

Appendices for COVID-19 Living Evidence Profile #4

(Version 1: 14 May 2021)

Appendix 1: Methodological details

We use a standard protocol for preparing living evidence profiles (LEP) to ensure that our approach to identifying research evidence as well as experiences from Canadian provinces and territories are as systematic and transparent as possible in the time we were given to prepare the profile. However, given that it was unlikely that we would find evidence syntheses and many empirical studies, we adapted the protocol to give greater attention to single studies and to include opinion pieces that justify the position(s) taken in ways described below.

Identifying research evidence

For each LEP, we typically search our continually updated [inventory of best evidence syntheses](#) and [guide to key COVID-19 evidence sources](#) for:

- 1) full systematic reviews;
- 2) rapid reviews;
- 3) protocols for reviews or rapid reviews that are underway;
- 4) titles/questions for reviews that are being planned; and
- 5) single studies.

In this case, we searched primarily for:

- 1) single empirical studies, including those published in the peer-reviewed literature, as pre-prints, and in the 'grey' literature; and
- 2) opinion pieces, specifically those that justify the position(s) taken with one or more of:
 - a. explicit assessment of the pros and cons of a course of action compared to the alternatives available,
 - b. cited data and/or evidence that was explicitly used in deriving lessons learned,
 - c. documented stakeholder-engagement process to elicit lessons learned, and
 - d. endorsement of lessons learned by a formal group (e.g., Canadian academies) or a large, informal group of signatories to a statement describing lessons learned.

To complement the databases containing COVID-19-specific single studies that are listed in the COVID-END [guide to key COVID-19 evidence sources](#), we also searched EMBASE and select grey-literature sources to identify any relevant empirical studies and opinion pieces. The grey-literature sources include:

- 1) websites of international agencies (Organisation for Economic Cooperation and Development and World Bank) and Canadian agencies (Canadian Institutes of Health Research, Canadian Institute for Health Information, Public Health Agency of Canada, and Statistics Canada);
- 2) databases of government reports (Federal Sciences Library, Office of the Auditor General, Office of the Parliamentary Budget Officer, and Policy Horizons Canada); and
- 3) grey-literature databases (Canadian Public Policy Collection, Canadian Research Index, and OAIster).

Each source for these documents is assigned to one team member who conducts hand searches (when a source contains a smaller number of documents) or keyword searches to identify potentially

relevant documents. A final inclusion assessment is performed both by the person who did the initial screening and the lead author of the living evidence profile, with disagreements resolved by consensus or with the input of a third reviewer on the team. The team uses a dedicated virtual channel to discuss and iteratively refine inclusion/exclusion criteria throughout the process, which provides a running list of considerations that all members can consult during the first stages of assessment.

We do not exclude documents based on the language of a document. However, we are not able to extract key findings from documents that are written in languages other than Chinese, English, French or Spanish. We provide any documents that do not have content available in these languages in an appendix containing documents excluded at the final stages of reviewing.

Identifying experiences from other countries and from Canadian provinces and territories

For each LEP, we collectively decide on what countries to examine based on the question posed. However, since this LEP was only focused on what went well and what could have gone better in the COVID-19 response in Canada, we did not include other countries in the jurisdictional scan. For the scan of Canadian provinces and territories, we search relevant sources included in our continually updated guide to key COVID-19 evidence sources. These sources include government-response trackers that document national responses to the pandemic. In addition, we search websites from relevant federal and provincial governments and agencies (e.g., public-health agencies and auditor-general offices).

Assessing relevance and quality of evidence

We assess the relevance of each included evidence document as being of high, moderate or low relevance to the question. We then use a colour gradient to reflect high (darkest blue) to low (lightest blue) relevance.

In this first edition, we did not appraise the methodological quality of empirical studies deemed to be highly relevant, but we were prepared to appraise (using AMSTAR) the methodological quality of full systematic reviews and rapid reviews deemed to be highly relevant, had we found any. Our standard protocol is that two reviewers independently appraise the methodological quality of systematic reviews and rapid reviews that are deemed to be highly relevant. Disagreements are resolved by consensus with a third reviewer if needed. AMSTAR rates overall methodological quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. High-quality reviews are those with scores of eight or higher out of a possible 11, medium-quality reviews are those with scores between four and seven, and low-quality reviews are those with scores less than four. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to health-system arrangements or to economic and social responses to COVID-19. Where the denominator is not 11, an aspect of the tool was considered not relevant by the raters. In comparing ratings, it is therefore important to keep both parts of the score (i.e., the numerator and denominator) in mind. For example, a review that scores 8/8 is generally of comparable quality to a review scoring 11/11; both ratings are considered 'high scores.' A high score signals that readers of the review can have a high level of confidence in its findings. A low score, on the other hand, does not mean that the review should be discarded, merely that less confidence can be placed in its findings and that the review needs to be examined closely to identify its limitations. (Lewin S, Oxman AD, Lavis JN, Fretheim A. SUPPORT

Tools for evidence-informed health Policymaking (STP): 8. Deciding how much confidence to place in a systematic review. *Health Research Policy and Systems* 2009; 7 (Suppl1):S8.

Preparing the profile

Each included document is hyperlinked to its original source to facilitate easy retrieval. For all included empirical studies and opinion pieces, as well as any evidence syntheses, had we found them, we prepare a small number of bullet points that provide a brief summary of the key findings, which are used to summarize key messages in the text. Protocols and titles/questions have their titles hyperlinked given that findings are not yet available. We then draft a brief summary that highlights the total number of different types of highly relevant documents identified (organized by document), as well as their key findings, date of last search (or date last updated or published), and methodological quality.

Appendix 2: Key findings from new evidence documents related to what went well and what could have gone better in the COVID-19 response, as well as what will need to go well in the future given available foresight work

Type of document	Relevance to question	Key findings	Recency or status
Rapid reviews	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Economic and social responses • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Economic 	<ul style="list-style-type: none"> • The review examines early responses to the COVID-19 pandemic across 12 countries • Overall the rapid review reiterated the importance of quarantine and social isolation combined with quick action from governments as critical factors to halt the spread • Select Canadian control measures which were suggested to be beneficial include: performing a health screening of returning travellers in major airports, establishing the emergency operation centre, and supporting employers with financial resources throughout the pandemic <p>Source</p>	Literature last searched April 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary ○ Information and education 	<ul style="list-style-type: none"> • Rapid review examining lessons learned from the first wave of the COVID-19 pandemic on integrated care initiatives in Ontario • The review found that moving forward, pandemic responses should focus on protecting the vulnerable, including supporting home and community care, long-term care and addressing mental health needs as opposed to the perspective of managing the surge which was prioritized in the first wave • The review also highlighted the importance of continued engagement with patients, family and caregiver advisors which was frequently dropped during the initial response to the pandemic <p>Source</p>	Literature last searched 22 September 2020
Protocols for reviews that are underway	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures 	<ul style="list-style-type: none"> • The future of public-health policymaking after COVID-19: a qualitative systematic review of lessons from Health in All Policies <p>Source</p>	Anticipated completion date 20 December 2021
Titles/questions for systematic and rapid	None identified		

reviews that are being planned			
Single studies	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Economic ○ Voluntary 	<ul style="list-style-type: none"> • Primary study comparing approaches in long-term care homes between Ontario and British Columbia found that prior to the pandemic, residents in British Columbia received more daily hours of direct care, which when combined with lower staffing levels was associated with COVID-19 infections in long-term care homes • Prior to the pandemic, links between long-term care and public health were stronger in British Columbia than in Ontario • During the first wave of the pandemic, British Columbia was faster than Ontario in responding to COVID-19 with actions to address public-health support, staffing and infection prevention and control including quickly announcing a single-site working policy, promoting full-time work and standardized wages for all staff, sending specialized teams including infection-control practitioners and public-health staff into homes with outbreaks regardless of governance or facility ownership, setting a single case as the outbreak threshold, implementing testing and screening of asymptomatic residents, and requiring universal masking from the outset. <p>Source</p>	Published 23 November 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Federal ○ Provincial ○ Municipal • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Voluntary ○ Information and education 	<ul style="list-style-type: none"> • Primary study comparing the non-pharmaceutical interventions used by Canadian governments at different levels finding 63 different types of non-pharmaceutical interventions • The study found that British Columbia was first to enact the most rigorous measures before the WHO pandemic declaration, while all provinces implemented measures following the declaration • Two regional variations in time to implementation were found for declaration of the state of emergency and school closures, with Quebec being first to enact a state of emergency and 	Published 31 August 2020

