UNLEASHING INNOVATION:
Excellent Healthcare for Canada

Report of the Advisory Panel on Healthcare Innovation

Canada

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July 2015

The Honourable Rona Ambrose
Minister of Health
Ottawa ON

Dear Minister,

Please find attached the final report of the Advisory Panel on Healthcare Innovation.

This report is the product of our consultations with Canadians, supplemented by literature reviews, commissioned research, and our own discussions and deliberations.

We were humbled to be asked for advice on a set of issues that affect all our fellow citizens. We have also appreciated both your support throughout our mandate and your respect for our independence.

We hope this report will be useful to you and your Cabinet colleagues, and that our recommendations will galvanize federal strategies and investments that strengthen Canada's healthcare systems.

David Naylor (Chair)

Neil Fraser

Francine Girard (Deputy Chair)

Toby Jenkins

Jack Mintz

Christine Power

Dedication

This report is dedicated to the memory of our fellow panelist, Dr. Cyril B. Frank (1949-2015), healthcare leader and innovator extraordinaire.

Chief Executive Officer of Alberta Innovates - Health Solutions, Cy Frank also found time to be Chief Medical Advisor to the Alberta Bone and Joint Health Institute, the McCaig Professor of Joint Injury and Arthritis Research at the University of Calgary, and a practising orthopedic surgeon.

Just days before his sudden death, Cy had been in top form on a visit by several panelists and team members to Yellowknife and Whitehorse. The next stop was a full Panel meeting in Edmonton, where Cy elevated our discussions with his unique combination of vision, common sense, and irrepressible optimism about an excellent future for Canadian healthcare. As fate would have it, Cy's parting words to us were that Canada should aim to build healthcare systems that were living laboratories, drawing patients and clinicians together in partnership with researchers, entrepreneurs, and innovators from all sectors and disciplines.

We have sorely missed Cy in these last few months of deliberations and writing. However, we remain deeply grateful that the Panel had the opportunity to benefit from Cy Frank's wisdom and unique perspectives as a relentless healthcare innovator, pioneering clinician-researcher, outstanding teacher, generous colleague, and great friend.

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Acknowledgments

This report is the culmination of thousands of hours of engagement, consultation, research, and deliberation, made possible only by the efforts of many. To these individuals and organizations, the Panel would like to express its gratitude. In doing so, the Panel members must emphasize that they alone bear final responsibility for what is presented in their report. In particular, elected and appointed officials of the federal, provincial and territorial governments should not be assumed to have endorsed or approved any of the views, interpretations or recommendations contained in this document.

First and foremost, the Panel wishes to thank the individuals from the Healthcare Innovation Secretariat who provided exceptional support to the Panel and its members. Marcel Saulnier, as Executive Secretary to the Panel, was both a fount of knowledge and the key departmental liaison with Health Canada. David Clements was the Executive Director for the Healthcare Innovation Secretariat, with overall responsibility for research, consultation and other activities. His extensive knowledge of the health sphere and expertise in indicators and information systems were invaluable. The Panel further wishes to highlight and acknowledge Peggy Ainslie for her exceptional leadership, many insights, and tireless effort over the course of the Panel's mandate. 'The Trio' as they came to be called, proved every day that three heads are better than two, let alone one. Panel members also had ample occasion to appreciate the talent and dedication of the entire secretariat staff – Joanne Desormeaux, Andrea Lecomte, Salimah Maherali, Leslie Meerburg, Karin Phillips, Kajan Ratneswaran, and Stephanie Soo – all of whom made indispensable contributions in administrative and strategic coordination, research, writing, analysis, and communications. In sum, while Panel members are content to be held accountable for anything in the report that makes anyone unhappy, they would ask that happy readers give due credit to the remarkable team listed above.

Many senior provincial and territorial health officials lent their time and counsel to the Panel, including Ministers Glen Abernethy, Gaétan Barrette, Dustin Duncan, Eric Hoskins, Steve Kent, Mike Nixon, and Fred Horne; and Deputy Ministers Bob Bell, Stephen Brown, Bruce Cooper, Janet Davidson, Debbie DeLancey, Max Hendricks, Karen Herd, Tom Maston, Michael Mayne, Patricia Meade, Colleen Stockley, and Peter Vaughan; as well as their respective staff, who facilitated and participated in visits, regional meetings, and stakeholder consultation events.

