disaggregated MSME data to better understand the varied and diverse landscape of MSMEs and entrepreneurs in APEC economies.

4. Target MSME policies and supports to the specific needs of different businesses and entrepreneurs.

5. Implement long-term strategies to advance the inclusion of marginalized entrepreneurs including women, youth, Indigenous peoples, and rural-based entrepreneurs.

INTRODUCTION

The COVID-19 pandemic has illuminated the economic vulnerability of MSMEs, and the weak points in government support for entrepreneurs. Since the beginning of the pandemic in early 2020, many enterprises have been forced to close or reduce their operations, putting businesses and the livelihoods of their employees at risk. Some MSMEs have survived to 2021 by adapting to the pandemic's restrictions, particularly through digital entrepreneurship and entering the digital economy. To ensure an inclusive, post-pandemic growth for all MSMEs, the APEC Secretariat and 2021 host economy, New Zealand, have argued that governments need to address critical areas for businesses' success that target the needs of marginalized entrepreneurs, including women, youth, and Indigenous peoples.[1]

The APEC-Canada Growing Business Partnership, announced by the Government of Canada in 2015, has developed insights into what this multi-pronged approach could look like. Since 2016, the Partnership has been actively building the capacity of MSMEs in developing APEC economies to promote poverty reduction and sustainable economic growth in the region. This initiative was jointly implemented by the Asia Pacific Foundation of Canada and the APEC Secretariat and funded by the Government of Canada. Through in-economy and virtual activities in Indonesia, Peru, the Philippines, and Vietnam, the Partnership has provided best practices, ideas, knowledge, and critical connections derived from Canadian experience tailored to entrepreneurs in the local markets of APEC economies. The Partnership's research for this policy brief will help illustrate the pre-pandemic challenges that MSMEs have faced, show how these challenges have intensified during the pandemic, and identify the gaps and priorities in MSME development for ensuring inclusive post-pandemic growth.

The Partnership has highlighted four thematic areas that can ensure inclusive post-pandemic growth for MSMEs. These areas constitute the critical components for ensuring MSMEs' success and continued long-term growth. The focus areas of this policy brief include:

Digital Entrepreneurship:

From the point of view of MSMEs, what do businesses need to digitalize, and how can governments and the private-sector support these efforts? What are the advantages and challenges of digital entrepreneurship?

MSME Competitiveness and Access to International Markets:

How can MSMEs be encouraged to see and realize their potential by expanding to international markets? How can governments support broader market access, such as through export opportunities and virtual trade missions?

[1]For example, refer to the following statements issued by the *APEC Secretariat* and by *New Zealand*.

Innovation for Micro-Enterprises and Startups:

What are the distinct needs of different MSMEs according to their size, level of maturity, industry, and entrepreneurs? What targeted support is required for micro-enterprises and startups?

MSME Growth and Inclusive Ecosystems:

How can governments continue to support the diversification of the MSME workforce, including gender diversity and the inclusion of rural-based entrepreneurs? Moreover, how can MSME financing and support programs be targeted toward the needs of MSMEs?

The Partnership maintains that strategies for inclusive growth must prioritize the inclusion of women, youth, and Indigenous peoples, as well as entrepreneurs in the informal sector. This position aligns with APEC initiatives, including the La Serena Roadmap for Women and Inclusive Growth (2019-2030) and the Policy Partnership on Women and the Economy, which serve as guiding principles for gender inclusion.

In addition, the Partnership relies on and supports on-the-ground research and MSME data collection, with the goal of informing policymaking and the creation of support programs for MSMEs.

This policy brief reviews the Partnership's implementation and legacy research, and encompasses additional research conducted to contextualize the current challenges and opportunities presented to MSMEs at the current stage of reopening.[2]

THE APEC-CANADA GROWING BUSINESS PARTNERSHIP

APF Canada has worked with APEC governments, business associations, academics, and entrepreneurs to produce thematic and context-specific programming for MSMEs. The project has used a hybrid of in-person and online activities delivered to MSMEs in Indonesia, Peru, the Philippines, and Vietnam.

The Partnership's activities have included:

- National survey reports of MSMEs
- In-economy research studies
- MSME training sessions
- Economy-specific entrepreneurship toolkits
- Policy workshops for government officials
- A mentorship program for women entrepreneurs
- A capstone policy report and toolkit for policymakers
- A capstone conference

[2] For more information about the Partnership's previous research, read our report *Advancing Inclusive Growth in the APEC Region: Challenges and Policy Solutions for MSMEs*.

DIGITAL ENTREPRENEURSHIP

Before the pandemic, businesses were heavily encouraged to go digital to reap the benefits of online markets and use digital tools like social media. Now, the pandemic has made 'going digital' a requirement for businesses to survive and continue in the face of physical distancing measures and a lack of access to local markets. Digital entrepreneurship not only offers MSMEs a way to survive the pandemic but also a way to continue their growth and development afterward.

Definition of Digital Terms:

Digital entrepreneurship:
The changes and new opportunities in entrepreneurship as a result of new and emerging digital technologies.

Digitalization:
An MSME's change in business operations to online platforms and software, such as digital communications and e-payment methods. The process of digitalization may involve a mix of physical and digital business practises, according to a given business' needs.

Digital transformation:
An MSME's overall transition to a digital business model, with the goal of participating in digital markets and entering the digital economy.

The current push toward online markets and digital business practices has highlighted the benefits of digital entrepreneurship while exposing its challenges. Some of the benefits offered by digital entrepreneurship include increased access to domestic and international markets through online marketplaces, wider dissemination of business information to consumer audiences, targeted online marketing, more flexible and cheaper business operations, and added credibility through an established online presence. But while digital entrepreneurship offers these advantages for MSMEs, it also poses challenges in areas including the provision of accessible internet and risks in data privacy and cybersecurity.

Once entrepreneurs adopt digital platforms, they also face risks on the web and in online marketplaces. The APEC Policy Support Unit has outlined the following risk areas that come with digital entrepreneurship:

Cybersecurity and Data Privacy Concerns:

Includes issues such as online hacks, data leaks, and online scams.

Digital Fraud:

An emerging issue with online transactions is fraud, such as fraudulent chargebacks.

Online Misinformation:

Entrepreneurs should be wary of the online platforms that they choose to use, being cognizant that fake reviews on popular sites like Facebook may negatively impact their sales.

Asymmetric Market Power and Platform Dominance:

MSMEs may be disadvantaged in comparison to larger companies on online platforms, which can dominate market shares and crowd out smaller businesses.

Digital Divide and Infrastructure-Related Issues:

Government policies must help level the playing field in terms of ICT infrastructure and access to the internet and data. This challenge also includes issues of data literacy and access to devices.

THE PARTNERSHIP HAS HIGHLIGHTED THREE FOCUS AREAS TO AID MSMES WITH THEIR DIGITAL TRANSFORMATION:

1. ### ICT Infrastructure:

Building and maintaining a robust internet infrastructure to ensure a logistically and financially accessible internet connection for all entrepreneurs, regardless of location and income.

2. ### Public-Private Collaborations:

Partnerships between governments and businesses to provide resources, training, and programs for MSMEs on digital entrepreneurship.

3. ### Assessing MSMEs' Progress:

Data collection on MSMEs' usage of social media, websites, and other digital tools to inform support programs for MSME digitalization.

ICT INFRASTRUCTURE

Maintaining a robust ICT infrastructure has been recognized by governments as an important issue in addressing the digital divide for systematically disadvantaged groups. Bridging infrastructure gaps between rural and urban areas, as well as Indigenous peoples, is important in building back more inclusive economies.

An example of best practises in ICT infrastructure is in Canada, where reliable high-speed internet has become a government priority and has been recognized as critical for work, education, and access to essential services. The Canadian federal government has so far committed C$9.5 million in funding and projects to bring high-speed internet to rural and Indigenous communities in the country's most populous province of Ontario.

Many other examples exist across the APEC region, with governments further integrating digital transformation and new technologies to facilitate the upgrading of existing infrastructure. Throughout the Partnership's focus economies, governments and internet providers face the challenge of catering to rural and remote areas across challenging terrains. For example, the Partnership's research in Peru found that entrepreneurs' geographic location can determine their businesses' success by impacting their access to MSME support services, government offices, domestic markets, and export hubs.[3]

PUBLIC-PRIVATE COLLABORATIONS (SPOTLIGHT: INDONESIA)

Indonesia has been one of the leaders in the APEC region in implementing digitalization support for MSMEs through government programs and collaborations with the Indonesian private sector. With the goal of digitizing 30 million MSMEs by 2024, the Indonesian government has launched a variety of programs and services to assist entrepreneurs in moving their businesses online. Indonesia has so far seen more than 10 million MSMEs enter the national digital economy, demonstrating the success of these initiatives.

For example, Indonesia's Ministry of Cooperatives and SMEs, together with the Ministry of Communications and Informatics, launched the UMKM Go Online program in 2017 to facilitate Indonesian MSMEs' entry into broader markets. This sweeping initiative has provided activities that aim to raise MSMEs' digital awareness, such as seminars, workshops, training, and free website domains for businesses. This initiative has become particularly timely as the global pandemic has created opportunities to prioritize digital entrepreneurship, alongside the upskilling of MSMEs and the shifting from domestic markets to international markets through digital education.

[3] Refer to 2020 Survey of Entrepreneurs and MSMEs in Peru: Building the Capacity of MSMEs Through Social Entrepreneurship

Similarly, Indonesia's Communications and Information Ministry partnered with the Indonesian E-commerce Association to provide online classes for entrepreneurs in Indonesia's least developed areas. These classes covered a variety of digital entrepreneurship skills, such as online branding and business financing. This initiative has complemented existing government-initiated programs by working with business associations to meet the needs of marginalized entrepreneurs in Indonesia's remote areas and thus expand the reach of government services in digital entrepreneurship.

Finally, public-private collaborations provide new opportunities for government to work with well-established large enterprises that can transfer knowledge to MSMEs. The Ministry of Trade has similarly hosted online classes in partnership with Facebook, including a shopping festival featuring MSMEs. Moreover, startups, including Grab and Gojek, have created digital platforms for MSMEs to begin selling their products online, such as Grab's #TerusUsaha campaign to encourage entrepreneurs to digitalize, and the GrabMerchant mobile app.

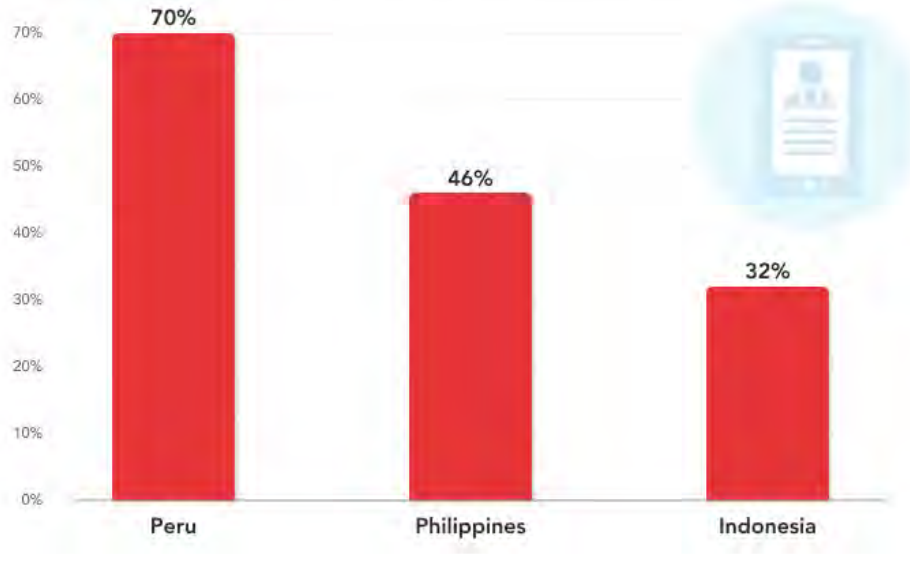
ASSESSING MSMES' PROGRESS

Continuous assessment of MSMEs' transition to the digital economy will be crucial in informing relevant support programs. Data collection on entrepreneurs' usage of digital tools, such as survey data (see the Partnership's national survey reports) or data from social media (e.g. Facebook), will be useful in gaining an understanding of entrepreneurs' progress and targeting digitalization supports accordingly.

For example, according to the Partnership's data, only a minority of MSMEs in the project's focus economies operated online prior to the pandemic. And except for Peru, less than half of surveyed entrepreneurs in the Philippines and Indonesia used social media for their business, which poses a concern for social media adoption during the pandemic, given the already low rate of usage and access.

FIGURE 1

Companies that reported using at least one social media application



Source: Partnership National Survey Data – Philippines (2018), Indonesia (2018), Peru (2019)

On the other hand, mentees in the Partnership's mentorship program for women entrepreneurs in Indonesia, Peru, the Philippines, and Vietnam have noted that they benefitted from guidance on creating a digital marketing strategy for their business, and this has helped some mentees keep their enterprises afloat during the pandemic.

Consistent assessments of digital uptake, such as the Partnership's national surveys and the OECD's report on The Digital Transformation of SMEs, are important for understanding entrepreneurs' needs in shifting their businesses online and targeting supports accordingly.

MSME COMPETITIVENESS AND ACCESS TO INTERNATIONAL MARKETS

An ongoing challenge for MSMEs is their successful expansion into domestic and international markets. As many MSMEs are micro or small in size, these enterprises may primarily see themselves as a local business. Moreover, the pandemic has encouraged a focus on domestic markets, due to travel restrictions and difficulties with obtaining supplies from overseas suppliers.

MSMEs must, however, be prepared to internationalize and go abroad, especially as markets gradually reopen and offer more opportunities for expansion than domestic markets. In turn, entrepreneurs should be encouraged to see their businesses as having global potential, provided they have the appropriate resources and support. The shift to digital entrepreneurship offers entrepreneurs with a low-cost way of exploring and expanding to new markets, while knowledge of overseas markets will help MSMEs take full advantage of online marketplaces.

THE RESEARCH FROM THE PARTNERSHIP IDENTIFIED THREE FOCUS AREAS FOR HELPING MSMES EXPAND INTO INTERNATIONAL MARKETS:

1. ### Encouraging Entrepreneurs to Gain International Experience:
Investing in opportunities for entrepreneurs to gain international experience and advertising the benefits of expanding market access abroad.

2. ### Clarity on Exporting Regulations:
Providing clear and updated information on the requirements and regulations of exporting and international business.

3. ### Entrepreneurial Support Programs:
Investing in accessible support programs and incentives for entrepreneurs to learn and gain skills in market expansion.

Some of the main challenges in MSMEs' market expansion identified in the Partnership's research include:

- Access to market information
- Marketing and branding constraints
- Access to finance
- Infrastructure
- Proximity of markets
- Inability to compete with competitors
- Difficulties in complying with international standards and government policies
- Human resource constraints
- Inadequacies in business operations

ENCOURAGING ENTREPRENEURS TO GAIN INTERNATIONAL EXPERIENCE

A crucial component in expanding market access is encouraging entrepreneurs to first gain international experience. The benefits of entrepreneurs gaining this experience include:

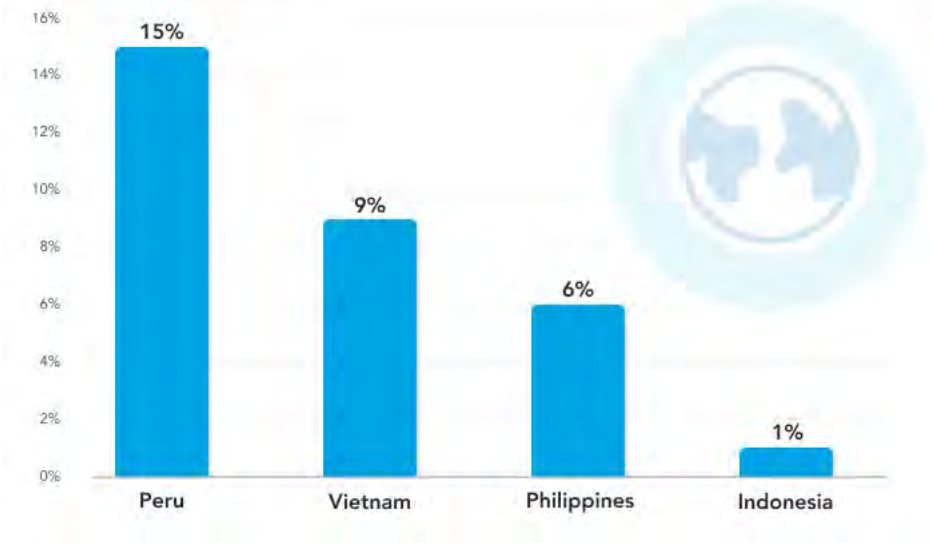
- Entrepreneurs gaining understanding of new markets by interacting with potential partners and consumers and building new entrepreneurial networks.
- New innovations in local business communities, through exchanges, internships, and training that foster growth and knowledge exchange.
- The opportunity for MSMEs to directly inform policy and trade discussions hosted by APEC governments.

Prior to the pandemic, international experience mainly came from in-person work, studies, or training opportunities abroad. While travelling and associated costs may have previously posed barriers to gaining international experience, the pandemic has provided more virtual opportunities for entrepreneurs to interface with potential overseas partners. These opportunities can include virtual trade missions, conferences, and international delegation pitch competitions, among other activities.

However, only a minority of entrepreneurs have had some experience abroad. According to the Partnership's data, prior to the pandemic, 47 per cent of surveyed entrepreneurs in Indonesia, Peru, the Philippines, and Vietnam said that none of their company's employees have gone to study or work abroad. Given this low number, entrepreneurs should ideally be encouraged to begin exploring international markets, particularly through low-cost, virtual experiences.

FIGURE 2

MSMEs with more than a quarter of their workforce who has international experience



Source: Partnership National Survey Data – Vietnam (2017), Philippines (2018), Indonesia (2018), Peru (2019)

Governments and the private sector alike have a role to play in providing entrepreneurs with opportunities for international experience. The Partnership's research shows that business associations can help translate government policies for their members and facilitate opportunities.[4] In turn, for government, the inclusion of MSMEs in international entrepreneurial forums can help make these businesses a priority in governments' trade engagements.

CLARITY ON EXPORTING REGULATIONS

It is also vital that the regulations for exporting and overseas business are clearly communicated to entrepreneurs. One of the major challenges for MSMEs is compliance with government regulations and policies, which can involve entrepreneurs needing to meet many requirements, facing difficult business registration procedures, and encountering internal corruption. Moreover, international standards such as quality certifications can further hinder MSMEs that do not have the finances and technologies needed to comply, further highlighting the need for MSMEs to be aware of international rules and regulations.

The Partnership's work has found several ways that regulations can be shared with MSMEs, such as:

- Through participation in international exhibits and fairs and learning market standards and qualifications through business peers.
- Training programs on topics including export packaging and securing overseas suppliers.
- Support initiatives and schemes for MSMEs on international market access.
- Knowledge dissemination through business associations.
- Mentorship with successful MSME exporters and business leaders.

[4] Refer to The Challenges to SME Market Access in the Philippines and the Role of Business Associations

ENTREPRENEURIAL SUPPORT PROGRAMS (SPOTLIGHT: THE PHILIPPINES)

To deliver relevant best practices on MSME business development to entrepreneurs in APEC, the Partnership developed a business toolkit focused on encouraging market access in the Philippines. This online toolkit developed for MSMEs in the Philippines is focused on enhancing the competitive capacity of MSMEs by providing information on the laws and regulations, policies on exporting, market access, and financing for businesses.

Toolkits such as the one by the Partnership highlight the importance of making government-implemented initiatives accessible for businesses and entrepreneurs. The Partnership's toolkit shares and maintains access to relevant resources from the Philippine government on the accreditation of exporters and other regulations available on the Department of Trade and Investment website. In the context of the pandemic, digital initiatives are increasingly important, such as the Philippine E-Commerce Roadmap, which recognizes the role of e-commerce in facilitating MSMEs' greater access to international markets.

Governments can also help streamline the process of gaining the necessary certifications for export by making certification processes simpler for MSMEs. For example, the Philippines has implemented the 2003 Barangay Micro Business Enterprises Act, which has helped make business registration easier and faster for entrepreneurs. Moreover, data from these registrations can be used by private-sector organizations and non-government organizations for business matching and trade and investment promotions.

INNOVATION FOR MICRO-ENTERPRISES AND STARTUPS

While MSMEs are often taken together as a cohesive group, within this broad category are distinct types of enterprises with varying business sizes, models, mandates, and goals, that require specific, targeted support. Due to their small size and often early-stage development status, micro-enterprises and startups face similar challenges in their growth, principally a lack of access to capital, a lack of entrepreneurial networks, and a lack of investor confidence. Overall, targeted support for MSMEs according to their distinct characteristics can more effectively support businesses, entrepreneurs, and the broader ecosystem, and thus better foster MSME growth and innovation.

THE PARTNERSHIP'S RESEARCH CONDUCTED IN ALL FOUR FOCUS ECONOMIES REVEALED THREE AREAS IN SUPPORTING MSME INNOVATION:

1. **Targeted Financing and Support for Micro-Enterprises:**
Providing targeted and specific forms of financing and support to micro-enterprises and startups, according to their size, maturity level, and industry, among other factors.

2. **Investing in Local Innovation Ecosystems:**
Fostering a strong innovation ecosystem to stimulate and sustain MSME growth.

3. **Supports for Youth-led Startups:**
Nurturing youth entrepreneurship in the startup and MSME ecosystems in the APEC region.

Micro-enterprises and Startups

A micro-enterprise is typically defined as a business with one to 10 employees, though economies have varied definitions according to the amount of capital or number of employees.

A startup is typically a small business that develops a new and unique product or service in order to introduce it to the market.

TARGETED FINANCING AND SUPPORT FOR MICRO-ENTERPRISES

As the Partnership's research has shown, many micro-enterprises and startups rely on entrepreneurs' self-financing and funds from family and friends when getting started.[5] Formal financing is inaccessible for entrepreneurs in these businesses due to high interest rates and typically low-risk tolerance from banks and other lenders. Moreover, there is often limited support for early-stage enterprises in APEC economies, which further dissuades private-sector investors from funding these businesses.

Micro-enterprises, in relation to small and medium enterprises, particularly lack the financial and human capital to access resources and tools to upscale their business. These enterprises would benefit from financing mechanisms such as micro-financing that are intended to help entrepreneurs launch their business, and that are contextualized to the current size and level of risk that an enterprise is willing to take on. Moreover, micro-enterprises require more support to gradually build up their human capital (e.g. employment, upskilling) and market access.

Startups thrive under a supportive local innovation ecosystem, which provides entrepreneurs with access to networks, connections to funders, and the overall support they need to develop

[5] E.g.: 2018 Survey of Entrepreneurs and MSMEs in Indonesia: Building the Capacity of MSMEs through Human Capital (2019); The Existing Landscape of Social Entrepreneurship in Peru (2019)

and advance their own innovative products. Support for these ecosystems can include government or private-sector investment into ecosystem organizations and cultivating partnerships and networks among the various actors.

INVESTING IN LOCAL INNOVATION ECOSYSTEMS

Investing in a strong startup and innovation ecosystem is an effective way to drive MSME development and help enterprises grow. These ecosystems help provide and foster the foundations and support that different MSMEs need to upscale and expand.

Various actors in an innovation ecosystem can provide entrepreneurs with different types of support – including funding, training, and mentorship – that can overlap and fill certain gaps in government or private-sector support. For example, the Partnership's work in Peru on social enterprises revealed the role of local social entrepreneurship hubs in providing the specific networks, resources, and guidance that these types of enterprises need. Co-ordination amongst the various ecosystem actors can help make government policies and support programs more effective by tapping into existing resources and expertise among ecosystem members.

Innovation ecosystem members include:

- Government actors
- Large corporations
- Universities / educational institutions
- Investors
- Tech and innovation hubs
- Business accelerators and incubators
- Business associations
- MSMEs

Moreover, the Partnership's work in Indonesia with local innovation platforms such as the Innovation Factory found that a thriving tech startup ecosystem can provide the best returns on investment by supporting startups' development of new innovative solutions in areas like access to alternative capital and new technologies that in turn support overall MSME growth. These innovations can play an important role in strengthening MSMEs' organizational performance and ensuring their long-term success.

SUPPORTS FOR YOUTH-LED STARTUPS

The Partnership's research included a survey of youth entrepreneurs from Canada, Indonesia, Peru, the Philippines, and Vietnam that explored their motivations, barriers to success, and opportunities to collaborate with their peers in other economies.[6] This survey identified a number of key action steps for different actors in the MSME ecosystem.

[6] Refer to the Partnership's paper Fuelling High-Tech Startups: Building the Capacity of MSMEs through Technology and Innovation.

For the Canadian business community to support young entrepreneurs, the Partnership's recommendations include:

- Building more active ties between accelerators and incubators across APEC economies.
- Seeking sister startups and design ongoing, mutually beneficial arrangements to share resources, local market intelligence, training, and senior leadership strategy sessions.
- Encouraging big business to sponsor subject matter experts to serve as limited-time mentors to startups, and also tailor these to targeted subsets of entrepreneurs such as women, youth, and Indigenous peoples.
- Encouraging big business to facilitate transpacific employee and working team exchanges that enhance institutional and cross-cultural knowledge.

FOR GOVERNMENTS ACROSS THE APEC REGION, THE PARTNERSHIP'S RESEARCH HAS IDENTIFIED THE FOLLOWING ACTION STEPS:

- Create industry-driven web resources that link entrepreneurs across APEC economies with opportunities for entrepreneur matching, business vetting, education, and short-term project opportunities.
- Enhance global internships/exchanges for entrepreneurially-focused youth. Be sure to include those young people outside of traditional colleges and universities and co-ordinate with other ecosystem players, such as university entrepreneurship programs and accelerators/incubators.
- Offer more funding for carefully vetted, pre-seed-stage young entrepreneurs from APEC economies to experience the hands-on rigours of Silicon Valley, and return home to a systematic program to help them get ready for their Asia Pacific pitches.
- Develop an online founding team toolkit specifically devoted to partnership selection, agreements, hiring, and building the health and stability of the startup team.

MSME GROWTH AND INCLUSIVE ECOSYSTEMS

To foster inclusive post-pandemic growth for MSMEs, the APEC Secretariat has stressed that governments and business communities must provide the foundations that MSMEs need to grow and thrive. These foundations include targeted support for distinct enterprises and entrepreneurs, and policies that advance the diversification of MSMEs, particularly the inclusion of women, youth, Indigenous, and rural-based entrepreneurs. Policies for inclusive growth must also emphasize policy implementation and co-ordination among various actors in MSME ecosystems in order to effectively lay the foundation for sustainable growth.

The Partnership's research has found that the following areas are key in supporting inclusive and sustainable growth of MSMEs:

1

Disaggregated MSME Data:

Robust collection of disaggregated data to understanding the pandemic's nuanced impacts on MSMEs, varied by MSMEs' industry, size, and an enterprise's formal or informal status, to create targeted financing mechanisms and support services for MSMEs.

2

Inclusive Business Models:

Promote inclusive business models and sustainable long-term practices (e.g. gender- and youth-inclusive strategies) that allow MSMEs to transition to a post-pandemic economy through innovation and adaptation.

DISAGGREGATED MSME DATA

Throughout its research and programming, the Partnership has emphasized the collection of MSME data, disaggregated by various factors, that reflect diverse enterprises and entrepreneurs. Disaggregated MSME data is crucial to understanding the MSME landscape for two main reasons.

First, disaggregated data ensures that policy-makers and private-sector leaders better understand the demographic composition of MSMEs in APEC economies. Disaggregation of data can be done in terms of individuals' gender, age, Indigenous status (depending on the economy), level of education, level of income, and others, as well as in terms of businesses' formal/informal business status, geographic location, business size, level of maturity (established or early-stage), and business mandates and goals.[7]

Second, this data can help to measure the impact and effectiveness of government initiatives, and thus create or update support programs and policies targeted to marginalized entrepreneurs who have faced particular forms of hardship during the pandemic.

The collection and analysis of disaggregated MSME data can then help create and inform more context-specific resources for different enterprises, particularly in financing and support programs. Financing and support are especially critical foundations for MSME growth and development due to their interlinked importance with other aspects of MSME development.

[7] For example, the Partnership's study, The Role of Gender In Micro and Small Enterprise Business Development In Indonesia: A Firm-Level Analysis, shows the distinct characteristics of women-led businesses in Indonesia.

Without robust and sufficient funding, MSMEs are unable to establish physical and digital infrastructure, improve human capital, expand to international markets, and more. In turn, support programs can teach and enable entrepreneurs to optimize their resources, networks, and business operations.

The Partnership has consistently highlighted the importance of evidence-based policy and program development, as well as policy co-ordination among MSME innovation ecosystem members, to help provide appropriate support for diverse enterprises and entrepreneurs.

SOME OF THE PARTNERSHIP'S RECOMMENDATIONS FOR TARGETED FINANCING MECHANISMS INCLUDE:

- Implementing more favourable terms for bank loans and other forms of formal financing that are better suited to the needs and capacity of MSMEs.
- Ensuring that entrepreneurs are aware of and understand the various types of financing available within the MSME ecosystem (e.g. bank loans, government grants, impact investment, private investment), their various requirements, and the benefits of each type.
- Facilitating collaboration between banks, private investors, and business associations to provide targeted forms of funding according to different MSMEs' needs and capacity.