		<p>Nova Scotia the last, while Ontario was the first to close schools and Manitoba the last</p> <ul style="list-style-type: none"> • Though interventions were implemented at various times across a three-week period, the order in which they were put in place was similar to international counterparts with travel restrictions being among the first • No evaluation was done as part of the study on the association between the interventions and their effects on reducing the spread of COVID-19 <p>Source</p>	
	<ul style="list-style-type: none"> • Types of response <ul style="list-style-type: none"> ○ Cross-cutting • Level of government <ul style="list-style-type: none"> ○ Federal ○ Provincial 	<ul style="list-style-type: none"> • Overview and comparative analysis of policy responses in France, Belgium and Canada during the early stages of the COVID-19 pandemic • The review found in general that the responses were largely dictated by existing health-system capacity, and that increasing levels of federalism, of which Canada has the greatest among comparators, was associated with more fragmented responses overall, but has allowed certain provinces to harness strong governance capacity while others have struggled • The decentralized decision-making may have also prevented widespread resource sharing between provinces including related to data sharing with the federal government <p>Source</p>	<p>Published 9 December 2020</p>
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<ul style="list-style-type: none"> • Examining the effects of changes to the health system on the operation of cancer treatment centres during the first wave of the pandemic • The study noted that one of the measures to be put in place was to limit screening programs which in combination with a reduction in access to primary-healthcare providers has also led to a reduction in cancer diagnoses and significant backlog • The study estimated a 20% reduction in screening compared to previous years • While the use of telemedicine was employed in some of these examples it had significant limitations and was infrequently used for new appointments 	<p>Published 28 February 2021</p>

	<ul style="list-style-type: none"> • The implementation of outreach programs to return proactive cancer screening may be necessary in the coming months and years to catch up with service disruptions and attempt to reduce further delays in diagnoses and treatment <p>Source</p>	
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures <ul style="list-style-type: none"> ▪ Screening ▪ Isolation of suspected or confirmed cases ○ Health-system arrangements <ul style="list-style-type: none"> ▪ Changing long-term care procedures • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<ul style="list-style-type: none"> • A cross-sectional survey assessing the preparedness of the long-term care sector to respond to the COVID-19 pandemic in Ontario, Canada • Communication and implementation of recommendations in the Ontario LTC sector was evident, but some concerns were raised regarding feasibility of implementing public-health recommendations • Additionally, LTC clinician respondents stressed the need for better engagement with LTC leaders to coordinate pandemic responses <p>Source</p>	Published 22 October 2020
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Cross-cutting • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Information and education 	<ul style="list-style-type: none"> • According to a study conducted in March 2020 assessing public attitudes towards governmental actions to combat the COVID-19 pandemic in G7 countries, Canadians had a relatively high approval rate of government response, communication and trust towards future COVID-19-related decisions • 65.6% of Canadians strongly or somewhat approved of government response (ranked 2nd) • 81.3% of Canadians evaluated government communication as very or fairly good (ranked 1st) • 77.2% of Canadians reported their trust in future government decisions as trusting a lot or trusting a little (ranked 1st) <p>Source</p>	Published 25 November 2020
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Information and education 	<ul style="list-style-type: none"> • A qualitative study of news releases from Canadian provincial government websites during the initial phases of the COVID-19 outbreak between 21 January 2020 and 31 March 2020 found that messaging across jurisdictions was generally consistent 	Published 4 September 2020

		<ul style="list-style-type: none"> • Most news releases were prescriptive and conveyed recommendations and mandates to slow transmission, and the tone generally shifted from reassurance early on to an emphasis on social-distancing measures and finally to a concern with public responsibility to slow transmission • The variations in tone and timing of the chief medical officers of health aligned with different and changing epidemiological realities across contexts <p>Source</p>	
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Federal 	<ul style="list-style-type: none"> • The aim of this study was to predict the trend of the COVID-19 outbreak in Canada in March 2020 by using comparative modelling, using Italy as the comparator country • Results of the modelling projected that in the absence of prompt public-health interventions, approximately 15,000 cases could be expected in Canada by the end of March 2020 • The results of the study suggests that Canada can capitalize on Italy’s prior experience where the closure of all non-essential activities led to a significant reduction in the country’s epidemic growth rate in early March • The study concludes that it is imperative to take immediate action to reduce the epidemic growth rate by implementing and enforcing a comprehensive package of public-health interventions given that the mitigation effect of interventions can be delayed for up to two weeks <p>Source</p>	Published 31 March 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Municipal • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<ul style="list-style-type: none"> • The descriptive study reported on an acute-care hospital’s response to a nursing home experiencing a COVID-19 outbreak in Toronto, Ontario • Partnerships and collaboration with the hospital and nursing home were valuable and can effectively manage a large COVID-19 outbreak • Key elements included a phased approach that involved building trust, a robust clinical and operations team with input from geriatric medicine, palliative care, IPAC, psychiatry, nursing, and senior hospital leadership, and a non-hierarchical structure to working with the nursing home staff 	Published May 2020

	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Types of policy instruments <ul style="list-style-type: none"> ○ Economic 	<p>Source</p> <ul style="list-style-type: none"> • The Conference Board of Canada (a not-for-profit think tank) released an issue brief that examined the economic implications of social distancing • The assumptions in the analysis included social-distancing measures and travel bans until the end of August 2020 • The modelling analysis reported that the real GDP could contract by 1.1% in 2020, with 330,000 jobs lost and unemployment rate of 7.7% • A rebound in household spending was projected to occur in the fourth quarter and into 2021, and potential real GDP growth of 3.3% <p>Source</p>	Published March 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory 	<ul style="list-style-type: none"> • This observational study assessed how mobility of staff between nursing homes in Ontario, Canada changed after the Government of Ontario enacted an emergency order that prevented staff from working in more than one nursing home • Location data from mobile devices was used to approximate connectivity between 623 nursing homes during the seven weeks before and after the implementation of the emergency order • Mobility between nursing homes dropped sharply after implementation of an emergency order restricting staff to working in a single nursing home, in which the number of nursing homes with any connection to another home fell by 70.3% • Staff mobility between nursing homes appears to be an important vector for importation of COVID-19 into and spread between homes, and should be a focus of efforts during a state of emergency <p>Source</p>	Published 26 January 2021
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial 	<ul style="list-style-type: none"> • In April 2020, a hospital-based Infection Prevention and Control (IPAC) SWAT team was developed and mobilized to long-term care facilities and retirement homes in Ontario to assess them for IPAC preparedness and actively manage COVID-19 outbreaks 	Published 22 February 2021

	<ul style="list-style-type: none"> • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Information and education 	<ul style="list-style-type: none"> • IPAC-SWAT assessed seven long-term care facilities and 10 retirement homes, and active-outbreak management was provided to 10 settings with COVID-19 outbreaks • IPAC-SWAT strategies were multi-interventional and involved the following: <ul style="list-style-type: none"> ○ Initial assessment through interview with leadership, tour of facility, staff and resident cohorting, and staff and resident COVID-19 testing ○ Education and training on COVID-19 transmission, hand hygiene, personal protective equipment (PPE) handling, break room etiquette, disinfection practices ○ Routine follow-up visits and outbreak meetings ○ Post-outbreak management to assist with reopening, visitor policies, contingency planning ○ Second wave visits with readiness assessments and second wave preparedness checklists ○ IPAC champions implemented to promote sustainability of best IPAC practices • Relationships and close communication with all partnered homes have continued following initial interventions, and after 80 days following cessation of outbreaks no new COVID-19 transmission occurred in the settings with previous cases • Anonymous surveys were sent to all partnered long-term care facilities and retirement homes for IPAC-SWAT feedback <ul style="list-style-type: none"> ○ Among 31 of 37 responses, 93.5% (29/31) felt IPAC-SWAT improved their ability to manage their COVID-19 outbreak ○ 83.9% (26/31) believed routine huddles and discussions improved the site's ability to manage ○ All responders (100%; 31/31) felt the support provided from a hospital-based IPAC team had a positive impact on their long-term care facility and retirement home <p>Source</p>	
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures 	<ul style="list-style-type: none"> • This study explored best practices and areas of improvement in the outbreak management of COVID-19 in long-term care 	Published 15 April 2021

