

# Informing Canada's Health System Response to COVID-19: Priorities for Health Services and Policy Research

## Éclairer la réponse du système de santé canadien à la COVID-19 : priorités pour la recherche sur les services et les politiques de santé

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## Abstract

To inform Canada's research response to COVID-19, the Canadian Institutes of Health Research's Institute of Health Services and Policy Research (IHSPR) conducted a rapid-cycle priority identification process. Seven COVID-19 priorities for health services and policy research were identified: system adaptation and organization of care; resource allocation decision-making and ethics; rapid synthesis and comparative policy analysis of the COVID-19 response and outcomes; healthcare workforce; virtual care; long-term consequences of the pandemic; and public and patient engagement. Three additional cross-cutting themes were identified: supporting the health of Indigenous Peoples and vulnerable populations, data and digital infrastructure, and learning health systems and knowledge platforms. IHSPR hopes these research priorities will contribute to the broader ecosystem for collective research investment and action.

## Résumé

Afin d'éclairer la réponse du Canada en matière de recherche sur la COVID-19, l'Institut des services et des politiques de la santé (ISPS), des Instituts de recherche en santé du Canada, a mené un processus d'identification rapide des priorités en matière de recherche. Sept priorités pour la recherche sur les politiques et services de santé liée à la COVID-19 ont ainsi été identifiées : adaptation du système et organisation des soins; éthique et prise de décision en matière d'allocation des ressources; synthèses et analyses comparatives rapides des résultats et des politiques d'interventions face à la COVID-19; personnel de la santé; soins virtuels; conséquences à long terme de la pandémie; et engagement de la population et des patients. Trois thèmes transversaux supplémentaires ont été identifiés : soutien à la santé des Peuples Autochtones et des populations vulnérables; données et infrastructures numériques; et systèmes de santé apprenants et plateformes de connaissances. L'ISPS souhaite que ces priorités de recherche contribuent à enrichir l'écosystème de l'investissement et des initiatives de recherche collective.

## Background

The coronavirus disease 2019 (COVID-19) pandemic has had devastating consequences worldwide and revealed the underpreparedness of systems (health, political, economic) to respond swiftly. Health systems are grappling with how to rapidly mobilize, organize and deploy resources to provide effective COVID-19 care while simultaneously attempting to reorganize the provision of non-COVID-19 care effectively and safely. The Government of Canada's top priority throughout the pandemic has been to keep Canadians healthy and safe (Government of Canada 2020), and one mechanism to achieve this has been to mobilize Canada's health research community to respond to the COVID-19 crisis.

As Canada's federal health research funder, the Canadian Institutes of Health Research (CIHR) has played an active role in the COVID-19 health research response along with its tri-council partners, Canada's broader health and science portfolios, provincial and territorial

research funders and health systems, charities and hospitals, as well as local, academic, private sector and other funders. On February 10, 2020, CIHR, together with funding partners, launched its first rapid research response funding opportunity (CIHR 2020a), which resulted in 99 funded research projects totalling \$54.2 million (CIHR 2020b). The Government of Canada then allocated an additional \$115 million to CIHR in March for a second round of rapid research funding (CIHR 2020c). Beyond these, CIHR has led several other COVID-19 funding calls, including the COVID-19 Clinical Epidemiology Research Rapid Response, World Health Organization Solidarity Trial and opportunities focused on mental health and substance use. Additional investments are under way to further support research teams with expiring grants, to maintain income support for trainees whose research has been delayed by the pandemic and to support the retention of research staff at universities and health research institutes.

