



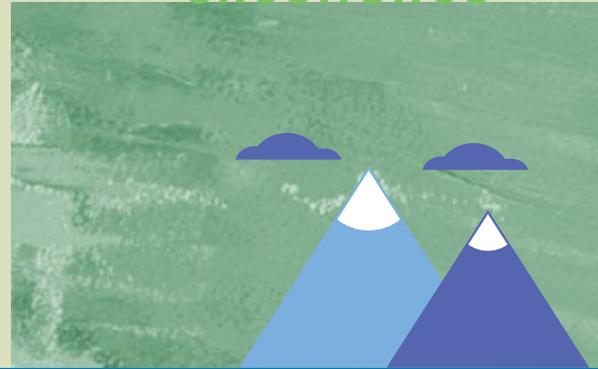
well-being



excellence



care



Directions for
Health Research in BC

2014

> priorities



> prevention

innovation

vision



Our vision



The best health for all British Columbians by excelling at research that we learn from and use to address priority health challenges.

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A HEALTH RESEARCH STRATEGY FOR BC

Health and wellness depend on many things, including where we live, the work we do, and our network of family and friends. Our health also depends on our genetic makeup and our ability to access high-quality and effective health care. While we can't control all of these variables, we can improve our health with the knowledge gained and applied through research.

Health research is the engine that drives innovation in our health system and improvement in the health of our populations. It is the origin of new diagnostic and therapeutic approaches and it helps us make informed decisions about the most effective treatments. It takes place and is used in many settings — from university labs, hospitals, community centres, and private companies, to our homes, schools and workplaces. Its purpose ranges from understanding biological processes and the causes of disease, to assessing the efficiency and effectiveness of health system policies and practices, and generating evidence about how to stay well.

A vibrant health research enterprise is critical to a healthy population and a sustainable health system. British Columbia (BC) has come a long way over the past decade and now has many areas of research excellence. But to achieve the best health for British Columbians, and the economic and social benefits gained from both health research and a healthy population, we need to strengthen our health research system by:



Reducing unnecessary duplication and expanding core services that are best centralized.



Encouraging and supporting more patients and their families, health providers and decision-makers to work with researchers to do and use research.



Enhancing BC's ability to attract investments that create jobs and training opportunities; accelerate improvements in health and health care; and foster a strong life sciences industry.

It is clear that to achieve success in these three areas, health research stakeholders will need to work in close collaboration. This document represents an important first step, with more than 1,000 people from across a broad range of sectors, organizations and communities providing input on its content, and an advisory board of thought leaders guiding its development.

The document provides insight into BC's health research landscape; places this provincial work in a broader context; and sets out a vision, strategic directions and actions that our community believes are vital to establishing a strong, coherent and effective research enterprise. It builds on the work already being done on many of these fronts and calls for shared action and distributed leadership so that we can collectively achieve our goals.



THE HEALTH RESEARCH LANDSCAPE IN BC TODAY

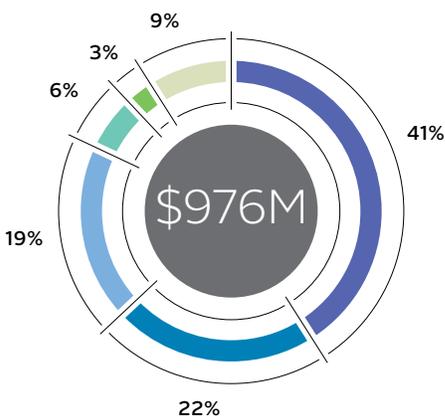
With a population of 4.5 million, BC is Canada’s third largest province, well behind Ontario and Quebec. Despite its small size, BC is a big player in Canada’s health research landscape.

In the late 1990s, BC lagged behind other provinces with its share of federal health research funding on the decline. Today, BC has a very successful health research enterprise thanks to strategic investments by successive provincial governments (Figure One). Starting in 2001, significant direct investments were made in health research through the BC Knowledge Development Fund (BCKDF), Genome BC, and the Michael Smith Foundation for Health Research (MSFHR). There were also dozens of smaller investments in other not-for-profit and charitable sector organizations. All together, these investments — more than \$950 million since 2001 — helped create a vibrant and globally competitive health research enterprise.