	<ul style="list-style-type: none"> • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial ○ Municipal • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<p>facilities through semi-structured interviews with front-line workers in a regional health authority in British Columbia</p> <ul style="list-style-type: none"> • Eight areas of best practices were identified: 1) early identification and action on new COVID-19 cases; 2) suite of public-health interventions; 3) additional supports and assistance for infection and prevention control; 4) staff training and education; 5) personal protective equipment use and supply; 6) workplace culture, organizational leadership and management; 7) communication and coordination; and 8) staffing levels • Specific best practices included: <ul style="list-style-type: none"> ○ High index suspicion/low threshold for testing in addition to early identification and rapid action ○ Implementing a range of public-health measures including visitor restrictions, resident cohorting, mass testing, and single-site restriction for long-term care staff ○ External assistance through Infection Prevention and Control support teams who conducted staff training and rapid on-site assessments ○ Ensuring adequate access and a secure supply of personal protective equipment through centralization by the health authority ○ Organizational culture promoting team-based approaches to address staffing shortages ○ A coordinated communication response between teams involved in outbreak management • Areas for improvement included reducing delays in identifying cases of COVID-19 and implementing control measures, addressing the harms associated with socially isolating residents as a result of public-health measures, local staffing shortages, changing guidelines, and a lack of direct communication between teams • Recommendations made by authors included maintaining a high level of vigilance for COVID-19 transmission at long-term care facilities, providing ongoing infection-prevention and control training and education for staff, and developing 	
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		<p>formal mechanisms for communication and coordination between the outbreak-management team</p> <p>Source</p>	
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Health-systems arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary ○ Information and education 	<ul style="list-style-type: none"> • This study evaluated the effectiveness of a virtual education program in delivering just-in-time learning and best practices to support long-term care teams and residents during the pandemic • The ECHO Care of the Elderly-Long-Term Care COVID-19 program provided participants with a weekly one-hour session for 12 weeks with a curriculum based on a needs assessment survey of healthcare providers in Ontario long-term care homes • The program was found to increase confidence in providing clinical care including improving the comfort level of participants working with older adults who are at risk, confirmed, or suspected of having COVID-19, to promote integration of knowledge into clinical care, and to promote knowledge dissemination of best practices among practitioners • The authors recommended that the ECHO Care of the Elderly-Long-Term Care (COE-LTC): COVID-19 program can be used as an innovative tool for delivering rapidly evolving and time-sensitive information and best practices directly to healthcare providers in long-term care <p>Source</p>	<p>Published February 2021</p>
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory 	<ul style="list-style-type: none"> • The Conference Board of Canada (a not-for-profit think tank) projected that Canada's economy will expand by 5.8% in 2021 and 4.0% in 2022 due to vaccine roll-out and gradual reopening of the economy • Savings rate among households surged from 1.4% prior to the pandemic to 14.8% • Unemployment rate was 8.2% in February 2021 and 80% of jobs lost during last year's severe recession have since been recovered • The Bank of Canada will keep interest rate hikes on hold until 2023 	<p>Published 30 March 2021</p>

	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public health <ul style="list-style-type: none"> ▪ Personal protection <ul style="list-style-type: none"> • Physical distancing • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory 	<p>Source</p> <ul style="list-style-type: none"> • Using a subsample of NutriQuebec, a web-based cohort study of the temporal changes in dietary habits among adults in Quebec, this study examined dietary habits before (between June 2019 and February 2020) and after (between April 2020 and May 2020) early lockdown efforts • Contrary to the hypotheses of the authors, there was a small improvement in diet quality and food insecurity was reduced from 3.8% to 1% • The improvements in diet quality were mostly due to small improvements in whole grains, greens and beans, refined grains, total vegetables, total dairy, seafood and plant proteins, added sugar and total protein • Young adults (18-29), participants with lower education, or participants with obesity showed particularly important increases in diet quality <p>Source</p>	<p>Published 6 April 2021</p>
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Equity considerations 	<ul style="list-style-type: none"> • An analysis of persons under investigation (PUI) for COVID-19 across eight emergency departments in Toronto, Ontario over a one-month period (20 January to 19 February 2020) was conducted to inform policies for handling COVID-19 outbreaks • Findings from the analysis were that only 2% of PUIs evaluated required supplementary oxygen during their emergency department visit and only 5% of PUIs were admitted to hospital; all others were discharged with home isolation pending COVID-19 test results • The study found that emergency department visits could have been avoided by addressing barriers to COVID-19 testing outside of the acute-care hospitals by, for example, providing primary-care physicians with the infrastructure to collect and transport testing specimens, establishing COVID-19 assessment clinics in high-risk areas, and providing home tests for PUIs <p>Source</p>	<p>Published 23 March 2020</p>

<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial 	<ul style="list-style-type: none"> • This study aimed to predict the effect of the COVID-19 pandemic on patient outcomes and hospital resource use in Ontario, Canada over 60 days by modelling the flow of COVID-19 patients through the hospital system in the province starting 5 March 2020 • Results of the study indicated that without the implementation of early public-health measures, hospital resources would be depleted within 14-26 days, and in the worst-case scenario, more than 13,000 patients would die waiting for needed resources • Although a collapse of Ontario’s hospital system was avoided because of early public-health interventions, study modelling showed that hospital resources could have been even less strained, and more deaths could have been avoided if an approach resembling that of South Korea’s was taken <p>Source</p>	<p>Published 15 June 2020</p>
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Clinical management • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial 	<ul style="list-style-type: none"> • The descriptive study found that a multi-centre collaborative approach that included strengthening management efforts, active stakeholder engagement and rigorous control measures in the laboratory and clinical sector were essential to manage transfusion medicine services in British Columbia <p>Source</p>	<p>Published April 2021</p>
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Cross-cutting • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial 	<ul style="list-style-type: none"> • The Canadian Centre for Policy Alternatives (a non-profit non-partisan research institute) reported the impacts of COVID-19 on Manitoba women, Two Spirit, and gender-diverse people • Unemployment rate in February 2021 was 7.1% for women compared to Manitoba men at 5.1% • The authors of the policy brief recommend the Manitoba government to further support childcare, long-term care, single parents, women’s social enterprises and the social safety net, and prioritize funding to public long-term care, post-secondary education, childcare, and housing and homelessness, reverse cuts to the public sector, increase minimum wage, and provide paid sick leave <p>Source</p>	<p>Published 8 March 2021</p>

	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Cross-cutting • Level of government • Federal 	<ul style="list-style-type: none"> • The report describes the successes, weaknesses and challenges of Canada’s COVID-19 response • The report indicates successes in the laboratory, public health and infection-prevention and control responses specifically in hospitals and the community, but noted the failures within the long-term care and retirement homes • The authors recommend routine use of data (e.g., hospital preparedness, severity of disease, and frequency of disease), the need for stronger evidence-based decision-making, and review experiences from other provincial and international jurisdictions to reduce the fear and uncertainty of the Canadian population <p>Source</p>	Published November 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Clinical management • Level of government <ul style="list-style-type: none"> ○ Municipal • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary • Information and education 	<ul style="list-style-type: none"> • In Toronto, palliative-care teams generally reported a decrease in their clinical load during the pandemic – especially in acute-care and hospital settings • Community-based palliative-care teams in Toronto have reported higher clinical workloads during the pandemic <ul style="list-style-type: none"> ○ Higher workloads in the community setting may have been due to patients trying to avoid acute-care settings and the lack of other options for community end-of-life care in Toronto • Some palliative-care teams in Toronto have established strong links with long-term care homes to assist in providing palliative care; however, most teams have not formed strong relationships or engagements with the long-term care sector • Early in the pandemic, palliative-care teams reported some medication shortages – particularly for drugs used in the intensive-care system • Palliative-care teams in Toronto were generally able to access personal protective equipment during the pandemic, but some teams reported their supplies to be at-risk during the first wave <p>Source</p>	Published 5 February 2021
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements 	<ul style="list-style-type: none"> • This article examines the experiences of six out-of-hospital premises that conduct elective plastic surgeries as they 	Published 23 December 2020

