



Submission to the Standing Committee on Science and Research

Study on the Successes, Challenges and Opportunities for Science in Canada

February 17, 2022

OVERVIEW

HealthCareCAN – the national voice of Canada’s research hospitals and healthcare organizations – welcomes the opportunity to make a submission to the Standing Committee on Science and Research.

We commend the Federal Government for its foresight in establishing this Standing Committee and recognizing the importance research and science will play in Canada’s post-pandemic recovery and future prosperity. We congratulate the Committee on undertaking a most important study on the Successes, Challenges and Opportunities for Science in Canada.

It is imperative that the Committee consider the feedback received from the health system and the health researchers working in hospitals and health research institutes across the country who face distinct challenges and opportunities as compared to their university and industry counterparts. HealthCareCAN’s members are at the centre of the health and life sciences sector. Our member institutions and our researchers are crucial to Canada’s health and life sciences sector, which contributes \$7.8 billion annually to the economy, employs one in eight Canadians, and creates new small- and medium-sized enterprises through the commercialization of research innovations. HealthCareCAN member organizations produce the next generation of Highly Qualified Personnel (HQP) that build our knowledge-based economy and attract global investments.

The increasing occurrence of health emergencies due to climate change and new viruses, Canada’s aging population, and Canada’s transition to an innovation and knowledge-based economy signify that the health sector will play a significant role in keeping Canadians healthy and productive, ensuring our economy grows, and our country remains competitive globally. The time has come to fully leverage research hospitals and healthcare organizations not only as valued patient care organizations, but also as economic and innovation engines with tremendous national and global potential.

Canada’s future is dependent on research. Strengthening the health research sector will support industry, create good jobs, build Canada’s knowledge-based economy, recruit and retain top-tier talent, attract international investment, make Canada more self-sufficient, increase population health, and help address health and social inequities and challenges with which Canada is grappling.

As the Committee charts the future of science in Canada, we have identified several recommendations that we believe will position Canada’s health research and life sciences sector to better serve Canadians, and ensure it is well positioned for scientific, economic and global success.

SUCCESSSES

The pandemic showcased the benefits of investing in health research and innovation. Canadian researchers helped lead the global fight against COVID-19, by first profiling the body’s immune response to the virus and developing the lipid nanoparticles to deliver mRNA to the body’s cells – a breakthrough based on 40 years of research. Canadians are proud of these achievements and consider health and medical research to be a priority.

The pandemic also fast-tracked the important initiative to modernize regulations, providing Health Canada the opportunity to pilot test some of the ways to improve the agility in licensing drugs and medical devices. This has resulted in more agile regulations that support innovation and economic growth without

compromising safety, efficacy and quality. This has benefited the health research community and we encourage the government to continue on the path towards modernizing regulations. Canada cannot afford to lose momentum in this area.

CHALLENGES

The health research and life sciences sector provides great potential, both nationally and internationally. Unfortunately, we have not yet realized its true potential, primarily due to the limited investment in this sector over the last decade. Funding is at the foundation of the many challenges confronting our health research ecosystem. It is not an understatement to say that there has been a crisis in funding for research across all granting council agencies and for all types of research. This has been confirmed by several reports including the [International Peer Review Expert Panel Report](#) and the report by the Fundamental Science Review entitled [Investing in Canada's Future: Strengthening the Foundations of Canadian Research](#), both of which identified rapidly increasing investment in independent investigator-led fundamental research by the Federal Government as the single most important recommendation. The [Industry Strategy Council Report](#) reaffirmed this recommendation, identifying the health and related biosciences sector as one of the key areas of investment to help reignite the economy and protect Canadians' health and safety post-pandemic.

Given limited federal funding, fundamental science has therefore suffered, our early and mid-career researchers are threatened, and the commercialization of our discoveries is stagnating. Consider the following:

- Despite Budget 2018's investment in science, Canada continues to underfund its health research sector. Canada sits near the bottom of G7 and OECD countries for overall research and development spending as a percentage of GDP at 1.5%, compared to 1.8% for the United Kingdom and 3% for the United States.ⁱ Canada also lags in the percentage of total public spending on health devoted to health research at 0.43% compared to UK at 0.89% and the US at 3.8%.ⁱⁱ
- Budget 2018 increased CIHR's budget by just over 1% in 2020-21 to \$1.2 billion, which is where it is expected to remain going forward. This small budget and investment in health research leaves little to be divided amongst Canada's researchers. For the Spring 2020 Project Grant competition, the success rate of receiving a CIHR grant was only 15.8%. Only 336 CIHR grant applications were successful, out of a total of 2130 applications submitted. The US National Institute of Health funded 20.6% of the research applications it received in 2020ⁱⁱⁱ, while the UK's National Institute of Health Research had a 31% application success rate in 202-21.^{iv}
- While government is the primary funding source for health research, this contribution does not cover the full cost of conducting research. There are a number of indirect costs for facilities and administration that are required to support the research enterprise that are not fully covered by available federal funding. The current level of coverage for indirect costs is 22%. For larger institutions it's 18-19%. Quite a bit lower than the 40% - 60% reimbursement range received by our American counterparts. Anecdotally, we know that hospital research institutes, their foundations, philanthropy and fundraising are covering an increasingly greater proportion of these research-related indirect costs – up to 40%, if not higher, at some research hospitals.

The full potential of Canada's health research institutes and healthcare organizations is being further restricted by their inability to compete directly for federal innovation funding programs. In many cases, research hospitals are required to apply for federal funding through their affiliated university, placing them at a disadvantage since the university, which has its own research priorities, ultimately decides which projects to put forward for consideration. This model reflects a misunderstanding of our sector and the health research ecosystem in Canada. Hospitals are independent legal entities, often with very different research priorities. Research hospitals' applications to federal innovation programs should not be gated by the priorities of universities.

OPPORTUNITIES

While the pandemic did expose many cracks in Canada's health research ecosystem, it also provides us with unprecedented opportunities. The past two years have demonstrated the importance of investing in health research and innovation and the opportunities that exist to strengthen the sector to benefit the health of Canadians and the economy. Canada must make supporting health research and innovation a larger priority.

HealthCareCAN and our members have identified several recommendations that will position Canada's health research and life sciences sector to better serve Canadians, and ensure it is well positioned for scientific, economic, and global success.

In this section, we identify three areas for action, under which we outline opportunities for the federal government to act to strengthen health research and innovation. The following is a summary of the areas for actions and opportunities that exist for the federal government:

1. Adjust federal health research and innovation funding structures, policies, and levels of investment to better support strategic and integrated health research.
 - A. Opportunity for action: *Re-invest in fundamental science through the Tri-Councils and move strategic science investments to the Canada Advanced Research Projects Agency (CARPA).*
2. Foster partnerships between academia, research hospitals and private industry as well as between federal, provincial and territorial governments.
 - A. Opportunity for action: Facilitate the creation of health networks or hubs around research hospitals and healthcare organizations that bring together academia, industry, start-ups and incubators.
 - B. Opportunity for action: Build or renovate buildings to create much needed lab and incubator space that attracts and brings together researchers, universities and colleges, industry, innovators, and non-profit organizations.
 - C. Opportunity for action: *Evaluate federal and tri-council funding programs with the objective of making the criteria less restrictive and more flexible to foster partnerships.*
3. Establish a pan-Canadian data strategy for health research data
 - A. Opportunity for action: *Create a pan-Canadian health research data repository to centralize health research data from across Canada and facilitate health research and innovation across institutions and jurisdictions.*

The rest of this section offers further detail on these areas of action and opportunities.

1. **Adjust federal health research and innovation funding structures, policies, and levels of investment to better support strategic and integrated health research.**

Fundamental science is essential to growing our innovation economy; without it, Canada will continue to fall behind its international counterparts. Yet, all of the federal government's promises and commitments in the Throne Speech and mandate letters are directed at high-risk, high-reward and priority-driven research, not fundamental science.

As part of its pre-budget submission to the Standing Committee on Finance, **HealthCareCAN calls for transformations investments in health research to protect Canadians from future health crises and capitalize on economic opportunities, starting with a minimum annual floor of two per cent of public spending on health (\$3.7 billion) to be put toward fundamental research, strategic initiatives to tackle pressing social issues, and knowledge translation.**

A. Opportunity for action: *Re-invest in fundamental science through the Tri-Councils and move strategic science investments to the Canada Advanced Research Projects Agency (CARPA).*

An increasing proportion of Canadian Institutes of Health Research (CIHR) funding grants and federal health research programs are directed at addressing gaps in knowledge related to specific federal objectives or priority areas, also known as strategic science. While this is important research, it limits the funding available for fundamental or basic science – curiosity-based research that addresses the questions "how," "what" and "why" to increase knowledge. Fundamental science provided the building blocks for the scientific community's response to the COVID-19 pandemic and was the foundation for the rapid development of diagnostics, therapeutics and vaccines to combat the virus.