The CIHR's Institute of Health Services and Policy Research (IHSPR) is one of 13 virtual institutes and one of many players in the health research ecosystem. IHSPR is aiming to create a shared understanding of health services and policy research (HSPR) COVID-19 priorities across the country to help align resources with the most important evidence needs for policies and interventions that contribute to improved health and health system outcomes. IHSPR identified COVID-19 priorities for HSPR through a rapid and iterative process that included literature and media scans, an environmental scan of COVID-19 research priorities in other countries (Table 1), input from leading HSPR experts in Canada and a brief survey of the HSPR community. Data from these sources were triangulated, analyzed and summarized to distill core and cross-cutting HSPR COVID-19 priorities and validated with the Institute Advisory Board. Detailed methods are available in Appendix 1, available online at [longwoods.com/content/26249](https://longwoods.com/content/26249).

## COVID-19 Health Services and Policy Research Priorities

IHSPR's rapid-cycle priority identification process resulted in seven core priority areas and three cross-cutting themes relevant for research and policy analysis within and across each priority.

### *System adaptation and organization of care*

Research that informs system adaptation and organization of resources and care in the COVID-19 era is urgently needed as many sectors have been ill-equipped to meet COVID-19 care needs, with community care homes (including long-term care [LTC] homes) being hardest hit. Areas of focus include hospitals and the primary, home and community care (including LTC) sectors (Basky 2020; Cadogan and Hughes 2020; Coccolin et al. 2020; Glauser 2020; Grabowski and Joynt Maddox 2020; Lin et al. 2020). Predictive and optimization modelling is needed to inform system resilience, resource planning, disease testing and surveillance systems, patient flow and continuity of care. Also critically needed is research that both evaluates innovations in the organization and delivery of care that were catalyzed

as a result of the COVID-19 pandemic, and analyzes the policy options and levers that would support the scale and spread of these innovations.

### *Resource allocation decision-making and ethics*

COVID-19 has revealed shortages of capacity and resources, including personal protective equipment (PPE) and, in some settings, intensive care unit (ICU) beds and ventilators (Emanuel et al. 2020; Gostin et al. 2020; Phua et al. 2020; Ranney et al. 2020; Truog et al. 2020; Wang et al. 2020). Non-urgent surgeries have been cancelled, and as reopening commences, decisions will be made about prioritization for care. Research, policy analyses and ethical frameworks are required to inform allocative decision-making and the consequences of those decisions (Antommaria et al. 2020; Emanuel et al. 2020; Fritz et al. 2020; Gostin et al. 2020; Rosenbaum 2020a). Further analyses are needed to examine the ethical implications of restrictive public health and social distancing measures, use of technology and data for contact tracing and the equity consequences for vulnerable populations (Laupacis 2020; Mazumder et al. 2020; Mulligan et al. 2020; Smith and Judd 2020; Van Dorn et al. 2020; Wang and Tang 2020).

### *Rapid synthesis and comparative policy analysis of the COVID-19 response and outcomes*

There has been considerable heterogeneity across countries and Canadian jurisdictions in the response and timing of policies enacted to flatten the curve (e.g., social distancing, school closures) and reopen society (e.g., non-essential services, return to school). Rapid knowledge syntheses and comparative policy analyses are needed to document and understand responses, analyze their intended and unintended consequences and develop response options to inform future planning and preparedness. As COVID-19-related policies have been enacted at municipal, provincial/territorial and federal levels and implemented by systems, organizations and individuals, analyses will require appropriate targeting to reach policy and decision-makers with differing mandates, accountabilities and contexts (Gibney 2020).

### *Healthcare workforce*

The healthcare workforce has needed to adapt quickly to the COVID-19 landscape. Enormous pressure due to a lack of PPE, high workloads and safety concerns (Xiong and Peng 2020) has added considerable stress to healthcare workers (Greenberg et al. 2020; Zhou et al. 2020), many of whom had high levels of burnout prior to the pandemic (Canadian Medical Association 2019). Research is needed to analyze how the healthcare workforce was deployed and supported to provide COVID-19 care, understand the facilitators and barriers to a coordinated and effective response (Basky 2020; Coccolin et al. 2020; Fraher et al. 2020; Lake 2020), evaluate the impacts on COVID-19 and non-COVID-19 care, and consider the strategies and policies that could be implemented to improve workforce planning, capacity and safety. Research is also needed to understand the role that

family and other informal caregivers played, the supports and resources they used and/or needed, the impact that COVID-19 had on their health and mental health and the policy options for supporting informal caregivers in the future.