The Panel wishes to especially acknowledge the generosity of those who voluntarily gave their time to participate in the Panel's endeavours. In particular, the Panel is indebted to many individuals who provided expert advice and critical assistance in the organization of roundtables, special sessions, and site visits, undertaking customized analyses, and otherwise moving the Panel's agenda forward. A special nod must go to: Phillip Bazel of the University of Calgary's School of Public Policy, Alan Bernstein of the Canadian Institute for Advanced Research, Meghan Baker and Alison Bourgon of the Canadian Institutes of Health Research, Ryan Galloway of the Center for Medicare and Medicaid Innovation, Jean-Louis Denis of the École nationale d'administration publique, Zayna Khayat of MaRS, Erik Landriault of the Royal Danish Consulate General (Toronto), Andrew Macleod of the Change Foundation, the Hon. John Manley and staff of the Canadian Council of Chief Executives, Angela Morin, Sonia Isaac-Mann and Erin Tomkins of the Assembly of First Nations, Pierre-Gerlier Forest of the Johns Hopkins Bloomberg School of Public Health and Jeremy Veillard of the Canadian Institute for Health Information. Additionally the Panel would like to express its deep appreciation to the hundreds of individuals who took the time to attend these events and contributed valuable perspectives. For a comprehensive list of organizers and attendees, please see appendix 2.

Mary Pat MacKinnon and staff at Ascentum Inc. helped to coordinate and effectively facilitated regional stakeholder consultation sessions across the country. As well, a number of individuals and organizations conducted commissioned research and facilitated engagement activities on the Panel's behalf, including G. Ross Baker of the University of Toronto, J.C. Herbert Emery of the University of Calgary, David Flaherty of David H. Flaherty Inc., Diane Gagnon of the University of Ottawa, Don Husereau of the Institute of Health Economics, Karine Guertin of the University of Montreal, Maria Judd of the Canadian Foundation of Healthcare Improvement, Sharif Mahdy of the Students Commission, Anne Snowdon of the Ivey Centre on Health Innovation at Western University, John Sproule of the Institute of Health Economics, Terrence Sullivan of Terrence Sullivan and Associates, and Jason Sutherland of the University of British Columbia. The Panel appreciates the excellent work of all the aforementioned individuals, organizations, and enterprises.

Finally, the Panel would like to thank the hundreds of stakeholder organizations and members of the public who took the time to provide thoughtful and considered written input as part of the Panel's online consultations. For a full list of individuals and organizations who contributed to the Panel's work, please see the appendices to the report.

Foreword

The Advisory Panel on Healthcare Innovation has been learning and deliberating more or less non-stop since members received their mandate from the Honourable Rona Ambrose in June 2014. We have had an extraordinary experience.

Panel members have read scores of submissions and commissioned research reports, dug through mountains of publications, crisscrossed Canada for consultations with hundreds of our fellow citizens, and conversed with many federal, provincial and territorial leaders, as well as international experts who work in the broad health arena.

We came at this task from different disciplines, sectors, and regions. Collectively, including the late Cy Frank, we can claim well over 150 years of engagement with Canadian healthcare systems, along with substantial expertise in public policy and governance. However, preparing this report was a serious challenge, simply because so many issues might reasonably be included under the broad rubric of healthcare innovation.

In this regard, it seems worth highlighting and explaining a few things that the Panel did and did not do.

Our terms of reference specified that our recommendations should fall within the *Canada Health Act* – and they do.

Our terms of reference further specified that our recommendations should respect the division of powers in the Canadian Constitution, and therefore focus on the federal government. They do so. Our recommendations are directed to the Government of Canada and in many instances to Health Canada in particular.

At the same time, it would be foolish – indeed, impossible – to write a report on innovation in healthcare without making general observations about Canadian healthcare systems and what would make those systems better. The observations in the report reflect our estimation of best practices internationally. They also repeatedly align with what has been recommended in the past by other commissions and panels advising, variously, the federal, provincial and territorial governments.

In that respect, throughout this report the terms "Canadian healthcare systems" or "Canada's healthcare systems" are used inclusively, i.e., not just for the provinces and territories, but also for the federal government in its role as a provider of care to specific populations. Regarding federal healthcare, we did not comment specifically on active military personnel and veterans, or prisoners in federal penitentiaries. However, we do comment on the federal role in First Nations and Inuit health services.