The BCKDF, administered through the BC Ministry of Technology, Innovation and Citizens' Services, contributes to the acquisition of infrastructure (space and equipment) that is fundamental to creating an innovative workforce and enabling BC to be a magnet for private sector and foreign investment.

Established to provide matching funds primarily for federal funding programs, including the Canada Foundation for Innovation, BCKDF has invested in nearly 300 health and biotechnology related infrastructure projects (\$215 million) that are now maintained by our universities and

FIGURE ONE: MAJOR HEALTH R&D INVESTMENTS BY BC GOVERNMENT SINCE 2001*



Total health research funding: \$976M

- MSFHR
- BCKDF
- Genome BC
- CDRD
- LEEF
- Other

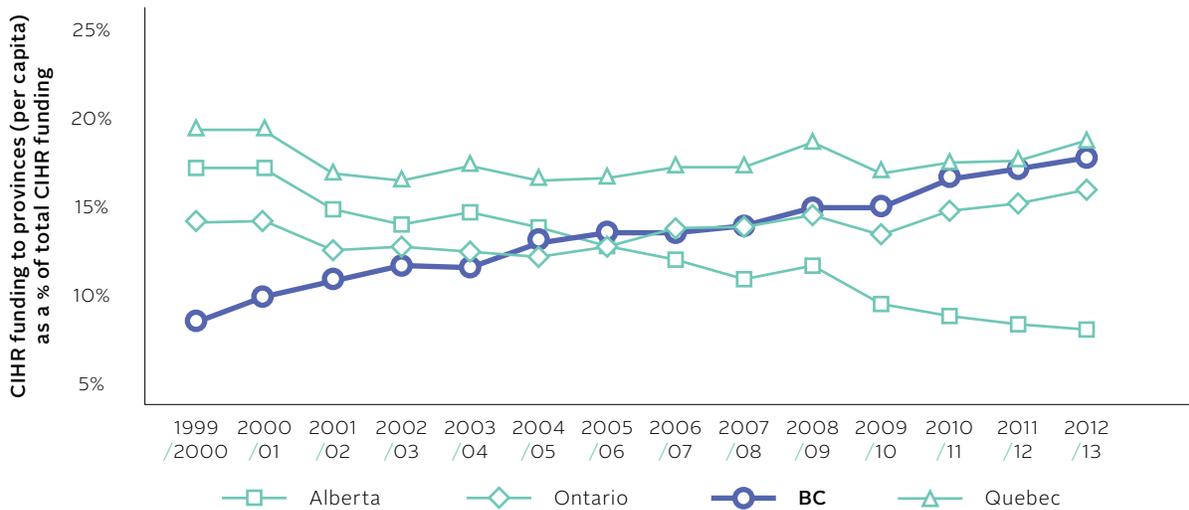
Other includes separate additional grants to specific research initiatives including Terry Fox Research Institute, Rick Hansen Foundation, and Pacific Alzheimer Research Foundation. BCKDF, Genome BC, and Leading Edge Endowment Fund (LEEF) numbers are for health research portion only.

*British Columbia Ministry of Technology, Innovation and Citizens' Services, May 2014

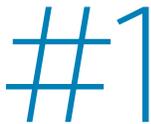
health authorities.¹ Investments by BCKDF worked synergistically with those of MSFHR, Genome BC and many others to create and advance the work of organizations such as the Centre for Drug Research and Development (CDRD), the Brain Research Centre and the Prostate Centre's Translational Research Initiative for Accelerated Discovery and Development.

The provincial government's investments have taken advantage of federal and private sector investments to make BC a vibrant hub for health research. On a per capita basis, BC is the only large province to experience significant growth in its health research enterprise since 2000 (Figure Two).