### *Virtual care*

COVID-19 crystallizes the importance of virtual care to meet patient needs and reduce the risk of disease transmission (Bhatia et al. 2020; Greenhalgh et al. 2020; Hollander and Carr 2020; Smith et al. 2020; Webster 2020). Research is needed to analyze and compare the extent and type of virtual care used across jurisdictions, who provided and received virtual care and for what purpose, the payment policies implemented and the intended and unintended consequences of expanded use. As well, research that analyzes the impact of virtual care on key outcome measures such as access, utilization, continuity, quality and safety, equity, cost and health is important to inform the design of future virtual care models.

### *Long-term consequences of the COVID-19 pandemic*

To respond to COVID-19, healthcare resources were rapidly redeployed, reducing access to routine and ongoing care and leaving many with cancelled referrals, tests and procedures (Angelico et al. 2020; Carter et al. 2020; Rosenbaum 2020b; Salako et al. 2020). Due to fear of infection, many Canadians did not seek healthcare even when needed. Certain sectors, such as LTC, and certain populations, such as the homeless and incarcerated, were disproportionately impacted. Gendered consequences include balancing work, childcare and household duties, which fall disproportionately on women (Kitchener 2020; Minello 2020). Longitudinal research is needed to study the long-term and far-reaching effects of the pandemic on health, health equity and health system outcomes, as well as the post-COVID-19 health, social and economic policies that are created. Policy analysis is imperative to shed light on why the consequences emerged, why they had a disproportionate impact across sectors and populations and to inform future policy development.

### *Public and patient engagement*

Citizen response to public health advice and restrictions has profound effects on viral transmission and therefore the COVID-19 pandemic itself. Research and policy need to meaningfully engage with the public and patients, including vulnerable and at-risk populations. Priorities need to be established through understanding the experience and perspectives of the public and patients with the pandemic, the COVID-19 and non-COVID-19 care received (or not received), caregiver needs and supports and the supports and tools needed as the crisis subsides (e.g., mental health supports and spiritual care). Public and patient engagement is also critical for decision-making about removing restrictions and what the “return to the new normal” should look like (Immonen 2020).

### *Cross-cutting themes*

Through IHSPR's rapid-cycle priority identification process, three cross-cutting themes were identified that intersect each of the seven priority areas:

1. *Supporting the health of Indigenous Peoples and vulnerable populations:* First Nations, Inuit and Métis populations are at high risk of COVID-19 acquisition and severe disease in both rural/remote and urban settings. People who are homeless, incarcerated and living in poverty are also at high risk. HSPR is needed to analyze the impacts of COVID-19 on Indigenous Peoples and vulnerable populations and the factors that exacerbated those impacts. Policy research is also needed to inform the development of post-pandemic health and healthcare policies that are culturally safe and grounded in Indigenous Knowledges.
2. *Data and digital infrastructure:* COVID-19 has highlighted the importance of timely access to data for researchers, decision-makers and front-line providers to inform policy and care delivery decisions. Access for researchers to linkable data from diverse sources (e.g., COVID-19 testing data linked with clinical and administrative data, consumer wearables, social media and patient reports) and digital infrastructure is needed to enable rapid analysis of the impacts and evidence-informed response strategies. COVID-19 has also revealed critical gaps in data. For example, the lack of race and ethnicity data, and measures and data about racism, hinders researchers' ability to decipher differential impacts of the pandemic and inform targeted policy responses, which risks further exacerbating existing inequities in health and outcomes.
3. *Learning health systems and knowledge platforms:* Knowledge platforms are needed that provide seamless and rapid access to high-quality research studies, synthesize the volumes of research that COVID-19 has spurred and tailor the evidence in ways that meet the diverse needs of policy and decision-makers. COVID-19 illuminates the ability of healthcare delivery systems (e.g., a health authority) and organizations (e.g., a hospital or LTC home) to use COVID-19 and other data to support real-time decision-making, foster continuous learning and evidence-informed planning and implement policies and interventions across the system.