In contrast, we made a commitment to provincial and territorial health ministers that the Panel would praise specifically while criticizing generically. We kept our word. This approach reflects not just attention to political sensitivities, but two obvious facts and a fundamental belief. The facts are that healthcare reform in Canada has proven extraordinarily difficult for every jurisdiction, with the result that, despite varied circumstances and unique strengths, Canada's healthcare systems today share many weaknesses and challenges. The belief is one that shaped the Panel's key recommendations: all Canadian governments – and all Canadians – would benefit from a stronger culture of inter-jurisdictional collaboration in healthcare.

To that end, many of our recommendations anticipate that some or all provincial and territorial governments may choose to begin new collaborative initiatives with each other and the federal government. In this regard, however, the language is precise. The report recommends priorities for federal support and action, and delineates a new incentive structure that clearly differs from standard transfer payments or past health accords. Each provincial and territorial government accordingly has a choice of working together with the federal government in the interests of their residents on specific projects – or going its own way.

Readers may notice further consistencies in wording. "Canadian governments" refers to all 14 federal, provincial and territorial administrations. The federal administration is referred to as "the federal government," or "the Government of Canada." General references to "Canada" and "Canadians" are national, not federal; the accompanying pronouns are "we" (and "our"), except in this Foreword[i]. Otherwise, we have resorted, with a collective grimace, to self-reference as "the Panel" ("Panel's" or "its") and "Panel members" ("their") throughout the report.

As noted above, we should also acknowledge things we did *not* do.

i The sole exception is a quote from the Foreword at the end of the report.

Because our mandate was healthcare and that in itself was overwhelming, we did not delve into broad determinants of health or strategies for community-wide health promotion. However, readers will note that our recommendations point strongly towards empowering patients with their own health information, and towards modes of reorganizing healthcare systems to put much greater emphasis on keeping Canadians as healthy as possible, including better integration of healthcare and social services.

In various submissions and presentations to the Panel, we were pressed to support the creation of new strategies or agencies addressing a range of conditions and population groups. We did not accept those ideas – nor did we reject them. With the obvious and, we trust, understandable exception of First Nations and Inuit health services, our focus was on broader capacity building and system re-design.

Under the heading "Fiscal Responsibility," the Panel's terms of reference insisted that our recommendations should "not result in increasing spending pressure on provincial and territorial budgets." We have respected this direction. The flow of federal funds and implementation of related strategies in the report do not depend on a full consensus of provinces and territories, nor do they demand new spending by provinces and territories that choose to participate. Rather, they anticipate that existing operating dollars can and will be re-aligned to common purpose in variously developing, assessing, scaling up, and spreading healthcare innovations.

We were also told that our recommendations "must not imply either an increase or a decrease in the overall level of federal funding for current initiatives supporting innovation in healthcare." Although it was not an easy decision, we did not follow this guidance. However, we believe our recommendations are indeed fiscally responsible.

We have ensured, for example, that our recommendations regarding tax policy are revenue neutral. No changes to current transfers are envisaged beyond the reduction in growth rate already slated for implementation by the federal government, and no new universal cost-sharing programs are proposed. Furthermore, as noted above, our approach departs from past federal-provincial-territorial accords that sought to 'buy change' based on unanimously agreed priorities and formulaic allocations of funds.

Instead, the Panel concluded unanimously that sustainable improvements in healthcare were unlikely ever to occur unless the federal government makes changes to its current vehicles for pan-Canadian collaboration, along with major investments to support provinces and territories in the implementation of fundamental changes to their systems. These funds would flow to 'coalitions of the willing' – jurisdictions, institutions, providers, patients, industry, and committed innovators of all backgrounds. Our report presents this concept in detail along with other recommendations designed to unleash innovation in Canada's healthcare systems.

We conclude this brief Foreword with a disclaimer, and expressions of both concern and confidence.

This report represents our best advice to the Minister of Health and the Government of Canada. We understand that not all recommendations may be accepted. However, we caution that, absent federal action and investment, and absent political resolve on the part of provinces and territories, Canadian healthcare systems are headed for a continued slow decline in performance relative to peers.