THE PARTNERSHIP ALSO RECOMMENDS THE FOLLOWING POLICY ACTIONS FOR ENSURING ACCESS TO MSME SUPPORT PROGRAMS:

- Ensuring that entrepreneurs are aware of the various support programs and resources available to them, in terms of marketing and promotion.
- Targeting the promotion of support services toward specific demographic groups (e.g. women, youth, Indigenous entrepreneurs) who are less likely to seek out or receive these resources, as well as toward specific MSME industries.
- Incorporating plans and investment for MSME support services into national industry support plans to prioritize the allocation of resources and time to MSMEs from the outset.

INCLUSIVE BUSINESS MODELS

Another crucial component in fostering inclusive growth for MSMEs is the implementation of long-term strategies and business models that intentionally prioritize the inclusion of marginalized entrepreneurs as a core component of MSME growth in national policies and individual business mandates.

In addition to ensuring that financing and supports for MSMEs are targeted toward specific entrepreneurs' needs, these inclusive business models should entail cultivating an entrepreneurship environment where women, youth, Indigenous peoples, and rural communities are not only included but are also enabled to thrive and grow. These long-term strategies and business models ideally reinforce one another over time.

Building an inclusive business model can include decisions on hiring and promotion practices, supplier organizations, online and in-person marketing, and target product or service audiences. Examples of national inclusive strategies include Canada's gender-based analysis plus (GBA+) and Indonesia's National Gender Mainstreaming Policy.

Creating and implementing these strategies and business models requires close study of the roles that societies have assumed for women, youth, and Indigenous peoples, and how we have collectively envisioned their participation in entrepreneurship. The Partnership's training activities with entrepreneurs have included exercises that explore how to practically implement a diverse and inclusive business by first prompting the audience on their unconscious biases toward marginalized entrepreneurs.

MSME FORMALITY IN VIETNAM'S AGRI-FOOD SECTOR[8]

One important consideration for post-pandemic recovery includes efforts to support informal MSMEs and extend support services to unregistered enterprises. In the context of the pandemic, informal or unregistered MSMEs often fall between the cracks in economies' COVID-19 support measures, due to their ineligibility to receive such benefits.

A focus on formality in the agri-food sector reveals the composition of enterprises and the challenges that they face. In Vietnam, approximately 70-to-80 per cent of women work in the informal economy, and around 60 per cent are in agri-food. Unfortunately, due to their lack of registered status, informal enterprises and entrepreneurs are not included in national statistics and in turn the design of MSME support. Furthermore, participants in the informal economy are often beholden to moneylenders, exacerbating issues in accessing financing and credit. For example, while approximately half of formal SMEs in Vietnam do not have access to formal financing, this number is around 72 per cent among informal enterprises.

The formalization of these enterprises is crucial for informal workers to be able to participate in social protection programs, and gain access to formal forms of financing. Assessing the landscape of informal enterprises in APEC economies through qualitative and quantitative data will be important in designing supports for these entrepreneurs. Moreover, it is important to draw on the resources within an MSME ecosystem and co-ordinate support for informal enterprises.

[8] Refer to the Partnership's paper Micro, Small, and Medium Enterprises in Agri-Food: A Study of the Philippines, Vietnam and Peru

RECOMMENDATIONS

To engender inclusive growth for MSMEs in the post-pandemic context, a multi-pronged and multi-stakeholder approach is essential. While the effects of COVID-19 have been experienced differently by regions around the world, the co-ordination and sharing of best practices through APEC's framework will have important benefits and long-term effects for the recovery of the region.

The Partnership's key recommendations and actions for policy-makers and business leaders alike for ensuring inclusive growth for MSMEs includes:

1

Policy and program co-ordination is key to advancing MSME growth and development and must involve the diverse stakeholders in the MSME ecosystem, including but not limited to government bodies, entrepreneurs, corporations, business associations, business incubators and accelerators, and investors.

Recommended action: Governments and business leaders must map local MSME ecosystems, identify key actors in the ecosystem, and build and maintain working relationships with these actors to co-ordinate the creation and delivery of relevant policies and programs.

2

Given the growing importance of digital entrepreneurship in all aspects of MSME development, ensure that resources and upskilling opportunities in digital business methods are available for entrepreneurs to enable and encourage MSME innovation, upscaling, and expansion to international markets.

Recommended action: As digitalization continues in lockstep with the pandemic, create and deliver resources and upskilling opportunities for MSMEs in digital entrepreneurship, with input and/or collaboration between government, the private sector, and local MSME ecosystems.

3

Ensure and continue the robust collection of disaggregated data on MSMEs and entrepreneurs to understand the varied and diverse landscape of MSMEs in APEC economies, and target financing and support mechanisms for different types of enterprises and entrepreneurs.

Recommended action: Collect MSME data through government or business community surveys, or through alternative means such as data collected through financial institutions, and then disaggregate this data according to priority areas including but not limited to entrepreneurs' gender, age, and level of education, and an enterprise's size, industry, geographic location, and informal or formal status.

4

Create and maintain targeted MSME policies, financing mechanisms, and support programs that are contextualized to the specific needs of different businesses and entrepreneurs, including micro-enterprises and startups, and marginalized entrepreneurs including women, youth, and Indigenous peoples.

Recommended action: Use the disaggregated MSME data to design and contextualize new and existing MSME policies, financing mechanisms, and support programs according to the distinct needs of different sectors, businesses, and entrepreneurs, with input and/or collaboration from the local MSME ecosystem and private sector.

5

Implement long-term national policy and business strategies that advance the inclusion of marginalized entrepreneurs in MSME development, particularly women, youth, Indigenous peoples, and rural-based entrepreneurs.

Recommended action: Make inclusive MSME development for marginalized entrepreneurs a key national and business priority by incorporating inclusivity into long-term national policy and business strategies, with input and/or collaboration from the local MSME ecosystem and private sector, especially as APEC Ministers continue to discuss post-pandemic economic recovery.

Although the pandemic has fundamentally altered the environment in which MSMEs operate in, the Partnership's research and recommendations continue to demonstrate the importance of a co-ordinated ecosystem approach between public and private-sector actors. As economies build individual solutions for more sustainable and inclusive economies, APEC must ensure that it continues to be a forum for regional co-operation and dialogue where economies can share best practices and work together to engender inclusive growth across the region.

ABOUT THE ASIA PACIFIC FOUNDATION OF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is dedicated to strengthening ties between Canada and Asia, with a focus on expanding economic relations through trade, investment, and innovation; promoting Canada's expertise in offering solutions to Asia's climate change, energy, food security, and natural resource management challenges; building Asia skills and competencies among Canadians, including young Canadians; and improving Canadians' general understanding of Asia and its growing global influence.

The Foundation is well known for its annual national opinion polls of Canadian attitudes regarding relations with Asia, including Asian foreign investment in Canada and Canada's trade with Asia. The Foundation places an emphasis on China, India, Japan, and South Korea while also developing expertise in emerging markets in the region, particularly economies within the Association of Southeast Asian Nations (ASEAN).

Visit APF Canada at http://www.asiapacific.ca

ABOUT THE APEC-CANADA GROWING BUSINESS PARTNERSHIP

The APEC-Canada Growing Business Partnership is a four-year initiative jointly implemented by APF Canada and the Asia-Pacific Economic Cooperation (APEC) Secretariat. Funded by Global Affairs Canada, this initiative helps build the potential of MSMEs to promote poverty reduction and sustainable economic growth in the APEC region.

The Partnership offers best practice tools, ideas, knowledge, and critical connections derived from Canadian experience, tailored to the local markets of APEC countries. The current economies of focus are Indonesia, Peru, the Philippines, and Vietnam. The focus areas of the Partnership aim to address key challenges faced by MSMEs and aspiring entrepreneurs from APEC developing economies in the areas of technology and innovation, market access, human capital, and social entrepreneurship, with an emphasis on the crosscutting themes of women, youth, governance, and the environment.

Visit the APEC-Canada Business Partnership at https://apfcanada-msme.ca/

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ARTIFICIAL INTELLIGENCE IN APEC:

Progress, Preparedness, and Priorities

Contents

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Foreword

Artificial Intelligence (AI) promises to revolutionize the global economy through exponential productivity gains; improved decision-making; unlocked insights and innovation; as well as newly expanded markets and revenue streams. Building on the 2020 *AI in APEC* report, *Artificial Intelligence In APEC: Progress, Preparedness and Priorities* is a critical contextual analysis of the APEC region's readiness to capitalize on AI. Through an analytical framework that examines policy and regulatory frameworks, private sector endeavours, ethical considerations, and cross-border linkages this report provides a roadmap to move the region to AI prowess.

Recognizing the importance of AI to businesses and to continued economic growth and integration across the region, the APEC Business Advisory Council (ABAC) sought to identify the critical features of an enabling environment that would facilitate the development, deployment, and adoption of AI. To achieve this, ABAC engaged AI business leaders and

experts from each economy in addition to conducting comparative research to better understand the current state of play and preconditions to success.

Artificial Intelligence In APEC: Progress, Preparedness and Priorities employs a regional lens and identifies a readiness gap that must be closed if the region is to take advantage of AI innovations. This report also identifies current strengths which must be catalyzed across the region's "capacity clusters" through a coordinated approach of best practice exchange. In addition, it also reveals competitive advantages within the region that, if combined with the emergence of leading AI ecosystems, would bolster APEC as an economic powerhouse.

To move the region to AI prowess, this report highlights key opportunities and policy actions for APEC Economic Leaders that would enable APEC to capitalize on the forthcoming AI revolution. These include creating enabling regional AI ecosystems, leveraging the role of diverse APEC AI leaders, and building trust by ensuring data privacy and security.

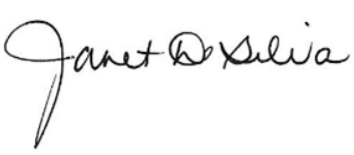
Our COVID-19 recovery and resilience toolkit must include the establishment of enabling environments for AI. APEC must be prepared to capitalize on the AI revolution. This report provides a roadmap to get us there.

Rachel Taulelei

ABAC Chair, 2021

ABAC New Zealand

Co-Founder, Oho



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ABAC
APEC Business Advisory Council

About ABAC

The APEC Business Advisory Council (ABAC) was created by the APEC Economic Leaders in November 1995 to provide advice on the implementation of the Osaka Action Agenda and on other specific business sector priorities, and to respond when the various APEC fora request information about business-related issues or to provide the business perspective on specific areas of cooperation.

ABAC comprises of up to three members of the private sector from each economy. ABAC members are appointed by their respective Leaders, and represent a range of business sectors, including small and medium enterprises. The economy determines the term of membership of each appointee as well as its own administrative arrangements and staff support.

The ABAC International Secretariat based in Manila, the Philippines, serves all members and all economies and maintains a website. Funding is provided through a system of annual dues, which are structured to reflect the size of each economy, following the APEC formula.

For more information, visit www2.abaconline.org

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The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada.

APF Canada is dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas.

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, Digital Media, and a regular Asia Watch newsletter that together support these thematic areas.

APF Canada also works with business, government, and academic stakeholders to provide custom research, data, briefings and Asia Competency training for Canadian organizations. Consulting services are available by request. We would be pleased to work with you to meet your research and business intelligence needs.

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Introduction

There is a lot of excitement surrounding artificial intelligence (AI). The advances in computing power and capacity, combined with an abundance of data, have resulted in the emergence of machines that can perform "human-like" cognitive processes through algorithms, production processes, and end-user products and services.[1] This has accelerated the adoption of AI in different fields, business functions, and products. AI offers vastly improved efficiency and decision-making, enabling businesses to be agile and scale rapidly. Moreover, it can provide a business (and economy) with a competitive advantage as it unveils new insights that lead to the creation of new products, services, markets, or even industries, unlocking new revenue streams through increased consumer demand. Indeed, AI holds significant promise globally, potentially delivering additional economic output of US$16T by 2030 and boosting global GDP by 14%.[2] The resulting economic impacts will manifest themselves in three main ways: improved labour productivity through innovation and efficiency gains, intelligent automation resulting in a virtual workforce, and increased diffusion of technology across sectors. This could profoundly affect how markets are structured and regulated, laws are adjudicated, and capital allocated.

With the potential to transform entire industries, supply chains, and markets, AI presents a paradigm-shifting opportunity for APEC as a regional economic forum. Such a transformation, if cultivated well, could increase jobs, trade, economic development, and participation in the economy. At the same time, the risks associated with AI could be just as significant, ranging from ethical considerations (trust, privacy, discrimination, etc.) to a lack of preparation required to take advantage of the coming revolution. Recognizing the paradigm-shifting phenomenon that AI signifies for all economies, governments around the world have begun introducing national strategies, and businesses are seeking adoption opportunities to become more competitive in AI.

The APEC Business Advisory Council (ABAC) continues to raise the profile of AI on APEC's agenda, supporting APEC's responsiveness to new developments and challenges that will impact the region's economic and trade environments. ABAC's 2020 Artificial Intelligence in APEC report highlighted the diverse ways AI technologies were implemented across member economies and their potential to spur economic growth. That report demonstrated examples of near-term policy measures APEC economies could implement to harness the benefits of AI. The report also raised awareness about existing AI-driven solutions to some of the region's more complex long-term challenges, which APEC members could consider for expansion and replication at national and regional levels. In addition, and more importantly, it emphasized

the need for APEC economies to have a common appreciation and shared knowledge of the added value and systemic transformation AI adoption could have for the region.

In its recommendations, the ABAC report proposed that APEC economies accelerate development in two fundamental areas to support widespread AI adoption. First, it recommended strengthening business environments that would encourage and distribute the costs of investment in AI technologies across government and private sector. Second, it suggested preparing and equipping the workforce with skills and knowledge necessary to capitalize on wider adoption of AI across the economy. The report proposed that such transformation should be driven by the public sector, guided by expertise from academia and industry, and sustained by the private sector.

The Readiness Gap

Building on the ABAC 2020 study, this report evaluates each APEC economy on its strengths, weaknesses, and opportunities as they relate to AI. In particular, it focuses on readiness to deploy AI across the region, assessing the policy, regulatory, and investment landscapes for their ability to encourage the development and deployment of AI.

In 2021, the European Union (EU) proposed the world's first comprehensive draft regulation for AI, which defined AI and AI readiness.[3] This report relies on the EU's definition of AI and builds on its definition of AI readiness.

What is AI?

The EU's draft regulation defines an AI system as "software that is developed with machine learning, logic-and-knowledge-based models, and/or statistical models that can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with."[4]

Through these approaches, AI systems decrease the costs of operation and maximize efficiency. However, all AI systems are currently "narrow." That is, their capability is limited to specific and predetermined tasks, as opposed to being "general," which would entail functioning like a human being. Put differently, a human will not beat AlphaGo in the game of Go, for which it was designed, but AlphaGo will not be able to do other things (e.g., play checkers or chess).

What is AI Readiness?

AI readiness refers to the economic, policy, and social environments that support the adoption and deployment of AI applications throughout multiple sectors and industries in an economy. In this context, becoming AI ready or AI competitive does not merely mean having AI technologies adopted and deployed within the economy or possessing *the best* AI technologies. Rather, it is the planning for, investment in, and co-ordination of the *enabling environment* for AI adoption.

Critically, the process by which an economy becomes ready for the deployment of AI must also address potential risks, thereby safeguarding the benefits of AI. These risks can include ethical considerations related to trust, data privacy, and the potential for discrimination as

well as any potential short-term adverse impacts of AI. The process should be collaborative and inclusive, bringing together government, industry, academia, and civil society.

HOW READY IS APEC TO CAPITALIZE ON AI?

In short, APEC is not optimally prepared to take advantage of AI. Member economies possess varying levels of familiarity, governance, and adoption of AI. While there are leaders and followers when it comes to AI capacity and readiness, our research reveals a spectrum where economies tend to cluster based on their shared challenges and capacities. Indeed, most APEC member economies are not fully prepared to develop and deploy AI, and every economy can improve its ability to capitalize on AI-related opportunities. At the same time, it is important to note that no two economies will have the same challenges or solutions when it comes to AI readiness and adoption. However, given the range of capabilities within APEC, there are great opportunities for sharing best practices among economies to accelerate readiness.

The global race for AI is on and competition is strong. Considering the opportunities that AI presents for each economy and for regional trade and development, if the status quo continues and member economies remain unprepared to take advantage of AI, these opportunities will be lost, and APEC will be left behind. This presents a grave situation that could lead to increased inequality within and between economies, reinforcing the digital divide for countries, businesses, and workers.[5] Moreover, fractured AI capabilities could mean decreased trade, economic integration, and immeasurable costs to catch up. This would undoubtedly put APEC on a back foot and at a global competitive disadvantage.

Purpose of This Report

While this study does not assign a "rank" or "score" of AI readiness or competitiveness to individual economies, it aims to complement those types of efforts by providing more qualitative, in-depth analyses that build AI profiles for each economy. The comparative analysis not only provides an environmental scan, but it also highlights opportunities for action in specific areas that would increase readiness for AI adoption.

As such, this report goes beyond considering more traditional indicators of AI readiness, such as government investment in R&D or the number of STEM students in an economy. Our research and analysis also examine the economic, policy, and social environments that may support or deter the widespread adoption of AI among APEC members. It strives to identify *niche* areas where AI adoption has the potential to make the most impact as a competitive advantage.

Roadmap to Readiness: From Preparation to Prowess

There are four critical areas for the establishment and development of ecosystems conducive to AI's innovation, adoption, and commercialization. AI development and adoption require the mobilization of resources across multiple stakeholders including government, industry, civil society, and academia. Therefore, the analytical framework underpinning the assessment of AI readiness across the region examines **government policies, private sector activities, society**, and **international linkages**, which are described below in more detail. Achieving a high degree of advancement in each of these areas contributes to each economy's readiness, whereas a high degree of advancement in all demonstrates AI leadership.

- **Government policies:** This section investigates the different policy and regulatory environments/structures within APEC economies that support their AI ecosystems. This could be existing AI national strategies, data regulation, digital government initiatives, AI talent development schemes, research and development subsidies, or other incentives. It could also include startup incubation and acceleration programs;

- **Private sector activities:** This factor examines the AI business landscape in APEC economies, highlighting key companies making important progress in AI across multiple industries. For each profile, this section also highlights sectors or industries with mature adoption or that show promise for AI application;

- **Society:** This delves into educational efforts supporting talent development for AI within business and industry-specific civil society organizations. It also looks at AI technologies already in widespread use in society. This section also covers ethical issues that have arisen in a particular economy and their impact on regulation, businesses, and consumers; and

- **International linkages:** This section investigates existing co-operation and investment ties in education, research, infrastructural development, and business opportunities that foster and advance AI adoption across APEC members.

APEC member economy profiles comparing achievements and opportunities in each of the areas above can be found in the Appendix.[1]

[1] Due to constraints in stakeholder interview access and availability of information, the Russian Federation could not be analyzed in this study.

From the analytical framework above, the research unveiled five distinct capacity clusters. Each cluster shares many characteristics while at the same time possessing the potential, through knowledge exchange, to impact other clusters and increase readiness across the region. These clusters are as follows:

- **AI Global Leaders** are economies that have developed strengths in government policy, private sector investment and activities, talent development, and international linkages. These economies also have significant influence over AI governance globally due to their market size, leadership in AI research and development, and geopolitical power;

- **AI Middle Powers** are economies that have strengths in government policy, private sector investment and activities, and talent development. AI Middle Powers possess capacities on AI that could allow them to play significant roles in AI governance internationally, but they lack the clout of global leaders in terms of academic and business strengths for AI and geopolitical influence;

- **AI Regional Hubs** are economies that have or are developing a combination of strengths in comparison to their neighbours, allowing them to serve as hubs. While they may lag behind AI Middle Powers, relative to their neighbours they are ahead on different aspects pertinent to AI, such as research, governance, or education. Due to their relative strengths, they attract talent (in industry or for education), businesses, jobs, and investment in AI from different economies. Often sharing language or cultural ties with geographic neighbours, they also host key academic or industry networks that exchange AI research, best practices, and products with the potential to impact AI ecosystems in peer economies;

- **Emerging AI Economies** are in the process of building readiness and advancing capabilities in private sector activities and investment, talent development, and international linkages. They have great potential to accelerate AI adoption because they have certain strengths in AI (e.g., large population, strong AI national strategy, high AI adoption in key sectors); and

- **Nascent AI Economies** refer to the economies that are at the early stages of building up their AI ecosystems and thus require significant action and investment in advancing government policy, private sector activities, talent development and education, and international linkages.

Plotting Preparedness: APEC AI Capacity Clusters

As alluded to above, each economy falls on a readiness spectrum from AI Global Leader to Nascent AI Economy. However, no economy is alone, which is encouraging for the region from a capacity building and knowledge transfer perspective. Each capacity cluster has its own strengths and opportunities, and recommendations for improved preparedness can be operationalized according to existing capacities.

AI Global Leaders	AI Middle Powers	AI Regional Hubs	Emerging AI Economies	Nascent AI Economies
• People's Republic of China • United States	• Australia • Canada • Chile • Chinese Taipei • Hong Kong, China • Japan • New Zealand • Republic of Korea	• Malaysia • Mexico • Singapore	• Indonesia • Peru • Philippines • Thailand • Vietnam	• Brunei • Papua New Guinea

Examples of Actions Supporting Preparedness

Several APEC economies have issued various policy programs to further develop their domestic AI ecosystem. Such policies can include a national AI strategy and updates to AI-relevant policies, like changes to data governance regulations or digital government roadmaps that support the foundational infrastructure for AI. Governments have also made or plan on making significant investments to address critical infrastructure needed to support widespread AI adoption, such as expanding internet connectivity within their territory and investing in upskilling or training programs for workers or directly contributing

to academic research through grants. However, there is a lack of co-ordination and cohesive approaches toward AI adoption and governance across APEC economies, as each tries to go at it individually.

The Opportunity for APEC

As an international organization with a focus on economic issues and co-operation, APEC has great potential to be the main venue for co-ordination and information exchange in the region, hence aiding in the forging of a more co-ordinated approach to AI. The organization also has the ability to facilitate high-impact, constructive dialogues on international AI governance, as it has done on related digital policy in the past. For instance, APEC successfully created frameworks such as the Cross-Border Privacy Rules (CBPR) for its members that sought to address the emerging issue of data governance. This effort also promoted good practices on personal data management while reducing barriers to international business.

APEC supports a range of capacity-building projects in its member economies, providing skills training and technological know-how. Based on its cross-border efforts, APEC has a great potential to be a key international body for AI governance worldwide.

Insights and Recommendations

This section provides insights and recommendations based on the results of this research study on how to expand and continuously support the already established experimentation, innovation, and usage of AI in APEC to support readiness. Recommendations also focus on APEC's role as a critical forum for policy co-ordination, knowledge exchange, and cross-border collaboration on AI development and governance.

There are three main recommendations for APEC Economic Leaders: to create an enabling regional AI ecosystem; to leverage the role of diverse regional AI leaders; and to build trustworthy AI for APEC. These are detailed below. More specifics on each economy can be found in the Appendix.

1. Create an Enabling Regional AI Ecosystem

Though relatively nascent in development and application when compared to other late technology advancements, artificial intelligence has the potential to advance commercial and economic opportunities across the region. Prioritizing AI by ensuring preparedness for deployment, a supportive policy and regulatory landscape, and increased opportunities for collaboration will increase uptake and make businesses across the region more competitive, ultimately increasing the efficiency of markets and capital allocation.

AI can expand existing strengths in each industry. Cross-border collaboration between academic institutions and networks as well as business-affiliated research institutions could increase sector- and mission-specific application of AI while potentially expanding markets for novel, innovative applications. This could result in an increase in investments for development, deployment, and adoption of AI technologies. Networks such as the Association of Pacific Rim Universities (APRU) could play an essential role in mobilizing the intellectual resources and capabilities from the region's sectoral R&D leaders to inform, build trust in, and push forward a more harmonized regulatory approach on AI in the APEC region. Moreover, pairing sectoral strengths with AI application could allow for a more inclusive ecosystem, bringing economies together and potentially bridging capacity gaps.

RECOMMENDATIONS

- Create a regional multi-stakeholder forum where policy and business leaders can periodically exchange the latest developments in AI governance and policies to improve regulatory coherence. Leverage existing networks of academic institutions and industry

experts (e.g., the APRU) for sector-specific discussions on AI innovation, regulatory frameworks and standards, and regional collaborative opportunities; and

- Mainstream AI across existing working groups and create venues to address sector- or mission-specific issues on AI for regulatory harmonization.

2. Leverage the Role of Diverse Regional AI Leaders

AI ecosystems in APEC member countries vary widely in their level of maturity, policy support, strength in AI application, and local knowledge. APEC should foster AI hubs as sources not just of innovation and research, but also for diffusion and commercialization of AI technologies throughout the region. This is particularly valuable when considering existing regional networks in industry and academia that increase the region's competitiveness in AI.

RECOMMENDATIONS

- Leverage the role of regional AI leaders as hubs for AI adoption, research, best practice sharing, cross-border collaboration, norm diffusion, and commercialization.

3. Build Trustworthy AI for APEC

The APEC CBPR system is a voluntary mechanism that facilitates cross-border data transfers across participating APEC members for businesses. It reduces compliance and administration costs and provides legal certainty for businesses involved in cross-border data transfers. However, only nine economies and 43 firms have joined since the system was founded in 2011. Considering the breadth of economic activity across the region, this uptake is extremely low and serves as a barrier to trade. Further, the CBPR, unlike the General Data Protection Regulation (GDPR) or more up-to-date privacy legislations around the world, does not address processing of personal data, which may limit its effectiveness regarding the regulation of AI.

RECOMMENDATIONS

- Develop and introduce a data sharing framework that addresses risks related to personal data processing by AI systems (e.g., updates to the CBPR or supporting Digital Economy Partnership Agreement [DEPA]).

Appendix:

APEC AI Economic Profiles

This project relied on qualitative research, literature reviews, and interviews with local stakeholders and experts. A non-scientific survey was also circulated through the ABAC Digital Working Group and considered through the research process. Each case study delves into government policies, private sector initiatives, civil society activity and societal factors, and international linkages relevant to AI to assess readiness and identify niche areas of strength and thereby potential ways of creating synergy between different economies.

AI Global Leaders

AI Global Leaders are economies that have strengths in government policy, private sector investment and AI commercialization activities, talent development, and robust international linkages. These economies also have significant influence over AI governance globally due to their market size, leadership in AI research and development, and geopolitical power.

People's Republic of China

INTRODUCTION

China's AI industry has developed extremely quickly over the past years. It is now regarded as a global AI superpower that is able to strategically compete with the United States in many AI fields. China's AI market size was nearly US$6.3B in 2020,[6] and it took a leading position in global share of AI research publications in the same year.[7] China possesses a well-established digital infrastructure, huge amounts of data, and public and private research capabilities driven by global tech giants such as Alibaba and Tencent, and AI technologies are now seeing a great variety of applications in the country. These include computer vision, facial and speech recognition, machine learning, and logistics.

GOVERNMENT

The Chinese government sees AI as a high-stakes strategic priority, and it invests heavily in promoting world-leading AI capabilities and applications. The most influential policy, the New Generation Artificial Intelligence Development Plan (AIDP), charts China's path toward becoming the world's primary AI innovation centre by 2030.[8] Under the guidance of this foundational policy, the government created a number of agencies, such as the AI Plan Promotion Office, with the aim to implement AIDP. Another critical agency is the National New Generation AI Governance Expert Committee, which is responsible for the ethical governance of AI.

In addition to AIDP, China has issued shorter three-year action plans – focusing on Internet Plus and AI in the 2016-2018 period and next-generation AI industry in the 2018-2020 period – that provide short-term guidance to public and private stakeholders. The Ministry of Industry and Information Technology is also actively involved in the national AI strategy.

In addition to the policy directions provided by China's central government, its provincial and municipal governments also play important roles in implementing and carrying out various AI-related initiatives, such as building industrial parks and collaborating with

local institutions on R&D efforts. Total investment on AI from both the central and local governments is so far estimated to be tens of billions of dollars.[9] Shanghai (Pudong), Shenzhen, Jinan-Qingdao, Beijing, Tianjin, Hangzhou, Guangzhou, and Chengdu are recognized as the eight AI innovation and application pilot zones that lead the country's AI development.

PRIVATE SECTOR

China has a sizable AI industry. A quarter of global AI corporations were located in China in 2020, just below the United States with 38.3%.[10] Most of these companies are based in Beijing, Shenzhen, Shanghai, and Hangzhou.[11] Driven by the recent boom in the industry, Chinese AI companies receive a huge amount of investment annually from investors and are growing to be specialized global leaders in many sub-fields of AI. The country has well over 200 unicorns, with approximately 15 so far specializing in AI. China's startups include internationally known names such as Ubtech Robotics, SenseTime, and drone manufacturer DJI. Moreover, China's "BAT" – Baidu, Alibaba, and Tencent – have made considerable progress with their AI divisions, specifically devoting resources to research and commercialization of AI technologies, such as automated vehicles. AI startups in China are in general well supported by industrial clusters formed around established AI "national champions," where government provides support such as incubator spaces to help their growth.[12]

As such, boundaries can sometimes be blurred between the private and the public in the Chinese AI industry. The incentives for private companies to develop commercial results that fall in China's areas of strategic importance are stronger, and public service and governance platforms – such as transportation, health-care, and policing systems – incorporate AI more than do similar digital tools employed by other economies.[13]

SOCIETY

Beijing's policy approach envisions AI playing a central role in the digitalization of Chinese society, which includes a pool of innovative, high-end AI talents. To cultivate the next generation's leading AI experts, China has been laying the groundwork for a supportive educational and research environment. The country has approved AI-related programs in 150 universities and colleges to date. Moreover, China is a front-runner in extending AI education at the secondary and even primary level. The AIDP sets out the goal of making AI education universal, by adding content on AI and coding to the country's K-12 informational technology curriculum, in which pilot cities and schools have the flexibility to work with various private sector partners in the design of courses.