### **Discussion and Conclusion**

IHSPR is one of many organizations in a broader ecosystem that funds research and is dedicated to contributing to the COVID-19 research response. The priorities identified in this paper are intended to help align collective HSPR investment, activity and collaboration in areas where COVID-19 evidence is critically needed and where it has the most potential to improve the lives of people, the health of populations and the performance of healthcare systems.

As shown in Table 1, the seven priorities are not unique to the Canadian context and conform closely with priorities identified in other jurisdictions. Common priorities include: clinical and health system innovations in the delivery, management and organization of

care; deployment of the healthcare workforce and addressing workforce needs; access to care by vulnerable populations; digital health and technological innovations; addressing mental health needs and challenges; and patient and community engagement. Canada's HSPR community has capacity, expertise and leadership in each of these common priorities. This presents an opportunity for Canadian researchers to leverage the community's strengths to lead or engage in international HSPR collaborations and cross-jurisdictional research.

Who is best poised to conduct the research? The impact of research on the COVID-19 response will be enhanced if the interdisciplinary nature of the HSPR field is harnessed. The health policy and care delivery solutions needed are multifaceted and will need to draw on the interdisciplinary expertise of Canada's health services researchers, epidemiologists, political scientists, economists, lawyers, healthcare providers, embedded scientists, policy and decision-makers and patient partners. Their skills in evaluation, health law and policy analysis, health economics, clinical and health informatics, organization and management of care, implementation science and other domains are critical to generating evidence in the identified priority areas that accounts for the complexity of the context and problem and has the potential for real-world impact.

Who is the COVID-19-related HSPR intended for? Given IHSPR's mandate, the research evidence is intended to inform COVID-19-related policy making within ministries of health and professional associations and decision-making within health authorities and healthcare delivery organizations. The goal is to equip health policy and decision-makers with evidence they can use to design and implement effective policies, programs and interventions that improve the organization, delivery and outcomes of healthcare. The CIHR COVID-19 rapid response and mental health knowledge synthesis funding calls included an objective to provide evidence to inform decision-making and the health system response. The calls also ensured that peer review criteria assessed the impact of the research and the quality of the proposed knowledge translation plan, but did not require decision-maker involvement on the research teams (CIHR 2020c; CIHR 2020d). To inform policy and decision-making, effort will be needed once the research is funded to meaningfully engage decision-makers in the work and develop effective knowledge mobilization strategies. IHSPR is committed to this effort.

In addition to relevant research as a lever for change, impact within several of the identified priorities will require the use of legislative, regulatory, funding and other policy levers. For example, addressing the COVID-19 crisis that has played out in Canada's LTC homes (Brown 2020) will require timely and relevant research evidence, plus attention to accreditation, regulation and inspection, staffing levels and working conditions, government funding levels and the expansion of public reporting efforts to include measures such as staffing and ownership type.

Importantly for the HSPR community, these COVID-19 priorities are not intended to serve as the sole focus of IHSPR or CIHR. Although CIHR's Spring 2020 Project Grant competition was delayed until summer 2020 and the institutes' strategic funding initiatives

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**TABLE 1.** Comparison of COVID-19 health services and policy research (HSPR) priorities