Our consultations also left us in no doubt that Canadians hope and expect the federal government will work together with provinces and territories to reverse the erosion of the nation's most cherished social program. We do fully understand – and the report elaborates on – the frustrations and failings of conditional fiscal federalism as it has unfolded in healthcare over the decades. While its decision was initially controversial, the current federal government gave momentum to change when it abandoned what had become a counterproductive fiscal model.

Thus, much of what we propose is specifically designed to move Canada toward a different model for federal engagement in healthcare – one that depends on an ethos of partnership, and on a shared commitment to scale up existing innovations and make fundamental changes in incentives, culture, accountabilities, and information systems. We do not pretend that this model offers an immediate remedy for the ills of Canadian healthcare. However, we have a high degree of confidence that concerted action on our major recommendations can make a meaningful difference that will be seen and felt across Canada by 2025.

Chapter 1

Healthcare Innovation in Canada: A Prologue

"It is time to get innovative. Time to change the way we have been thinking and how we have been doing things. It is time to work collaboratively to make the system more responsive to the needs of Canadians. The time is now."

The Honourable Rona Ambrose,
Minister of Health, Canada

Healthcare Innovation in Canada: A Prologue

On June 24, 2014, the Government of Canada's health minister, the Honourable Rona Ambrose, launched the Advisory Panel on Healthcare Innovation. Her mandate to the Panel was clear:

- Identify the five most promising areas of innovation in Canada and internationally that have the potential to sustainably reduce growth in health spending while leading to improvements in the quality and accessibility of care.

- Recommend the five ways the federal government could support innovation in the areas identified above.

The creation of the Panel and its mandate reflected what seems to be an emerging consensus among patients, providers, policymakers, and the general public alike: healthcare across Canada, for all its continuing strengths, is a long way from what it should be or could be.

Debates still take place about how much should be spent, and what the private-public balance or federal-provincial/territorial balance should be. However, as regards the publicly-funded systems collectively and popularly known as Medicare, polling data suggest that only one out of four Canadians believes that insufficient funding is the main source of problems in healthcare.[1] What seems to be emerging instead is a focus on how the system spends the dollars that already flow into it, along with a sense of unease about what will be left of Medicare for future generations.

Meanwhile, across Canada, system leaders are working with providers and patients to make healthcare better. The work of all these innovators is highly laudable and the Panel in its travels heard first-hand about some of the bright spots their efforts have created. The Panel also heard that, while these pioneers are often celebrated locally, their efforts have only limited impact. Somehow, the structures and incentives of Canada's healthcare systems are suboptimal for widespread adoption of positive change.

This chapter provides an opening overview of the structure and development of healthcare in Canada, summarizes the Panel's mandate and its processes for gathering relevant input and evidence, and closes with a preliminary sketch of what panelists have heard, read, and seen over the last year.

A Structural Snapshot of Medicare

Chapter 3 will say more about the architecture of Canadian healthcare and the federal role in particular. For now, it is worth noting that all Canadian provinces[ii] share some common elements:

- All offer universal access to medically-necessary health services provided in hospitals or by physicians. These services are rendered without charge at the point of service, and coverage is portable across provinces and territories. At the federal level, these common features are embedded in the *Canada Health Act*, which requires that provincial and territorial health insurance plans meet specific criteria in order to receive federal health funding through the Canada Health Transfer.

- All provinces and territories have widened public coverage beyond hospital and physician services to include home care, long-term care, and drugs dispensed in the community. Access to these additional services is typically targeted to certain segments of the population such as low-income families and seniors. These services go beyond the scope of the *Canada Health Act*. Thus, what is deemed eligible for provincial coverage, and the extent of such coverage, varies from jurisdiction to jurisdiction and may include co-payments or other charges to the patient at the point of service.

- Many – but not all – working Canadians and their families have access to private health insurance through their place of work. Private health insurance plans typically cover prescription drugs, single- and double-bedded rooms for hospital stays, prescribed medical devices, and ambulatory services provided by other healthcare professionals such as dentists, optometrists, physiotherapists and psychologists.

- The result is a "narrow but deep" public insurance structure. All physician and hospital services are covered under public plans, while other increasingly important goods and professional services are financed through a mix of public and private payment

ii These descriptors are less applicable for the territories and for the services provided under direct federal aegis, but the core principles hold.