AI technologies have also been introduced to society through health care, solving efficiency problems in the areas of telemedicine and image processing.[14] Applications of AI have also been recently used to combat the COVID-19 pandemic.[15]

The AIDP explicitly states China's goals to set the norms and standards related to the use of AI and has made some attempts to frame the conversations around AI governance both domestically and internationally. While public debates often emerge around the surveillance and privacy aspects of the use of AI technologies, China's approach to AI ethical standards have thus far been largely focused on the high-level principles. However, Beijing has already launched Governance Principles for the New Generation AI and Ethical Norms for the New Generation AI and is promoting their implementation. Beijing's most recent regulatory moves in the tech space, including the antitrust probes and tightened data/privacy oversight targeting technology giants, are further developments to watch that could have significant implications on the AI industry and its many downstream applications.

INTERNATIONAL LINKAGES

China's international co-operation and exchanges on AI have been strengthened in recent years through joint research institutions and projects, as well as efforts that tackle common challenges in AI governance and technological standards. An important channel through which China is internationalizing its AI technologies is the Digital Silk Road (DSR), part of the Belt and Road Initiative that extends to Southeast Asia, Eastern Europe, the Middle East, Latin America, and Africa. The DSR projects allow China to play a key role in some of its partners' AI capacity-building efforts and to set standards more broadly for the next generation of digital infrastructure.[16]

The United States

INTRODUCTION

The United States has been the world's leader and pioneer in the development of AI since the 1960s. The US federal government invests heavily in facilitating AI innovation, research capability, and the commercialization of these results. Projected government funds to be allocated to AI-related research and development have amounted to US$6B in 2021 so far. The country also takes the world's largest share of private investment in AI.[17] AI market size in the United States remains the largest in the world, estimated to reach US$21.9B in 2021.[18] Known as home to some of the world's most powerful tech giants, America's private sector is known for possessing commanding technological breakthroughs and application capabilities across a broad range of areas of AI. Despite China's recent gains in terms of research activities, the United States has accumulated the largest number of AI-related

research publications over the past two decades and remains the largest and deepest AI talent pool in the world. In addition, the wide adoption of AI technologies in end-industries that demonstrate high levels of digital prowess and awareness also acts as a conducive factor for the AI sector to continue its rapid growth.

GOVERNMENT

AI has been one of the federal government's top priorities. The United States' charting of AI strategies began with the Obama administration. The National AI R&D Strategic Plan, first released in 2016 and revised in 2019, acts as the guiding document that sets the overall direction of and strategic priorities for federally funded research and development in AI.[19] The United States launched the Artificial Intelligence for the American People initiative via an executive order in 2019, outlining five key principles including "increasing AI research investment, unleashing Federal AI computing and data resources, setting AI technical standards, building America's AI workforce, and engaging with international allies."[20] This was followed by the release of the *National Artificial Intelligence Initiative Act of 2020* and the establishment of the National Artificial Intelligence Initiative Office to oversee the implementation of the act. As such, the United States has clear mechanisms for inter-governmental agency co-ordination and collaboration on AI policy-making, in which the Office of Science and Technology Policy, the National Institute of Standards and Technology, and the National Science Foundation (NSF) are playing key parts.[21]

Apart from these policy-making efforts focused on the AI sector itself, the US federal government set up several special bodies, such as the Select Committee on Artificial Intelligence, the AI Center of Excellence, the AI Community of Practice, and several summits on AI to support the use of AI technologies in government agencies as well as their engagement with industry stakeholders. At the state and city level, several governments have introduced bills on the accountable and safe use of AI technologies, to protect people from unauthorized and unethical intrusion of privacy and other rights by various forms of AI applications.

PRIVATE SECTOR

Forefront Players

The United States has the world's largest and most-developed AI industry, with 5,751 privately held AI companies in 2020.[22] It continues to be home to the greatest number – 38.3% – of AI corporations in the world.[23] Among them are several of the most important players in the field, such as Microsoft Azure, Amazon Web Services, IBM Cloud, Nvidia, Salesforce, Google Cloud, and Automation Anywhere. Leveraging the well-established entrepreneurial ecosystems in Silicon Valley and their already massive scale, the United States' tech giants

are investing heavily in developing cloud, artificial intelligence, and machine learning divisions to generate technologies at the world's forefront and undertaking the most startup acquisitions (60 during 2016-2020) in the AI space.[24] The country also has a sizable, vibrant, and well-funded AI startup scene.

Wide Applications

The country sees the use of AI in a wide range of sectors, including health care, environmental protection, transportation, education, scientific research, manufacturing, agriculture, and financial services. The use of AI innovation in the US health-care system can be traced to before the COVID-19 outbreak, with AI-enabled solutions such as natural language processing and robotic process automation employed to enhance diagnosis results and the collection of clinical data.[25] The use of AI tools and techniques in combatting the COVID-19 pandemic has, to an extent, accelerated the slow-moving AI adoption in medicine. AI use has increased in patient screening and monitoring, data analysis, modelling and forecasting, treatment, and vaccine development.[26] Another example of the wide use of AI is in environmental protection. SkyTruth is a non-profit, satellite-based environmental watchdog that uses the Automatic Identification System technology to track ship traffic at sea. It collaborates with Google Earth to identify fracking sites and natural gas flaring in the ocean. Both tech companies have partnered with the ocean protection organization Oceana to develop Global Fishing Watch, a platform for real-time monitoring and deterrence of illegal fishing.[27]

Military AI

For the United States, leveraging AI applications to expand its military and defence power has been an established priority for the technology's development. In 2018, Congress created the National Security Commission on Artificial Intelligence to advance AI and machine learning development for national security and defence needs. This was followed by the creation of the Joint Artificial Intelligence Center, tasked with delivering AI-enabled capabilities for the Department of Defense's key missions by partnering with industrial, academic, and military stakeholders. The main areas of focus include perception, predictive maintenance, humanitarian assistance and disaster relief, and cyber sense-making.[28] The United States currently has a number of military AI combat programs, such as Project Maven, but the actual use of relatively new technologies such as driverless AI-powered systems in combat activities are often debated. Some corporate partners like Google have opted out from participating in the development of warfare technologies.[29]

SOCIETY

The United States possesses tremendous AI research and development capabilities that can only be matched by other AI Global Leaders. The country had produced the largest volume

of AI-related research papers for years, until being overtaken by China in 2019. Nonetheless, AI research publications from the United States still outperform those from other countries in terms of quality, as they were cited about 40% more than average.[30] World-renowned US universities in computer science, such as the California Institute of Technology and Carnegie Mellon University, continue to dominate internationally in the space of AI research projects and degree programs. The country also has no shortage of corporate-led and university-led research centres, while the NSF has most recently announced the addition of 11 National Artificial Intelligence Research Institutes, each with specific areas of research focus, to the first round of seven institutes built throughout 2020.[31]

In terms of public debate and standard-setting efforts in the development and use of AI, an overwhelming majority of the US public supports the responsible use and management of AI and regards it as a high-priority governance issue.[32] The focus of public and political discussions often falls on issues like the development of autonomous AI-driven military systems and the subsequent decision-making process, facial recognition technologies, and AI/machine learning-powered social media monitoring. The US government has played a key role in defining the principles of ethical and responsible use of AI since the Obama administration, developing guidelines and sector-specific principles to address public concerns and make sure downstream applications of AI are not only commercially viable but socially beneficial.

INTERNATIONAL LINKAGES

As the global leader in AI, the United States emphasizes the importance of international collaboration and is actively pioneering such efforts through existing international governance mechanisms. It works extensively with its allies and partners by leading a number of AI-themed initiatives, such as the Global Partnership on AI through the G7 network. Washington also actively participates in the OECD AI Recommendations and the G20 AI Principles.[33] Through engagement, the United States seeks both to advance AI innovation and research and to define rules and norms for trustworthy AI.

The US AI industry, academia, and policy-makers also engage with their counterparts in many bilateral settings, by signing formal agreements such as the US-UK co-operation on AI R&D declaration as well as through company-to-company and school-to-school joint efforts. For instance, US tech giants like Google encourage the widespread application of AI to top global issues through initiatives such as the Google AI Impact Challenge. Members of the Challenge have access to a US$25M pool of funding as well as a six-month Launchpad Accelerator program that provides mentorship, expert workshops, and networking opportunities. One successful Challenge grantee was Indian startup Wadhwani AI, specializing in AI-powered

pest control.[34] In addition, Google provides AI and machine learning resources to be applied in the areas of health care, agriculture, and economic and democracy development to a number of developing countries through non-profits and institutions including the U.S. Agency for International Development.[35]

AI Middle Powers

AI Middle Powers are economies that have strengths in government policy, private sector investment, R&D, and commercialization activities. They also have competitive talent pools and continue to expand them through education and upskilling schemes. AI Middle Powers possess capacities on AI that could allow them to play significant roles in AI governance internationally, but they lack the clout and capacity of global leaders in terms of academic and business strengths for AI, and geopolitical influence internationally.

Australia

INTRODUCTION

Australia has a thriving artificial intelligence scene. With a supportive federal government leading and funding various AI initiatives and with active participation from private actors and research institutions, Australia is well positioned to become a future regional or even global leader in the field, particularly in sub-fields of AI such as deep learning, field robotics, and computer vision.[36] As a key pillar of Australia's US$128B (AU$139B) digital economy,[37] AI technologies are already being used across a wide range of sectors, including retail, finance, mining, agriculture, and health care. This trend has been accelerating since the onset of the COVID-19 pandemic, as demand for AI and machine learning applications to address supply-chain and remote work issues has been on the rise. To better cope with this demand, the Australian government unveiled in June 2021 its first dedicated Artificial Intelligence Action Plan, to set out visions and lay out future plans to accelerate the growth of the country's AI capabilities.

GOVERNMENT

With a total US$90.4M (AU$124.1M) investment, Australia's AI Action Plan will channel government support to four focus areas: (1) developing and adopting AI to transform Australian businesses; (2) creating an environment to grow and attract the world's best AI talent; (3) using cutting-edge AI technologies to solve Australia's national challenges; and (4) making Australia a global leader in responsible and inclusive AI.[38]

One of the major actions under this Action Plan – with nearly US$39.2M devoted to it – will be to establish a National Artificial Intelligence Centre and four different AI and Digital Capability Centres over the next four years. The goal of this initiative is to lay a solid foundation to facilitate R&D and boost the application of AI in a collaborative manner

among government, academia, and private sector stakeholders. By better co-ordinating expertise and capabilities, the centres are expected to facilitate the adoption of cutting-edge AI technologies and tools by businesses, especially small and medium-sized enterprises (SMEs).[39]

Another important element in the Action Plan is the Next Generation AI Graduates program, which will seek to attract and train more than 200 Australian AI specialists and to increase the talent supply in areas with the most pressing technology needs.[40] This program builds on a number of existing education and skills-training programs that the federal government has been funding since 2018.[41]

PRIVATE SECTOR

While local branches of internationally renowned big tech brands such as IBM, Google, and Amazon Web Services are the major players operating in Australia's AI industry, the country is also home to more than 500 AI and machine learning startups. Fast-growing local players such as Hyper Anna and Metigy are building up their profiles regionally and internationally.[42]

Australia's Artificial Intelligence Roadmap, co-developed in 2019 by the Department of Industry, Science, Energy and Resources and CSIRO's Data61, the data science and digital arm of the country's national science agency, identified three areas of specialization that have the greatest potential for Australia's AI application.[43] In natural resources and the environment, AI tools are developed to enhance productivity of mining, agriculture, fisheries, and environmental management. One famous example is the world's first AI-driven production optimization tool developed by Origin Energy that can more efficiently manage gas wells while reducing side effects from emissions.[44]

Another area in which AI solutions are being actively explored is infrastructure and construction management. The AI-powered congestion management system in New South Wales is one of the most-cited examples of how "digital twinning" processes, the creation of virtual replicas of physical regions and systems, can transform ex-ante analysis and predictive models.[45]

With regard to deploying AI technologies to support health, aging, and disability, the applications of AI range from vision processing tools and wearable monitoring devices to AI-based platforms that help improve health outcomes.[46]

SOCIETY

Australia is known for its world-leading capacities in AI research. The country is ranked eighth and fourth globally in terms of AI research and development, respectively.[47] In particular,

peer-reviewed AI publications produced by Australian researchers are among the world's most impactful in citations.[48] Yet, a significant gap exists between cutting-edge research results and their real-life application and commercialization. Early business adopters of AI in Australia, while recognizing the importance of such technological deployment to their companies' success, believe that they have been mainly using AI as a tool for catching up and keeping on par with their competition, rather than establishing a distinctive competitive edge.[49] Some of the more recent programs, including the government-funded Cooperative Research Centres Projects Grants and initiatives under CSIRO Data61 are tasked with improving industry–research collaboration so that partners can work together to deliver tangible outcomes.[50]

However, almost half of these business adopters indicated that the shortage of AI researchers, business leaders, and software developers is leading to a "major to extreme AI skills gap."[51] To tackle the lack of AI skills readiness and help the country meet its demand of 161,000 additional AI specialists by 2030, the Australian federal government is topping up its funding in scholarship programs and working with research institutions and universities to set up new programs to foster AI literacy.[52]

The Australian civil society believes in regulated and carefully managed uses of AI. Despite relatively high levels of acceptance of the use of AI for work and business, the general public remains distrustful and cautious of the deployment of AI and facial recognition technologies.[53] Common concerns include accountability and oversight mechanisms, accuracy and discrimination, and data privacy and governance issues.[54] Meanwhile, the Australian government is taking into account the popular demand for upholding ethical and trustworthy AI through numerous policy and regulatory efforts. These include the Australian Human Rights Commission's Human Rights and Technology Report that examines the human-rights implications of AI technologies[55] and the AI Ethics Framework released in 2019 to guide responsible development and use of AI.[56]

INTERNATIONAL LINKAGES

Australia is striving to be a leader in setting and shaping global standards on AI. The country is one of the founding members of the Global Partnership on Artificial Intelligence, a key multilateral mechanism for collaboration on AI.[57] Trade relations with its neighbouring countries, especially opportunities for exporting digital goods and services, are another important venue for Australia's AI norm-building efforts. In addition to traditional regional partners in Oceania, the country has been working closely with India, Japan, and the United States on the broader issues of cybersecurity and emerging technology, which are highly relevant to AI development.[58] The Quad Tech Network, for instance, is one such Track II initiative created by Australia.[59]

Canada

INTRODUCTION

Canada is at the global forefront of the artificial intelligence and machine learning-powered revolutions currently underway. Propelled by its US$182B (C$230B) information and communications technology (ICT) sector, Canada's AI ecosystem is one of the most comprehensive and well developed in the world. Its unique model, in which government investment, venture capital, corporate sponsorship, and research initiatives come together with entrepreneurs and researchers at the centre, has helped generate nearly US$2.4B in investment since 2010 and double the number of active AI firms since 2015.[60] Canada's vibrant AI development scene is fuelled by its strong and capable AI clusters. For example, the Toronto region is known for having the world's highest concentration of AI startups, and Montreal for the highest concentration of AI and deep learning researchers.[61] These are supported by the Canadian federal government, which, in 2017, launched the world's first national AI strategy, the Pan-Canadian Artificial Intelligence Strategy.

GOVERNMENT

Capacity Building

The Pan-Canadian Artificial Intelligence Strategy is the Canadian federal government's keystone effort to strengthen Canada's global leadership in AI. Developed and led by the Canadian Institute for Advanced Research (CIFAR), the program pledged US$99M (C$125M) in initial funding to help meet the objectives, including attracting outstanding AI researchers and establishing a collaborative ecosystem with several centres of scientific excellence.[62] The strategy was renewed in the 2021 federal budget, with a funding commitment of US$350.7M (C$443.8M), to be spent mainly in areas such as commercialization of AI and talent retention, over the next 10 years.[63]

Innovation Superclusters Initiative

Other key government initiatives that support AI's development in Canada include the Innovation Superclusters Initiative, under which the government supports and co-invests in industry-led consortiums to speed up growth of innovation ecosystems. The Digital Technology Supercluster in BC has allowed several AI-powered applications to be deployed in addressing health, economic, and labour challenges, and it supports the growth of the Canadian AI industry through capacity-building programs.[64] The Scale AI supercluster initiative housed in Quebec channels government investment to promote the integration of AI with a range of industries in their supply chains.

Global Skills Strategy

Another key area of the federal government's efforts seeks to retain AI talent in Canada. Policies such as the Global Skills Strategy's fast track program, post-graduate work permits, and residence and citizenship opportunities are helping companies and research institutions attract highly specialized AI talents to Canada.

PRIVATE SECTOR

Vibrant Startup Scene

Currently ranked sixth globally for commercial AI-focused activities on the Global AI Index, Canada's AI industry has been booming in recent years.[65] With Toronto leading in the number of AI startup clusters, Canada saw over 660 AI startups, attracting US$2.4B in investment over the past decade.[66]

Active R&D Efforts

Canada's private sector also participates actively in the AI ecosystem by investing in corporate research labs and institutes dedicated to AI and machine learning technologies. Royal Bank of Canada's Borealis AI and TD Bank's Layer6 are examples of financial institutions working closely with academia, creating a dedicated business unit to explore the deployment of AI solutions in financial services.[67] Several multinational corporations, including Microsoft, Alphabet, and Nvidia, are behind the 40+ private sector-invested AI research labs across Canada.[68]

Applications in Health Care and Beyond

Canada is also looking to advance AI applications in health care. The AI4Health Task Force was created by CIFAR in 2019 to develop a nationally co-ordinated strategy for applying AI innovations in the health sector, focusing primarily on improving health service delivery, informing disease prevention, and developing diagnostic tools and treatments.[69] Several CIFAR-funded AI research projects are already generating tangible results used to enable public health measures against COVID-19.

Given the country's vast geography, the focus of AI industrial development and applications in different regions could vary. AI innovators in Alberta, for instance, are looking to create better synergy with energy and agriculture sectors, while BC is aiming more to embed AI technologies in its finance and high-tech sectors.[70]

SOCIETY

Canada is known globally as a strong AI research base. The three CIFAR-associated national AI institutes – Vector Institute for Artificial Intelligence (based in Toronto), the Montreal Institute for Learning Algorithms, and the Alberta Machine Intelligence Institute – have been working closely with their affiliated universities and corporate partners to not only advance their research priorities and deepen sectoral strengths, but also to facilitate the strengthening of AI innovation ecosystems and collaborative networks across regions. Together, they have supervised more than 1,200 trainees and developed 190 formal industry partnerships since 2017.[71] The University of Alberta, ranked second worldwide in the field of AI and machine learning, leads among the country's higher-education institutions for artificial intelligence research, along with Université de Montréal and the University of Toronto.

In terms of ethics and governance, responsible use of AI has been a key theme since the beginning of policy-making around artificial intelligence in Canada. Some initiatives on responsible AI include the 2018 Montreal Declaration for Responsible Development of Artificial Intelligence, the Advisory Council on Artificial Intelligence, the *Digital Charter Implementation Act*, and the revised *Personal Information Protection and Electronic Documents Act*.[72]

INTERNATIONAL LINKAGES

As a global leader in AI research and responsible uses of AI, Canada proactively engages partner countries across the world. The International Panel on Artificial Intelligence, now known as the Global Partnership on Artificial Intelligence, was first announced by Canada and France in 2018 within the G7 framework and has now developed into a key multi-stakeholder mechanism for advancing international collaboration on AI.[73] Canada also works closely with the United States in the tech space and signed the 2019 Canada-US Innovation Partnership, which included AI-themed projects from the beginning.[74] Most recently, Canadian AI researchers and stakeholders had their collaborative networks expanding into Europe and Asia, forging formal linkages through initiatives such as the Canada-UK AI Initiative and the India-Canada Digital Collaboration through the Digital Technology Supercluster.

Chile

INTRODUCTION

Chile is among the leading Latin American economies, well positioned for AI adoption and development. The country has high internet coverage rates, with over 82% of its population having access to the internet, among the highest in the region. Chile also ranks well in key technology areas relevant to AI adoption. For instance, Chile outranks neighbouring countries in the Global Cybersecurity Index 2020, only following Brazil and Uruguay in South America. Chile also has a strong legal foundation for cybersecurity with a national-level law regularly updated according to international standards.[75] Compared with its regional peers, Chile also leads in the adoption of broadband and fibre optic connectivity, mostly led by government programs addressing the domestic digital divide by increasing internet penetration throughout its territory. Chile is the South American economy with the most fibre optic connections, with broadband penetration of 32%, outranking both Latin American neighbours and the OECD average.[76]

GOVERNMENT

Chile has multiple government initiatives in progress designed to support its digital transformation, including adoption of AI technologies across the public and private sector. Released in 2019, Chile's *Estrategia de Transformación Digital* (Digital Transformation Strategy) has the main objective of promoting the adoption of digital, data-driven tools within government to provide public services for citizens, like digital identification cards. It also provided a roadmap to digitalize public service procedures, reducing bureaucratic red tape and encouraging the adoption of emerging technologies and cybersecurity within government. Also, the *Ley de Transformación Digital del Estado* (Government digital transformation law) entered into force in 2021. The law gives government ministries and agencies five years to remove the use of paper-based documents and procedures, adopt data science for policy-making, and create mechanisms to make cross-agency data interoperable and open.[77]

The country has also been a leader in creating a data ecosystem to fuel the research and adoption of AI solutions. Mainly, the Agenda Digital 2020, a key nationwide roadmap with 60 policy measures to advance sustainable and inclusive development through ICT. The agenda has five strategic pillars it supports through policy and investment: (1) human-rights approach to digital development; (2) digital connectivity; (3) digital government; (4) digital economy; and (5) digital competency and skills. One of the key results from this agenda has been the launch of the Open Data platform, making data from 520 government actors publicly available. However, the platform still struggles with standardizing data formats and

facilitating access to individual citizens.[78] At the same time, the government collaborated with Datawheel – a US-based big data company providing data analysis, integration, and visualization products for governments and the private sector – to create the DataChile public platform that collects and visualizes data from government, making it accessible to civil society and citizens.[79]

The government has also created its own technology business accelerator, Start-Up Chile, already boasting one of the most diverse and largest startup communities globally. The accelerator program provides financing for early-stage startups, with at least 50% of funded enterprises led by women.[80] It also provides mentorship and training for technology entrepreneurs and provides connections to industry networks and to domestic or international investors.[81]

National AI Strategy in Progress

Following its adoption of the OECD's principles of trustworthy AI, Chile began work on its own National AI Strategy in 2019. The strategy was developed by the Ministry of Science in collaboration with an expert committee with 12 members from academia, industry, civil society, and government. They provided the ministry with key technical knowledge and recommendations for policy, data use, and ethical considerations for the adoption of AI. The drafting of the National AI Strategy involved over 1,700 people across multiple sectors and was available for industry and public consultation in December 2020. Slated for final publication in 2021, the National AI Strategy will set the direction and key objectives Chile must follow in the next 10 years to empower citizens to use and develop AI tools and stimulate social debate over the legal, ethical, social, and economic impacts of AI. The draft document emphasizes the government's human-centred and interdisciplinary approach to development and regulation of AI, with key goals of using AI tools to improve Chilean's well being and support sustainable, inclusive economic development. AI must also be guided by principles of transparent, explainable, and secure AI. The strategy will focus on developing three key pillars:[82]

1. Enabling factors for AI, including secure and open data, human capital, and investment in connectivity infrastructure (5G);

2. Strengthening Chile's overall scientific research ecosystem, with support for increased fundamental and applied AI research within public and private sectors. Also includes collaborative projects between academia and industry; and

3. Developing ethical, agile, and human-rights-guided governance for AI and its applications, addressing the socioeconomic impact of AI on the labour market and

transitioning workers to new career opportunities, and establishing key standards for algorithms and AI-driven products in terms of their transparency and other guiding principles.

PRIVATE SECTOR

Chile has one of the most competitive entrepreneurial and innovation ecosystems in Latin America. New businesses have fertile ground thanks to relatively stable macroeconomic conditions and robust infrastructure. Currently, Chile has a thriving startup ecosystem, led by the Start-Up Chile program, with a growing number of emerging tech players with AI products. At the same time, large companies in telecommunications, banking and financial services, and retail in Chile have been early AI and big data adopters.[83]

Certain sectors in Chile are promising for AI application. For instance, according to private sector experts, Chile's forestry, mining, and fishery sectors could reap vast benefits from AI applications. Since these are commodity-dependent industries, AI can add value in supply-chain optimization and transparency, but also in monitoring and addressing their respective environmental impacts. For example, NotCo, an environmentally friendly food commodity business, is a Chilean startup using AI to accelerate its research and development of plant-based alternatives to meat and dairy products.[84]

Due to its geographical location, Chile has also developed a niche expertise in astronomy, particularly centred around observatories in the Atacama Desert. This is another sector where AI can contribute. For instance, the Automatic Learning for the Rapid Classification of Events (ALeRCE) is a Chilean-led scientific community generating and managing vast amounts of data from telescopes, then sharing these databases in real time to astronomers around the globe.[85]

SOCIETY

As explained above, the development of Chile's National AI Strategy has been a consultative, transparent, and open process. In 2019, widespread protests prompted the government to begin drafting a new constitution in Chile. Although this process was delayed due to the COVID-19 pandemic, the administration of President Sebastian Piñera convened the first sitting of the constitutional convention in June 2021, made up of 155 elected members. The convention was charged with the development of Chile's new constitution. This process has emphasized citizen and civil society participation, a model followed in the development of Chile's AI strategy. Throughout its consultative process, the Ministry of Science received over 200 public comments from academia and industry. Also, over 1,300 experts from academia, industry, and civil society participated in roundtables, providing valuable input to the National AI Strategy.[86]

The country has a robust technology education foundation, in both private and public institutions. The top five universities in Chile, which include the Pontificia Universidad Católica de Chile, the Universidad de Chile, and the Universidad de Santiago de Chile, all have undergraduate, graduate, and PhD-level programs in AI. These three higher-education institutions also have established AI research laboratories. Other research and education institutes include the Instituto Milenio Fundamentos de los Datos, a multidisciplinary research organization focused on data science for positive social impact.[87] Further, the Derechos Digitales organization is a non-profit and policy research institute with the goal of protecting human rights in the technological and data fields. Their work centres on protection of freedom of expression, privacy, and protection of personal data.[88]

INTERNATIONAL LINKAGES

Chile has strong trade relationships with China, the United States, Japan, South Korea, and Brazil. As an OECD member, it has adopted the multilateral organization's AI principles, basing its national strategies on AI, infrastructure, and data on OECD recommendations. It is also a member of the Pacific Alliance (PA), along with Colombia, Mexico, and Peru. It is a signatory to PA's technology transfer initiatives, which seek to promote an ecosystem of innovation and entrepreneurship in the region and to facilitate cross-border co-operation with members. The initiative also grants Chile access to competitive and successful digital technologies and knowledge seen in member countries through PA's network of business accelerators (AcelerAP), angel investors (AngelesAP), and innovation agencies (InnovAP).[89] Chile also receives investment from China, with Huawei building its first Latin American data centre in Chile and launching a second one at the end of 2020.[90] US technology companies like Microsoft have also invested in Chile, particularly to further develop the country's cloud infrastructure. Microsoft has also developed upskilling programs for Chileans on technical skills.[91]

Chinese Taipei

INTRODUCTION

Building on its existing competitive strengths in ICT and semiconductors, Chinese Taipei has a robust foundation for the development of intelligent technologies. With a clear aim at two niche markets, namely on-device solutions and sound ecosystem,[92] Chinese Taipei is looking to foster hardware-software collaborations to promote the applications of AI across various industries, with most recent achievements seen in education, traffic management, and drone development.[93] The island's well-established internet infrastructure, top-quality engineering talent pool, and vibrant research environment are reasons that Chinese Taipei is regarded as a top candidate in which to base AI R&D centres. The island is also an investment

destination from global tech giants including Google, IBM, and Microsoft.[94] Moreover, Chinese Taipei's first place on the Global Open Data Index since 2015 gives it another key advantage in developing AI applications.

GOVERNMENT

Chinese Taipei's Ministry of Science and Technology set out five key strategic areas for the 2017-2021 period in what it refers to as the "grand strategy for a small" economy.[95] These areas are: (1) creating a high-speed AI cloud computing platform that serves R&D; (2) establishing four AI innovation research centres to develop technologies and train AI talent; (3) setting up AI robot maker spaces at science parks and launching an AI semiconductor "moonshot" project focusing on ground-breaking capabilities around edge computing; and (4) organizing tech competitions to discover and engage young talent in developing AI applications.[96] A government investment of US$517.5M (NT$16B) is allocated to support this five-year strategy.