Organization	HSPR-related research priorities*
<b>Jurisdiction: Canada</b>	
Canadian Institutes of Health Research (CIHR 2020a, 2020c, 2020d)	<p>As per <i>Operating Grant: Canadian 2019 Novel Coronavirus (COVID-19) Rapid Research Funding Opportunity</i> (January 2020), HSPR-relevant research priorities include:</p> <ul style="list-style-type: none"> <li>• Medical countermeasures: <ul style="list-style-type: none"> <li>» Clinical management</li> </ul> </li> <li>• Social and policy countermeasures: <ul style="list-style-type: none"> <li>» Coordination, governance and logistics</li> </ul> </li> </ul> <p>As per <i>Operating Grant: COVID-19 May 2020 Rapid Research Funding Opportunity</i>, HSPR-relevant research priorities include:</p> <ul style="list-style-type: none"> <li>• Clinical management and health system interventions</li> <li>• Social, policy and public health responses and related indirect consequences</li> </ul> <p>As per <i>Operating Grant: Knowledge Synthesis: COVID-19 in Mental Health and Substance Use</i>, HSPR-relevant research priorities include:</p> <ul style="list-style-type: none"> <li>• Knowledge translation approaches, practices and platforms applied to inform both population-level and targeted mental health and substance use responses during the pandemic</li> <li>• Population-based interventions to reduce potential mental health and substance use impacts of COVID-19</li> <li>• Targeted interventions to address the mental health and substance use issues and needs of high-risk groups</li> <li>• Innovative surveillance and monitoring in both the general Canadian population and among high-risk groups to assess mental health and substance use needs and system transformations (including the use of learning health systems, other modes of service delivery [e.g., virtual care], alternate remuneration models, etc.)</li> </ul>
<b>Jurisdiction: Global</b>	
World Health Organization (WHO 2020)	<p>As per <i>A Coordinated Global Research Roadmap: 2019 Novel Coronavirus (March 2020)</i>, HSPR-relevant priorities include:</p> <ul style="list-style-type: none"> <li>• Clinical care and health systems</li> <li>• Engagement</li> <li>• International coordination</li> </ul>
World Health Organization/ Global Research Collaboration for Infectious Disease Preparedness (GloPID-R) (WHO 2020)	
<b>Jurisdiction: UK</b>	
National Institute for Health Research (NIHR)	<p>As per the joint NIHR/UKRI <i>COVID-19 Rapid Response Rolling Call</i>, HSPR-relevant research priorities include:</p> <ul style="list-style-type: none"> <li>• Health and care delivery</li> <li>• Clinical management</li> <li>• Optimized use of personal protective equipment and other infection prevention and control measures in healthcare and community settings</li> </ul>
Medical Research Council (MRC)/UK Research and Innovation (UKRI) (MRC 2020)	
<b>Jurisdiction: US</b>	
AcademyHealth (AcademyHealth 2020)	<p>As per <i>Health Systems Respond to COVID-19: Priorities for Rapid-Cycle Evaluations (2020)</i>, there are six HSPR-relevant categories of rapid-cycle research and evaluation priorities:</p> <ul style="list-style-type: none"> <li>• Patient and community experience, engagement and outcomes</li> <li>• Care delivery, management, decision-making and operations</li> <li>• Workforce needs, training and policies</li> <li>• Technology, data and telehealth</li> <li>• Policies, including payment policy</li> <li>• Collaboration and coordination</li> </ul>