FIGURE TWO: GROWING BC'S SHARE OF NATIONAL FUNDING



BC's genomic researchers are ranked



in Canada for the impact of their research

We are now second only to Quebec based on the share of national funding that we receive from the Canadian Institutes of Health Research (CIHR). Genome BC is an excellent example — it leverages Genome Canada funding and other investments to help genomic research move from discovery through translation. As a result, BC's genomic researchers not only perform on par in research productivity with Quebec and Ontario, but are ranked number one in impact compared to other Canadian provinces.² To date, Genome BC has funded 140 health-related projects and technology platforms (\$368 million), which have contributed to more than 850 research publications and 133 patent applications and leveraged a further \$360 million in health research funding.³

¹ In addition to the \$215M invested directly by BCKDF, other provincial investments bring the total to \$491M. Total infrastructure investment is \$614M when all funding sources (federal, provincial and other) are included. Data provided by the BC Ministry of Technology, Innovation and Citizens' Services, May 2014.

² Genome BC database Apr 2014

³ Ibid

⁴ MSFHR "Research Impact Report to the Ministry of Technology, Innovation and Citizens' Services", Feb 2014

The largest provincial investment (\$392 million) established and sustains MSFHR. Since its inception, MSFHR's largest investment has been in excellent researchers (\$117 million) who collectively form the engine that drives innovation and creates thousands of knowledge economy jobs. MSFHR researchers have obtained more than \$1 billion in additional grants, apprenticed 4,700 trainees, and filed more than 140 patent applications.⁴ These researchers are among the best in their field not only because of funding from MSFHR but also because of investments from elsewhere in the system.

Health research is not just about discovering new diagnostics and treatments. It also delivers evidence needed to run a responsive, effective and efficient health system and to advance knowledge in health promotion and disease prevention.

BC has invested in these latter areas over the last decade through activities focused on assessing the impact of health redesign and change initiatives, providing supports to help nurses get involved in research, linking health data to support researchers, and reviewing public health systems renewal in BC, just to name a few. With these investments, BC's health system and population health researchers have a big impact both locally and globally. As an example, University of British Columbia's (UBC) health services researchers collectively leverage provincial funding for their work better than any other academic institution across Canada (>7 fold).⁵

VALUE OF HEALTH RESEARCH



Health research is not just about discovering new diagnostics and treatments. It also delivers evidence needed to run a responsive, effective and efficient health system and to advance knowledge in health promotion and disease prevention.

Leading edge health practice happens in places where research, practice and education are co-located and patients, providers and policy-makers work in partnership. A feature of the BC context is our unique distributed system for medical education. After nearly 7,000 people packed a hockey arena in Prince George in 2000 to demand better health care in their community, UBC embarked on a journey to create medical education programs on Vancouver Island, in Prince George and in Kelowna. With our distributed medical school, strong allied health professional training programs, and our provincial and regional health system, including the new First Nations Health Authority, BC has created significant capacity for producing and using health research across the province.

Both direct and indirect investments in health research through BC's academic institutions and health system have enabled significant growth in number and size of our research centres and institutes.⁶ These organizations, like the Centre on Aging at the University of Victoria, the Innovation and Development Commons partnership between Northern Health and the University of Northern British Columbia, and the Centre for Applied Research in Mental Health and Addiction at Simon Fraser University, are key structural elements of BC's health research landscape. They enable connections among researchers with specialized expertise and common interests; optimize work on specific diseases, populations or types of research; provide a means of connecting researchers with the public and communities; and support knowledge translation and commercialization.

⁵ Canadian Institutes of Health Research, Institute for Health Services and Policy Research Asset Map, www.cihr-irsc.gc.ca/map-carte_ihspr-isps/e/ca_prov.html, accessed March 31, 2014

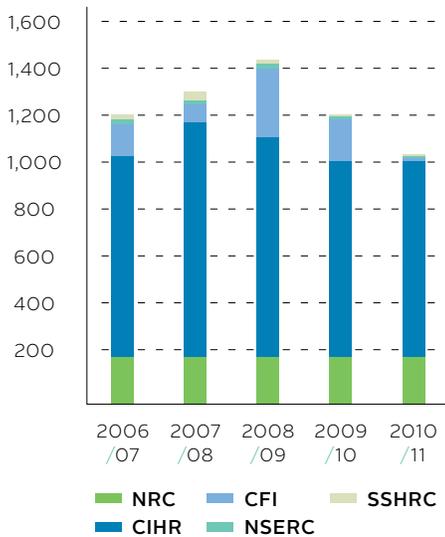
⁶ BC Clinical Research Infrastructure Network, Asset Map (www.assets.bccrin.ca)

TRENDS SHAPING THE FUTURE OF HEALTH RESEARCH

Continued growth and success in BC's health research enterprise must take into account the broader context of national and international trends in technology, investment strategies, and models for generating and using research.