In 2018, the Chinese Taipei's government rolled out the AI Taiwan Action Plan (2018-2021) to further specify the near-term initiatives for building a comprehensive AI industry. The initiatives include the AI Talent Program to train more than 10,000 AI technicians and application specialists every year; the AI Pilot Project to develop an AI forward-looking research network; the AI International Innovation Hub initiative to foster 100 AI-related startups and develop innovation clusters; the Test Fields and Regulatory Co-creation initiative that revises relevant laws and regulations to facilitate intelligent applications; and the AI for Industrial Innovation initiative to match AI talents to demands from industry and help SMEs with AI-driven transformation.[97]

PRIVATE SECTOR

High Adoption Rate

About 84% of Chinese Taipei's companies have, to different extents, introduced AI technologies to their businesses, with the fastest pace of adoption seen in manufacturing and high-tech industries, and the most mature uses in banking and finance.[98]

Expanding Semiconductor Success

Capitalizing on its world-leading position in tech hardware production, especially semiconductor manufacturing and IC design, several public-private partnerships have been launched to leverage and expand Chinese Taipei's traditional leadership in these industries. Directed by the AI semiconductor moonshot project and supported by government R&D investment, the semiconductor industry is actively developing AI-powered capabilities in key areas such as next-generation memory chip design, Internet of Things (IoT) systems

and security, and system solutions for driverless vehicles and augmented/virtual reality applications.[99] Chinese Taipei's most valuable AI chip startup Kneron, for instance, specializes in designing and developing edge AI solutions for applications in areas such as IoT and industrial control.

Wealth of Data

Other areas where Chinese Taipei's AI applications are seen under development include finance, retail, health care, and surveillance. AI applications in the health sector, for example, can potentially benefit from over 20 years of accumulated data in Chinese Taipei's National Health Insurance system, if data and privacy protection issues can be properly addressed in future AI research for commercial purposes.

SOCIETY

There is good synergy between the government and universities for conducting Chinese Taipei's AI research. Four government-launched AI centres are based at the National Taiwan University, National Tsing Hua University, National Chiao Tung University, and National Cheng Kung University. These centres specialize in research on AI core technologies, AI for manufacturing, AI services, and AI for medical applications, respectively.

The island's AI and data talent pool has been growing at a fast pace in recent years, albeit still several years behind the AI superpowers. The relatively well-developed hardware industry remains more appealing to domestically trained young ICT professionals, as opposed to software-oriented subsectors such as AI and big data, although this mentality has started to slowly change. Meanwhile, the government has taken several measures to promote AI education in public school curriculums at the elementary and secondary levels.[100]

Ethical questions surrounding the use of AI that are particular to Chinese Taipei's context have so far been largely related to medicine, health-care services, and biotechnologies. Further, discussions are taking place about laws and regulations on the legal management of information security, as well as rights and obligations arising from AI applications. Human-centredness is one of the core values in government guidelines on researching and developing AI solutions that is well understood by private sector practitioners.

INTERNATIONAL LINKAGES

The Chinese Taipei's government proactively encourages the forging of international linkages in the field of AI through setting up R&D centres in partnership with international tech companies. This is seen as a crucial means to nurture the local AI industry and construct a comprehensive AI ecosystem. Microsoft, for instance, established its AI R&D centre in Taipei

in 2018, under the Ministry of Economic Affairs' Global R&D Innovation Partner Program. Areas of focus include computer vision, user intention recognition, and AI applications for vertical industries. Tech multinationals' strong presence in Chinese Taipei's AI industry is also seen in talent and entrepreneurship development. Nvidia, Google, and Microsoft are among the corporations that have been actively collaborating with local research institutions, government agencies, and startups on developing AI training and certificate programs.

Hong Kong, China

INTRODUCTION

The landscape for AI development and adoption is vibrant in Hong Kong, China. It is home to a tech-savvy population and businesses familiar with AI and machine learning concepts. AI applications have been seen in various industries as part of the productivity-enhancing and digital transformation of the city.[101] With its large talent pool and prestigious institutions in computer science and technology, the city is well equipped for AI research and development, and once came in third place among global economies producing the most-cited research papers.[102]

GOVERNMENT

The government of Hong Kong, China (HKC) has long been committed to creating and enhancing an innovation and technology ecosystem that is competitive and cutting-edge in future-oriented technologies, underpinning the importance of AI. The 2017 Smart City Blueprint, HKC's overarching framework for constructing a smart future, specifies three application areas where AI technologies should be embedded: AI-powered sensors to monitor climate change, robotic assistance for elderly people, and efficient data sharing and exchange in public services such as transit system management.[103]

HKC also provides significant R&D funding for AI technologies, such as using part of its US$6.4B (HK$50B) Innovation and Technology Fund to build an R&D cluster for AI and robotics.[104] It also supports AI-related initiatives through a number of quasi-government convening bodies, such as the Hong Kong Science and Technology Park (HKSTP)'s AI Plug initiative to forge a more engaged and connected community of AI stakeholders.

In addition to policy and financial support, the HKC's government is leveraging big data analytics and AI applications to enhance its service systems. It most recently launched the Government Cloud Infrastructure Services platform.[105]

PRIVATE SECTOR

In HKC, the private sector's involvement in developing hard AI technology is limited. It is, however, notable that one of the world's most valued AI companies, SenseTime, was founded in HKC and the regional business hub provides a strong base for some 200 AI innovators and startups. Most other businesses in the city focus on the application side of AI, exploring ways to leverage the benefits of AI to improve current processes in their own areas of expertise.

Being an established global financial hub, HKC's financial and banking services are frontrunners in leveraging AI technologies and combining them with big data for applications in more efficient and more time- and cost-effective underwriting, pricing, risk management, and fraud detection processes.[106] Other areas in which AI finds strong adoption cases in HKC include construction, transportation, logistics, and retail, where digitizing and automating previously labour-intensive tasks are key in helping create a more efficient supply chain and revitalizing the city's most important traditional industries.[107]

Knowing the benefits, businesses in HKC in general display high levels of eagerness to use AI technologies, but actual deployment is still in the early stages and limited to the most relevant teams within the business. Constraining factors include small market scale, insufficient application scenarios, existing data silos, and regulations that are not up to date.

SOCIETY

The public in HKC has a good awareness of AI technologies and is optimistic about the benefits of using them. HKC is ranked among the highest within the Asia Pacific region in terms of readiness to adopt AI, with the majority (65%) of people expecting a positive impact on society from more extensive use of AI.[108] Despite the optimism, the actual everyday usage rate of AI services has yet to pick up in the city, and concerns about data sharing and privacy are key issues that remain to be addressed.

In terms of education and talent training, there are several initiatives addressing the need for talent and to effectively combine AI technologies with sectoral expertise. The HKAI Lab, founded jointly by Alibaba, SenseTime, and HKSTP, is one such platform that fosters local AI talent development and accelerates commercialization of cutting-edge results. The government is also looking at fast-tracking visa arrangements to attract more overseas and mainland technical personnel as a way to expand its AI talent pool.[109] Moreover, recent calls for strengthening the STEM curriculum and incorporating AI and data analytics in school curriculums focus on the mid- to long-term impact on preparing the city's next generation.

As AI usage continues to rise in HKC, specific legislation and regulation related to it are still in the early stages. Some initial regulatory attempts related to the ethical use of AI include

government-led initiatives to set out frameworks for data impact and ethical accountability, and spontaneous, case-by-case assessments conducted by businesses that look at issues pertaining to the specific industry.[110]

INTERNATIONAL LINKAGES

HKC's AI industry engages with partners in mainland China, which is the single most impactful market for the city in terms of industry development, R&D, and the regulatory environment. Working closely with partners on the mainland, AI startups and research institutions in Hong Kong benefit from access to more investment, customers, and opportunities to experiment with market-ready results that were previously constrained in the smaller home market. With the Greater Bay Area initiative looking to build an integrated international business and technology hub, Hong Kong's collaboration with neighbouring Guangdong province on AI and robotics has been further enhanced through research funding opportunities, academic alliances, forums, and publicity campaigns.[111]

Japan

INTRODUCTION

Japan has been known as a technologically savvy economy, but it has been slow in its digitalization. However, with the rising importance of AI, Tokyo has taken steps to build the foundations for accelerating digitalization and AI adoption, leveraging its existing strengths in robotics and manufacturing. Internationally, the Japanese government has shown the intent to play a greater role, leading conversations on AI ethics and data privacy (e.g., Prime Minister Shinzo Abe's Osaka Track).

GOVERNMENT

Bill Concerning Digital Reform (May 2021)

In May 2021, the Japanese National Diet introduced a legislative package called Bill Concerning Digital Reform, which includes six different bills: Cabinet Bills No. 26-31. The six bills propose three main digitalization initiatives: (1) the creation of a data agency to improve the adoption of data and digital systems within the government; (2) updating data governance legislation; and (3) digitalizing public services through the My Number System, an app that allows Japanese citizens to verify their identities and access public services.[112]

National AI Roadmap: Abe's Society 5.0

Prime Minister Abe's Society 5.0 national strategy is centred around solving Japanese societal and economic problems by using Industry 4.0 technology (e.g., artificial intelligence).[113]

This includes developing digital competitiveness strategies such as the Strategic Council for AI Technology to develop the national AI Technology Strategy through inter-ministry co-operation.[114] Society 5.0 was first launched in 2016 through the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) within its fifth Science and Technology Basic Plan, Japan's five-year science and technology strategy. Under Society 5.0, the Strategic Council for AI Technology was established to lead the AI rollout and R&D. In 2017, the Council released its Artificial Intelligence Technology Strategy with the goal of creating an AI industrial ecosystem by 2030.[115]

Research and Development

Japan has a substantial investment in R&D through both the public and private sector. For example, in April 2016 MEXT provided a funding subsidy for the RIKEN Center for Advanced Intelligence Project, which conducts AI research.[116] In 2019, Japan's R&D expenditure made up 3.241% of GDP, above the OECD baseline of 2.475%.[117] Furthermore, while there is proactive AI research being undertaken by private sector tech giants like Mitsubishi's Electric Research Laboratories, there has been less growth in government research.[118]

PRIVATE SECTOR

Japan's industrial manufacturing sector is highly mature, sophisticated, and renowned for its high-quality products. In a 2020 report, McKinsey identified four areas where AI could be applied in the sector: (1) machine learning for probability forecasting; (2) computer vision deep learning for image/object detection and classification; (3) natural language deep learning for text and speech processing; and (4) fully autonomous driving.[119] In this context, the following are three snapshots across Japan's private sector of specific cases where AI is or can be applied:

1. **Looking to the Future: NEC and the Environment**

In an environmentally friendly initiative, Japanese IT and electronics giant NEC partnered with the Japan Agency for Marine-Earth Science and Technology to create an AI-powered microplastic detection system aimed at keeping oceans free of plastic waste. The AI software uses visual imaging recognition to detect micro-plastics in the water and sorts them according to size and shapes at a speed of 60 microplastics per minute.[120]

2. **Upgrading Manufacturing: MusashiAI**

Japanese manufacturing firm Musashi Seimitsu partnered with Israeli tech startup SixAI to create a joint venture called MusashiAI, specializing in AI-powered quality-control robots. This program increases the efficiency of quality control by letting the robots perform the

straightforward inspection (approximately two seconds for a gear piece), therefore freeing up human workers to engage in more creative and critical-thinking tasks, such as investigating why the defect occurred rather than determining whether there is a defect at all.[121]

3. Revolutionizing Fetal Health Care: AI and Detecting Heart Abnormalities

A research group led by the RIKEN Center for Advanced Intelligence Project in collaboration with Fujitsu Ltd. and Showa University has developed an AI system that can detect real-time heart abnormalities in fetuses.[122] Predicting fetal congenital heart diseases has historically been difficult due to the rareness of the diseases and subsequently the limited and incomplete data sets around them. Through machine learning, this AI system can predict the diseases despite the small data sets using the "object detection technique" to visually identify and classify multiple objects.

SOCIETY

Education and Human Capital

Japan faces talent challenges on two key fronts: (1) the lack of digital education and therefore technologically savvy experts; and (2) an aging population and declining workforce. A 2020 report by McKinsey found that there is low digitization from primary to tertiary education. The Japanese government has taken concrete steps in addressing both facets of the human capital shortage. On the education front, MEXT launched the Global and Innovation Gateway for All program, which promotes and subsidizes technology access in education, aiming for every Japanese school to have high-speed internet by 2020 and one laptop per child by 2023. In 2020, MEXT also announced an initiative called Scheem-D (student-centred higher education ecosystem through digitization), which provides university instructors and tech companies with a platform to spread tech innovations among universities across Japan. Finally, Japan is attempting to bolster its tech workforce numbers by encouraging professionals to move to Japan through a 2017 policy change (the highly skilled professional visa) that allows them to gain permanent residency in a year alongside more access to loans and employment opportunities.[123]

Ethics

Japan began addressing AI governance and ethics early when the Ministry of Internal Affairs and Communications organized a committee to develop the 2017 AI R&D Guidelines. This was followed by inter-governmental and multi-stakeholder discussions resulting in the Social Principles of Human-Centric AI published by the Cabinet Secretariat in February 2019.[124] Finally, the 2021 Digital Governance Reform package proposed by the Japanese government covers two initiatives to reform digital governance in Japan. The first is to centralize data

privacy regulations under the Personal Information Protection Commission; the second is to consolidate the *Act on the Protection of Personal Information*, the *Act on the Use of Numbers to Identify a Specific Individual in Administrative Procedures*, and the *Act on the Protection of Personal Information Held by Administrative Organs*.[125]

However, despite the Japanese government's concerted efforts to address AI governance, there have been some ethical controversies around AI. In August 2019, a controversy arose surrounding a recruitment management company selling users' and students' data to client companies, followed by another controversy in November, where a University of Tokyo associate professor and director of an AI company tweeted racist opinions regarding the company's recruitment policy and then claimed that his discriminatory comments were created by machine learning. More recently, another issue emerged when AI technology was used to reproduce performances of two deceased Japanese cultural icons – singer Hibari Misora and Astro Boy creator Osamu Tezuka. Ultimately, while the Japanese government continues its efforts in governing AI, achieving more comprehensive enforcement of AI ethics is still a work in progress.[126]

INTERNATIONAL LINKAGES

Japan has taken an active leadership role in encouraging international leadership on AI. In 2019, Prime Minister Abe introduced the data free flow with trust concept at the World Economic Forum and initiated the "Osaka Track" at the G20 meeting in Japan. Japan is also a founding member of the Canada-led Global Partnership on AI established in 2020. In terms of bilateral partnerships, interviews with two Japanese AI experts (Dr. Arisa Ema at the University of Tokyo and Akihiko Iketani) have identified Canada, India, and Singapore as leading partners for AI collaboration. Canada, in particular, was cited by Dr. Ema as a good partner for collaboration on the intersection between AI and democracy in terms of addressing how AI should be responsible when applied in critical decision-making sectors, given the risk facial recognition and deep fakes pose for democracies.

New Zealand

INTRODUCTION

Although New Zealand is still currently developing a national AI strategy, the economy has undertaken several government-led Fourth Industrial Revolution policy initiatives (including AI) with active participation from industry and civil society. The government recognizes the economic importance of widespread AI adoption, particularly since a 2018 study estimated that AI adoption has the potential of adding US$38B to New Zealand's GDP by 2035.[127] At the same time, the government is keenly aware of the risks this technology can have in

society and for human rights. Through its Ministry of Business, Innovation and Employment (MBIE), New Zealand has engaged in several research and policy efforts, including expanding its own understanding of the country's needs and ethical considerations for future AI policy, and contributing internationally to the development of novel frameworks for AI innovation and regulation.

GOVERNMENT

In 2019, the New Zealand government launched its Industry Strategy, further updating it during 2020 in light of the challenges and digitalization acceleration experienced through the COVID-19 pandemic. The Strategy presents a blueprint for the strengthening and expansion of innovative industries in New Zealand. It is composed of Industry Transformation Plans (ITP), particularly to support the transformation and growth of the domestic digital technology sector.[128] It is under the Digital Tech ITP that New Zealand is developing an AI strategy, along with data-driven innovation and digital skills roadmaps, as critical growth-enabling engines for the present and the future.[129]

The government has partnered with the New Zealand AI Forum, a non-profit membership association founded in 2017 that brings together the domestic AI community. Its members include technology entrepreneurs, industry experts, investor groups, researchers, educators, and end-users. The AI strategy will help New Zealand develop a co-ordinated approach to the use and adoption of AI in the country. It will also help the country build trust in the technology and its widespread use. Another strategic objective is to assist New Zealand in playing a significant role on the international stage in AI products, best practices, and regulation. A drafting update published by MBIE in May 2021 showed that New Zealand's forthcoming AI strategy will rest on five cornerstones:

1. **Uniquely New Zealand:** The AI strategy will build on the country's strengths of innovation, ethics, and inclusiveness to develop a globally recognized brand for domestic AI products. AI implementation in New Zealand will also be guided by Māori worldviews and ethics;

2. **Human-centred and trusted AI:** The country will develop appropriate ethical and regulatory frameworks and standards to govern AI research, development, and commercialization;

3. **Investment in the AI economy:** To support businesses adopting AI, the country will identify and invest in strategic sectors, support AI startups, and continue to promote AI adoption across value chains; and

4. **Preparing the workforce:** New Zealand will invest in training and reskilling the workforce. It will also support researchers in academia and industry.

5. **New Zealand's place in the world:** The country will be a trusted and active partner working with other economies to ensure AI and its impact are equitable, transparent and safe.[130]

PRIVATE SECTOR

New Zealand has a vibrant startup ecosystem, well supported by a highly educated workforce, government support, and readily available private or public funding. The following are some examples:

1. Humanoid Avatars/Digital Assistants: Soul Machines

New Zealand tech startup Soul Machines has created an AI-powered customer service system, complete with CGI-generated faces, that makes it seem like users are talking to a real human being on the screen. These AI digital avatars have been rolled out across multiple sectors from telecommunications to finance to real estate. Soul Machines has offices in San Francisco, Los Angeles, New York City, London, Tokyo, Melbourne, and Auckland. Some of its biggest clients include the Royal Bank of Scotland and Australia and New Zealand Banking Group.[131]

2. Driverless Transportation: Ohmio

Ohmio's driverless car technology is powered by AI, the first of its kind in New Zealand. Ohmio's products are not only driverless, but also environmentally friendly and scalable. Multiple Ohmio vehicles can be linked together to form a convoy for public transportation. In fact, Ohmio contributed to Auckland's "Smart Village" test run, developing a completely automated shuttle system powered by AI. Ohmio currently has three models available: Hop, Lift, and Lift XT1, which can carry 4-6, 20, and 40 passengers, respectively.[132]

3. Detecting Skin Cancer: MoleMap

New Zealand health tech company MoleMap provides revolutionary skin cancer detection technology powered by AI. As a skin-mapping system, MoleMap helps dermatologists and other health-care professionals detect possible cases of skin cancer earlier and more efficiently.[133] This enhanced ability to detect skin cancer (melanoma) earlier has a life-changing impact on skin cancer patients since "early melanoma detection offers a nearly 100% chance of survival within five years."[134] Currently, MoleMap has over 40,000 clinics across New Zealand.

SOCIETY

New Zealand has multiple initiatives to build digital skills among New Zealand's workers. Digital technology has been part of the K-12 curriculum since 2019, including skills like computational thinking.[135] Since 2014, Auckland, Wellington, and South Island established ICT graduate schools, providing a mix of digital upskilling and business focused skills to students.[136]

In terms of research, New Zealand has several higher-education institutions with varied and deep AI expertise. Universities like the Auckland University of Technology, the University of Auckland, the University of Otago, and Victoria University of Wellington have globally recognized expert teams in machine learning, algorithms for data mining and optimization tasks, computer vision, edge detection, segmentation, and object recognition. These institutions also have close ties to industry, with the University of Auckland successfully commercializing startup ventures like Soul Machines. New Zealand's universities are also at the forefront of AI ethics and regulation, with the University of Otago investigating the impacts of AI on law and society and regulatory issues surrounding diverse uses of AI. For instance, the university has released an assessment of potential regulatory challenges in the implementation of predictive models of AI in government departments.

As demonstrated by the work on AI in law and regulation at the University of Otago, New Zealand has extensive and evolving experience and knowledge of AI ethics and regulation. The New Zealand AI Forum has reported on citizens' concerns on AI's potential to make biased, unfair, and inaccurate decisions. The development of a human-centred and trust-building approach to AI will be a key factor in the country's AI policy moving forward. Also, New Zealand will include Māori communities in the identification and discussion of the social, economic, and labour risks and impacts of AI. Key government bodies like Statistics New Zealand have also issued AI-relevant standards, most significantly the Algorithm Charter for Aotearoa New Zealand.[137]

INTERNATIONAL LINKAGES

New Zealand is a founding member of the Global Partnership on AI, along with other APEC members like Mexico, Japan, the Republic of Korea, Singapore, and the United States. The country also participates in other AI-specific international collaboration initiatives such as the Partnership on AI, a non-profit association of academic, civil society, industry, and media organizations developing AI solutions, recommendations, and resources for global stakeholders. New Zealand is also collaborating with the World Economic Forum in 2019 to develop novel regulation for safe, trustworthy, and ethical AI.[138]

Republic of Korea

INTRODUCTION

Ranked first in the 2021 Bloomberg innovation index, South Korea is already a tech powerhouse, and Seoul has been mobilizing its resources to attain international competitiveness in AI. From the National Strategy for AI (2019) to the Korean New Deal (KND), there are various government initiatives that support AI adoption across different industries. Universities, public schools, and civil society organizations have started to develop AI education and training programs. South Korean conglomerates and newly emerged tech giants such as Samsung, LG, Naver, and Kakao have invested heavily in AI, accelerating both R&D and commercial adoption. While concerns remain over its regulatory environment and issues around AI ethics, South Korea's AI agenda is well underway.

GOVERNMENT

Capacity Building

As early as 2017, the Ministry of Science and ICT launched the Mid-to-Long-Term Master Plan in Preparation for the Intelligent Information Society: Managing the Fourth Industrial Revolution policy. This policy covers three main goals, reflecting South Korea's core approach to AI capacity building: establishing a world-class technological foundation; promoting intelligent industry; and revising existing social policies and regulations. Then in 2020, the South Korean government launched the KND to drive the country's COVID-19 economic recovery. Within the KND, the Digital New Deal means C$128.5B ($US102B) is earmarked for digitalization focusing on "DNA" (data, network/5G, and artificial intelligence).[139] Other KND initiatives include green infrastructure (the Green New Deal), and the creation of 1.9 million high-quality jobs by 2025 with social/employment safety nets (the "human" pillar).[140]

National AI Roadmap

In 2018, the Presidential Committee on the Fourth Industrial Revolution (PCFIR) was established to co-ordinate national policies on AI and other emerging technologies based on the I-Korea 4.0 Strategy, which promotes intelligent technology innovation projects in 12 different sectors. The I-Korea 4.0 Strategy focuses on the research, development, and rollout of Industry 4.0 technologies, including AI. It seeks to prepare Korea for the future of disruptive technologies by building growth engine technologies and establishing industrial infrastructure and ecosystems.[141] PCFIR and the I-Korea 4.0 Strategy were followed in 2019 by the National AI Strategy covering "nine strategies and 100 initiatives in the three main areas of AI – establishment of AI ecosystem, utilization of AI, and creation of human-centered AI – by 2030."[142]

Research and Development

The Korean government has made serious commitments to R&D investments for AI. For example, PCFIR launched the AI R&D Strategy in May 2018, committing C$2.66B (US$2.1B) until 2022 for developing AI technology and talent. The next year, President Moon's "manufacturing renaissance strategy" included a US$7.1B investment in the integration of AI across the manufacturing sector, along with the development of non-memory chips, future mobility, and biohealth. In a 2018 report by the Asia Pacific Foundation of Canada, South Korea's financial investment in its R&D strategy was benchmarked at a staggering C$2.66B. Finally, South Korea's private sector has taken the initiative in developing their own AI research centres in addition to government programs. Between 2015 and 2017, a plethora of corporate R&D centres were established, including Naver Labs AI, SK Telecom AI, Samsung Research AI Center, LG AI Lab, SK T-Brain, Kakao Brain, Naver Clova, Samsung SDS AI, and Hyundai Motors AI.[143]

PRIVATE SECTOR

1. Naver: South Korea's Search Giant

Naver has long been one of South Korea's most prolific tech companies. It is the leading search engine in South Korea, used by 59% of South Koreans in 2020. In addition to being a search engine host, Naver also offers cloud, fintech, and e-commerce services. In May 2021, Naver rolled out a "hyperscale" AI platform called HyperCLOVA, capable of various functions including chatting with humans, processing AI training data, and summarizing complex documents. HyperCLOVA has been applied to Naver's portal site and further options for foreign languages, videos, and images are being developed.[144] Later the same year, in July, Naver announced that it had obtained 22 patents to construct a technological convergence building – the first of its kind in the world – that will integrate various Industry 4.0 technologies such as AI, robotics, and cloud connect.[145]

2. LG's US$100M Investment in AI

LG's AI research arm[146] recently partnered with the University of Toronto and announced two new academic papers on Explainable AI, "a technology that easily explains a result of its research to humans by providing reasons and evidence."[147] In February 2021, LG announced that it would be investing US$100M over the next three years to further develop its advanced AI capabilities with the aim of attaining "human-level learning, judging, and thinking capability."[148] Then in June 2021, LG unveiled an AI-powered X-ray detection machine, aimed at helping medical professionals identify lung diseases.[149]

3. AI as a Service: MINDs Lab

MINDs Lab is a leading South Korean tech company with AI at the core of its business. It provides integrated AI services ranging from corporate AI consulting and AI business support through its maum.ai platform to integrating AI into education.[150] MINDs Lab has expanded internationally as far as Canada. The company announced in 2020 that it plans to make Toronto its new headquarters for global growth. Most recently, Korea's Science and ICT Ministry announced that it will be developing a US$37.6M AI-powered immigration system through 11 consortiums including MINDs Lab.[151]

SOCIETY

Education and Human Capital

The South Korean government has taken a comprehensive approach to AI education, beginning at the elementary school level and going all the way through to university and even beyond to public population access. The Ministry of Education has announced a plan to train 5,000 AI teachers by 2024.[152] Local stakeholders are moving quickly as well; in addition to four specialized high schools that have been selected to focus on AI and big data education, the Seoul Education Office has announced plans to upgrade 10 Seoul vocational high schools to specialize in AI or big data. Meanwhile, government funding has also been provided to 10 leading South Korean universities to offer AI graduate programs as of May 2021. Finally, the Korean government has also ensured that AI education resources and vocational training are available to the general population.[153]

Ethics

Since 2018, the South Korean government has made its serious commitment to AI ethics and security clear, with the release of the Ethics Guideline for Intelligent Society in June 2018 under I-Korea 4.0, built on the principles of Seoul PACT (publicness, accountability, controllability, and transparency).[154] Moreover, the Ministry of Science and ICT announced in May 2021 its commitment to invest C$70M for its Implementation Strategy for Trustworthy AI between 2021 and 2025.[155] There is also an official Korea AI Ethics Association, which has published an AI Ethics Charter.[156] However, South Korea still faces difficulties regarding the ethical and secure use of AI technology. One of the most famous incidents in South Korean AI usage is the Lee Luda case. Lee Luda was an AI chatbot developed by South Korean tech startup Scatter Lab that was launched in December 2020. Soon after, Lee Luda garnered intense controversy when it began generating hate speech against women, sexual minorities, foreigners, and people with disabilities. Lee Luda had learned this language from the private messaging data of the Science of Love app users (a dating advice app also owned by Scatter Lab that creates advice based on private conversation analysis). The controversy

caused national backlash on multiple issues – data privacy, AI ethics, and social identity – with some experts calling it a potential watershed moment for South Korea as it grapples with AI ethics.[157]

INTERNATIONAL LINKAGES

South Korea has strong international linkages in all aspects of AI, from research to development to governance. South Korea's digital collaboration with developing economies is integrated directly into its New Southern Policy, New Northern Policy, and official development assistance (ODA) strategies. Notably, South Korea has provided countries like Indonesia and the Philippines with digital public service systems, and has even helped build a data centre in Tanzania. Overall, South Korea has led 130 such ODA projects and has donated US$174.7B worth of ICT projects – forming 15% of its total ODA. Seoul has promised further commitment in international digital development in its new Digital New Deal ODA. Aside from ODA projects, Korea has also been deeply involved in international digital governance through the OECD's Going Digital initiative. It is also one of the five founding members of the Digital Nations, and it was one of the 15 founding members of the Global Partnership on AI. Finally, Seoul's private sector has been just as globally minded as its government in helping digitalize developing economies. Naver, for example, has collaborated with local research groups in building two AI R&D centres in Vietnam.[158]

AI Regional Hubs

AI Regional Hubs are economies that have a combination of strengths in comparison to their neighbours allowing them to serve as hubs. While they may lag behind AI Middle Powers, relative to their neighbours they are ahead on different aspects pertinent to AI, such as research, governance, or education. Due to their relative strengths, they attract talent (in industry or for education), businesses, jobs, and investment in AI from different economies. Often sharing language or cultural ties with geographic neighbours, they also host key academic or industry networks that exchange AI research, best practices, and products with the potential to impact AI ecosystems in peer economies.