Organization	HSPR-related research priorities*
<b>Jurisdiction: US (continued)</b>	
Agency for Healthcare Research and Quality (AHRQ 2020)	<p>As per AHRQ's <i>Novel, High-Impact Studies Evaluating Health System and Healthcare Professional Responsiveness to COVID-19 (ROI)</i>, HSPR-relevant research topics include:</p> <ul style="list-style-type: none"> <li>• Research to improve the quality of care received and patient outcomes during and following the COVID-19 pandemic</li> <li>• Research to improve healthcare patient safety during and following the COVID-19 pandemic</li> <li>• Research to understand how the response to COVID-19 affected socially vulnerable populations and people with multiple chronic conditions during and following the COVID-19 pandemic</li> <li>• Research to understand how digital healthcare innovations contributed to the health system response to COVID-19, outcomes and unintended consequences</li> <li>• Research plans and dissemination of findings</li> </ul>
Patient-Centered Outcomes Research Institute (PCORI 2020)	<p>PCORI's COVID-19-targeted funding opportunity specifies three priority areas:</p> <ul style="list-style-type: none"> <li>• Adaptations to healthcare delivery</li> <li>• Impact of COVID-19 on vulnerable populations</li> <li>• Impact of COVID-19 on healthcare workforce well-being, management and training</li> </ul>
National Institutes of Health (NIH 2020)	<p>As per individual institutes' <i>Notice of Special Interest</i>, examples of HSPR-relevant research objectives or questions include:</p> <ul style="list-style-type: none"> <li>• National Institute on Drug Abuse: how potential overcrowding of emergency departments and health services will impact the treatment of opioid overdoses and opioid use disorder</li> <li>• National Institute on Aging: studies in prehospital, emergency or critical care settings to improve screening, risk stratification, care delivery decisions, resource allocation and clinical outcomes for older adults exposed to COVID-19; evaluating strategies used by health systems to reallocate resources, rapidly train practitioners, communicate preventive practices and maintain adherence to public health and clinical guidelines, with a particular interest in those who serve high-risk groups (e.g., nursing homes) and resulting racial, ethnic or regional disparities in access/care</li> <li>• National Institute of Mental Health: studies on the impact (e.g., access, quality, and clinical outcomes) of state, local, federal and guild-specific guidelines and policies around telehealth services and of changes in those policies, with specific attention on the risks and benefits of relaxing those guidelines or policies</li> <li>• National Institute on Minority Health and Health Disparities: examine the effects of the COVID-19 outbreak on disparities in healthcare utilization and health outcomes among medically and socially vulnerable populations</li> <li>• National Cancer Institute: impact on cancer-related care delivery due to the COVID-19 pandemic</li> <li>• National Institute of Biomedical Imaging and Bioengineering: the NIBIB is seeking applications to develop life-saving technologies that can be ready for commercialization within one to two years; for example: rapid point-of-care and home-based testing/diagnostics; digital health platforms and models that integrate data, assess risk and provide illness surveillance and management tools</li> <li>• National Institute on Alcohol Abuse and Alcoholism: what workforce development and deployment strategies are needed to address emerging challenges in mental health/alcohol use disorder treatment during the pandemic?</li> </ul>

\*Not exhaustive; intended to be a snapshot only.

were temporarily put on hold, the CIHR Project Grant budget and the institute's budgets have been preserved, and CIHR's open funding programs have reopened. The time horizon for the reopening of CIHR's strategic funding programs is evolving. There is recognition that although concerted attention and resources were required to enable CIHR's rapid response to the COVID-19 crisis, non-COVID-19-related research cannot stop as a consequence.

Within IHSPR, we are actively engaged in CIHR's broader COVID-19 efforts (including our work to identify HSPR COVID-19 priorities) and will continue to finalize our next five-year strategic plan and initiate planning for large-scale funding programs in areas that align with our institute's mandate. The implications of this for the HSPR community are important: *there is space and resources for researchers to lead COVID-19-related research, pivot their existing research to contribute to COVID-19 and/or continue with their core HSPR programs of research.*

In the face of a pandemic that has placed tremendous demand on resources and generated a significant human toll, HSPR is critically needed to inform the path forward. Research that evaluates the health system response, analyzes and informs policy options and identifies how to improve the design and delivery of health services is essential for many reasons, including successful navigation out of the current pandemic, improving health system preparedness for future outbreaks and ensuring that the Canadian healthcare system that reopens is stronger, resilient, and more accessible, more equitable and of higher quality than the one that existed before the onslaught of COVID-19.

### *Acknowledgements*

The authors would like to thank Emma Kaplan, IHSPR Communications and Events Officer, for her help with the media scan that informed this paper. The authors would also like to thank the members of the IHSPR Institute Advisory Board for their insightful and invaluable contributions, comments and feedback regarding the priorities.

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