CIHR, and the other federal funding agencies, must return to their roots of being the primary funder of fundamental science. All strategic or priority-driven science should be moved under the Canada Advanced Research Projects Agency (CARPA). Along with this change in focus there **must be a significant infusion of funding to CIHR to make up for decades of minimal investment**, and to ensure discoveries that result in longer lifespans, improved quality of life, higher economic productivity, and Canada's global competitiveness are supported and well-funded.

Insufficient funding has put undue stress on researchers and their staff and students. It has resulted in lost opportunities for promising researchers who are being squeezed out of grant competitions, and research that is either delayed, not pursued or taken abroad. Many research hospitals and healthcare organizations are unable to recruit new scientists and retired slots are not being filled with new scientists due to overspent budgets. We need to ensure there exists a healthy pipeline of talent if we want research and innovation to benefit our health and the economy. Dr. J. Evans wrote in 2008, "...*Canada is viewed as a great place to work. It would be tragic to undermine morale and lose momentum by uncertainty about the government's ongoing commitment to research. Talent is mobile and the market is hot.*"⁷⁰ His comment and observations still hold true today, nearly 15 years later. **Increased funding to CIHR and the federal funding agencies will ensure that we do not lose the considerable knowledge, skills and talent of our researchers.**

2. Foster partnerships between academia, research hospitals and private industry as well as between federal, provincial and territorial governments.

COVID-19 has clearly demonstrated the importance of collaboration among stakeholders — academic health science centres, research hospitals, universities, colleges, health and biosciences companies, health charities and governments — that comprise the health research and innovation ecosystem. Yet Canada has not built strong, cohesive policies nor demonstrated the political will to create a Canadian landscape that unites these sectors to properly support health research and innovation.

A. Opportunity for action: *Facilitate the creation of health networks or hubs around research hospitals and healthcare organizations that bring together academia, industry, start-ups and incubators.*

For research hospitals within the health research and life sciences sector, their strength lies in their ability to foster networks and relationships between researchers, academia, industry, innovators, start-ups, clinicians, and patients. The federal government must recognize research hospitals and healthcare organizations role as powerful innovation hubs within healthcare and the health research and life sciences sector. They sit at the centre of the health research and life sciences ecosystem, where pressing healthcare needs and the innovations to address these needs converge. Within research hospitals and healthcare organizations, multiple researchers, universities, patients, companies, and industry work together in a non-competitive context to drive new technologies and to commercialize promising products to improve patient care and the health of people across Canada.

Despite the significant role research hospitals and healthcare organizations play in innovation, their acknowledgement and inclusion in federal innovation programs occurs sporadically depending on the government departments establishing these programs. Facilitating and supporting research hospital and healthcare organization networks or hubs must be a higher priority in the federal government's innovation agenda. A first step would be to ensure that at least one of the research hubs receiving funding in the inaugural competition of the [Canada Biomedical Research Fund](#) be led by a research hospital or healthcare organization.

B. Opportunity for action: *Build or renovate buildings to create much needed lab and incubator space that attracts and brings together researchers, universities and colleges, industry, innovators, and non-profit organizations.*

There is a critical shortage of physical lab space in Canada. Entrepreneurs, incubators, and start-ups continually reach out to Canada's research hospitals in the hopes that they can access their labs. Sadly, research hospitals cannot accommodate these requests.

Fully leveraging the innovative and economic power of the health research and life sciences sector requires investments to build or renovate existing space to create purpose-built incubator space that contains dry and wet lab space.¹ Ideally, new lab space must be located at research hospitals or healthcare organizations as this is where health science is taking place, where new ideas are being conceived, and where end users - patients, caregivers, and clinicians - are located.

The co-location of researchers, engineers, entrepreneurs, and businesses will lead to the organic development of relationships between the health system, academia, and the private sector while immersing

¹ Dry labs refers to labs that undertake applied or computational mathematical analyses via the creation of computer-generated models or simulations. Wet labs are where drugs, chemicals, and other types of biological matter are analyzed and tested using various liquids.

the people developing innovations to be immersed in the health system where their innovations will eventually be deployed to improve patient outcomes.