Malaysia

INTRODUCTION

Malaysia has pursued its own development by heavily investing in new technologies and attracting foreign investment (as a tool for technology transfer), a trend that has continued as Malaysia enters the Fourth Industrial Revolution. Government support for nascent internet and digital technology was solidified with two major policy programs in the 1990s, setting up the foundation for today's Malaysia. Its early work has paid off, not just guaranteeing consistently high rankings in ease of doing business, but also giving rise to a dynamic digital economy growing at 20% per year before the pandemic.[159] The domestic digital economy is also sustained by a high internet penetration rate of over 80%.[160] Combined with a significant electronics and semiconductor manufacturing sector connected to global supply chains, Malaysia is well positioned for the advent of the Fourth Industrial Revolution technologies such as AI. In 2020, the government also re-directed its policy and funding efforts toward more collaborative policy approaches with industry in a concerted effort to build an ecosystem to allow Industry 4.0 technologies to take root more naturally in the country.

GOVERNMENT

Capacity Building

Both the Sixth Malaysia Plan and the Vision 2020 policy programs were designed to develop Malaysia into a high-income country, advanced manufacturing hub, knowledge-based economy, and leader in digital technologies. These initiatives include programs to incentivize foreign investment into Malaysia through tax breaks, grants, and other financial and ecosystem investments. Notably, Vision 2020 focused on nascent internet technologies

and ensuring Malaysia has the necessary internet infrastructure for domestic businesses to flourish and attract foreign investment.

Malaysia has focused on the building blocks necessary to establish a technology and innovation ecosystem where AI can be widely applied for commercial, industrial, and societal purposes. The 2010 National Broadband Initiative and the 2018 National Fiberisation and Connectivity Plan were implemented to expand internet connectivity throughout the Malaysian territory and ensure affordable, robust, and high-quality 5G and high-speed internet networks across rural and urban Malaysia.[161] With the onset of COVID-19, Malaysia delayed its national AI strategy, announced in 2018, to address the economic repercussions of the pandemic and provide further building blocks for its emerging AI ecosystem. For example, the National Economic Recovery Plan[162] and Jalinan Digital Negara Plan[163] offer direct, long-term investments in the digital economy and Industry 4.0 by providing digital training programs and improving the coverage of 5G networks.

National AI Strategy

While Malaysia has yet to release its own national AI strategy, currently in development by the Malaysia Digital Economy Corporation (MDEC), it does have a variety of long-term planning programs and different government institutions fostering the domestic development and adoption of AI. Two major programs – Vision 2020 and Shared Prosperity Vision 2030 (SPV 2030) – have heavily influenced Malaysia's development direction. These programs progressively look at newer technologies as tools for economic growth, social change, and the establishment of internationally competitive domestic industries. Expanding on Vision 2020, SPV 2030 fosters the adoption of Fourth Industrial Revolution technologies, considered crucial for future sustainable development. Although the document does not outright mention AI, it identifies both preparation and adoption of Fourth Industrial Revolution technologies as critical for Malaysia to build a digital and technology ecosystem where AI would be well supported. In addition, the Industry4ward program under the Ministry of International Trade and Industry (MITI) fosters smart automation adoption in the manufacturing sector with a budget of RM210M (US$50.5M) between 2019 and 2021 to implement the manufacturing sector's transition to Industry 4.0 technologies.[164]

Research and Development

The goals within Vision 2020 and SPV 2030 have been translated into state initiatives and included under the 2020 and 2021 federal state budgets, both of which support various digitization and talent creation initiatives. At the sub-national level, individual Malaysian states have released their own initiatives. For instance, in 2018 the state of Penang released a US$1M Industry 4.0 fund to build a Silicon Valley-inspired tech hub and promote the

adoption of Industry 4.0 technologies.[165] The program builds on Penang's advantages as a key manufacturing hub for electronic components and semiconductors.[166] The state also provides funding and mentorship for tech startups in AI, IoT, and smart manufacturing, among others.[167] At the federal level, the 2020 and 2021 state budgets have targeted key digital ecosystem sectors, most significantly connectivity infrastructure, industrial upgrading, talent development and upskilling, and SME digitization. Several government institutions are also involved in the formulation of science and technology policies, including MDEC, the Ministry of Science, Technology and Innovation, MITI, and the Ministry of Communications and Multimedia (KKMM), all of which offer their own digitization incentives and financial aid.

PRIVATE SECTOR

In addition to public-private partnerships in developing Malaysian AI talent pools, there have also been several intriguing AI applications in Malaysia's private sector. This section highlights three snapshots of private-sector-driven AI adoption, highlighting the potential for widespread AI adoption in the country:

1. **Intelligent Health Care: Predictive Analytics and Telemedicine**

In June 2021, Lenovo announced the launch of its new Device Intelligence Plus in Malaysia. Driven by AI-powered predictive analytics, the tool "collects 10,000 data points every 15 seconds from each device, allowing it to monitor millions of aggregated data points across the fleet in real time" to report and analyze health device trends. Meanwhile, Malaysia's telemedicine scene is rapidly developing.[168] A notable example is DoctorOnCall, which provides health screening, e-consultation, online pharmacy, COVID-19 testing, and COVID-19 vaccination appointment booking services.

2. **The Future of Government and Digital Identities: Public Services in the Cloud and WISE AI**

Microsoft has partnered with local tech firm Enfrasys Solutions to provide cloud services to public service agencies. Access to cloud technology should streamline Malaysia's public services and create better co-ordination and efficiency.[169] Moreover, developments in digital identity management complement this advancement in e-government. Notably, WISE AI is a Malaysian electronic know your customer (eKYC) and facial recognition firm. It specializes in optimizing customer onboarding, identity verification, and customer due diligence for private sector clients.[170] With its cutting-edge technology, it has the potential to make national digital IDs a reality across Malaysia.[171]

3. Revolutionizing Fintech: The Inflection Point

The adoption of digital finance solutions in Malaysia has skyrocketed, with the e-remittance (only one aspect of fintech) total transaction value growing by 106% in 2020.[172] New regulations regarding fintech, such as the use of eKYC, have facilitated this boom, resulting in a plethora of fintech firms and options across the country – as of 2021 there are 223 in total.[173] Some notable examples include superapp giant Grab and gaming/fintech startup Raze.

SOCIETY

Education and Human Capital

Malaysian public discourse on AI mostly revolves around key economic issues, mainly the urgent need for digitization of SMEs in the country, which make up 90% of the economy. According to a survey done by Microsoft and IDC, workers in the business sector are optimistic about the integration of AI in business operations and daily work. The major concerns are not whether AI technologies will render some jobs obsolete, but rather that workers are not prepared to operate and manage new technologies. Over the past few years, Malaysia has concentrated on developing a digital talent pipeline, starting with basic computer skills among children and youth, which should translate into more adults entering the fields of IoT, big data analytics, and AI. Malaysia has included coding as a subject in year six (12-year-old students) since 2016. MDEC has also partnered with the Ministry of Education (MOE) in a variety of long-term talent development programs. In 2019, MOE announced that a design and technology curriculum related to AI and computer programming would be introduced in schools at the beginning of 2020.[174] Most recently, the approved 2021 budget also increased the funding for technical and vocational education and training programs, allocating RM6B of funding.[175]

Ethics

During the COVID-19 pandemic, Malaysia also focused on another AI building block: strengthening its data governance policies. The *Personal Data Protection Act* of 2011 is under review by KKMM, who is working with multiple government agencies, including MDEC, to update it according to current and future technology demands. This is a particularly salient issue as the protections and protocols applied to handling, processing, and storage of data collected through Malaysia's COVID-19 contact tracing application – MySejahtera – remain unclear. Ethical questions for AI applications centre on issues of data protection, use, and privacy. While the *Personal Data Protection Act* from 2010 protects personal data of the domestic data subject, and Malaysian courts have been quite active in enforcing it, the act has not kept up with the amount of new data and types of data generated as Malaysia's

digital economy expands and more operations and businesses come online.[176] The strictest protection in policy is afforded to financial information, something that will be changing in the future as new laws on personal data protection and security standards are expected between 2021 and 2022. Government representatives and civil society organizations are also concerned about how AI (combined with its prerequisite infrastructure foundations like internet access) may exacerbate inequality in Malaysia. Government frameworks and policies like SPV2030 often try to address income inequality by focusing on its low-income group – also known as B40 households – making it a must that educational, welfare, and employment programs contribute to stopping cycles of poverty.

INTERNATIONAL LINKAGES

At the international level, Malaysia endorses several international frameworks related to AI, like data governance and science and technology plans under ASEAN. These include the following:

- Ministerial Understanding on ASEAN Cooperation in Telecommunications and Information Technology (2001), which entails collaboration among ASEAN member states in telecommunications and IT to foster development in the region and an attractive ICT environment;

- ASEAN Agreement on Electronic Commerce: member states agree to foster an enabling legal and regulatory environment conducive to competitive business practices and to facilitate cross-border e-commerce; and

- ASEAN Framework on Digital Data Governance.

Another major multilateral organization for co-operation on AI and related fields has been APEC, which Malaysia chaired through 2020. During this time, Malaysia heavily emphasized the digital economy in the region, framing Fourth Industrial Revolution innovations as opportunities for technology-led development. One of its key goals as chair was to work with other APEC countries in projects and policies that enabled larger segments of industry and society to adopt new technologies.

International entities also play an important part in the development of Malaysia's AI ecosystem. For instance, China's Alibaba has been implementing its smart-city technology in Kuala Lumpur since 2018. The project, endorsed by MDEC, brings a whole suite of AI-enabled smart-city tools, including digital and physical ones like smart traffic lights designed to reduce traffic congestion. The tech giant also collaborated with MDEC in launching Malaysia's first Digital Free Trade Zone (DFTZ) powered by Alibaba's AI and big data analysis

technology. The DFTZ will serve as an international logistics hub facilitating cross-border e-commerce for Malaysian enterprises, particularly to and from China. It also provides talent training and funding for those requiring it.[177] Other capacity-building projects, which will provide technical and policy guidance in the digitization of micro, small, and medium-sized enterprises, are also on the roster, with Huawei[178] and HSBC[179] as partners.

Mexico

INTRODUCTION

Recognizing the opportunities for economic and social development presented by AI, Mexico has prioritized policy formulation and investment in AI since 2017. In 2018, Mexico became one of the first countries in the world to formulate and release a national AI strategy. Since the publication of its national AI strategy, Mexico has made great progress in key building blocks that sustain digitalization and AI adoption, mainly in connectivity and digital talent development. Approximately 72% of Mexico's population used the internet in 2020. However, the digital divide is still a major challenge, particularly between urban and rural areas: 78% of city residents have internet access, compared to 50% of rural residents.[180] The government has committed to nearly universal internet and mobile coverage at a national level by 2023.[181] Government efforts have also focused on several programs that encourage digital inclusion and development of digital skills to prepare its workforce for AI.[182] However, after a change of government in 2018 and the 2020 COVID-19 pandemic, Mexico's priorities have shifted away from its AI agenda.

GOVERNMENT

Capacity Building

Mexico has prioritized digital transformation and created supportive policies to govern data-driven technologies, embodied by its National Digital Strategy released in 2013. The strategy set out a five-year plan to encourage the adoption and development of ICTs, with the purpose of creating a "digital Mexico" and an information- and knowledge-based society. The document has five objectives: (1) government transformation and public service provision through the adoption of ICT; (2) develop a digital economy ecosystem; (3) integrate ICT into the educational system as part of both teaching and learning processes; (4) create a comprehensive digital health policy to increase coverage and access to public health services; and (5) use ICT to prevent social violence and better prepare and mitigate the impact of natural disasters.[183]

Furthermore, according to the OECD, Mexico has progressively built foundational institutional and organizational capacity to leverage the use of data in the public sector. These efforts have led to the successful implementation of the Gob.mx online portal for citizens to access public services. The government also launched a new Digital Academy, an online platform for training and educating civil servants, and has organized digital government training workshops to upskill public workers.[184]

Toward an AI Strategy in Mexico: Harnessing the AI Revolution

Mexico's 2018 national AI strategy was developed by the government of Mexico's National Digital Strategy office, the British Embassy in Mexico, Oxford Insights, and the civil society organization C Minds. The report's recommendations centred on the creation of inclusive governance for AI, with the government as the key leader in developing a multi-sector 2030 AI roadmap. The report also urged the country to strengthen AI research and development through public investment and a national AI research centre. Lastly, it recommended that Mexico increase AI talent development, broadening AI learning beyond computer science and STEM in public and private universities, by teaching computational thinking in schools while increasing the number of graduate students in AI and data science. The federal government recognized the report as a national policy on AI and created an AI sub-commission, led by the Office of the President. The sub-commission has official participation from industry, civil society, academia, and local governments.[185]

Sub-National leadership

Since 2019, the federal government has not been as engaged with or prioritized AI initiatives compared to previous years. However, the 2019-2024 administration has focused on continuing to expand internet connectivity infrastructure to close the domestic digital divide. The current administration has also launched the Data Mexico initiative, providing improved public data for research and evidence-based policy-making. Further, taxation authorities at the federal level have been among the first to adopt and become sophisticated users of AI and data science technologies.[186]

Most leadership in government is seen at the state level, particularly the states of Jalisco and Nuevo León, the special economic zone of Yucatán, and Mexico City (which functions at the same level as a state), where the states continue to act on the recommendations put forth in the 2018 strategy. The state government of Jalisco has emerged as a key hub, supporting AI development and adoption as well as local startups. It has an Innovation, Science and Technology Secretariat at the state level, which supports scientific research for both academic and civil society organizations. It also provides higher-education scholarships for STEM students. Jalisco's Innovation Secretariat has a specialized office for AI supported

by the Inter-American Development Bank and the university Tecnológico de Monterrey. The state agency also works with the private sector to attract investment, particularly for technology development and adoption.[187]

Nonetheless, Mexican stakeholders from academia and civil society interviewed for this project continued to emphasize the key need for government leadership at the federal level. This is particularly needed for the development of more targeted AI regulation for individual applications, cybersecurity standards, and personal data protection regulation. Greater support for funding on AI research, as well as federal government leadership in connecting academia with private sector actors for AI development and commercialization, remain important areas for Mexico to work on.

PRIVATE SECTOR

In the last few years, the entrepreneurial ecosystem for AI technologies in Mexico has been booming. Notable startups have popped up, offering AI-driven productivity tools for business operations to securely facilitate digital interactions with consumers. Businesses developing and commercializing AI products for consumers are also growing in the financial and health technology sectors. For instance, Prosperia Labs is a health tech startup focusing on improving early detection and treatment of chronic diseases through AI and computer vision. It counts on support from the US-based non-profit startup accelerator, MassChallenge.

Financial technology is a key sector for Mexico's AI ecosystem, supported by policy from the Central Bank of Mexico, the National Banking and Securities Commission, and the Ministry of Finance. Mexico has been a leader in fintech, boasting the most fintech companies after Brazil in 2020. It has also been proactive in policy, creating the *Ley para Regular las Instituciones de Tecnologia Financiera* (also known as the Fintech Law) in 2018, which imposed licensing requirements for e-wallet, crowdfunding, and digital banking companies. Mobile payment, remittances, and lending services have been the most active, providing funding and banking services to SMEs as well as to unbanked consumers, who total approximately 50% of Mexico's population. Private investment for fintech startups in Mexico grew by 190% in 2021 alone, with Konfio being a promising newcomer to the scene. The startup provides digital banking and software tools for SMEs, as well as capital loans and corporate credit cards.[188]

Mexico also has key sectors where AI applications can thrive, particularly for process, operations, and logistics automation. A promising sector for AI application is agribusiness, particularly in tools for better tracking the sale and movement of key commodities from producers to market. According to experts in Tecnológico de Monterrey, the Mexican

conglomerates, mainly run by families, are interested in AI tools to better understand and optimize their own supply chains for products in the vegetable, poultry, and meat industries. Similar supply-chain insight and transparency through AI could also aid growth and increased productivity among SMEs.

SOCIETY

Civil Society Leadership in AI

Mexico has numerous civil society organizations and initiatives supporting AI adoption through talent development and policy advising. Motivated by the recommendations for AI adoption in the 2018 strategy, 10 institutions from academia, government, and industry created the IA2030Mx coalition. In collaboration with the AI sub-commission, the association has created and updated the Artificial Intelligence Agenda MX through 2019-2021. The AI agenda identifies challenges and provides recommendations within six strategic pillars: (1) data, digital infrastructure, and cybersecurity; (2) ethics and a human-rights approach to AI development and regulation; (3) research and development, fostering greater cross-sectoral collaboration on AI across academia and industry; (4) government leadership for digital transformation and policy formulation for the application of AI in public services; (5) increasing and diversifying AI-related digital skills and education for workers, students, and micro, small, and medium-sized enterprises; and (6) strengthening engagement with Mexican diasporas living abroad, applying AI tools to improve education among vulnerable, migrant, and displaced groups.[189]

Another key player in Mexico's AI ecosystem and co-founder of the IA2030Mx coalition is C Minds, an institution led by women dedicated to fostering innovation and accelerating the impact of disruptive technologies like AI in Mexico and Latin America. C Minds is the volunteer co-ordinator of the coalition through 2019-2020 and a major stakeholder working with civil society, academia, and government to align AI adoption with Mexico's sustainable development goals.[190]

Similarly, higher-education institutions have been key to developing AI-ready talent, conducting research, and pushing the national AI agenda. This includes both the Tecnológico de Monterrey and the Universidad Nacional Autónoma de México (UNAM). Both institutes offer post-graduate and PhD-level education and research opportunities in AI. UNAM in Mexico City focuses mainly on foundational AI research, while Tecnológico de Monterrey in Guadalajara is an AI hub focusing on industry needs like cybersecurity and smart manufacturing. Similar AI-related programs are also available in multiple public and private higher-education institutions in the country. Hence, Mexico has a large pool of tech talent, from PhDs to software engineers, with a high bilingual proficiency in Spanish and English.[191]

INTERNATIONAL LINKAGES

In terms of AI policy frameworks, Mexico is a signatory to the OECD's AI principles, but the application of specific recommendations is still in its early stages. Mexico's closest AI and technology linkages are with the United States. The technology hub in the state of Jalisco and its capital, Guadalajara, attract major US-based tech companies including Intel, HP, and IBM. Amazon and Intel also have research and development facilities there. More recently, Mexico has strengthened its relationships and partnerships with South Korea and Germany, mainly through university ties. Mexico is a key recipient of South Korean investment, with funds increasing by 144% in the last five years.[192]

Singapore

INTRODUCTION

Singapore is a high-income economy and leader in the digital economy space.[193] In fact, "the majority of recent e-commerce investments in the region went to companies based in Singapore and Indonesia."[194] Singapore also has the geographic advantage of being located at the heart of Southeast Asia. In 2020, a joint report by Google and the investment firm Temasek forecasted that Southeast Asia's digital economy will boom to over US$200B by 2025.[195] Singapore is the undoubted leader in Southeast Asia for AI adoption and is a global trailblazer as well. Proactive government policies and infrastructure, built on a robust innovation and technology framework, are coupled with serious monetary investment.

GOVERNMENT

Capacity Building

The Singaporean Infocomm Media Development Authority released an overarching Digital Economy Framework for Action that provides the foundation for the rollout of AI and other Industry 4.0 technologies in Singapore.[196] Under this framework, Singapore is working to grow its digital economy by developing four main "enablers": workforce talent, research and innovation, policies and regulations, and physical and digital infrastructure.[197]

National AI Strategy

In 2019, Singapore released a National AI Strategy document through the Smart Nation and Digital Government Office and the National AI Office. The strategy has three main goals: (1) identifying AI development priorities on which to focus national resources; (2) strategizing how the government, academia, and industry can work collaboratively to fully utilize AI; and (3) addressing the possible risks of AI adoption.[198] Through these three approaches,

Singapore hopes to become a global leader in AI by 2030.[199] The national strategy takes a two-pronged approach, tackling national AI projects and AI ecosystem enablers.[200] Under the National AI Strategy, there are five ecosystem enablers "to anchor AI innovation and adoption across the economy."[201] The first and core enabler is the triple helix partnership, which brings academia, industry, and government together through AI Singapore, the national AI research program established by the National Research Foundation in 2017.[202] The second enabler is AI talent and education development programs. The third enabler is developing data architecture through the 2018 Government Data Architecture Strategy, which strives to increase government use of data by 2023.[203] Fourthly, the Singaporean government works to gain its citizens' trust through its Model AI Governance Framework, which provides guidance on the responsible use of AI for any organization.[204] Finally, the fifth enabler of the AI National Strategy is focused on growing neutral international collaboration both regionally and globally.[205]

Research and Development

The state-run National Research Foundation will invest S$150M over five years into AI Singapore.[206] In 2020, Singapore also allocated S$24B over the next three years to help businesses adapt to the post-COVID world, with S$1B earmarked for helping firms adopt digital solutions, including AI.[207]

PRIVATE SECTOR

The Services and Digital Economy Technology Roadmap is a key component of the Digital Economy Framework for Action. The focus of the roadmap is to visualize the future of Singapore's "Services 4.0" – or how new services and technologies can be successfully incorporated into the Singaporean services industry. Some of the roadmap's key goals include making new technologies more accessible and creating a more inclusive ecosystem for all sizes of companies.[208] Under the National AI Strategy, there are also five national AI projects that seek to establish AI adoption across a breadth of sectors including transportation, logistics, smart cities, health care, education, and security.[209] The following are three snapshots of AI applications across different segments of Singapore's private sector:

1. **Revolutionizing Health Care: Diagnosing Heart Disease and Screening for Mental Health Illnesses With AI**

Singapore's medical sector is booming with AI-powered tools that revolutionize the quality of health care. First, a joint research team from the Nanyang Technological University and the National Heart Centre Singapore developed a heart disease screening tool powered by AI that analyzes electrocardiogram signals to identify healthy patients versus those with cardiovascular diseases. The pilot study's results were over 98.5% accurate in identifying

three unique heart conditions.[210] AI has also been applied to a software program that screens for mental health illnesses in the elderly by analyzing facial expressions for positive and negative emotions in real time.[211]

2. **Rethinking Digital Wealth Management: Bambu's AI Robo Advisor**

As early as 2018, Bambu was identified as a top Singaporean fintech company to watch. Founded in 2016, Bambu announced that it would be expanding operations outside of Asia in March 2020.[212] Over the last few years, Bambu has leapt from success to success, providing AI-powered digital wealth technology to prestigious firms like HSBC and Standard Chartered Bank[213] all around the world. Bambu offers finance robo-advisor services as well as a wealth management Application Programing Interface (API) library and a portfolio-builder program.

3. **Looking to the Future: Infrastructure Maintenance and the Military**

In late June 2021, the Republic of Singapore Air Force announced that it plans to trial the use of AI-powered drones to help detect and assess runway damages at the Paya Lebar Air Base, thereby reducing the time and labour needed to deal with such damages. These trials are part of a broader initiative to integrate multiple Industry 4.0 technologies (i.e., robotics, data analytics, and artificial intelligence) into air force operations.[214]

SOCIETY

Education and Human Capital

Under the National AI Strategy, human capital is identified as a crucial component for AI adoption. The second enabler under the Strategy is AI Talent and Education development, which aims to keep Singapore's workforce properly skilled to match the economic disruptions caused by AI adoption by offering post-graduate fellowships, an AI Apprenticeship Program, and the SkillsFuture for Digital Workforce Programme.[215]

Ethics

As a society, Singapore takes technology ethics very seriously both in regulation and research. In addition to the AI Governance arm included under AI Singapore, the Research Programme on the Governance of AI and Data Use established by the Singapore Management University School of Law provides further scholarly research on the ethics and regulations of AI and data usage.[216] There is also the AI Ethics and Governance Body of Knowledge, a live digital repository of AI guidelines jointly maintained by the Singapore Computer Society and the Infocomm Media Development Authority.[217] Meanwhile, the FEAT Principles (2018)

address AI and data analytics ethics in the finance sector[218] alongside Veritas (2019), which provides guidance on how financial institutions can verifiably enact the principles in their operations.[219]

INTERNATIONAL LINKAGES

Singapore has successfully sought to establish itself as a regional and global leader in AI and AI's accompanying foundational requirements like cybersecurity. In 2016, it hosted the inaugural ASEAN cybersecurity conference and proposed the ASEAN Cyber Capacity Program.[220] When it took over as ASEAN chair in 2018, Singapore made it clear that cyber issues, e-commerce, and the digital economy were top priority concerns,[221] and in 2021 it gained approval for the establishment of an ASEAN cybersecurity centre for excellence in Singapore.[222] Singapore is also a founding member of the DEPA, which explicitly addresses ethical AI usage and regulation.[223] Beyond the region, Singapore has engaged with global organizations like the World Economic Forum through the WEF Centre for the Fourth Industrial Revolution to develop and promote the Model AI Governance Framework.[224] Finally, Singapore has also pursued bilateral AI R&D partnerships with French research institutions.[225]

Emerging AI Economies

Emerging AI Economies are in the process of building readiness and advancing capabilities in private sector activities and investment, talent development, and international linkages. They have great potential to accelerate AI adoption because they have certain strengths in AI (e.g., large population, strong AI national strategy, high AI adoption in key sectors, and thriving startup environments).

Indonesia

INTRODUCTION

Indonesia's national policies all consider AI as the key instrument to revitalize industries such as petrochemicals, textiles, and so on that play a significant role in the Indonesian economy but have struggled to gain international competitiveness. For example, Making Indonesia 4.0 is the roadmap for adoption of AI in five key industrial sectors: food and beverage, textiles and clothing, automotive manufacturing, petrochemicals, and electronics. Under the roadmap, Jakarta hopes to improve the production capabilities of the textile and other manufacturing industries using Industry 4.0 technology, including AI, through efficient automation and supply-chain management.[226] Indonesia aspires to join the world's top 10 economies by 2030 through technology-led development. The National Industrial Development Master Plan 2015-2035 also supports innovation and adoption of Fourth Industrial Revolution technologies (AI, IoT, 3D printing, etc.) to accelerate development and catch up with already developed economies. However, Jakarta hopes to not only promote self-reliance in the industrial sector and reduce dependence on the export of raw materials, but also to create a self-reliant AI ecosystem in Indonesia that is competitive internationally.

GOVERNMENT

Capacity Building

Indonesia has numerous technology policies that support the adoption of AI and other Industry 4.0 technologies: Vision of Indonesia 2045 (Visi Indonesia 2045) released in 2019, Making Indonesia 4.0 (2018), National Industrial Development Master Plan 2015-2035, Presidential Regulation No. 95 of 2018 on Electronic Based Government System, and Indonesia E-Commerce Road Map 2017-2019. Of these policies, Visi Indonesia 2045 is the main national development strategy that ties the archipelago's multiple technology policy programs to its sustainable development goals.[227]

National AI Strategy: Stranas KA

In August 2020, Indonesia released its national AI strategy, known as Stranas KA (Strategi Nasional Kecerdasan Artifisial in Bahasa), drafted by a consortium of government, academic, and industry stakeholders led by the Ministry of Research and Technology and the National Research and Innovation Agency. Stranas KA is intended to serve as the blueprint for domestic research, development, and application of AI technologies from 2020 to 2045. It targets four key areas of support to promote Indonesia's nascent AI ecosystem: (1) ethics and policy; (2) talent development; (3) infrastructure and data; and (4) industrial research and innovation. Stranas KA also outlines Indonesia's industry areas where AI applications offer the most promise for development and achieving the Visi Indonesia 2045 goals: (1) improving telemedicine and further digitizing health-care systems; (2) AI applications for e-government services, informing policy-making, and reducing bureaucratic processes; (3) using AI to standardize education curriculums while simultaneously providing some level of customization; (4) using AI technology to track agricultural and fishery production, improve and forecast yields, predict crop failures, and manage food and natural resources to minimize food security issues; and (5) developing smart cities where AI aids in city planning, transportation management, and citizen services.[228]

Research and Development

Indonesia's AI ecosystem also has numerous think tanks – independent or associated with various universities – actively involved in several AI initiatives and providing consultation to the government. The ELSAM research centre, for instance, has advocated for issues such as personal data protection, cybersecurity standards, and a human-centred approach to AI.[229] From a policy perspective, there is the National Research Master Plan 2017-2045, which seeks to apply AI toward research in national research priorities: food security, energy and renewables, health and pharmaceuticals, ICT, defence and security, and advanced materials. However, R&D funding is still woefully low, with the most recent World Bank data (2018) for Indonesia showing that R&D expenditure only accounts for 0.23% of national GDP. It should be noted that this statistic encompasses overall R&D expenditure and not just AI-specific R&D.