	<ul style="list-style-type: none"> • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Voluntary 	<p>resumed services over six weeks following the amendment of the provincial directive that had required all elective procedures to be postponed</p> <ul style="list-style-type: none"> ○ The directive from the Chief Medical Officer of Health came into force on 19 March 2020 and was amended on 26 May 2020 to allow elective procedures to continue with appropriate personal protective equipment and hazard controls in place <ul style="list-style-type: none"> • Upon resumption of services, the medical directors of the studied out-of-hospital premises followed guidelines that recommended only low-risk patients undergo procedures, and required patients and staff to follow COVID-19 screening and prevention protocols • Over the six-week study period, 368 patients underwent surgical procedures requiring a general anesthetic <ul style="list-style-type: none"> ○ Three patients failed the pre-screening requirements and had their procedures postponed ○ Three-hundred-and-fifty-two patients (95.7%) had a COVID-19 polymerase chain reaction test completed in the days before their procedure and returned a negative result; the other patients were unable or unwilling to complete the test • Endotracheal intubation was performed on 220 patients (59.8%) and the remaining 148 patients (40.2%) received a laryngeal mask <ul style="list-style-type: none"> ○ Medical directors reported that there was greater use of intubation when compared to the pre-pandemic period ○ No additional tools for intubation or extubation (such as plexiglass boxes) were used in any of the studied facilities ○ When airway management was being performed only the required staff remained in the operating room • Of the 368 patients included in this study, seven (1.9%) had complications arising from their procedures within 30 days of the procedure <ul style="list-style-type: none"> ○ Three patients (0.8% of the total) required a hospital visit due to the complications that arose 	
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		<ul style="list-style-type: none"> ○ One patient (0.3%) was admitted to hospital due to complications ● No patients or staff members in the out-of-hospital premises reported a positive COVID-19 test during the study period ● The authors conclude that – based on their experience conducting elective surgical procedures with no resulting COVID-19 infections and minimal strain placed on the public healthcare system due to complications that require hospitalization – with appropriate measures in place surgery can be performed in a manner that is safe for patients and healthcare workers, and presents a low risk of contributing towards virus transmission in the community <p>Source</p>	
	<ul style="list-style-type: none"> ● Type of response <ul style="list-style-type: none"> ○ Health-system arrangements ● Level of government <ul style="list-style-type: none"> ○ Municipal ● Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory 	<ul style="list-style-type: none"> ● COVID-19 restrictions prevented radiation oncologists from working at multiple healthcare facilities, initiating a satellite facility to operate remotely from April to July 2020 ● Data reports from this time period of April to July 2020 were compared to the same months in 2019 when the facility was operating under normal conditions, to analyze the total number of referrals, average wait times from referral to consult, number of cases undergoing peer review, total number of fractions given over each period and patient satisfaction ● Data comparisons showed the following: <ul style="list-style-type: none"> ○ An observed decrease in the number of referrals received, most likely due to many patients being hesitant to visit a doctor’s office to receive healthcare services or referral ○ An observed decrease in the total number of fractions administered ○ An observed decrease in the number of patients providing patient-reported outcomes ○ No observed change in patient wait times ○ No observed change in cases undergoing peer review before commencing treatment ○ No observed change in overall patient satisfaction 	<p>Published 1 May 2021</p>

		<ul style="list-style-type: none"> • The results suggest that it is feasible to operate a radiation clinic remotely for short periods during a state of emergency, and it can be delivered in smaller centres with heavy reliance on technology to maintain safety, efficiency and patient satisfaction <p>Source</p>	
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Economic and social responses • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Information and education 	<ul style="list-style-type: none"> • This study examined the impact of COVID-19 on radiology resident training and the education workflow in Canada using a survey to receive responses from radiology residency program directors and residents across Canada on the nature, scale, preparedness and adaptation of the COVID-19 changes to radiology training • Most respondents agreed that objectives were being met for knowledge, but less so for case volumes and technical skills • Less time was allotted for on-site activities with more time for off-site activities • Most respondents indicated that changes were met with enthusiasm by both faculty and residents • Most respondents expressed that there were challenges with lack of training on virtual platforms for delivery of teaching, and decreased staff-resident interaction • Although changes were adapted and met with enthusiasm, they also present challenges and anxiety regarding the future of radiology resident education <p>Source</p>	Published 13 October 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Clinical management ○ Health-system arrangements ○ Economic and social responses • Level of government <ul style="list-style-type: none"> ○ Municipal • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<ul style="list-style-type: none"> • The Princess Margaret Cancer Centre in Toronto, Canada provides an acute palliative-care unit, and following the declaration of COVID-19 as a global outbreak the cancer care committee at Princess Margaret developed a clinical response to each of its three proposed phases of pandemic planning: <ul style="list-style-type: none"> ○ During phase one, the priority was to maintain a COVID-19 free cancer centre. Patients with cancer and suspected COVID-19 were diverted to designated acute-care inpatient units at another hospital, Toronto General Hospital, and COVID-19-negative cancer patients at Toronto General were transferred to Princess Margaret 	Published 15 September 2020

		<ul style="list-style-type: none"> ○ During phase two, Priority A cancer patients (defined as those with COVID-19 for whom active treatment could not be delayed or deferred) were admitted and cohorted to a COVID-19-positive unit at the cancer centre ○ During phase three, which has not yet been activated, uses inpatient spaces that have previously been converted to office space are to be reconfigured for inpatient use again ● For the duration of the pandemic, the inpatient teams were split into two distinct teams, one covering the palliative-care unit and the other focused on consulting service to minimize the risk of infection and exposure among the entire team ● Princess Margaret’s inpatient consulting service provides support to patients admitted to the medical and radiation oncology units, and a triage tool was developed along with the hospitalist team to identify those patients who might be managed with virtual support from the palliative-care team, and those who would continue to require face-to-face support ● Pandemic-planning documents and guidelines developed for COVID-19 will be useful for future pandemics to dictate resources, education and service provision, and should be shared amongst hospitals and centres <p>Source</p>	
	<ul style="list-style-type: none"> ● Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Health-systems arrangements ● Level of government <ul style="list-style-type: none"> ○ Provincial/territorial ● Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary 	<ul style="list-style-type: none"> ● This commentary summarized approaches taken in the hospital care of patients with COVID-19 during the first wave of the pandemic related to: 1) hospital capacity; 2) physical infrastructure and ward organization; 3) patient cohorting; 4) health human resources and team-based care; 5) communication with patients and families; 5) hospital outbreaks; and 6) testing and managing patients under investigation for COVID-19 were used to inform ● Based on experiences during the first wave, wards and care teams were reorganized to care for COVID-19 patients, hospital surge and staffing plans were established, personal protective equipment supply chains were strengthened, and vaccinations for healthcare workers were prioritized 	<p>Published 19 April 2021</p>

		<ul style="list-style-type: none"> The authors recommended an increase in research dedicated to managing hospital operations during the pandemic and increased support for knowledge exchange <p>Source</p>	
	<ul style="list-style-type: none"> Type of response <ul style="list-style-type: none"> Cross-cutting Level of government <ul style="list-style-type: none"> Federal Types of policy instruments <ul style="list-style-type: none"> Legal and regulatory Economic 	<ul style="list-style-type: none"> This study compared how COVID-19 has affected the policy agenda for fiscal federalism and health care financing in Canada, the United States and Mexico, using the multiple streams framework by Kingdon The authors posit that COVID-19 has shifted the policy agenda away from Pharmacare and towards long-term care policy in Canada, it may promote reforms towards universal coverage and an increased role of federal government in healthcare in the United States, and it may promote reforms of fiscal federalism and healthcare financing at the national level in Mexico In Canada in particular, the pandemic has highlighted the coordination challenges that result from its decentralized healthcare system which have led to disproportionate rates of COVID-19 in long-term care settings <p>Source</p>	Published 7 January 2021
	<ul style="list-style-type: none"> Type of response <ul style="list-style-type: none"> Public-health measures Level of government <ul style="list-style-type: none"> Provincial/territorial Types of policy instruments <ul style="list-style-type: none"> Voluntary 	<ul style="list-style-type: none"> This study utilized the Ontario Ministry of Health and Long-term Care's COVID-19 outbreak database to determine trends in COVID-19 deaths in long-term care in Ontario Long-term care residents had an incidence of mortality over 13 times higher than older adults over age 69 living in the community The authors found that lagged infections in institution staff were a significant predictor of death in residents Strategic guidance from health regions, provision of sufficient testing and personal protective equipment, and integrated regional approaches for long-term care human resource management to provide living wages for staff were recommended by the authors <p>Source</p>	Published 17 April 2020