FIGURE THREE: TOTAL FEDERAL GOVERNMENT INVESTMENT IN HEALTH RESEARCH IS ON THE DECLINE

Total health-related research, Canada, 2006/07 to 2010/11 in constant 2011 dollars



Source: Nova Scotia Health Research Foundation, The Current State of the Canadian Health Research Landscape: Review and Data Analysis, page 13 (www.nshrf.ca/sites/default/files/canpaperjune_4_2013_final.pdf)

NRC: National Research Council
 CFI: Canada Foundation for Innovation
 SSHRC: Social Sciences and Humanities Research Council
 NSERC: Natural Sciences and Engineering Research Council

Increasingly, user-centric diagnostic and treatment technologies — such as mobile health, telehealth and social media — offer unprecedented opportunities to improve health and wellness. But their effect on costs and quality of care are not yet known. The notion of truly personalized medicine based on our biology and our individual priorities as patients is growing rapidly. Both supporting and driving this paradigm shift is a wealth of data that hold the potential for new insights into patterns of disease, effective treatments, and more efficient health-care delivery. Data-driven research has significant potential, but we need to unlock this data while maintaining an individual's right to privacy and the security of our systems.

More than ever, health research is being called upon to develop, test and implement products, programs and policies. It can also help inform decision-making about what we need to stop doing and determine where outcomes, costs or quality may be seriously compromised.

While the need for health research is growing, both federal and provincial investments have been limited in recent years as a result of the global economic downturn. Health research funding from federal sources has dropped by 14 percent since 2006 (Figure Three). Increasingly, federal investments are being redirected to research with ties to commercialization. While BC has benefited from this shift, it is becoming increasingly difficult to obtain resources for some types of health research. For a strong health research ecosystem, balanced support for all stages of the innovation continuum — basic science, translation and commercialization — is required, in addition to ongoing support for research in health promotion, disease prevention and the health system.

Lastly, the way research is conducted is changing. Advances in knowledge have traditionally been made by individual researchers, often working in isolation, on problems they chose to pursue. In an era of constrained resources and increasingly complex problems — and with new and innovative methods, tools and skills emerging — there are significant opportunities to identify and address problems differently by involving the full range of stakeholders who produce and use research.

Our vision

The best health for all British Columbians by excelling at research that we learn from and use to address priority health challenges.



THE FUTURE OF HEALTH RESEARCH IN BC

BC has the potential to advance in all areas of health research thanks to provincial investments and the additional funding and other resources these investments have attracted. Trends in BC and in the broader context underscore the importance of developing coherence in our health research enterprise, and a common understanding of our priorities, to capitalize on this potential.

Broad consultations with the community and an analysis of the environment have led to the framework for action presented here. Many of the actions listed in this strategy are already underway and some will be facilitated with the establishment of BC's patient-oriented research unit, part of CIHR's national strategy.

Strategic directions and actions

To bring our vision to life, we need to:

1ST DIRECTION

Develop and enhance key foundations that support the creation and use of knowledge.

2ND DIRECTION

Create a culture of inquiry and innovation across sectors that encourages health research and its use.

3RD DIRECTION

Make BC a hub for world-class research that makes a difference.

1ST DIRECTION

DEVELOP AND ENHANCE KEY FOUNDATIONS THAT SUPPORT THE CREATION AND USE OF KNOWLEDGE

The complex and distributed nature of health research across the province is a strength of our enterprise. The system is able to adapt and provides opportunities for specialization that reflect geographic and population contexts. But there are challenges with this complex distribution of entities that includes universities, colleges, health authorities, and research institutes and centres. Duplication is common in distributed systems, especially when they develop from the ground up and individual institutions try to

meet the needs of a broad range of stakeholders. Consolidation of key resources has begun, but research producers and users across BC will benefit from the creation of new provincial foundational elements and the further enhancement of existing elements, especially those that no institution could or should develop and maintain on its own. Similarly, standardizing best practices and procedures by expanding core services that are best centralized will maximize collective and individual work.