PRIVATE SECTOR

AI adoption among businesses in Indonesia is quite high, leading the region with a quarter of tech companies adopting AI, according to IDC. Indonesia's e-commerce, ride-hailing, tourism, and fintech (i.e., micro-lending, P2P loans) have been the most successful sectors in terms of investment attraction and commercialization. Indonesian startups and other industry players in several sectors have created formal and legally recognized associations for mutual support, capacity building, education for policy-makers on technology, public

advocacy, and consumer engagement. They also collaborate with academics and other experts and set up industry best practices. The following are three snapshots of AI adoption across different segments of Indonesia's private sector:

1. **Rise of the Superapps: Gojek and Grab**

The creation of "superapps" – a single app housing multiple, distinct services – is perhaps the Indonesian tech sector's crown jewel. The two superapp giants (and rivals) in Indonesia are Gojek and Grab. Both tech startups have their roots in ride sharing but have quickly grown to offer AI-powered services from ride sharing and digital wallet services, to e-commerce and health care. Grab, for example, uses AI in its ride-hailing service to streamline operational efficiency by matching drivers and riders based on multiple factors such as the driver's profile, location, and the time of day.[230] Grab is further planning to expand its use of AI to improve transportation across Southeast Asia, targeting issues such as traffic congestion and transportation safety. Meanwhile Gojek, which completed a merger with Indonesian e-commerce giant Tokopedia in June 2021,[231] uses AI facial recognition in its drivers' login system as a security measure.[232] Notably, both Gojek and Grab use AI facial recognition to prevent user fraud across their services.[233]

2. **Intelligent Telemedicine: Good Doctor, Halodoc, and Alodokter**

In the health-care industry, Indonesia is making huge strides in rolling out AI adoption in telemedicine. In the Indonesian telemedicine sector, there are three key players: Good Doctor Technology (GDT), Halodoc, and Alodokter. GDT is a major signifier of the booming Indonesian AI telemedicine market that attracts substantial foreign investment. GDT is the product of collaboration between three different tech firms: Indonesia's Grab, China's Ping An Good Doctor, and Japan's SoftBank.[234] The Good Doctor app provides AI-powered booking and e-consultation services with medical professionals as well as a linked pharmacy service for prescription purchasing and delivery. Similarly, Halodoc and Alodokter both provide medical e-consultations and medicine delivery, partnering with the government to provide free telemedicine services during the COVID-19 pandemic.[235]

3. **Building Cities of the Future: Nodeflux and Smart Cities**

Nodeflux specializes in facial recognition algorithms, and it has partnered with the Indonesian government on smart cities, developing software to identify vehicles with unpaid taxes. Nodeflux technology is also used by the police in enforcing security, such as by identifying suspects on public CCTV.[236] Other Indonesian tech giants like Tokopedia, Grab, and Gojek are also involved in smart city development, specifically regarding transportation systems and the creation of a "smart economy."[237]

SOCIETY

Education and Human Capital

In education, Indonesia faces concerning disparity between men and women. While Indonesia has relatively high percentages of female graduates in STEM and ICT fields and the country scores well for leadership opportunities for women in industry, Indonesia still has one of the widest gaps in internet access among emerging economies. Women and girls in Indonesia also have less access to mobile phones and internet access than men, with 72% of women owning a mobile phone compared to 80% of men.[238] On a positive note, the private sector also has been very proactive in addressing national strategic goals, mainly the talent shortages in Indonesia. While Indonesia has a young and growing population, it faces a deficiency in properly skilled workers for an increasingly digital future. Numerous sector-specific projects for research and education in AI have cropped up, like Tokopedia's AI research centre in partnership with the University of Indonesia.[239] Bukalapak, another e-commerce leader, also jointly founded the AI and Cloud Computing Innovation Centre for education and research with the Bandung Institute of Technology.[240]

Ethics

High-profile data leaks have become more frequent, making the matter of data protection more salient. For instance, in 2020 Tokopedia reported a data leak affecting approximately 91 million users.[241] There have also been conversations on the ethical ramifications of certain AI-enabled digital products, particularly in the fintech space, where P2P lenders have been infamous for unethical and privacy-violating practices in the interest of collections. There are also discussions about the level of de-anonymization of data sets earmarked for AI uses, with some advocates arguing that information like political affiliations should also be considered personally identifiable.

As the world's fourth-most populous country, with a 2019 population of 266.91 million people, and Southeast Asia's largest market, Indonesia has the potential to become a data generation giant comparable to China.[242] Effective data governance that balances innovation and privacy protection is a top priority for the Indonesian government and industry. Indonesia has looked at the European Union's GDPR as a benchmark, but it lacks comprehensive and clear privacy regulations and data governance frameworks, particularly cybersecurity standards and enforcement and law-backed protocols on data collection, use, and sharing. To address this gap, Jakarta has submitted a draft of the Personal Data Protection law to parliament, which is projected to be passed in 2021.[243] The need for data sovereignty is explicitly highlighted in Stranas KA as a key goal of the roadmap. Jakarta has clearly expressed its preference for data localization, which would provide greater agency

over data generated within Indonesia, while international tech leaders with investments in Indonesia have advocated for freer flow of data across its borders.

INTERNATIONAL LINKAGES

Stranas KA emphasizes the need for Indonesia to collaborate with other countries on the joint development of AI. Indonesia is also looking to further its collaboration efforts with international universities on research, algorithm development, and practical applications within the identified five priority areas. Like Malaysia and the Philippines, Indonesia has strong regional ties through ASEAN. Moreover, Indonesia is a member of the G20 and ascribes to the G20 AI principles put forth in Osaka in 2019. This is also a platform for engagement with other countries on AI governance and research.

Peru

INTRODUCTION

Peru has prioritized digitalization and the adoption of new technologies since 2006 with the launch of its first Digital Agenda. The country also established the Secretariat of Digital Government and Digital Transformation in 2017, a government agency tasked with overseeing and leading digitalization in Peru. The agency handles the implementation of key policies relevant to AI adoption and manages the government's platforms for public services. While the Andean economy is not among the largest in Latin America (in market size), it has been one of the best-performing economies in the region, also boasting a rapidly growing startup scene.

GOVERNMENT

Peru's government has been very active in issuing policies that support the adoption of new, internet-enabled technologies. The new Bicentennial Digital Agenda, published in February 2020, outlines the strategies, goals, and concrete actions to promote and deploy digital technologies (including AI) to foster economic growth and competitiveness and improve Peruvians' quality of life. To date, this major policy program has published three national strategies on data governance, cybersecurity, and artificial intelligence. Strategies for digital innovation and digital talent creation are currently under development.[244]

Peru's National AI Strategy has been proposed for the period of 2021-2026 and will be updated every two years according to technological advancements and Peru's internal situation. The strategy has six pillars:

1. **Talent:** Train and attract AI professionals for research, development, and use of AI. Close education and training opportunity gaps for women and minority groups;

2. **Economic model:** Promote the development of AI and its adoption to boost economic development and welfare. Support national-level and local governments in development and adoption of AI tools for evidence-based policy-making and public service delivery. Create and expand programs to support startups and encourage private sector R&D on AI;

3. **Digital infrastructure:** Strengthen digital and telecommunications infrastructure in the country to facilitate widespread use of AI. In addition to investing in 5G infrastructure, particularly through public-private partnerships, this pillar also includes better educational infrastructure for AI and machine learning in higher-education institutions in growing need of broadband connectivity and computer equipment;

4. **Ethics:** Adopt ethical guidelines for the sustainable, transparent, and replicable use of AI with clearly defined data protection and responsibility principles. Also, implement the OECD's principles on AI, and create regulatory sandboxes to monitor, support, and promote ethical and responsible uses of AI;

5. **Data:** Make Peru a leader in the accessibility of open data in government. Also, turn Peru into a open and trusted source of diverse data, such as Peru's Indigenous languages and biodiversity; and

6. **Collaboration:** Create a collaborative AI ecosystem within Peru and abroad. Under this pillar, the government seeks to promote collaboration between industry and academia, among domestic universities, and with international research and higher-education institutions. Peru has also proposed the creation of a Pacific Alliance for Artificial Intelligence.

The AI strategy also calls for the creation of a national AI centre of excellence, as a critical organization to foster talent development and AI adoption across public and private sectors. The centre would be a research institute for AI with individual projects or with projects in collaboration with industry or academia. The centre would also identify and research key niche areas for AI with high impact for Peru's digital economy.[245]

PRIVATE SECTOR

AI development and adoption in Peru's private sector is led by large companies and economic groups. The main organizations using AI in the country include family-owned conglomerates like Breca Group and Intercorp. Banks and telecommunications companies in Peru are also

sophisticated AI users, employing AI for better customer communications, as well as risk scoring, know your customer, and fraud detection processes.[246]

Mining is a critical economic sector in Peru that is also rapidly adopting AI applications. Peru is rich in mineral resources such as copper, gold, silver, and lithium. It is the world's second-largest producer of copper and silver. It is also the largest gold producer in Latin America. According to the country's Energy and Mines Ministry, Peru has over 200 mines operating currently and 48 additional projects in development between 2020-2025.[247] Peru's mines are adopting AI to improve metal extraction from mined materials and throughout the grinding process. Mining companies like Volcan are also using sensors and AI to inform decision-making on operations and monitor mine safety.[248]

Financial technology is another promising sector with ample opportunities and growing adoption of AI. Peru has approximately 120 fintech startups providing banking and financial services to underbanked populations and SMEs.[249] Around 14 million Peruvians do not have a bank account, providing a fertile market for fintech startups working on financial education and inclusion.[250] Top services provided by fintech startups include digital payments, remittances, foreign exchange, and financial management tools for individuals and small businesses. Large banks have also warmed to the idea of partnering with up-and-coming financial startups.[251] For instance, in collaboration with Peruvian banks BBVA, Interbank, and Scotiabank, YellowPepper (a Miami-based startup) launched PLIN, an app facilitating peer-to-peer money transfers.[252]

Peru also has vast opportunities for AI applications in its e-commerce and agricultural sector. E-commerce has boomed in the country over the COVID-19 pandemic, with lockdowns and other mobility restrictions keeping small businesses shuttered. Small, family-run shops have increased their use of messaging applications like WhatsApp and digital payment/e-wallet platforms like Yape, PLIN, and Tunki (all Peruvian fintech startups) to operate their businesses. At the same time, they have also increased their uptake of B2B e-commerce platforms to reach out to and purchase from suppliers.[253] The sector is further supported by other startups providing delivery and shipping logistics such as Chazki (Peru-based) and Rappi (Colombian food delivery startup). Despite the ravages of the pandemic, Peru's agricultural sector remained stable, with the production of eggs, chicken, pork, and milk increasing significantly.[254] AI applications within the agricultural supply chain for such food staples could facilitate growth, cost-reduction, and transparency, particularly for small producers.[255]

SOCIETY

Peru's largest challenge by far is addressing its digital divide. According to the World Bank, approximately 65% of Peruvians have access to the internet.[256] Internet use is also limited by high prices for mobile data plans and for acquiring a device.[257] The Secretariat of Digital Transformation identified a large gap in schools with internet connections and proper technological equipment for teaching in 2018. According to UNICEF, 9 in 10 homes in Lima had internet access in 2019. However, the number drops for other urban centres (8 in 10 households), and more significantly for rural areas, where only 4 out of every 10 households had internet connections.[258] While free internet programs created by the government have contributed to connecting students from rural and remote areas over the 2020 pandemic,[259] closing gaps to internet access in the long term, particularly for education, will be critical for AI talent development.

According to the Inter-American Development Bank, Latin America suffers from a lack of public trust in government actors, with Peru being no exception.[260] This issue was also highlighted by Peruvian experts interviewed for this project, noting that the public tended to disbelieve policy promises and the government's capacity to enforce or adequately fund programs for education or poverty alleviation. This same distrust can also colour society's perspectives on AI development and adoption, with citizens doubting Peru's capacity for monitoring and enforcement of trustworthy AI.[261]

Despite the challenges, Peru has multiple advantages conducive to widespread AI adoption. First, it has robust research on AI coming from both public and private universities. According to the Government and Digital Transformation Secretariat, Peru's top 10 universities have published research on AI. Research publications on AI grew by 400% over the last seven years, peaking in 2020 (to date). Most of Peru's publications on AI comes from researchers in the fields of engineering, computer science, and medicine, key scientific and talent strengths for the country.[262] Second, Peru has an active and engaged civil society sector promoting AI uses and providing research and policy guidance for government and industry. For instance, Lima-based non-profit Hiperderecho promotes digital literacy on emerging technologies like big data and AI. It also conducts research on public policy and best practices to safeguard the rights of Peruvians in digital spaces. In the areas of research and education, KapAITech is a group of researchers working on AI fundamentals, deep learning, and operationalizing privacy principles in AI. Data Science Research Peru is also a non-profit focused on talent development and research to tackle social challenges in Peru.

INTERNATIONAL LINKAGES

Peru is increasingly connected in the technology fields, starting with being one of six Latin American economies that have adopted the OECD AI principles. The Andean country is also a member of the Pacific Alliance (PA), which also includes Mexico and Chile within APEC. PA focuses on regional integration to facilitate the mobility of goods, services, resources, and people within member countries. The alliance also has a digital agenda, promoting the growth of digital economies, connectivity, and digital government in member economies. Peru has also had strong collaboration on technology programs with South Korea since 2017. Seoul supported the creation of the Korea-Peru e-Government Cooperation Center to aid in the digitalization process of government services and open data. Both economies will work together on a National Center for Digital Innovation to promote the use of and research on data science and AI.[263] Canada and Peru also have a strong trade relationship, particularly in mining ore products. The Andean economy is also the second-largest destination for Canadian direct investment in the region.[264]

Philippines

INTRODUCTION

The Philippines is in the early stages of AI development but has progressed rapidly, hitting major landmarks. The country has a cohesive National AI Roadmap, bolstered by other government legislation. In terms of cybersecurity, there is the Data Protection Act of 2012 and the new Cybersecurity Plan 2022.[265] For digital infrastructure development, the government has passed the National Broadband Roadmap, the Common Tower Policy, and the new Philippine National ID System.[266] The Philippine government has released more industry-specific initiatives, such as the E-Commerce Roadmap for the e-commerce sector and the IT-BPM Roadmap for the information technology and business process management industry.[267] As an emerging economy in transition, the development and implementation of AI nationally will play an integral role in the country's future.

GOVERNMENT

Capacity Building

The overarching national program leading digitalization in the country is the Inclusive Innovation Industrial Strategy (i3S). Under i3S, the government published the Draft Inclusive Filipinnovation and Entrepreneurship Roadmap in 2019. The roadmap illustrates six strategic actions: (1) building the Philippines' innovation and entrepreneurship ecosystem; (2) embracing Industry 4.0 technologies; (3) integrating the production system, strengthening domestic supply chains, and increasing involvement in global value chains;

(4) promoting innovative enterprises and startups; (5) investing in digital and other physical infrastructure; and (6) upskilling/reskilling human capital nationally.[268]

National AI Roadmap

In addition to iS3, the Department of Trade and Industry recently released an AI Roadmap in May 2021. The roadmap identifies four dimensions of AI readiness: (1) digitization and infrastructure; (2) research and development; (3) workforce development; and (4) regulation. These dimensions are supported by 42 strategic actions, which are divided into six categories: (1) improve data access and data value extraction; (2) build a robust connected and networked environment; (3) transform institutions to maximize the impact of AI R&D; (4) build an AI ecosystem "conscience"; (5) transform education and nurture future AI talents; and (6) upskill and reskill the workforce. With the roadmap so new, it remains to be seen how successful the Philippine government will be at achieving the listed targets. A comprehensive plan of action detailing how and when the 42 goals will be achieved has not yet been released.[269]

Research and Development

In terms of R&D, funding has been disappointingly low. According to the 2019 i3S Strategy Document released by the Department of Trade and Industry, "in the last four years, government expenditure for R&D (GERD) in the Philippine national budget has not reached 0.1% of GDP."[270] There is also a lack of strong government incentives to encourage private sector innovation and AI adoption. While the new National AI Roadmap calls for the establishment of a National AI Center for Excellence and has increased funding for both domestic and international co-operation for R&D, a concrete and substantial budget for said initiatives is sorely lacking.[271]

PRIVATE SECTOR

Adoption of AI in the Philippine private sector is still in its early stages and is not yet widespread. However, there have been notable pioneer initiatives in several industries, including the financial, IT-BPM, agriculture, e-commerce, infrastructure, and energy production industries. With a strong digital economy and continuously improving technology infrastructure, the Philippines is well positioned to roll out AI nationwide. AI application in three Philippine private sectors – finance, IT-BPM, and agriculture – demonstrates that the country is on a good path to further digitizing its economy with AI.

1. Bridging the Past and the Present: Agriculture and E-Commerce

The Philippine agriculture sector is particularly struggling to keep up with the boom of e-commerce. However, the implementation of AI has proven to be an unexpected boon for

local farmers. For example, the creation of Krops, an Azure-based e-commerce platform supported by Microsoft's AI-grounded Power BI analytics tool, enables farmers to reach consumers directly through a mobile app, cutting out the intermediary and reducing operational sales costs. Farmers can also use the app to track supply and demand of goods and thereby adjust their production. On the consumer side, location, price, and produce availability are all accessible through the app.[272]

2. Revolutionizing Contemporary Banking: The Financial Sector

A pioneering example of the adoption of AI in the financial sector is the Union Bank of the Philippines' trial in adopting the SAP Data Intelligence system to collect and process data used in the bank's "data science factory" model. The model aims to help customers "hyper-personalize" their accounts and thereby improve customer service. It also aims to streamline operations by increasing the bank's efficiency in providing AI-led services such as automated loan approval.[273]

3. Looking to the Future: Disruption and Growth in the IT-BPM Sector

The IT-BPM industry is at a crossroads with the growing importance of AI adoption in the Philippines. Although the industry has grown to constitute 8% of national GDP in under 20 years, it faces significant logistical hurdles and the threat of decreasing global revenue. On one hand, AI will prove to be a major disruption to the industry as thousands of low- and mid-level skilled jobs are threatened by automation and chatbots. On the other hand, if the Philippines can keep apace by effectively upskilling its workforce, the industry will be boosted further up the global value chain, securing the Philippines' prominence as a major player in the digital economy.[274]

SOCIETY

Education and Human Capital

While the Philippines has a young and growing population ready to enter the workforce and use AI technologies, there is a need to improve workforce skills and education in the country. For instance, while the Philippines performs well in the IMD rankings for science graduates, there is still a need to update school curriculums to further train a forward-looking labour force.[275] Even in the country's leading digital economy sector, the business process outsourcing sector, there has been an urgent need to upskill its workforce in order to move higher up the global value chain and remain a leader in the global digital economy.[276] In its own assessment of digitalization in the country, the Philippine government has acknowledged that the country also lacks the necessary human resources, skilled engineers, and scientists to support AI adoption. Even in basic education, the Philippines has performed

poorly according to the most recent World Bank education report, which was based on the 2019 Program for International Student Assessment. The report found that 80% of Filipino students failed to meet minimum proficiency for their grade levels and placed last in reading and second-to-last in science and mathematics categories. It is critical that the Philippines invests in education and capacity-building programs to prepare students and workers for AI labour market disruptions and to promote innovation in AI applications and commercialization.

Ethics

The Philippines main challenges remain data privacy and protection, as well as cybersecurity, which impact the trust and adoption of technologies like AI domestically. Despite being the second ASEAN country to adopt a data privacy act, low trust from consumers on privacy and security of digital services has constrained adoption of technologies like digital payments.[277] Consumers and small businesses remain very vulnerable to data hacking and other cyber attacks. According to the 2021 study by Cisco, 57% of small and medium-sized businesses in the Philippines suffered cyber attacks in the past 12 months.[278] AI ethics is also a key aspect of the National AI Roadmap; however, the country lacks formal legislation specifically for the ethical use of AI and big data. As AI adoption continues to accelerate nationally across a multitude of sectors from health to law enforcement, ethical and robust government regulation centred around rule of law is essential to the long-term, holistic success of AI in the Philippines.

INTERNATIONAL LINKAGES

The Philippines is blessed with a key geostrategic location at the heart of Southeast Asia that encourages bilateral and multilateral economic linkages with its neighbours. Notably, the Philippines is an active member of ASEAN, giving it strong existing ties to leading tech nations like Singapore and Japan. While the country is lacking in robust R&D, the Philippines can benefit from partnerships with these countries to develop its capabilities for R&D and provide a favourable digital economy for foreign investors. Moreover, as a member of the Belt and Road Initiative and with growing economic relations with China, the Philippines has also benefited from an accelerated pace in the development of critical infrastructure like 5G. Continuing these partnerships and forms of international capacity building is integral to the widespread adoption of AI nationwide.

Thailand

INTRODUCTION

While Thailand has not formulated a national AI policy, the government still considers AI critical for transforming the country into a high-income, knowledge-based, and innovation-driven economy. Thailand's AI landscape, though in an early stage, is developing rapidly, and the government is focused on capacity building, reskilling, and upskilling. The development of AI has received strong support from various ministries in Thailand, notably, the Ministry of Higher Education, Science, Research and Innovation and the Ministry of Digital Economy and Society.

GOVERNMENT

Capacity Building

Thailand's 20-Year National Strategy (2018-2037) includes two key strategies for AI capacity building domestically. Under the Strategy on Competitiveness Enhancement, Thailand primarily aims to develop future industries and services of the Fourth Industrial Revolution (including AI) to enhance the country's competitiveness, and to apply these technologies in the manufacturing and services sectors. Under the Strategy on Developing and Strengthening Human Capital, Thailand aims to develop a modern public health service system by integrating AI to assist with consultation, diagnosis, and disease forecasting. The strategy also highlights the importance of public-private partnerships in investing and carrying out AI projects that create more use cases.

National AI Policy: A Work in Progress

Policy regarding AI in Thailand can be divided into four main components. First is the 20-Year National Strategy,[279] which is central to promoting the development of key industries and services such as robotics, big data, and AI. This central policy is translated into various Five-Year National Economic and Social Development Plans to enhance national competitiveness and economic development via the application of AI, which is the second component. In this category, the two key policies include the 12th National Economic and Social Development Plan and Thailand 4.0. The two strategies advocate for increased R&D efforts in AI and expanding Thailand's AI talent pool. The third main component is to develop an AI ethics guideline. The last component of the policy regarding AI focuses on methods to communicate and increase public understanding of AI.

Research and Development

Thailand is still in the early stages of AI adoption but is seriously pursuing the development of its AI research and other capacities. According to a 2020 study by EDBI and Kearney, AI investment in Thailand, reaching US$0.37 per capita, was the second highest in Southeast Asia.[280] However, it still lags far behind Singapore at US$68 per capita. There have also been public-private partnerships to support R&D growth in Thailand, such as a Huawei-built 5G research centre in September 2020 and the construction of the Chinese tech giant's third data centre worth US$23M in 2021.[281] Finally, the Digital Government Development Agency launched the country's first state-backed AI centre in November 2020 to promote more AI-based platforms within government agencies and upskill state officials on AI and data analytics.[282]

PRIVATE SECTOR

Public-private partnerships have played an important role in Thailand's AI development. This began with a formal endorsement from the government in the 12th National Economic and Social Development Plan, encouraging the private sector to increase investment in key technologies including AI. There is also Thailand 4.0, introduced in May 2016, a sector-specific industrial policy in which the government aims to transform the economy to a digitally oriented and innovation-driven one, focusing on high-value-added manufacturing and services. Thailand has three promising sectors for AI application: infrastructure, medicine, and manufacturing.

1. **Bridging the Past and Present: Manufacturing**

Manufacturing is traditionally a major driver of Thailand's economic development, accounting for 25.3% of the country's GDP[283]. As Thailand's manufacturing sector is plagued by several barriers, such as labour shortages, rising wages, and a maturing consumer market, many manufacturing companies are transitioning to Industry 4.0 by employing AI, big data automation, robotics, and IoT to increase output and productivity.

2. **Revolutionizing Contemporary Health Care: Thailand as a Leading Medical Hub**

Thailand has a strong public health sector, and the government aims to use AI to maintain its position as Southeast Asia's medical hub. Thailand's Board of Investment has actively supported investment and development in the medical robotics sector. In 2017, doctors at Ramathibodi Hospital successfully performed the first robot-assisted brain surgery in Asia. In addition, an AI program to screen for diabetic eye diseases between Google and state-run Rajavithi Hospital was announced in 2018.[284]

3. Building Infrastructure for the Future: The Rise of Thai Smart Cities

AI plays a key role in Thailand's smart-city plans. Aside from being popular tourist locations, Phuket, Chiang Mai, and Khon Kaen were piloted as the first domestic smart cities, home to digital industries and international research and innovation centres. By 2022, Thailand aims to develop 100 smart cities in accordance with Thailand 4.0. In November 2019, the Ministry of Digital Economy and Society signed a memorandum of understanding with Microsoft to establish an AI lab to create advanced solutions for smart farming and smart-city programs.[285]

SOCIETY

Education and Human Capital

Thailand faces a large aging population and labour shortages in its manufacturing and services sectors, which constitute 40% of its GDP.[286] Also, 95% of jobs in Thailand will likely be impacted by change over the next three years, with 30% of the jobs outsourced, automated, or rendered obsolete.[287] However, the number of new jobs created by technological advancement is roughly equal to the number displaced, and 35% of the labour force can be retained. Thailand has so far garnered a strong response in the face of its human capital challenges. Thammasat University, for example, joined the Thailand AI Consortium, which aims to develop a workforce trained to work with AI.[288] There have also been strong public-private partnerships such as the memorandum of understanding between Microsoft Thailand and the Ministry of Higher Education, Science, Research and Innovation to provide digital training classes.[289] Finally, there is Thailand's Smart Visa program, which encourages science and technology talent to live and work in Thailand.[290]

Ethics

Thailand has two key legislations regulating data: The Data Governance Framework (DGA) released in May 2018,[291] and the *Personal Data Protection Act B.E. 2562* (2019) (PPDA) released in May 2019. The DGA provides guidance on the duties of public sector stakeholders regarding the operation and management of data, while the PPDA addresses data localization and transfer processes, supported by the 2019 *Thailand Cybersecurity Act*. Regulating AI more directly is the AI Ethics Guideline Draft, which was submitted by the Ministry of Digital Economy and Society to the Cabinet for endorsement in November 2020. The AI Ethics Guideline demonstrates that Thailand takes a human-centred approach to the development and use of AI, which are the shared responsibilities of all involved parties, both in the public and private sectors.

INTERNATIONAL LINKAGES

Thailand has made efforts to bilaterally engage with other states in developing its digital economy. For example, in June 2021 it began negotiations with Singapore on a digital trade agreement. The agreement notably covers issues like co-operation in developing ethical guidelines for AI, among other Industry 4.0 technologies, and promoting the digital trade participation of SMEs.[292] Thailand is also a member of the ASEAN Smart Cities Network (ASCN) proposed by Singapore in 2018 with the aim of synergizing the efforts of member states in developing their own smart cities. In line with the ASCN, Thailand endorsed Bangkok, Chonburi, and Phuket as its pilot cities within the network. Beyond Southeast Asia, Thailand formed another partnership at a state level with the UK to work on smart-city projects.[293] An example of a project under this program is improving the flood management system of Lat Phrao, a district in the capital city of Bangkok.[294] Meanwhile in the private sector, Thailand has partnered with the global network of the City Possible program, pioneered by Mastercard, to accelerate smart-city development in Thailand's 27 cities.[295]

Vietnam

INTRODUCTION

Vietnam's AI landscape is still in an early stage, focusing on capacity building, reskilling, and upskilling. Since Prime Minister Nguyen Xuan Phuc embraced the Fourth Industrial Revolution in his speech at the country's 2016 ICT Summit,[296] the development of core Industry 4.0 technologies such as AI, blockchain, and IoT and the urgency of building a future-ready workforce have been mentioned in a multitude of government documents and speeches. The first key government document was Directive No. 16 on strengthening the national innovation capabilities to prepare for the Fourth Industrial Revolution, issued in May 2017.[297] Throughout the next four years, various ministries embraced the development and use of emerging technologies in their strategies and programs.

GOVERNMENT

Capacity Building

The COVID-19 pandemic has accelerated digital transformation in Vietnam. In June 2020, the government approved the National Digital Transformation Roadmap 2025, reaffirming the objectives and initiatives of the Industry 4.0 strategy for e-government, e-economy, and e-society. Vietnam's overarching Digital Transformation Program (2025-2030), emphasizes the need for a digital government, economy, and society.[298] It seeks to address many of the basic infrastructure concerns needed to successfully roll out AI, such as improving national connectivity (e.g., fibre optic and 5G services available nationwide).[299]

National AI Policy

In March 2021, the landmark National Strategy on R&D and Application of Artificial Intelligence was released.[300] The strategy sets high goals for the deployment of AI in the country from 2020 until 2030, with the aim of boosting Vietnam to upper-middle income status.[301] It calls for the establishment of three national innovation centres, ten research institutes, and three national big data hubs.[302] Using AI nationwide, Vietnam hopes to improve public sector productivity and strengthen national security.[303]

Research and Development

In September 2018, Vietnam's Ministry of Science and Technology released the Plan for Research and Development of Artificial Intelligence 2025 to increase the research and commercialization of AI technology and develop homegrown AI products. In the past five years, Vietnam has committed to developing a thriving tech ecosystem across three major hubs – Hanoi, Da Nang, and Ho Chi Minh City – under the Program on Supporting the National Innovative Startup Ecosystem to 2025 (Project 844).[304] Project 844 has been tasked with creating a favourable environment for the growth of startups and providing support to 2,000 tech projects and 600 tech startups, of which 100 will successfully attract follow-up investment of C$120M by 2025. Via these objectives, Project 844 has a bigger task of forming closer relationships between the triple helix agents – government, industry, and universities – in Vietnam's innovation ecosystem.[305] Private sector groups like Samsung and Naver have also contributed to R&D efforts in Vietnam through substantial funding, building R&D centres, and co-operating on AI research with Vietnamese universities.