	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Health-system arrangements • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary ○ Information and education 	<ul style="list-style-type: none"> • The Division of General Surgery at the University of Ottawa restructured its residency program in response to the COVID-19 pandemic • Junior and senior residents were divided into independent teams and alternative-care delivery and human resource arrangements were implemented to minimize opportunities for virus exposure, avoid crossover among residents, and ensure there are back-up residents available in the case of exposure • The department converted all teaching activities to a virtual format and increased the total hours dedicated to teaching every week • The authors suggest that, based on the positive experience with adaptation in their program, other residency programs should implement similar plans to ensure that they maintain a healthy workforce and are able to continue providing educational opportunities for residents <p>Source</p>	Published 11 May 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Provincial/territorial 	<ul style="list-style-type: none"> • The descriptive study reported on the response by the Alberta Precision Laboratories, Public Health Laboratory (ProvLab) • Partnership between development and deployment were key to the rapid response provided by ProvLab, which involved decision-making authorities, individuals with rapid design skillset, and expert technical staff to implement and scale up testing • Other key implementation factors included streamlining protocols, rapid decision-making, and training technical staff, to identify and address bottlenecks • Other key lessons learned included the importance of a close relationship between public-health laboratories across the country in developing and validating testing protocols and sharing knowledge, a single health authority and laboratory system, and a close working relationship between the different laboratories within the province <p>Source</p>	Published August 2020

<p>Opinion pieces</p>	<ul style="list-style-type: none"> • Types of response <ul style="list-style-type: none"> ○ Cross-cutting • Level of government <ul style="list-style-type: none"> ○ Federal ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Economic ○ Voluntary ○ Information and education • Equity considerations 	<ul style="list-style-type: none"> • Overview of public-health measures taken during the pandemic and lessons learned about what went well and what could have gone better during the response • In general, the piece identified the following four points as going well: <ul style="list-style-type: none"> ○ The early response managed to avoid overwhelming the acute-healthcare system ○ The availability of PPE appeared adequate with the federal government intervening to address early shortages and developing patches to the supply chain to meet demand ○ Residents and businesses largely respected the direction provided by public health ○ Income supports have helped to address the needs of the employed • The piece identified the following as areas where the response could have done better: <ul style="list-style-type: none"> ○ Inconsistent management approaches between provinces and territories ○ Lack of timely release of national guidelines for managing cases in long-term care homes ○ Lack of national data collection standards resulting in inconsistencies in how surveillance data is reported, particularly as they relate to individual groups such as income level and race-based data ○ Backlogs in testing and rigid testing criteria implemented across provinces created challenges understanding the epidemiological landscape across the country ○ Lack of human resources to undertake contact tracing effectively and complexities in the responsibility for contact tracing among First Nations living off-reserve limited further containment of the virus ○ Limited provincial efforts to provide supports to those experiencing housing security and homelessness, including those who may have difficulty adhering to public-health measures <p>Source</p>	<p>Published 16 February 2021</p>
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	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Economic and social responses • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Economic 	<ul style="list-style-type: none"> • Report outlines the effect of COVID-19 pandemic and its associated responses on women and their participation in the labour force • Women-majority sectors were hardest hit during the pandemic with significant employment losses, and have had weaker recoveries including in personal services, information culture and recreation, and public administration • There has also been a trend of women with children exiting the workforce entirely or reducing their hours to part-time to provide care during the pandemic while other childcare options were limited or perceived as risky • Policy recommendations from this report include mandating intersectional gender-based plus analyses in policy and program development to support the recovery from the pandemic • Other areas for focused action but that are not based in particular data include: building robust childcare supports, continuing to provide work accommodations for women with disabilities, ensuring supports are in place for those at the margins or left out of the labour market, modernizing income security to protect women in the labour market and reduce income inequality, and expanding gendered workforce-development programs particularly in male-dominated areas <p>Source</p>	Published December 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Voluntary • Equity considerations 	<ul style="list-style-type: none"> • Report examines the challenges of applying public-health guidelines to First Nations communities • Frequent handwashing was provided as a public-health recommendation, however many First Nations homes in rural communities run out of water frequently or have water concerns related to the quality of water contained in the cistern or water barrels • Overcrowded housing is also a common issue on reserves with 37% of First Nations living on reserve in unsuitable housing, which makes following physical-distancing guidelines nearly impossible 	Published May 2020

		<ul style="list-style-type: none"> • First Nations leaders have declared states of emergencies for their communities and erecting barriers to enter, which are credited with keeping the virus out of these northern communities • Guidelines and recommendations should be informed by the experience of First Nations and Northern communities to consider ways that adjustments may need to be made to support their implementation • Funding from the federal government for Indigenous communities to address COVID-19 was not at the scale or proportionality available to other communities given the challenges experienced <p>Source</p>	
	<ul style="list-style-type: none"> • Types of responses <ul style="list-style-type: none"> ○ Health-system arrangements • Level of government <ul style="list-style-type: none"> ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Economic 	<ul style="list-style-type: none"> • The report examines the conditions in long-term care homes across Canada that were in place prior to the pandemic and that were central to the crisis experienced, including: <ul style="list-style-type: none"> ○ Positioning of long-term care and other residential care (e.g., nursing homes) outside of what is included in the Canada Health Act ○ Challenges with the labour force in the long-term care sector ○ The use of punitive regulations which tend to focus on physical structures and workers rather than working conditions, ownership or employer practices ○ Deficiencies in the physical structures of long-term care homes included surcharges for private rooms, old buildings with poor ventilation, and limited space to accommodate physical distancing • This points to the need to re-examine health-system arrangements in light of COVID-19 <p>Source</p>	Published April 2020
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Economic and social response • Level of government <ul style="list-style-type: none"> ○ Federal ○ Provincial 	<ul style="list-style-type: none"> • National survey of childcare centres and licensed family childcare providers found a substantial decline in childcare enrolment across Canada between February and November 2020 	Published March 2021

<ul style="list-style-type: none"> • Types of policy instruments <ul style="list-style-type: none"> ○ Economic 	<ul style="list-style-type: none"> • The survey found this was being driven by a mix of factors, including difficulty retaining staff as well as a constellation of parental factors such as lost jobs, concerns over the risk of contracting COVID-19, and parents working from home or withdrawing children due to income concerns • The association between high fees and withdrawal from daycare is demonstrated when comparing Quebec, which has low-fee centres, to the remaining provinces which have seen a significantly greater reduction in enrolments • These findings point to the importance of considering the childcare sector as an essential service during the national recovery and considering ways to reduce the burden of childcare on parents in select cities across the country <p>Source</p>	
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Economic and social responses • Level of government <ul style="list-style-type: none"> ○ Federal • Types of policy instruments <ul style="list-style-type: none"> ○ Economic • Equity considerations 	<ul style="list-style-type: none"> • The report examines the effects of the COVID-19 pandemic on women’s participation in the economy and evaluates the effects of the policy approaches put in place • The report found a significant drop in women’s labour-market participation in addition to climbing demands of unpaid caregiving which has a further impact on women’s paid work • Income security programs including CERB have provided support for women, as well as the change in eligibility rules for employment insurance that was introduced in October • The report points to a number of areas where additional supports are needed, including the lack of affordable childcare, particularly for essential workers, as well as income supports for those who do not qualify for CERB <p>Source</p>	Published March 2021
<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Economic and social • Types of policy instruments <ul style="list-style-type: none"> ○ Economic 	<ul style="list-style-type: none"> • The Conference Board of Canada (a not-for-profit think tank) projected that Canada’s economy will expand by 5.8% in 2021 and 4.0% in 2022 due to vaccine roll-out and gradual reopening of the economy • Savings rate among households surged from 1.4% prior to the pandemic to 14.8% 	Published 30 March 2021