| ACTION | OUTPUTS | DESIRED OUTCOMES |
|--|---|--|
| <p>a → Create a secure platform for and improve access to linked data</p> | <ul style="list-style-type: none"> → Clear legal frameworks to underpin data access and linkage → Processes that ensure privacy protection and ethical data use → System that enables timely access to relevant data for both research and quality improvement | <ul style="list-style-type: none"> → Deeper understanding of health status and its determinants → Hypotheses generated for novel solutions → A health system that can continuously improve → Increased external investment in BC-based research |
| <p>b → Standardize best practice research processes across BC</p> | <ul style="list-style-type: none"> → Harmonized ethics review of multi-centre projects → "Consent to contact" program that engages all clients of the health system → Contract harmonization | <ul style="list-style-type: none"> → Improved efficiency and effectiveness of research system → Shortened timeline for multi-centre research projects and clinical trials → Increased investment in BC-based health research → Increased patient participation in research |
| <p>c → Establish ongoing provincial mechanisms for health research priority setting</p> | <ul style="list-style-type: none"> → Broad stakeholder engagement in determining the research that gets done → Identification of the strengths, weakness, opportunities and gaps for health research → Cross sector dialogue on BC's priorities | <ul style="list-style-type: none"> → Common understanding of priorities across sectors → Shift to incorporate more user-driven research → Accelerated advances on key health challenges |
| <p>d → Develop a provincial framework to evaluate the impact of health research</p> | <ul style="list-style-type: none"> → Shared measurement system for impact analysis → Periodic system-wide assessment of progress against goals as well as return on investment | <ul style="list-style-type: none"> → Understanding of impact in various outcome areas → Evidence base for decisions about where and how best to invest |

2ND DIRECTION

CREATE A CULTURE OF INQUIRY AND INNOVATION ACROSS SECTORS THAT ENCOURAGES HEALTH RESEARCH AND ITS USE

Health research priorities have traditionally been set by individual researchers and research funders. But the users of health research in the public and private sectors often have different research priorities as well as expertise and unique perspectives that can enhance the research process as well as its results. We need to encourage partnerships among research producers and research users, providing support for them to create new knowledge and use it to improve health.

The pay-offs from these new partnerships range from increased rigour in health system improvements to more real world input to research. Working together, we can advance in many areas — including promoting health and preventing disease for British Columbians, shifting to more patient-centred care, strengthening the interfaces among community, primary and specialist care, and enhancing market pull for “made-in-BC” technologies.

| ACTION | OUTPUTS | DESIRED OUTCOMES |
|---|--|--|
|  <p>a Establish an academic health science network across BC</p> | <ul style="list-style-type: none"> → More locations in BC whose core mandate is care-teaching-research → More linkage of university research with real world practice → Exceptional training opportunities for the next generation of health-care professionals → Formal agreements between universities and health authorities to collaborate | <ul style="list-style-type: none"> → More rapid application of evidence to practice and policy → Leading-edge education of health professionals → Improved health care and health research → Timely access to advanced patient-care services |
|  <p>b Scale-up and spread capacities for dissemination and use of knowledge</p> | <ul style="list-style-type: none"> → Innovative training on effective knowledge translation in the community, public and private sectors → Improved access to resources that support evidence-informed decision-making → Facilitated connections among health-care decision-makers, policy makers, patients, community members, industry decision-makers, and researchers | <ul style="list-style-type: none"> → Leading edge, best practice care all across BC → A vibrant health research enterprise with a deep understanding of the needs of research users → Well-informed stakeholders and decision-makers |
|  <p>c Facilitate public involvement in health research</p> | <ul style="list-style-type: none"> → Mechanisms to involve the public in all aspects of health research, from governance and priority setting to participating in studies | <ul style="list-style-type: none"> → A more effective health research enterprise → Increased public involvement in health research → Increased public understanding of the value of health research for taxpayers |