PRIVATE SECTOR

Although the COVID-19 pandemic has certainly upended many innovation programs, Vietnam has capitalized on the crisis. For example, in June 2020, Hanoi University of Science and Technology revealed its plan to launch a US$2M venture fund to invest in early-stage startups.[306] But despite strong government support and increased digitalization during COVID-19, the regulatory landscape for innovation in Vietnam has remained fragmented. Tech startups in the country urgently need a pipeline to efficiently and safely develop, test, and commercialize innovative tech solutions, such as regulatory sandboxes. Still, Vietnam has made progress, as showcased in the following three private sector snapshots:

1. **Supporting SMEs: Pique**

Formerly known as Next Smartly, Pique specializes in AI-powered customer personalization and recommendation services to promote digital engagement, aimed at SMEs. Pique

was recently acquired in June 2021 by Vietnamese e-wallet firm, MoMo, with the goal of maximizing data from its 25 million registered users.

2. **Natural Language Processing: Viettel**

Viettel's AI-backed natural language processing (NPL) is one of the top Vietnamese-language voice-recognition services.[307] Viettel's NPL technology is used in assessing its call-centre services to analyze customer complaints. Viettel also provides the technology to private and public sector clients, for example, for text-to-speech software in online newspapers and for automated notetaking. Viettel's high accuracy in Vietnamese-language NPL services highlights the importance and advantage domestic AI startups have in developing services for local populations, which also have the potential to serve global customers.

3. **Digital Identities and Banking: WeeDigital and ABBank**

WeeDigital uses AI-powered biometric security technology and deep data analytics to help firms manage client digital identities. One of WeeDigital's most notable clients is Vietnam's An Binh Commercial Joint Stock Bank (ABBank). The partnership, called Wee@ABBank, allows ABBank's clients to use facial recognition when authorizing transactions. WeeDigital has also partnered with Vinpearl resorts by providing facial recognition technology to screen guest access to resort services.

SOCIETY

Education and Human Capital

Vietnam's key comparative advantage is its young and abundant tech talent, which has attracted many foreign tech companies to the country. However, there are large skill gaps associated with Vietnamese tech talent. Though they have excellent technical skills, they have low English proficiency and lack skills in problem-solving and creative thinking. Increasing training in STEM has been the focus in all Industry 4.0-related government decrees. The latest effort was the issuance of a dispatch on implementing STEM in secondary-level curriculum by the Ministry of Education and Training on August 14, 2020. The Ministry of Planning and Investment also launched the Vietnam Innovation Network Initiative in August 2018 to encourage overseas Vietnamese tech experts to return home. Leading groups Vingroup and FPT Telecom are attracting overseas talent with their extensive resources and increasing number of AI projects, such as Vingroup's VinAI research lab and residency program. In recent years, the country has been experiencing a "reverse brain drain," in which many Vietnamese tech experts, working at leading tech companies worldwide, are returning to Vietnam to contribute to the country's development of AI and growing startup ecosystem.

Ethics

As Vietnam has not had a strong intellectual property regime, Prime Minister Phuc approved Vietnam's first-ever National Intellectual Property Strategy until 2030, a guideline designed to promote Vietnam's intellectual property regime, in August 2019. This was followed by the release of the National Industry 4.0 Strategy, which identifies 5G, AI, blockchain, and cloud computing as key technologies for economic restructuring and development of a digital economy, which includes the building of a digital government and supporting STEM talent development.[308]

INTERNATIONAL LINKAGES

Vietnam has been actively seeking partnerships with key partners in the region and beyond to further strengthen its innovation capacity. Under Project 844, the government has tasked the Ministry of Science and Technology to build a network of startup support centres across the country. In July 2020, Saigon Innovation Hub (SIHUB) launched a joint incubation program with international partners, namely Shinhan Future's Lab (Korea), Expara (Singapore), and Jica (Japan). Since July 2019, SIHUB has partnered with Singapore's government-owned enterprise development agency, Enterprise Singapore, as part of its Global Innovation Alliance network, an initiative to connect Singapore with overseas partners with a focus on technology and innovation. Under this partnership, Singapore's tech startups collaborate with partners, investors, and clients in Ho Chi Minh City, connecting with Vietnam's emerging innovation scene. Finally, Japan and South Korea have been top foreign investors in Vietnam and are now tapping into Vietnam's large pool of tech talent by hiring local engineers and setting up R&D centres.[309]

Nascent AI Economies

Nascent AI Economies refer to the economies that are at the starting point of building up their AI ecosystems. They require significant action and investment in advancing government policy, private sector activities, talent development and education, and international linkages for AI.

Brunei

INTRODUCTION

Brunei is still at its most nascent stages of AI development. Current national policies focus more on capacity building rather than direct AI implementation. Under Wawasan 2035, its national development strategy, Brunei established a National Vision task force in 2004 and officially launched the plan in 2008. Wawasan has three main goals to be accomplished by 2035: education and a skilled population, high quality of life, and a dynamic and sustainable economy. Wawasan 2035 serves as a foundation for the overall development strategy, including AI.[310]

GOVERNMENT

Capacity Building

Over the last few years, Brunei has taken concrete steps to lay a solid foundation for AI rollout. In August 2020, the government established Cyber Security Brunei to safeguard the country's digital operations. Then, in April 2021, the government launched its pilot 5G project.

National AI Policy

Brunei lacks a specialized national AI policy, and its current progress toward AI adoption centres around building up the country's digital infrastructure foundation necessary for AI development through the Digital Economy Masterplan 2025 developed by the Brunei Digital Economy Council. Under the masterplan, government, industry, and society are to collaborate around these three main digital structures: digital ID, digital payment, and a people hub to become a smart nation.[311]

Research and Development

More financial investment is needed to develop Industry 4.0 technologies including AI. Despite being a high-income country, Brunei's R&D investment in 2018 was only 0.278% of its GDP, only a marginal increase from the last data point obtained by the World Bank in 2004 of 0.037%.[312] In the Global Innovation Index 2020, it scored 29.82 out of 100, below the median score of 30.94 and ranking 71st.[313]

PRIVATE SECTOR

Widescale adoption of AI in Brunei's industries and government is limited due to the lack of a cohesive national strategy and digital infrastructure. However, there are some existing and potential AI private sector applications worth noting.

1. **Health Care Today: Fighting COVID-19**

During the COVID-19 pandemic, the government rolled out an AI-powered web application that provided self-assessment and health education resources. The app also contained a map feature where users could track confirmed COVID-19 cases. Users could also access information on nearby medical service centres.

2. **AI Analytics and Telecommunications: The Imagine Sdn Bhd-Lynx Analytics Partnership**

In May 2021, Brunei telecommunications firm Imagine Sdn Bhd announced a new partnership with Singapore-based Lynx Analytics. As a contribution to Brunei's Smart Nation government program, the partnership incorporates AI-powered data analytics across several industries such as banking, telecommunications, and retail. More specifically, Imagine Sdn Bhd aims to use data analytics and predictive modelling to improve customer service and optimize business operations in Brunei.

3. **Looking to the Future: Protecting the Environment, Overhauling the Oil and Gas Industry**

As early as 2016, a Bloomberg study forecasted that Brunei would be the most oil-dependent economy in the world by 2018, estimating that 60.3% of Brunei's national GDP would come from oil exports.[314] According to World Bank data from 2019, fuel makes up 91% of Brunei's total merchandise exports.[315] AI applications, such as predictive monitoring of carbon emissions or optimization of carbon dioxide storage, could enhance Brunei's oil and gas industry by improving its operational efficiency while addressing environmental concerns.

SOCIETY

Brunei has been taking steps to encourage AI education among youth, building up its future AI and technology workforce. The Teens in AI program, for example, encourages Brunei youth to develop their skills in technology and AI outside the classroom through workshops and competitions.[316] Brunei startup InTurn Co. collaborates with the Authority for Info-communications Technology Industry of Brunei Darussalam and the Science Technology Environment Partnership Centre at the Ministry of Education in hosting the program. The program is also sponsored by large firms and organizations such as Brunei Shell Petroleum.[317]

INTERNATIONAL LINKAGES

Citing the ASEAN Digital Masterplan 2025, Brunei has called for increased regional co-operation to accelerate digitalization, particularly in areas like cybersecurity and data governance. Furthermore, Brunei has proactively engaged in bilateral partnerships with other economies. For instance, Brunei's central bank, the Autoriti Monetari Brunei Darussalam, and the Monetary Authority of Singapore signed a fintech co-operation agreement. Together, the two organizations will work to digitize Brunei's financial system and share information on emerging fintech trends.[318]

Papua New Guinea

INTRODUCTION

Papua New Guinea's economy largely depends on natural resource extraction, and much of its commercial activities remain informal. Currently, only 15% of the Papua New Guinean population has access to both fixed and mobile internet subscriptions.[319] Therefore, Port Moresby's development strategy focuses on building infrastructure and human capital and acknowledges the importance of digitalization. While AI adoption could potentially contribute to the economy's development policies and specific sectors and missions, more widespread adoption will likely require more robust connectivity infrastructure.

GOVERNMENT

Capacity Building

Papua New Guinea's development policies emphasize the importance of addressing the lack of digital infrastructure. With only 15% of the population with access to the internet (therefore limited data generation), on top of limited market infrastructure, it is difficult for Papua New Guinea's private sector to actively adopt AI. PNG Vision 2050 seeks to increase the economy's communication access from 10% to 100% and establish a National Information Database Management System by 2050.[320] Its Long Term Development Strategy 2010-2030

seeks to increase the number of mobile subscribers to 80% of the population and provide internet access to 70% of the population by 2030.[321]

Papua New Guinea's Digital Transformation Policy

Currently, there is no AI-specific strategy in Papua New Guinea. However, Papua New Guinea's Digital Transformation Policy highlights Port Moresby's priorities regarding digitalization and therefore potential areas of AI adoption moving forward.

Launched in 2020 with the leadership of the Department of Information and Communication Technology, the policy builds on Papua New Guinea's existing development policies, as well as the APEC 2018 priorities such as improving connectivity, promoting inclusive and sustainable growth, and strengthening economic growth through structural reform. The policy highlights the following six priorities:

- Digital infrastructure;
- Digital government;
- Digital skills;
- Innovation and entrepreneurship;
- Cyber safety and privacy; and
- Financial inclusion.[322]

Clearly, Port Moresby seeks to take leadership to provide critical digital infrastructure and adopt digitalization from the government level with a very limited private sector. In this context, the most tangible opportunities for AI adoption can be found in digital government, such as public health, education, or digitalization of government services.

PRIVATE SECTOR

1. NiuPay: Papua New Guinea's Fintech Leader

NiuPay offers end-to-end fintech services in collaboration with the Papua New Guinean government, its state-owned enterprises, and SMEs. NiuPay successfully created Papua New Guinea's e-visa payment system for the Immigration and Citizenship Authority. It also worked on a project with the Department of Lands and Physical Planning in which machine learning is used to reconcile payments for leasing government lands. NiuPay has

also entered into an agreement with one of Papua New Guinea's main banks, Kina Bank, to help SMEs integrate online payment as digital payments become more prevalent in light of COVID-19.[323]

2. Opportunities for Smart Mining

Papua New Guinea is heavily dependent on the export of natural resources, especially precious metals such as cobalt, gold, and silver. In 2012 (most updated information), raw materials contributed to 38.13% of Papua New Guinea's total export, and multinational corporations such as Chevron are actively engaged in this sector.[324] AI application in this sector could lead the way with the adoption of the technology in Papua New Guinea, maximizing the efficiency of mining operations while minimizing their environmental impacts. For instance, Canada's Minerva Intelligence conducted an evaluation for Freeport Resources' Star Mountains mines with its AI-powered DRIVER system.[325]

SOCIETY

Education and Human Capital

Education and training will be essential for Papua New Guinea's digitalization. More than two-thirds of all jobs in Papua New Guinea are susceptible to automation. The Digital Transformation Policy acknowledges this point and has made digital skills one of its six pillars.

Ethics

Papua New Guinea has one of the largest tropical rainforests with unique biodiversity, and illegal logging has been an ongoing issue. Approximately 70% of logging in Papua New Guinea is estimated to be illegal.[326] In this context, initiatives such as those of Rainforest Connection, which uses sensors and machine learning to identify illegal logging, could be useful.

INTERNATIONAL LINKAGES

Papua New Guinea is heavily dependent on foreign development aid, especially from Australia, which provided approximately A$479.2M (US$380.5M) in the 2020-2021 fiscal year, and multilateral organizations such as the Asian Development Bank, IMF, and the World Bank.[327] It was the APEC host country in 2018, and it has closely aligned its domestic policy, including the Digital Transformation Policy, with the APEC goals.

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ASIA PACIFIC FOUNDATION OF CANADA

FONDATION ASIE PACIFIQUE DU CANADA

ASIA BUSINESS LEADERS ADVISORY COUNCIL 2021

Broad Diversification: Strengthening Canada-Asia Engagement After COVID-19

Summary Report

ASIA PACIFIC FOUNDATION OF CANADA
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ASIA BUSINESS LEADERS ADVISORY COUNCIL

2021

APRIL 8-9, 2021 *(Asia)*

VIRTUAL

APRIL 7-8, 2021 *(Canada)*

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EXECUTIVE SUMMARY

The Asia Business Leaders Advisory Council (ABLAC) held its fifth annual meeting in a virtual setting on April 7-8, 2021 (April 8-9 in Asia). While the COVID-19 pandemic prevented an in-person meeting from occurring, ABLAC 2021 was perhaps the most engaging and critical Council meeting to date, as more than 150 ABLAC members and invited guests convened virtually over the two-day meeting to discuss a number of timely issues related to the overarching meeting theme, "*Broad Diversification – Strengthening Canada-Asia Engagement after COVID-19*."

As it did globally, the COVID-19 pandemic led to major economic disruption in Asia. But in contrast to other regions, Asian economies weathered the storm better than most. This is not to suggest that Asia escaped economic disruption, but most countries in the region managed the pandemic more effectively than their Western counterparts. While the economic recovery will be uneven in Asia, the region's GDP is expected to grow at around 8.4 per cent in 2021, with China's own GDP growth for 2021 projected to be around 7.9 per cent, according to the IMF. Compared with projected EU growth at 3.5 per cent and U.S. growth at 6.4 per cent, Asia will be the fastest-growing region for the short to medium terms.

The key takeaway echoed throughout the ABLAC 2021 meeting, which was held under Chatham House Rule, is that engagement with Asia is as important as ever and will be crucial for Canada's own post-COVID economic recovery. The various sub-regions within the broader Asia Pacific region will each face their own challenges and present unique opportunities.

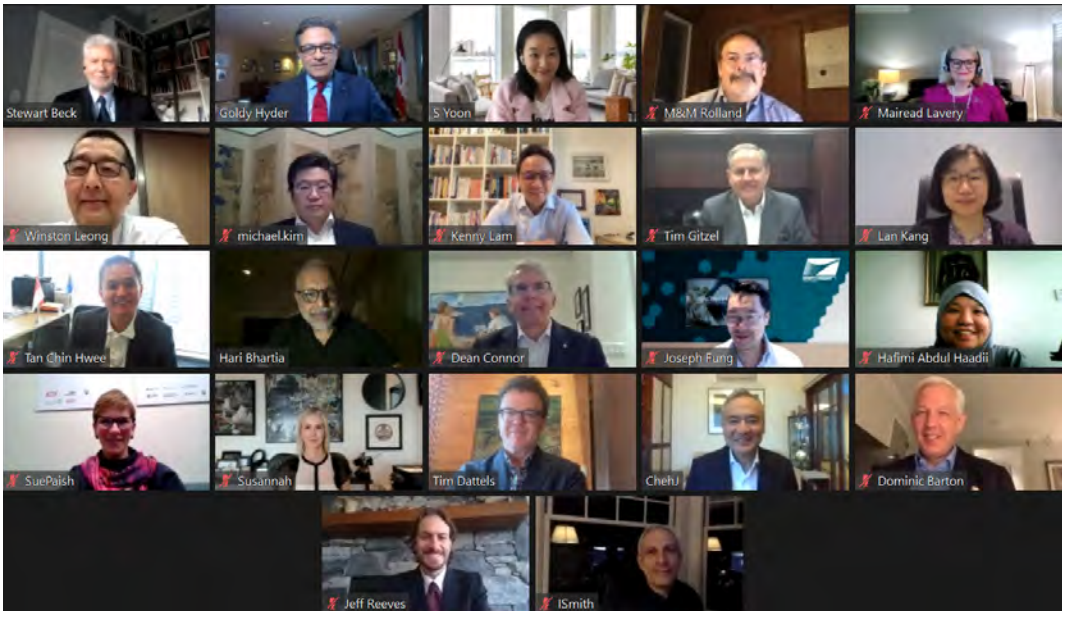
The Opening Plenary Session included prerecorded video remarks from The Honourable Mary Ng, Minister of Small Business, Export Promotion and International Trade, Canada, and, The Honourable Seamus O'Regan, Minister of Natural Resources, Canada. Dr. Jeffrey Reeves, Vice-President, Research & Strategy, Asia Pacific Foundation of Canada, closed the session by providing a "state of the region" overview of the primary political, economic, security, environmental, and technology trends in the Asia Pacific and highlighted some challenges and opportunities for Canada to engage with the region.

Participants were reminded that Canada is a trading nation with international trade accounting for nearly two-thirds of its national economy and providing millions of jobs.

By 2030, the Asia Pacific market is expected to encompass 65 per cent of the world's middle class and by 2050, the region will contain four of the world's 10 largest economies. With this in mind, it is quite clear that trade and investment with the Asia Pacific region will become even more important for Canada, with ample opportunity for our businesses to collaborate, generate growth, and create good jobs that will strengthen the middle class.

The digitalization process currently underway globally, and especially in Asia, is significant and represents an area where Canada can make a contribution. While a lot remains unknown at this point – particularly with regard to what the future of digital payments will look like and if approaches will be developed globally or regionally – it is a significant trend Canadians should be paying attention to, and can potentially benefit from.

Canada and the Asia Pacific region also share common challenges, such as the existential threat posed by climate change. The importance of working with the region to achieve our shared goal of building a clean energy future that powers economic growth, creates good jobs, and dramatically lowers emissions, cannot be overstated.



Select ABLAC Members engaged in one of many discussions over the two-day virtual meeting.

ABLAC Members and special guests were invited to engage in three smaller, dedicated panel discussions addressing different regional topics of importance to Canada, including: opportunities for digital collaboration with Southeast Asia; opportunities related to the environment and carbon commitments in Northeast Asia; and, the growing importance of trade and investment with South Asia in Canada's broad diversification efforts. The objective of these sessions was to examine how Canada can excel in engagement with specific regions of interest in Asia, and to generate recommendations for presentation at the Closing Plenary and for this ABLAC 2021 Summary Report.

All participants convened virtually for the Closing Plenary Session to listen to a prerecorded address to the Council by The Honourable Marc Garneau, Minister of Foreign Affairs Canada. This was followed by an engaging keynote address by Mark Carney, Vice Chair and Head of ESG and Impact Fund Investing, Brookfield Asset Management; Former Governor of the Bank of England; and, Former Governor of the Bank of Canada. Ambassador Dominic Barton, ABLAC Honorary Chair and Ambassador of Canada to China, joined Mr. Carney following the keynote address to moderate a lively virtual fireside chat.

ABLAC 2021 was supported in part by the following organizations: Air Canada, the Business Council of Canada, Caisse de dépôt et placement du Québec, CPP Investments, Export Development Canada, Invest in Canada, and Sun Life Financial.

The Hon. Marc Garneau, Minister of Foreign Affairs Canada, addressed Council Members and guests in a prerecorded video message.

KEY RECOMMENDATIONS

1. Broad Diversification is Key

The importance of international trade for the Canadian economy was underscored in each ABLAC 2021 session. And amid the lingering COVID-19 pandemic and current global uncertainties, more than ever before Canada needs to accelerate its diversification efforts and establish new markets to exports its products, services, resources, and capital. Opportunities exist in Canada's traditional export markets, but other countries are growing exponentially and represent long-term opportunities for Canada. South and Southeast Asia are two significant markets where Canadian investment and exports have been minimal, yet tremendous opportunities exist. Canada's lacklustre engagement in these two dynamic regions is in part due to a poor understanding of these markets by Canadian businesses and a lack of awareness of what Canada has to offer. The Council recommends Canadian trade and investment promotion agencies double their efforts in promoting these underexplored markets, as well as Canada's unique value propositions. The Council also strongly supports the negotiations of a Free Trade Agreement (FTA) and a Foreign Investment Protection Agreement (FIPA) with both ASEAN and India. This recommendation is further supported by APF Canada's 2020 survey of business leaders in Asia, which revealed, for example, that 76 per cent of companies in India and 48 per cent of companies in Vietnam not currently doing business in Canada say they are either considering or planning to enter the Canadian market.

2. Going Digital, But Doing it Right

The ability to digitize information continues to open up new global trade possibilities. While digitalization worldwide has been in motion for some time now, the COVID-19 pandemic has accelerated the trend. The ability to digitize information and the proliferation of e-commerce have not only created opportunities to trade new kinds of products and services, they have also affected the way companies do business. Digitalization is progressing faster in Asia than in other parts of the world, and Canada needs to ensure it doesn't miss out on the opportunities this transformation presents. The penetration of e-commerce in retail is already about 33 per cent higher in China than in the United States. While e-commerce adaptation is lower in the rest of Asia, it is catching up quickly. To support Canada's digital trade diversification strategy, in the coming year APF Canada plans to conduct two deep-dive surveys about economic engagement with, and opportunities for Canada in, two particularly high-potential Asian markets: Indonesia and Singapore.

While broad in scope, the survey will include a focus on sub-sectors, including e-commerce, digital innovation, AI, and digital governance. With the 'Pacific Century' also set to become the 'Digital Century,' the Council recommends that Canadian government and business leaders work hand-in-hand to develop good practices, rules and regulations, and standards that will create an environment where they are empowered and able to succeed.

3. Investing in Carbon Neutrality

The green transition around the world, and especially in Northeast Asia, represents an immense opportunity for large Canadian investors, such as pension funds. Countries worldwide, including China, Japan, and South Korea, recently took significant pledges to reduce carbon emissions to net-zero by 2050/2060. In order to achieve net-zero emissions, de-carbonization will need to take place across all sectors, from transportation to electricity and heat, and investment will be required in carbon removal solutions. Asia represents over 60 per cent of GHG emissions, with China, Japan, and South Korea contributing about one-third of global GHG emissions. Given Canada's considerable expertise in global investment acumen, the Council recommends that the Canadian government, at the federal and provincial levels, work with Canadian pension funds and asset managers to facilitate opportunities to help finance the climate transition in Northeast Asia.

4. Investing in Canadian Skills and Asia Competency

Canada's businesses are falling short when it comes to the intercultural skills required to work effectively in Asian markets. The Council recommends to further invest in helping Canadian educational institutions across the country adapt their curricula to better reflect the fundamental and long-term shifts happening globally and in Asia. This adaptation should begin at the primary and secondary school levels, namely, by placing a stronger emphasis on teaching about Asian cultures, histories, economies, and political systems. According to APF Canada's most recent National Opinion Poll (2020), solid (and growing) majorities of the Canadian public in every region of the country support such an initiative. These efforts need to continue at the post-secondary level, with a renewed (post-pandemic) focus on the need to give more young Canadians the opportunity to gain first-hand experience in Asia through study abroad and internship programs. Such an investment would also contribute to a longer-term solution to the recent rise in anti-Asian sentiment seen across the country.

5. The Power of People-to-People Connections

Immigration from Asia not only enriches Canada's diversity, but Canadians of Asian heritage also present a unique opportunity to improve Canada's overall engagement in the region. People-to-people linkages between Canada and Asia are strong, and effectively leveraging Canada's dynamic and diverse diaspora communities would create new economic opportunities on both sides of the Pacific. According to Canada's 2016 census, approximately 15 per cent of Canada's population is of Asian origin (Northeast Asia, Southeast Asia, and South Asia). These Canadians of Asia heritage, with their language skills, international connections, and cultural awareness, are the ideal 'ambassadors' to facilitate exchanges between Canada and their home countries. Research reports have highlighted the positive impact that these individuals can have on Canada's engagement with Asian countries. But Canada's diaspora communities remain an underutilized resource that the Council recommends should be better supported and deeper engaged by government and industry. The Council further supports Canadian immigration policies to make Canada an international talent hub.

6. New Mindset on China

Confronting international partners on behaviour at odds with Canadian values and interests is necessary, but Canada needs to avoid an all-or-nothing approach. Indeed, Canada needs to better understand the current power transition globally and consider gains in relative, instead of absolute, terms. Canada wins when its international partners also do well economically. Demonizing China will accomplish nothing more than further harden public opinion and eventually restrict avenues for future co-operation. Effective engagement with China requires that we understand China's viewpoints, but understanding China's views and incorporating them into our thinking are vastly different. Better understanding the broader context behind contentious issues that arise in the relationship enables Canada to be more flexible and effective in its engagement and interactions with China. With that in mind, the Council strongly supports efforts that would help fill the gaps in Canadians' collective knowledge about China's history, culture, current conditions, and perspectives.

Mark Carney, Former Governor of the Bank of England and the Bank of Canada, made a keynote address to ABLAC participants. The candid talk was followed by a fireside chat moderated by Ambassador Dominic Barton, ABLAC Honorary Chair and Ambassador of Canada to China.

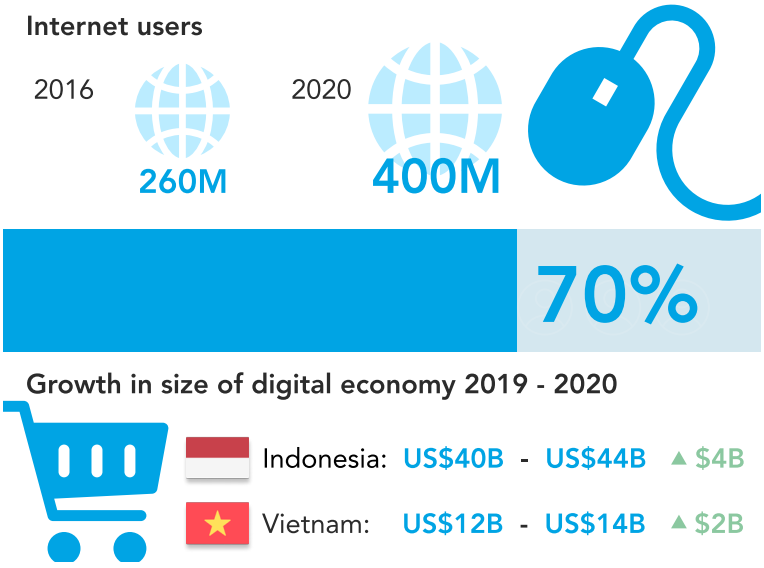
OVERVIEW OF REGIONAL SESSIONS

Session I. Integrating Southeast Asia's Digital Sector

This session was moderated by Dean Connor, Chief Executive Officer of Sun Life Financial, who opened the conversation by highlighting the importance of digitalization in this century and the opportunities for Canada in Southeast Asia's digital sector. Mr. Connor was joined by panellists Hafimi Abdul Haadii, Executive Director of LVK Group of Companies in Brunei Darussalam, Sue Paish, Chief Executive Officer of Canada's Digital Technology Supercluster, and Chin Hwee Tan, Asia-Pacific Chief Executive Officer of Trafigura.

Southeast Asia in the Era of the Digital Pacific Century

The panel started by recognizing the growth potential of the Southeast Asian region and its digital market. First, the region is young and tech-savvy. For instance, Brunei has a 95 per cent internet connectivity rate and a 130 per cent mobile subscription rate, and 95 per cent of Bruneians have signed up for their COVID-19 mobile application. In the Philippines, 25 per cent of the population (110 million) is under the age of 25, most of whom have English language skills. Also, the pandemic has highlighted the importance of digitalization for Southeast Asian governments, which have in turn given more space and trust for their private sectors to innovate. One panellist emphasized that, "digitalization is at the heart of what ASEAN does."



Panellists then highlighted more opportunities specific to Canada. For instance, one of the speakers noted that Southeast Asia is a diverse region with more than 600 million people living with a wide range of resources and capabilities, which means that there are different types of opportunities for Canada. One of the speakers noted that the challenges that ASEAN and Southeast Asian economies face with large geographical diversity mirror Canada's experiences governing a large, diverse country that stretches from coast to coast to coast, and that Ottawa's governance know-how has a strong appeal and respect in the region. Also, another speaker highlighted that most Southeast Asian unicorns are B2Cs (business-to-consumer), which means that Canadian companies that specialize in the B2B (business-to-business) services could find their niche in the region without having to compete with these unicorns.

Canada's Superclusters as the Linchpin for Collaboration

Panellists highlighted that Canada has a "humility" problem in that its companies have not been deliberate about working together ("hunting as a pack"), nor have they been vocal enough in showcasing Canada's strengths on the international stage. This point was acknowledged by both Canadian and Southeast Asian participants. Here, panellists agreed that Canada's Superclusters can help address this problem and play the role of linchpin for collaboration with Southeast Asian partners, and highlighted talent development, agriculture, health, and environment as priority areas for future engagement in the region.

Speakers highlighted that there are 65 live projects in Canada's Digital Supercluster alone, some already engaged with stakeholders in Southeast Asia. For instance, Spectrum Mobile Health has developed a platform that allows health professionals to collaboratively build clinical guidelines in a pandemic, and it would have engaged more than 900 health professionals in Myanmar if the political crisis hadn't erupted. Vancouver-based Terramera's use of computational biology to eliminate the need for chemical pesticides, and MDA's AI-based tool to detect illegal fishing activities were also highlighted as technologies that could address pressing needs in Southeast Asia.