		<ul style="list-style-type: none"> • Unemployment rate was 8.2% in February 2021 and 80% of jobs lost during last year's severe recession have since been recovered • The Bank of Canada will keep interest rate hikes on hold until 2023 <p>Source</p>	
	<ul style="list-style-type: none"> • Type of response <ul style="list-style-type: none"> ○ Public-health measures ○ Economic and social responses • Level of government <ul style="list-style-type: none"> ○ Provincial • Types of policy instruments <ul style="list-style-type: none"> ○ Legal and regulatory ○ Economic 	<ul style="list-style-type: none"> • Report examining Manitoba's public-health and economic responses to the COVID-19 pandemic • The report found that early responses to the pandemic were successful, including: the declaration of the state of emergency; the shut down of non-essential services and implementation of social-distancing measures; restrictions to personal care home workers in a single home; and money spent on personal protective equipment and other medical supplies early on • The report also emphasized a number of places where the response could have been better, including: an early reopening in May 2020 and lack of preparation of a second wave; delayed shut down of businesses with numerous outbreaks including meat-packing plants; and closing of the government's COVID-19 response centre in June 2020 which was widely criticized by academics and medical professionals • The economic response to COVID-19 in Manitoba was also found to have particular limitations, including: <ul style="list-style-type: none"> ○ Delayed provision of business support and wage-subsidy programs which lead to undersubscription and unallocation of funds including for the Manitoba Gap Protection Program and student recovery jobs program ○ Underspensing of ear-marked funds to provide tax credits for childcare supports <p>Source</p>	Published March 2021

Appendix 3: Lessons learned from the COVID-19 pandemic from Canadian provinces and territories

Province/ territory	Cross-cutting	Public-health measures	Clinical management	Health-system arrangements	Economic and social responses
Pan-Canadian	<ul style="list-style-type: none"> • Signals of what would become COVID-19 were identified early by the Global Public Health Intelligence Network (GPHIN) and reported to leaders in the Public Health Agency of Canada (PHAC), which prompted them to act early in notifying public-health officials across Canada of a potential public-health threat by 2 January 2020 • The GPHIN highlighted that to improve on the identification of signals and issuance of alerts in the future, an evaluation of the extent to which GPHIN can or should be providing early signals to international partners, and how risk assessments can be embedded into the alerting process, is needed • The Auditor General of Canada reported that Canada's pandemic preparedness was less than optimal because of <ul style="list-style-type: none"> ○ Long-standing shortcomings in comprehensive health surveillance information ○ The lack of testing of the pandemic response described in prepared plans and national guidance of the Public Health Agency of Canada (PHAC) 	<ul style="list-style-type: none"> • Statistics Canada reported that implementation of the physical-distancing guidelines during the pandemic led to increased outdoor activity amongst Canadians as they took advantage of their environment to exercise, spend leisure time, and make social connections safely <ul style="list-style-type: none"> ○ Creative solutions that gave more Canadians opportunities to safely be outdoors included the shutdown of roads in favour of pedestrian and cyclist use and the opening of more public washrooms • The Statistics Canada report also highlighted a survey on the role of parks that found that 82% of respondents said that during the pandemic, parks have 		<ul style="list-style-type: none"> • CIHI's analysis of pandemic data from the first wave of the COVID-19 pandemic (March 1 to August 31, 2020) concluded that compared to the same period in 2019, LTC residents across Canada received fewer physician and family visits, fewer residents were transferred to hospitals for care, hospitalized residents had to wait longer to be discharged back to their homes, and there was a significant drop in new admissions to LTC homes • Recommendations to improve the LTC response across provinces and territories that were highlighted in CIHI's evaluation include: <ul style="list-style-type: none"> ○ Increasing staff levels and retention programs for LTC workers 	<ul style="list-style-type: none"> • A report by Statistics Canada on the well-being of Canadians in year one of the COVID-19 pandemic highlighted that the financial resilience of Canadians has improved as the pandemic has progressed, in part due to the significant financial supports of the Canadian government and financial institutions as well as changes in consumer behaviours • After conducting an economic analysis of the impact of travel restrictions during the pandemic on the Canadian economy, Statistics Canada concluded that the longer it takes for travel restrictions to be lifted and for recovery to begin, the larger the impact on the economy and the

	<ul style="list-style-type: none"> ○ The need for updates to PHAC’s pandemic response plans and guidance ● The auditor general recommended that PHAC’s information technology infrastructure should be improved on a specified timeline, and that a plan should be developed to address the shortcomings in its health surveillance activities and to promote timely risk assessments of pandemic threats ● The Chief Public Health Officer of Canada proposed a Health Equity Approach to COVID-19 Framework in her 2020 Report on the state of public health in Canada to explore opportunities for changes to the public-health system that suggests: <ul style="list-style-type: none"> ○ Actions to ensure equitable access to quality jobs (i.e., secure jobs with benefits and paid sick days) in Canada ○ Policy options that address childcare constraints for working parents ○ The provision of safe and secure housing for all Canadians, particularly the homeless, those with disabilities, those susceptible to violence in the home, and the elderly 	<p>become more important to their mental health</p> <ul style="list-style-type: none"> ● In its evaluation of the impact of COVID-19 on Long-Term Care (LTC) in Canada, the Canadian Institute for Health Information (CIHI) found that a number of major investigative reports at the provincial level on the LTC sector recommended that the risk of future infections, outbreaks and deaths can be reduced by: <ul style="list-style-type: none"> ○ Implementing strong infection-control practices that are mandatory ○ Providing access to personal protective equipment (PPE) and training for staff ○ Implementing a response plan for outbreaks that includes rapid testing and contact-tracing strategies ○ Reducing crowding and occupancy in homes, and 		<ul style="list-style-type: none"> ○ Improving home inspection and enforcement processes ○ Improving accountability amongst staff within each home and system-wide ○ Increasing communication and coordination across all parts of the system ● A survey conducted by Statistics Canada involving Canadians working in a healthcare setting found that 60% of respondents who required respirators (e.g., N95 masks) on their jobs said that they were always available when needed during the second wave <p>81% of these participants also said that they received formal infection-prevention and control training for their job, and 57% said that their employers supported them when they were sick and needed to stay home</p>	<p>tourism industry in particular</p> <ul style="list-style-type: none"> ○ Estimates of the analysis suggest that the impact could vary based on when travel restrictions are lifted and the type of recovery that follows ● The 2021 report by the Auditor General of Canada on the Canada Emergency Response Benefit (CERB) found that the planning and design process for the benefits program was conducted robustly with full consideration of its cost and the need for flexibility in getting the benefits to Canadian residents who faced impacts from, the pandemic <ul style="list-style-type: none"> ○ The turnaround time for the design process was shortened tremendously to a few hours or overnight when, under normal circumstances, the process can occur over many months
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	<ul style="list-style-type: none"> ○ Actions that support access to virtual healthcare as well as mental health supports ○ Assistance for students as they transition back to in-person school and rebuild their social networks ○ Policies that focus on building sustainable food systems that involve community and local food production 	<p>adapting spaces to isolate sick patients and prevent the spread of infection</p> <ul style="list-style-type: none"> ● A CIHI report comparing Canada's pandemic experience in the LTC sector with the experiences of other countries found that countries that implemented mandatory prevention measures specific to the long-term care sector, in combination with stay-at-home orders and closures of public places, had fewer COVID-19 infections and deaths in LTC than countries that did not ○ These mandatory prevention measures included immediate infection control measures (e.g., broad LTC testing and staff training, isolation wards) and additional support for staff (e.g., specialized staffing teams, personal 			<ul style="list-style-type: none"> ○ Key areas that were considered included the benefit's structure and its impact on recipient groups, sectors of the economy, and the labour supply ● Employment and Social Development Canada and the Department of Finance Canada also ensured that gaps in the initial design of the program, such as support for those who were not working because of the pandemic, were addressed and analyses were performed on an ongoing basis to ensure the flexibility of the program as the pandemic evolved ● According to the auditor general's report, pre-existing controls that were vital to the roll-out of the CERB included: <ul style="list-style-type: none"> ○ Automated pre-payment controls in existing technology systems
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		<p>protective equipment)</p> <ul style="list-style-type: none"> • According to Statistics Canada's report on school closures and children's online preparedness during the pandemic, the learning activities of children in Canada varied based on the income level of the households they live in and the level of engagement of their parents in their learning activities <ul style="list-style-type: none"> ○ It was found that children in lower-income households tend to have less access to internet-enabled devices, such as personal computers, and their parents tend to be less involved in their learning activities because of competing work obligations, which may ultimately lead to poorer academic performance • After evaluating Canada's border-control measures 			<ul style="list-style-type: none"> ○ Confirmation of Social Insurance Number ○ Confirmation that applicant was not deceased ○ Confirmation of an applicant's age ○ Confirmation that an applicant was not in a correctional facility • The auditor general's report recommends that Employment and Social Development Canada and the Canada Revenue Agency (CRA) finalize and implement their plans for the CERB's post-payment verification work • The auditor general also conducted an audit of the Canada Emergency Wage Subsidy (CEWS) program and found that although the CRA delivered the wage subsidy payments quickly, it lacked tighter controls as well as sub-annual and up-to-date earnings to
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		<p><u>during the pandemic</u>, the auditor general found that the Canada Border Service Agency (CBSA) acted quickly on the emergency orders put in place to prohibit entry of foreign nationals into Canada, and that PHAC did not always meet its target to verify if arriving travellers to Canada completed their mandatory 14-day quarantine</p> <ul style="list-style-type: none">• The auditor general indicated that addressing gaps in border-control measures would require a review of decisions made by border-service officers when applying exemptions for entry of essential workers, and improving the systems and processes for verifying compliance with the mandatory quarantine order, including the collection of traveller contact information and follow-up			<p>efficiently assess applications</p> <ul style="list-style-type: none">• The report recommended that:<ul style="list-style-type: none">○ A full economic evaluation of the CEWS program be completed and published○ Tax compliance efforts for GST/HST be strengthened○ Automated validations with a unique identifier be used in all programs of the CRA○ Targeted audits of the CEWS be conducted using business intelligence information as soon as it is available
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		<ul style="list-style-type: none"> • In her report on the state of public health in Canada, the Chief Medical Officer of Health highlighted that between April and Augusts 2020, public health measures undertaken by Canadian provinces and territories combined with efforts to increase healthcare capacity protected Canada's healthcare system from being overwhelmed 			
British Columbia		<ul style="list-style-type: none"> • The Government of British Columbia released a Restart Plan on 6 May 2020, two parts of which included evaluations based on modelling data: <ul style="list-style-type: none"> ○ Based on modelling research assessing the impact of social-distancing policies, British Columbians reduced their social interactions and contact with others to 30% of normal levels • Using the same mathematical 			