3RD DIRECTION

MAKE BC A HUB FOR WORLD-CLASS RESEARCH THAT MAKES A DIFFERENCE

Starting in 2001, BC's health research enterprise demonstrated its ability to "rise to the challenge." By making strategic investments in building capacity, we overturned the decline in national funding and surpassed the per capita funding level for BC. Given the challenges and trends in our environment, it is time to reinvigorate our efforts to attract the best

researchers and lead the country in new methods and strategies for solving population and health system challenges. If we want to strengthen our life sciences industry and, in turn, our economy, we need to move research discoveries through the translation and commercialization phases.

| ACTION | OUTPUTS | DESIRED OUTCOMES |
|---|---|---|
| <p>a →</p> <p>Continue to attract exceptional health researchers to BC</p> | <ul style="list-style-type: none"> → Programs to identify, develop and promote BC opportunities → A workforce with the capacity to solve our most pressing problems → Increased federal, foreign and private sector investments in BC | <ul style="list-style-type: none"> → A strong pipeline of new talent that can solve problems and address our most pressing health challenges → Greater wealth creation |
| <p>b →</p> <p>Deliver opportunities for solution-oriented, team-based research and knowledge translation</p> | <ul style="list-style-type: none"> → Investments in the best people, projects and programs that are focused on key health priorities → Strong engines of innovation, knowledge creation and informed decision-making → Leadership distributed throughout the system | <ul style="list-style-type: none"> → Increased depth, breadth and application of evidence to inform decision-making → Accelerated problem solving → More resilient health and research enterprises |
| <p>c →</p> <p>Accelerate translation of research with commercial potential</p> | <ul style="list-style-type: none"> → New programs to support the continuum from discovery to market → New partnerships among provincial, national and international (both public and private) partners → Programs and placements that enable cross training in research, business, finance and law as they relate to health → Attraction and retention of entrepreneurial talent → Jointly managed public-private sector innovation fund | <ul style="list-style-type: none"> → More federal, foreign and venture capital investment in BC → More rapid development of products that will improve health and benefit the economy → Highly qualified workforce for life science companies in BC → A stronger life sciences industry in BC → Increased employment and tax revenue to BC and a sustainable health research ecosystem |
| <p>d →</p> <p>Build BC's capacity to evaluate health system innovations</p> | <ul style="list-style-type: none"> → Mechanism to ensure that BC efficiently implements new cost-effective technologies and eliminates ineffective interventions | <ul style="list-style-type: none"> → Reduced health-care delivery costs → Improved patient outcomes → Improved processes/practices for health-care providers |



TOWARDS IMPLEMENTATION

Investing in BC’s health research enterprise has made us strong and diverse, but our landscape is changing, and a road map is needed so we can capitalize on our assets and ensure a healthy future.

This document creates that road map, building on our collective accomplishments from the past decade, considering trends affecting our health and research systems, and anticipating changes that signal a welcome shift in our approach to addressing health issues through research.

Any strategy that arises from a broad engagement across jurisdictions and sectors will necessarily be ambitious. This document provides the framework for a collective effort that requires all parts of the health research enterprise to participate — including individuals, teams and organizations within the public, private, non-government organization and civil society sectors.

A separate implementation plan capitalizes on the momentum created by the health research strategy consultations that informed this document. It considers the work already underway on many fronts, as well as the assets built, and calls for shared action and distributed leadership to push towards the collective vision outlined here.



BC has a unique opportunity to strengthen the foundational elements necessary for a strong research enterprise while also supporting the distributed leadership needed to achieve our collective vision. To stay up to date on our progress, visit www.bchealthresearchstrategy.ca.

ACKNOWLEDGMENTS

The BC health research strategy project would not have been possible without the efforts of many dedicated individuals. The process began with a meeting of BC's health research and health-care leaders in April 2012. At that meeting, participants endorsed the Michael Smith Foundation for Health Research (MSFHR) to consult with the community and facilitate the strategy's development. That initial group, supplemented by additional leaders in the community, became an important touchstone during the development of this document.

To develop this document, a planning team, led by MSFHR, undertook extensive environmental scanning, supplemented by a multi-pronged consultation process that included regional workshops, key informant interviews, focus sessions, and an online survey.

Throughout the process, the BC health research strategy advisory board provided invaluable advice and direction to the planning team. A particular thank you goes out to the following individuals for their guidance and leadership:

| | |
|-------------------------|--|
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Directions for
Health Research in BC

www.bchealthresearchstrategy.ca

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