The panel also highlighted the Superclusters' outcome-oriented approach, which is aligned with the pragmatism that is valued by Southeast Asian industry leaders. Superclusters deviate from the previous Canadian approach of "babysitting" MSMEs centred around government funding. Now, Superclusters bring together competitive Canadian firms as an ecosystem to take them abroad, allowing MSMEs to gain know-how and competitiveness by working alongside larger firms. Panellists agreed that Superclusters could play the role of a catalyst between Canada and Southeast Asia, and one of them noted that the model has been adopted by Brunei. One of the Canadian panellists said, "[Canadians] are still very polite. We're still very nice. We've still got humility, but it is not an excuse for not being ambitious," and described the Superclusters initiative as a sign that Canada will play a more active role in the international market.

Action Items:

- Canada should take an "ecosystem" or "hunting-as-a-pack" approach through Superclusters and, backed by pension funds, pursue meaningful partnerships with Southeast Asian economies. The ecosystem approach and backing from pension funds would allow Canadians to compete against well-funded rivals in the region (e.g. Chinese firms).

- Canada should not discount its soft power and experiences governing a diverse federation in its engagement with Southeast Asian economies. There is a lot of shared history and goodwill. For instance, Prime Minister Justin Trudeau is the fifth grandchild of Singapore's co-founder, William Farquhar. Canada's soft power should be leveraged more actively.

- Overall, we need to pay more attention to the 'human links' and use them more effectively. There is a generational change with youth-driven growth in Southeast Asia and the emergence of young entrepreneurs playing an increasingly important role. In this context, we need to pay attention and better support academic and professional exchanges, as well as the chambers of commerce in the region and the Canadian Tech Accelerators (CTAs) that could be leveraged further.

ABLAC 2021 Session 1 Panel on Integrating Southeast Asia's Digital Sector, featuring moderator Dean Connor, CEO of Sun Life Financial, and featuring (clockwise) panellists Sue Paish, CEO of Canada's Digital Technology Supercluster, Chin Hwee Tan, Asia-Pacific CEO of Trafigura, and Hafimi Abdul Haadii, Executive Director of LVK Group of Companies.

Session II. Carbon Neutrality Commitments in Northeast Asia: Where are the Opportunities for Canada?

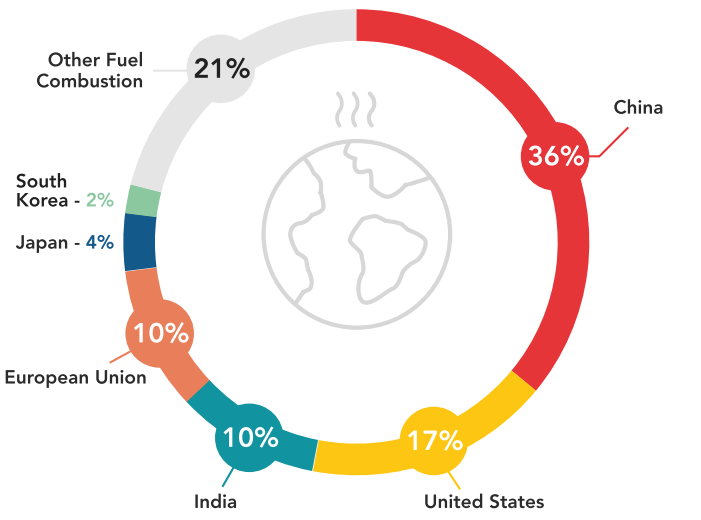
This session was moderated by Susannah Pierce, President & Country Chair, Shell Canada, with panellists Tim Gitzel, President & CEO, Cameco Corporation; Michael ByungJu Kim, Founder & Partner, MBK Partners; Kenny Lam, CEO, Two Sigma Asia Pacific; and, Mark Wiseman, Global Investment Manager.

Significant Climate Pledges, Equally Significant Opportunities for Canada

The session started with a reminder of the recent climate pledges taken by Northeast Asian countries. As China, Japan, and South Korea recently took significant pledges to reduce carbon emissions to net-zero by 2050/2060, the goal of the panel was to discuss and reflect on how Canada can collaborate with Northeast Asian countries in reaching their climate goals and discuss specific challenges and opportunities for Canada, as these markets are invested in transitioning to carbon neutrality. To reach their climate pledges, all three Northeast Asian countries will have to develop strategies and implement new policies, presenting opportunities for Canada as a clean technology and green energy leader.

Together, China, Japan, and South Korea produce nearly one-third of all carbon emissions worldwide. China ranks 1st in carbon output, while Japan and South Korea are the 5th and 8th largest emitters, respectively. In emission per capita, however, South Korea ranks 6th, Japan 8th, and China 13th.

Global GHG Emissions



Panellists noted that after a lull created by the COVID-19 pandemic, the debate over addressing climate change made a comeback with the election of Joe Biden and his administration's cancellation of the Keystone XL and return to the Paris Agreement. Alongside carbon neutrality pledges taken by various countries around the world, this signals the importance that addressing carbon emissions will assume in the coming years, which, as one panellist suggested, will significantly increase the demand for carbon-free electricity around the world, and particularly in Asia. One panellist pointed out that 85 per cent of electricity is currently coming from fossil sources. Generating carbon free electricity will create tremendous opportunities for Canadian companies. Every sector (wind, solar, nuclear) will be needed and Canada has the resources, expertise, and technologies to share and sell.

One panellist emphasized the opportunity that green transition around the world and in Northeast Asia especially is providing Canadian investors, and argued that the current climate transition will be one of the greatest investment opportunities of a generation. The panellist commented, "China is investing quite heavily into cleantech. Currently, it is putting about US$40 to 50 billion in cleantech every year. It will increase five to tenfold in the next three to five years in electronic vehicles, in wind turbines, and across different types of technology."

Another panellist argued, however, that the climate pledges taken by Asian countries are aspirational and that in reality each has different degrees of commitments toward achieving net-zero, especially China. The panellist explained that China has come a long way economically in the last decades but there is a sense that the country is still developing and will continue prioritizing economic development and only lower GHG emissions in sectors that will not impede economic growth.

The panellist pointed out that some in China consider the carbon neutrality agenda as a Western idea and reminded participants that the first goal for the Chinese government is to become a prosperous middle-class society by the 100th birthday of the founding of the People's Republic of China, in 2049. He suggested Canada focus on more developed markets, such as Japan and South Korea.

A new mindset for engaging with China

Panellists also discussed how best to engage with China in these troubled times. They highlighted the importance of engaging with China despite the current difficulties in the bilateral relationship and globally, as engaging China will be key for both addressing the climate emergency and ensuring Canada's future prosperity. As a panellist noted, "If we are going to attack climate change around the world, we, by definition, have to attack it in Asia

and in particular, in Northeast Asia, in China specifically." To better engage with China, panellists discussed the importance of China and the need to develop better expertise and on-the-ground know-how, and the importance of having a presence in China and in other markets where Canada wants to succeed. The success of CPP Investments in Asia is a case in point. CPP Investments opened an office in India in 2015, and showing its commitment to that market, it worked with local teams, leveraged local partners, and developed deep local knowledge and expertise.

The importance of Canadians having the right mindset about engaging with China and Asian countries in general was further emphasized. One panellist made the case for adopting non-zero-sum-game thinking regarding China. How to engage with China is a significant problem for the world and Canada. China is responsible for close to 40 per cent of global emissions and Canada needs to engage with China, not only for its own prosperity but also to address global problems like climate change. The panellist argued that China wants to engage with the world on climate change and other issues, but the current global environment and the U.S.-China confrontation make discussion and collaboration on specific topics more difficult.

While panellists agreed that the polarization of the situation with China presents challenges, they also highlighted the advantage that Canada has and can build on to better facilitate understanding, communication, and trade with Asian countries: our connectivity with the Asian region. "That cultural connectivity that we have in Canada today, people who speak the language, understand the culture, maybe were born in Asia and have grown up in Canada, is a tremendous asset," one panellist remarked.

Action Items:

- Given Canada's considerable expertise in global investment acumen, the Canadian government - at the federal and provincial levels - should work with Canadian pension funds and asset managers to facilitate opportunities to help finance the climate transition in Northeast Asia

- Canada should better leverage its connections with Asian countries. There are a lot of people of Asian descent in Canada, representing an incredible – but underutilized – resource for governments and companies to elevate their engagement in Asia.

- Help Canadians better understand the situation with China, and its perspectives on various issues. Encouraging young Canadians to live, study, and work abroad in Asia will contribute to helping Canada broaden its understanding of the region. We need to reconcile Western and Asian approaches to world affairs and build trust in the relationship. Investing in Canadians' understanding of Asia and Asian competency could go a long way in the future.

ABLAC 2021 Session 2 Panel on Northeast Asia: Environment, featuring moderator Susannah Pierce, President & Country Chair, Shell Canada, and featuring (clockwise) panellists Tim Gitzel, President & CEO, Cameco Corporation; Mark Wiseman, Global Investment Manager; Kenny Lam, CEO, Two Sigma Asia Pacific; and, Michael ByungJu Kim, Founder & Partner, MBK Partners.

Session III. Unlocking India's Significant Trade and Investment Opportunities

Session 3 was moderated by Mairead Lavery, President and CEO of Export Development Canada. Ms. Lavery was joined by panellists Hari Bhartia, Founder and Co-Chairman of Jubilant Bhartia Group; Suyi Kim, Senior Managing Director and Head of Asia Pacific for CPP Investments; Ian McKay, CEO of Invest in Canada; and, NG Subramaniam, COO and Executive Director of Tata Consultancy Services.

The discussion spurred the question, has the right time come for stronger Canada-India trade and investment relations? The panellists highlighted the current state of the Indian economy and its efforts to combat the COVID-19 crisis. They described their experiences operating businesses abroad in Canada, shared deep insights on understanding the trade relationships and seizing the opportunities in one of the largest growing economies, and reflected on what to expect as economies move towards a recovery post COVID-19.

India's Economy and the Response to COVID-19

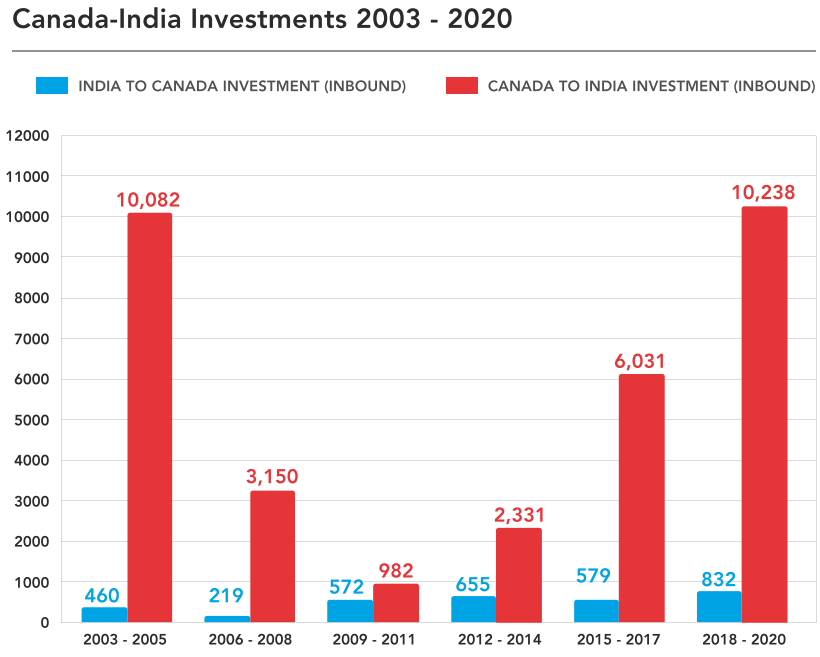
Similar to other countries globally, India has been deeply affected by the pandemic, which led to a 10.3 per cent contraction in its economy in 2020. Despite the significant challenges that India is facing with the current second wave, participants agreed that there are some optimistic signs of economic recovery in India, as highlighted by the International Monetary Fund (IMF) economic forecast for 2021, which projected (at the time of the Council meeting) that India's economy would grow by 12.5 per cent.

One participant observed that even in these uncertain times, the economic activity of India's second and third-tier cities is returning to normal, prompted by a series of relief measures announced by the Indian government, such as additional spending, temporary direct and indirect tax concessions, credit guarantees, and liquidity enhancement. The panellist further explained that stable and low interest rates should keep inflation under control and that privatization efforts undertaken by the government show the increasing confidence in and efficiency of the private sector. This is expected to attract large investment in the coming years, especially in sectors such as pharmaceuticals, food processing, automobiles, and electronics. "Foreign direct investment has been strong and even this year we expect almost $50 billion worth of FDI coming into India," the panellist remarked. India's demographic advantage will also play in its favour, with India expected to become the most populous country on the planet by 2050, with a young population that will have strong influence on future consumption.

Challenges and Opportunities in the Canada-India Partnership

After detailing the many ways India is becoming a vibrant, robust, dynamic economy in a region of the world quickly becoming a vital centre of gravity, another panellist highlighted the challenges that Canada faces in attracting investments from India, which the panellist characterized as a proximity issue and a lack of awareness. When Indian investors look West, they consider the United States as the default landing ground from which to also cover Canada, an economy they end up neglecting and conflating with the U.S. market. Indian investors remain unaware of the specificities of the Canadian context and its opportunities for investment. The panellist argued that it is the prerogative of investment promotion companies to build awareness about Canada and what the country can offer to attract investments from important economies such as India. The Canadian governments should do more to sell its competitive attributes to Indian investors. Canada has a lot to offer, such as a super cluster framework involving the digital and protein clusters, various incentives provided to investors by the federal government, and world class research and development facilities.

Another speaker added that Canada is India's 31st largest export partners and that India is Canada's 10th most important trade partner, emphasizing the potential to grow this two-way exchange. In terms of investment, Canada currently invests significantly more in India than the other way.



One speaker argued that India is in a unique situation and that almost every sector is likely to grow, as there is huge consumer demand for experiential, quality products and services across the board. In addition, the huge growing middle-income families are transforming India from a savings oriented economy to a spending economy. In addition to export opportunities, it is estimated that there will more than C$6 trillion of investment opportunity in India by 2025. The panellists highlighted the specific business and investment opportunities in agriculture, addressing sustainability issues, and developing innovation and technology partnerships.

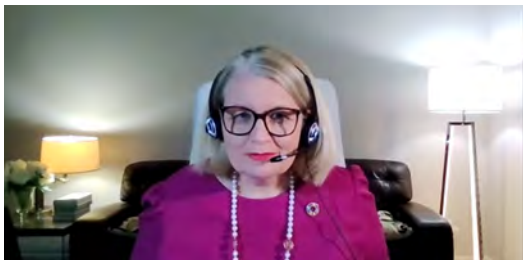
Regarding possibilities for strengthening the Canada-India partnership and helping Canada seize inherent economic and investment opportunities, one panellist stressed the importance of renewing discussions on a bilateral free trade agreement and an investment protection agreement. Various Canadian organizations and services can also be further leveraged, including the Indian Commission of Canada, Trade Commission Services, Export Development Canada, and the Indo-Canada Business Chamber. These organizations can help promote the required awareness about Canada to Indian investors and help exporters navigate the Indian market.

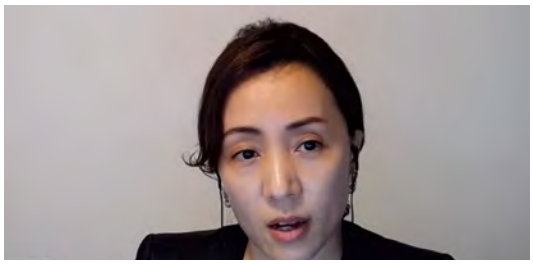
Action Items:

- Better promote in India the attractiveness of the Canadian market and its consumers. Canada is a unique market, but it lacks visibility in India and is often conflated with the U.S. market. Canadian export promotion agencies need to build the awareness of Canada in India and highlight what the country can offer to attract investments and promote exports.

- Further educate Canadians about the opportunities in the Indian market. As stressed throughout the panel, India presents tremendous opportunities for Canadian exporters and investors. But opportunities in India remain unknown to many Canadian companies and businesses.

- Canada should negotiate a Free Trade Agreement (FTA) and a Foreign Investment Protection Agreement (FIPA) with India.





ABLAC 2021 Session 3 Panel on Canada-India Trade and Investment Opportunities, featuring moderator Mairead Lavery, President and CEO of Export Development Canada, and featuring (clockwise) panellists Hari Bhartia, Founder and Co-Chairman of Jubilant Bhartia Group; Suyi Kim, Senior Managing Director and Head of Asia Pacific for CPP Investments; Ian McKay, CEO of Invest in Canada; and, NG Subramaniam, COO and Executive Director of Tata Consultancy Services.

MEETING PROGRAM

Broad Diversification:
Strengthening Canada-Asia Engagement After COVID-19

April 7, 2021

Date & Time	Description
5:00pm PDT	ABLAC 2021 Welcome Remarks
	Stewart Beck, *ABLAC Member and President & CEO, Asia Pacific Foundation of Canada*
5:05pm PDT	Opening Remarks and Introduction
	Dr. Songyee Yoon, *ABLAC 2021 Chair and CEO, NCSOFT West*
5:15pm PDT	Canadian Ministers' Remarks
	The Honourable Mary Ng, *Minister of Small Business, Export Promotion and International Trade, Canada (video remarks)*
	The Honourable Seamus O'Regan, *Minister of Natural Resources, Canada (video remarks)*
5:35pm PDT	APF Canada Presentation: Setting the Stage for the Regional Sessions
	Dr. Jeffrey Reeves, *Vice-President, Research & Strategy, Asia Pacific Foundation of Canada*
5:50pm PDT	Closing Remarks & Transition to Regional Sessions
	Stewart Beck, *ABLAC Member and President & CEO, Asia Pacific Foundation of Canada*

Date & Time	Description
6:00pm PDT	Session I: Regional Discussion – Integrating Southeast Asia's Digital Sector

How can Canada ride Southeast Asia's digital wave?

Southeast Asia has been undergoing a rapid digital transformation, driven by rising consumer classes with increased disposable income, a strong startup sector, low-cost and accessible devices, and young and tech-savvy citizens who have embraced social media, e-commerce, and a variety of other online platforms. The pandemic has accelerated digital adoption in Southeast Asia, with its internet economy projected to remain on track to cross the threshold of US$300 billion in gross merchandise value by 2025.

Home to tech unicorns such as Grab, Traveloka, and Gojek, the region has demonstrated not only its potential, but also its capacity as an innovator. The resilience of its digital sector shown through this pandemic suggests that Southeast Asia will remain a key player in this space, and presents enormous potential for Canadians businesses and entrepreneurs. However, the broader Southeast Asian region is "new" to many Canadians. How can Canada carve a space in Southeast Asia's incredibly diverse and competitive digital market?

Moderator

Dean Connor, *ABLAC Member and CEO, Sun Life Financial*

Panellists

Hafimi Abdul Haadii, *ABLAC Member and Executive Director, LVK Group of Companies*

Sue Paish, *ABLAC Member and CEO, Digital Technology Supercluster*

Chin Hwee Tan, *ABLAC Member and CEO, Asia-Pacific, Trafigura*

Date & Time	Description
	Suggested Discussion Questions What are some of the opportunities and challenges for Canadian entrepreneurs? What should an effective Canadian strategy in the region look like, considering the diversity and competitiveness of the region? What actions can be taken to particularly enable women entrepreneurs? How can Canada leverage connections in markets, such as Japan and South Korea, to help Canadian businesses succeed in Southeast Asia's digital economy? What are some specific action items for Canada (policy-makers and business) in the next year? What are the barriers to entry? What strengths can Canada build on?
6:00pm PDT	Session II: Regional Discussion – Northeast Asia: Environment
	Carbon neutrality commitments in Northeast Asia: Where are the opportunities for Canada? There has been a recent surge of carbon neutrality pledges around the world, especially in Northeast Asia. China, Japan, and South Korea all recently made ambitious pledges to slash carbon emissions to zero before 2060. They also released aggressive plans and strategies to help them achieve those goals. While climate diplomacy and actions to reduce emissions following the Paris Agreement are not seen as being aggressive enough to limit global warming, Northeast Asia's commitments have been welcomed and may revive global efforts to tackle climate change. This could lead to a re-engineering of the global economy inclusive of eliminating global greenhouse gas emissions, presenting an opportunity for Canada to leverage its strengths and take a leadership role.

Date & Time	Description
	Moderator **Susannah Pierce,** *ABLAC Member and President & Country Chair, Shell Canada* Panellists **Tim Gitzel,** *ABLAC Member and President & CEO, Cameco Corporation* **Michael ByungJu Kim,** *ABLAC Member and Founder & Partner, MBK Partners* **Kenny Lam,** *ABLAC Member and CEO, Two Sigma Asia Pacific* **Mark Wiseman,** *ABLAC Member and Global Investment Manager* Suggested Discussion Questions How significant are the region's net-zero emission pledges and how might they impact Canada's own climate policies and commitments? How can Canada leverage its strengths to help and collaborate with Northeast Asian countries to reach their climate goals? What are the commercial opportunities for Canada in Northeast Asia's ambitious net-zero greenhouse gas emissions schemes? Can Canada become a global leader in green technologies that will help reduce emissions? What specific opportunities are there for Canada under the Korean New Deal? What actions can be taken to particularly enable women entrepreneurs? How will this change the way we do business?

April 8, 2021

Date & Time	Description
6:00am PDT	Session III: Regional Discussion – South Asia/India: Trade & Investment Opportunities

Has the time come for stronger Canada-India trade and investment relations?

India is a huge untapped market for Canadian businesses and entrepreneurs. It is poised to become the world's most populous country within the coming decade. And despite experiencing some challenges dealing with the COVID-19 pandemic, the country is expected to bounce back to 8.8 per cent GDP growth in 2021.

While India is a priority market for Canada, the country also presents challenges. Although Canada and India have a longstanding bilateral relationship, India remains Canada's 10th largest overall trade partner. India has been a challenging market for Canadian businesses and entrepreneurs, but significant improvements are being made in terms of accessibility. Has the time come for stronger Canada-India trade and investment relations?

Moderator

Mairead Lavery, *ABLAC Member and President and CEO, Export Development Canada*

Panellists

Hari Bhartia, *ABLAC Member and Founder and Co-Chairman, Jubilant Bhartia Group*

Suyi Kim, *Senior Managing Director & Head of Asia Pacific, CPP Investments*

Ian McKay, *CEO, Invest in Canada*

N Ganapathy (NG) Subramaniam, *ABLAC Member and COO & Executive Director, Tata Consultancy Services*

Date & Time	Description
	Suggested Discussion Questions India is increasingly connected to global supply chains. What challenges and opportunities does this present for Canada? How does the current U.S.-China conflict alter Canada's approach to India? Should Canada prioritize an FTA with India? What can we do outside of an FTA? Do Canada and India need a reset on trade negotiations/ CEPA? Is India a suitable market for first-time exporters? Is Canada succeeding in the Indian market? What priorities/ reconsiderations should be made? How well is Canada doing in the Indian market (market share, networks)? What resources are available specifically for the Indian market? What can be done at a sub-national level to drive more region-to-region trade and investment?
5:00pm PDT	Governance Session (ABLAC Members Only) Moderated by **Dr. Songyee Yoon,** *ABLAC 2021 Chair and CEO, NCSOFT West*
5:30pm PDT	ABLAC 2021 Closing Introduction **Stewart Beck,** *ABLAC Member and President & CEO, Asia Pacific Foundation of Canada*
5:35pm PDT	Remarks by The Honourable Marc Garneau, Minister of Foreign Affairs Canada

Date & Time	Description
5:40pm PDT	Keynote Presentation
	Mark Carney, *Vice Chair and Head of ESG and Impact Fund Investing, Brookfield Asset Management; Former Governor of the Bank of England; and, Former Governor of the Bank of Canada*
5:50pm PDT	Fireside Chat: Mark Carney & Ambassador Dominic Barton
	Mark Carney, *Vice Chair and Head of ESG and Impact Fund Investing, Brookfield Asset Management; Former Governor of the Bank of England; and, Former Governor of the Bank of Canada* **Ambassador Dominic Barton,** *ABLAC Honorary Chair & Ambassador of Canada to China*
6:10pm PDT	Summary of Regional Discussions and Key Recommendations
	Moderated by **Goldy Hyder,** *ABLAC 2021 Vice-Chair and President & CEO, Business Council of Canada* Speakers • Session I: **Dean Connor,** *ABLAC Member and CEO, Sun Life Financial* • Session II: **Susannah Pierce,** *ABLAC Member and President & Country Chair, Shell Canada* • Session III: **Mairead Lavery,** *ABLAC Member and President and CEO, Export Development Canada*
6:35pm PDT	Thank You and Final Remarks
	Dr. Songyee Yoon, *ABLAC 2021 Chair and CEO, NCSOFT West*

ABOUT

THE ASIA BUSINESS LEADERS ADVISORY COUNCIL

The Asia Business Leaders Advisory Council (ABLAC) is a high-level group of Asian and Canadian business leaders established by the Asia Pacific Foundation of Canada (APF Canada) in 2016.

Convened annually to identify and articulate opportunities for improved Canadian-Asian business engagement, APF Canada established the Asia Business Leaders Advisory Council for two purposes. First, the Council builds a powerful platform for networking and business development that can help catalyze stronger commercial and investment opportunities between Canada and Asia. Second, it provides strategic information, counsel, and advice to a select group of Canada's high-level political representatives from the federal and provincial governments with the aim of strengthening Canada's strategic engagement with the region.

ABLAC is a critical forum to catalyze dialogue and action, with a specific focus on targeted changes to policies and laws that inhibit, or can advance, Canada-Asia engagement.

ABLAC seeks to:

- Affect change in Canadian government attitudes and actions by directly engaging officials on a Canada-Asia strategy;
- Share Canadian government policy and strategic direction with Asian government and private sector leaders, explore perspectives, and test impact;
- Support a co-ordinated and aligned 'broad diversification' approach to Canada's engagement with the region;
- Foster Canada's reputation as a progressive and stable democracy, with high-value products and services, as an attractive business destination for stakeholders in Asia; and,
- Encourage Canada to build the necessary toolkit of trade instruments and 'Asia competent' talent for better integration in Asian markets.

These objectives are more important now than ever before. By nearly all measures, both pre- and post-pandemic, the Asia Pacific is and will remain the world's most dynamic region in terms of economic growth and innovation and home to many of the world's fastest-growing economies, critical resources, capital, key supply chains, and world-leading technologies.

APF Canada has an ambitious vision for our country: to seize the moment and lead Canada to the next level of engagement with Asia. Canada stands to benefit significantly from Asia's growth and innovation, but we need to think strategically and creatively about what we need to do, and how we need to do it. It is imperative that business leaders from across Canada and Asia meet collectively, debate key issues, and sit at the forefront of this discussion.

ABLAC 2021 Chair, Dr. Songyee Yoon, addressed ABLAC members and guests.

ABOUT

THE ASIA PACIFIC FOUNDATION OF CANADA

The Asia Pacific Foundation of Canada (APF Canada) is a not-for-profit organization focused on Canada's relations with Asia. Our mission is to be Canada's catalyst for engagement with Asia and Asia's bridge to Canada. We are dedicated to strengthening ties between Canada and Asia with a focus on seven thematic areas:

- Business Asia: Trade and Investment
- Perspectives Asia: Surveys and Polling
- Strategic Asia: Regional Security
- Digital Asia: Digital Technologies
- Engaging Asia: Domestic Networks
- Sustainable Asia: Sustainable Development
- Education: Asia Competency

Our research provides high-quality, relevant, and timely information, insights, and perspectives on Canada-Asia relations. Providing policy considerations and business intelligence for stakeholders across the Asia Pacific, our work includes Reports, Policy Briefs, Case Studies, Dispatches, Digital Media, and a regular Asia Watch newsletter that together support these thematic areas.

HOW CAN APF CANADA HELP YOU?

APF Canada works with business, government, and academic stakeholders to provide custom research, data, briefings, and Asia Competency training. Through our data-driven research, transpacific networks, and proven convening capabilities, we are uniquely positioned to help you achieve the 'next level' of Canada-Asia engagement through enhanced trade, investment, and innovation connectivity.

Our services include:

- **Advisory Services**
  Expert briefings, strategy workshops, and tailored research.

- **Data Analysis**
  Actionable, business-relevant, curated data and intelligence designed to inform decision making.

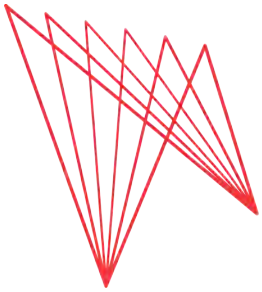
- **Education & Training**
  'Asia competency' training for professionals, from the staffroom to the boardroom.

- **Network Facilitation**
  Business acclimatization and networking opportunities between Canada and Asia's industry groups and corporate stakeholders.

If your company is interested in any of APF Canada's services, please contact lauren.chang@asiapacific.ca.

We would be pleased to propose a custom solution to meet your needs.

Contact us at info@asiapacific.ca
Visit APF Canada at www.asiapacific.ca



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