		<p>modelling, a return to pre-COVID-19 social interactions and physical distancing would result in a massive spike in cases, while 80% and 60% would result in significant and steady increases in cases, respectively</p> <ul style="list-style-type: none"> • According to B.C.'s Economic Recovery Plan, which focused on the effects of public-health measures and was released 17 September 2020, the unemployment rate in B.C. increased from 5% in February 2020 to 13.4% in May 2020 and women and youth were especially affected • By August 2020, 62% of the total jobs lost had been restored as businesses were allowed to begin re-opening 			
Alberta					
Saskatchewan		<ul style="list-style-type: none"> • Approximately 17% of Saskatchewan residents report in a recent government survey being confused 		<ul style="list-style-type: none"> • A provincial evaluation of the effects of the COVID-19 pandemic on mental health in Saskatchewan found 	

		by public-health orders related to COVID-19 restrictions		that the uptake of online/phone supports has not materialized as anticipated, resulting in many people (15% of respondents) with existing mental health disorders no longer being treated	
Manitoba					<ul style="list-style-type: none"> The Office of the Auditor General of Manitoba is in the process of conducting an audit of educational approaches for K-12 education during COVID-19
Ontario	<ul style="list-style-type: none"> The Office of the Auditor General of Ontario released a six-part report that describes in detail Ontario’s COVID-19 response, including: 1) Emergency Management in Ontario; 2) Outbreak Planning and Decision-Making; 3) Laboratory Testing, Case Management and Contact Tracing; 4) Management of Health-Related COVID-19 Expenditures; 5) Pandemic Readiness and Response in Long-term Care; and 6) Personal Protective Equipment (to be released) <ul style="list-style-type: none"> Key lessons and strategies from the SARS outbreak were not implemented prior to the 	<ul style="list-style-type: none"> The Office of the Auditor General of Ontario released a six-part report that describes in detail Ontario’s COVID-19 response <ul style="list-style-type: none"> The Chief Medical Officer of Health of Ontario did not fully exercise his powers under the <i>Health Protection and Promotion Act</i>, which led to 34 local medical officers of health seeking more direction and regional inconsistency 	<ul style="list-style-type: none"> Ontario Health released recommendations on optimizing care through COVID-19 transmission scenarios that were rooted in lessons learned from Ontario’s first wave: <ul style="list-style-type: none"> Provide care to all types of patients and clients Do not defer emergency, urgent, and 	<ul style="list-style-type: none"> The Office of the Auditor General of Ontario provided nine recommendations with 29 action items in the Outbreak Planning and Decision-Making report to address findings from the comprehensive audit <ul style="list-style-type: none"> The Ontario command governance structure was not dominated by public-health expertise and was often cited as complex and confusing Ontario’s Provincial Emergency 	

	<p>COVID-19 pandemic, and lessons learned from previous waves of the current pandemic have not been applied consistently</p> <ul style="list-style-type: none"> ○ Communication with external stakeholders is inconsistent and not timely ○ The federal government did not provide accurate and timely information on travellers entering Ontario ○ Since the publication of the Office of the Auditor General of Ontario’s report, the ministry has since responded and planned to address some of the recommendations 	<ul style="list-style-type: none"> ○ Early decisive action and preventive measures were not taken to protect the public’s health in absence of scientific certainty ○ Public Health Ontario played a diminished role in the overall provincial response (e.g., Ontario Health did the reporting of provincial surveillance data and coordinating provincial laboratory testing) which led to confusion by local medical officers of health on roles and responsibilities ○ Variations in management and operations among public-health units contributed to fragmentation and inconsistencies ○ Public-health information systems and laboratory information systems were not 	<p>time-sensitive care</p> <ul style="list-style-type: none"> ○ Follow an equitable and person-centred approach with full continuum of care that engages patients and their care partners ○ Heighten level of regional/sub-regional oversight and coordination with flexibility (where care activities may be asymmetrical due to local context) ○ Increase collaboration with health and social services ○ Accelerate services to reduce backlogs (e.g., maintaining staff wellness 	<p>Management Office had significant leadership changeover, outdated emergency plans, lack of involvement, inadequate communications and record-keeping, and lack of sufficient staff to implement a provincial response structure</p> <ul style="list-style-type: none"> ○ Scientific expert advice was not adequately presented during decision-making ● The General Auditor of Ontario’s report described 16 key recommendations with 55 action items to address challenges raised in the pandemic readiness and response in Long-term Care report ○ Overall, the sector was not sufficiently prepared or equipped to respond to the pandemic due to existing facility, staffing, and infection-prevention and control issues 	
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		<p>modernized prior to the pandemic, which had a significant impact on public-health units and labs to conduct proper case management, contact tracing, and laboratory testing</p> <ul style="list-style-type: none"> ○ As of August 2020, 92% of close contacts of cases have been contacted within a day (after the Ministry started tracking public health units' performance) ● Race-based information was not initially collected and factored into decision-making to target high-risk populations for prevention and public-health measures ● An evidence brief on the economic impacts due to public-health measures in response and recovery during and after COVID-19 was published by Public Health Ontario 	<p>and access to PPE)</p> <ul style="list-style-type: none"> ○ Continue testing, contact tracing and isolating ○ Integrate health equity considerations ● Ontario Health released recommendations for regional health-care delivery during the COVID-19 pandemic (i.e., outpatient care, primary care, and home and community care) and for optimizing the supply of PPE based on planning assumptions derived by previous waves ● The Office of the Auditor General of Ontario outlines key conclusions related to the audit of Management of 	<ul style="list-style-type: none"> ○ Long-term care is often disconnected with other care services ○ Pandemic responses led to unintended consequences on long-term care staff and residents ○ Unclear communication, lack of enforcement and oversight affected containment of COVID-19 ● The Ontario Long-term Care COVID-19 Commission report was published on 30 April 2021 and found that the province's lack of pandemic preparedness and the existing poor state of the long-term care sector led to the current devastation <ul style="list-style-type: none"> ○ There was insufficient long-term care workforce, lack of leadership, lack of infection-control training, and improper home infrastructure ○ No drills or simulations for a 	
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		<ul style="list-style-type: none"> ○ Public Health Ontario recommend a data-driven, regional or provincial approach (instead of a reactive and local approach) to support a sustainable transition from response to recovery as vaccination rates increase in Ontario ○ Lockdown strategies that maintain a moderate lockdown level are more effective than oscillating between strict and mild lockdowns according to published modelling studies cited in the brief ○ Early action with stringent public-health measures can be less costly for the economy than multiple less-intense, shorter duration lockdowns ○ Basic income for individuals affected 	<p>Health-Related COVID-19 Expenditures</p> <ul style="list-style-type: none"> ○ The audit reviewed \$4.4 billion of spending related to 26 health initiatives ○ The ministry does not have a proper monitoring and reporting system to track COVID-19 related expenditures ○ The province has sufficient authorizations and approvals in place, which were design effectively to prevent payments to ineligible individuals or organizations ○ The audit found issues with ministries of health, long-term care, and seniors and 	<p>pandemic were conducted</p> <ul style="list-style-type: none"> ○ The province did not track the status of PPE supplies in long-term care ○ The commission recommends the involvement of private investors by funding the infrastructure of long-term care homes (like hospitals) ○ The commission states that a proactive approach should have occurred instead of an episodic and reactive approach ● The Long-Term Care COVID-19 commission reported best practices that were applied in some settings, such as: <ol style="list-style-type: none"> 1) strong and accountable leadership (e.g., acted decisively, sense of urgency, effective mobilization, implemented creative solutions with external relationships); 2) support for staff (e.g., offer full-time hours at one home, hire private caregivers, hire family 	
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		<p>by lockdowns should be in place</p>	<p>accessibility. related to poor reporting processes</p> <ul style="list-style-type: none"> ○ Front-line workers did not receive their pandemic pay until months later 	<p>members, additional pay, regular communication); 3) being prepared (e.g., existing pandemic plan, robust infection-prevention and control); 4) relationships with other health partners</p> <ul style="list-style-type: none"> ● The Ontario Patient Ombudsman provided four key recommendations based on 250 complaints related to long-term care homes during the COVID-19 pandemic: 1) backstops and contingency plans for all healthcare providers; 2) visitation policy changes; 3) dedicated resources for communication; and 4) enhanced whistleblower protection 	
Quebec		<ul style="list-style-type: none"> ● A preliminary analysis of data regarding providing one dose of mRNA vaccines to residents of long-term care homes shows the campaign to have been successful in reducing cases of COVID-19 among long-term care residents in Quebec 			