The close connections between these groups, and their proximity to the health system and patients, will also lead to better knowledge translation, so that research and the resulting innovations are implemented to improve outcomes, which in turn allows Canada to get even greater returns on investment for its health research dollars.

C. Opportunity for action: *Evaluate federal and tri-council funding programs with the objective of making the criteria less restrictive and more flexible to foster partnerships.*

Many federal and tri-council (The Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada and the Social Sciences and Humanities Research Council of Canada) funding programs have stipulations that are restrictive. For example, tri-council funding program criteria stipulates that grants are awarded to the researcher's institution and not directly to the researcher, so unless community hospital researchers are affiliated with a university or have a university appointment, they are unable to access funding despite the important community-based research they conduct. Similarly, the shifting of programs that support international partnerships and collaboration, such as [Genome Canada](#), [The Centre for Aging + Brain Health Innovation](#) (CABHI), [Brain Canada Foundation](#), and the [Stem Cell Network](#), under the [Strategic Science Fund](#) will further constrain these programs as additional governance and management requirements from the federal government will likely be imposed.

HealthCareCAN highly recommends that the federal government and tri-councils make their funding programs more flexible in supporting collaboration with other domestic and international partners. This will foster important research partnerships that will have a significantly benefit Canada's research ecosystem, health system, economy and to the health of Canadians.

3. Establish a pan-Canadian data strategy for health research data

There are many Canadian entities that capture and store an extraordinary amount of health data across the country. These include primary care providers, clinics, hospitals, public health units, and governments. This siloed, disconnected series of separate systems has left valuable health data inaccessible and unusable.

While the pandemic has motivated the federal government to invest heavily in health data systems, no coordinated approach or strategy has been developed. This has a negative impact on health outcomes, hinders research, impairs public health decisions and increases health system costs. The [Health and Biosciences Economic Strategy Table](#) (HBEST) is one of several bodies that have called on government to create an interoperable health data system. HBEST proposed a number of sector-wide actions to unleash innovation, one of which is to create a national digital health strategy that features an interoperable digital health platform. A high-performing interoperable, digital data system is a critical enabler in health and health research.

The Public Health Agency of Canada's (PHAC) pan-Canadian Health Data Strategy Expert Advisory Group's [second report](#) identified interoperability across jurisdictions as the backbone of data in the health system. The current strategy of implementing digital health technology on a service basis is compromising individual care and public health measures.

A. Opportunity for action: *Create a pan-Canadian health research data repository to centralize health research data from across Canada and facilitate health research and innovation across institutions and jurisdictions.*

As outlined earlier in this brief, connections and networks among Canada’s health researchers are well-established, but they lack the tools to effectively communicate and share data and information across institutions and provincial and territorial divides. This is true in all areas of health research and innovation and especially acute when it comes to clinical trials.

HealthCareCAN supports the recommendations of both the HBEST and PHAC reports outlined above. Moving towards a national health data strategy that allows for interoperability between institutions, jurisdictions and governments will enrich the quality and availability of health data and research, and foster the partnerships and collaboration needed to drive innovation that will address Canada’s most pressing health challenges.

There is a role for the federal government – that of leadership – in establishing a pan-Canadian data repository and working with provincial and territorial counterparts in creating such a repository. The development of a pan-Canadian health research data repository could be led by any of several federal departments or agencies, such as Health Canada, the Public Health Agency of Canada, or the tri-councils.

CONCLUSION

HealthCareCAN and our members understand that we must chart a better way forward for health research and innovation as we emerge from the COVID-19 pandemic. We must use the lessons learned during the pandemic to address longstanding issues and leverage new opportunities to ensure Canada is tapping into the full innovative and economic potential of the health research and life sciences sector. We must ensure that Canada is positioned for success here at home and globally. HealthCareCAN and our members are ready to work with government towards this important goal.

ⁱ HealthCareCAN (2021). [Approach for Healthcare and Health Research in Canada.](#)

ⁱⁱ HealthCareCAN (2021), [Emerging Stronger: HealthCareCAN's Election Imperative.](#)

ⁱⁱⁱ National Institute of Health (2020). [Extramural Research Overview for Fiscal Year 2020.](#)

^{iv} National Institute of Health Research (2021). [Programme Grants for Applied Research and Programme Development Grants – Success rates.](#)

^v HealthCareCAN, [Leveraging up the Canadian Advantage: The Hidden Economic and Innovation Engine of Canada's Research Hospital Sector](#)

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