		<ul style="list-style-type: none">○ A significant reduction in case numbers was observed 28 days following vaccination in long-term care homes, and this reduction in case numbers was sustained○ The reduction in case numbers in long-term care homes (whose residents were prioritized to receive the first vaccine doses) was greater than the reduction in COVID-19 cases in the general population during the studied period○ There was a 95% reduction in COVID-19-related deaths among long-term care residents in March 2021 (post-vaccination) when compared to December 2020 (pre-vaccination)○ Another Quebec evaluation reported a preliminary			
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		<p>vaccine effectiveness rate of 80.3% for long-term care residents between 21 and 27 days after vaccination</p> <ul style="list-style-type: none"> • Preliminary data on vaccine effectiveness among healthcare workers in Quebec show a significant reduction in COVID-19 cases among healthcare workers as vaccination was rolled out in this group 			
New Brunswick	<ul style="list-style-type: none"> • The Auditor General of New Brunswick has recommended that the provincial Office of the Comptroller improve its process for the tracking and reporting of program funding, financial relief measures, and federal assistance related to the COVID-19 pandemic 	-	-	-	-
Nova Scotia				<ul style="list-style-type: none"> • A report from the Northwood Quality-improvement Review Committee submitted to Nova Scotia's Minister of Health and Wellness has identified key drivers for the largest nursing home outbreak in the province, and 	

				<p>recommendations for the future</p> <ul style="list-style-type: none">• The report has 17 recommendations for Northwood, the Department of Health and Wellness and government, informed by consultations with more than 350 stakeholders including residents and families, staff members, healthcare practitioners and leaders involved in the Northwood outbreak response• The recommendations are indicated to be acted upon in short (less than three months) and long term (greater scope and require longer than three months) time horizons, and are organized based on level of intervention: facility level, governance and organization level, and legislation and provincial level• Nova Scotia's Department of Health and Wellness and Nova Scotia Health Authority published a report presenting a literature	
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				<p>review, analysis, findings and recommendations based on long-term care Infection Prevention and Control (IPAC) teams during the first wave of the COVID-19 pandemic</p> <ul style="list-style-type: none"> • Recommendations and actions should be formalized to continue through subsequent waves of the pandemic 	
Prince Edward Island	<ul style="list-style-type: none"> • The Auditor General of Prince Edward Island's annual report of 2021 indicates that the auditor general has been requested to undertake an examination of the government's COVID-19 pandemic response • The office of the auditor general is to report back by August 2021 and is currently in phase one (includes reviewing programs paid for using the Emergency Contingency Fund) of their reporting 				
Newfoundland and Labrador					
Yukon					
Northwest Territories					
Nunavut					

Appendix 4: Documents excluded at the final stages of reviewing

Type of document	Hyperlinked title
Full systematic reviews	A systematic review on COVID-19 mitigation strategies on transmission and social-economic impact and key lessons for low-income countries (LICS)
	Lessons learned from the resilience of Chinese hospitals to the COVID-19 pandemic: A scoping review (Pre-print)
	Social protection as a key tool in crisis management: Learnt lessons from the COVID-19 pandemic
	Policing in pandemics: A systematic review and best practices for police response to COVID-19
	COVID-19 economic response and recovery: A rapid scoping review
Rapid review	Strengthening the role of local and international non-governmental organizations in pandemic responses
	Review of international public policy responses to easing restrictions introduced to limit the spread of COVID-19
	What factors may help protect Indigenous peoples and communities in Canada and internationally from the COVID-19 pandemic and its impacts?
	What is known about the impact of the COVID-19 pandemic on Indigenous communities in Canada?
	Les services sociaux et de santé mentale à maintenir, à remettre en place ou à déployer auprès de la population générale lors de la phase de rétablissement de la pandémie
Single studies	Mental health consequences for healthcare workers during the COVID-19 pandemic: A scoping review to draw lessons for LMICs
	Neurological complications of coronavirus infection; A comparative review and lessons learned during the COVID-19 pandemic
	Adaptations of transfusion systems to the COVID-19 pandemic in British Columbia, Canada: Early experiences of a large tertiary care center and survey of provincial activities
	Overall Impact of the COVID-19 Pandemic on interventional radiology services: A Canadian perspective
	Socio-demographic disparities in knowledge, practices, and ability to comply with COVID-19 public-health measures in Canada

	Covid-19: Regard sur la fréquentation dans les urgences au Québec
	Unintended consequences of COVID-19: Impact on self-harm behaviour
	Unintended consequences of COVID-19: Impact on harms caused by substance use
	Potential earnings losses among high school and post-secondary graduates due to the COVID-19 economic downturn
	Uncertainties around COVID-19 from the perspectives of oral healthcare workers during the first wave of SARS-CoV-2 infections in British Columbia, Canada
	How did the COVID-19 pandemic affect the hours worked in Canada? An analysis by industry, province and firm size
	COVID-19 in Canada: A one-year update on social and economic impacts
	Impact of COVID-19 on businesses majority-owned by women, third quarter of 2020
	Impact of COVID-19 on small businesses in Canada, third quarter 2020
Opinion pieces	Policymakers must act on incomplete evidence in responding to COVID-19
	CADTH drug implementation advice: Bamlanivimab for mild-to-moderate symptoms of COVID-19
	Best Brains Exchange proceedings report: Strengthening the structural determinants of health post-COVID-19
	What we heard: Indigenous peoples and COVID-19: Public Health Agency of Canada's companion report
	Recording COVID-19 measures in the national accounts
	Foresight on COVID-19: Possible shifts and implications
	Unpacking the health and social consequences of COVID-19 through a race, migration and gender lens
	Be kind, be calm, be safe: Four weeks that shaped a pandemic

Waddell KA, Wilson MG, Demaio P, Sharma K, Bain T, Al-Khateeb S, Bhuiya A, Lavis JN. Appendices for COVID-19 living evidence profile #4 (version 4.1): What went well and what could have gone better in the COVID-19 response in Canada, as well as what will need to go well in the future given any available foresight work being conducted? Hamilton: McMaster Health Forum, 14 May 2021.

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