– with the patient often assuming a significant burden of the costs.

- Most physicians are remunerated primarily on a fee-for-service basis, meaning that they get paid at a negotiated rate each time they deliver a service. The same is true for other independent professionals to the extent that their services are covered by provincial and territorial health insurance plans.

- Most general hospitals are structured as public sector organizations or non-profit corporations. All are publicly funded via some mix of global (i.e., lump sum) budgets, programmatic envelopes, or activity-based funding. In many provinces, these acute care institutions are linked by common regional governance or shared budgeting to other parts of the system (e.g. home care, or institutions such as chronic-care or rehabilitation hospitals).

How did this particular configuration arise?

Medicare's Arrested Development

Many of the defining features summarized above are legacies of policies formulated in the 1960s or even earlier, and codified in 1984 by the *Canada Health Act.*[iii] The basic structure of Canadian Medicare is therefore one that is deeply familiar and reassuring to millions of Canadians. Moreover, Canadians from all regions and all walks of life still value this iconic set of social programs that aimed to eliminate financial barriers to healthcare.

Perhaps it is understandable, then, that accounts of the developmental history of Medicare in Canada often feature a cast of heroic figures. Tommy Douglas takes top billing for two bold steps as premier of Saskatchewan. Douglas implemented Canada's first universal hospital services plan in 1947, and oversaw the legislative approval of Canada's first universal medical insurance act in 1961.

Prime Minister John Diefenbaker also figures twice. His government brought in the *Hospital Insurance and Diagnostic Services Act* in 1957, offering federal dollars to split the cost of the Saskatchewan hospital plan and any similar provincial plan. This injection of funds catalyzed the extension of universal hospital coverage to all Canadian provinces and territories. Diefenbaker again took centre stage in 1961 when he appointed Mr. Justice Emmett Hall as chair of the Royal Commission on Health Services. The Hall Commission report (1964) set out a blueprint for further federal cost-sharing, starting with medical care insurance, with the vision of broadening coverage over time to other health services such as dental care for children. That vision, however, was never to be realized.

Prime Minister Lester B. Pearson and his cabinet colleagues take the spotlight next in most historical accounts. Pearson's government accepted Hall's advice, and, with the cost-sharing provisions of the *Medical Care Act* of 1966, opened the door for all provinces to follow Saskatchewan's lead with universal and comprehensive first-dollar coverage of medical services. By the end of 1972, all provinces and territories were aboard.

In hindsight, barriers to innovation were visible even in those heady early days of Medicare.

For example, in the early 1970s, Canadian researchers showed that a specially-trained nurse practitioner collaborating with a family doctor could do 70 percent of the doctor's work, with no difference in patients' health outcomes or satisfaction. These landmark findings were published in 1974 by the *New England Journal of Medicine,* but the report concluded on a cautionary note: "Although cost effective from society's point of view, the new method of primary care was not financially profitable to doctors because of current restrictions on reimbursement for the nurse-practitioner services."[2] Indeed, even as nurse practitioners found varied roles across the globe, the spread and scaling-up of the concept was so slow that Ontario mothballed its pioneering training programs for several years.

The warning signs were few, however, and universal publicly funded healthcare was a definite success that set Canada apart from the US. There, in landmark 1965 legislation,[3] two steps toward wider public insurance were taken. Medicare was implemented federally as a direct payment

iii Enacted in 1984, the *Canada Health Act*, RSC, 1985, c. C-6 (CHA) is legislation that sets out conditions for federal fiscal transfers to provinces and territories for healthcare. The CHA describes the primary objective of Canadian healthcare policy as follows: "to protect, promote and restore the physical and mental well-being of residents of Canada and to facilitate reasonable access to insured health services without financial or other barriers." To receive the full cash contribution under the Canada Health Transfer, provincial and territorial health insurance plans must fulfill the following conditions: public administration, comprehensiveness, universality, portability and accessibility. The CHA also includes provisions to discourage extra-billing and user charges for insured services. These provisions have constrained the emergence of private insurance or private delivery of "medically necessary" services as broadly defined by the Act. However, the CHA does not say anything about how provinces and territories should organize, manage and deliver healthcare services.

program for seniors' care and, through Medicaid, a 1960 cost-sharing plan for states was extended to cover health services for citizens in receipt of social assistance.

These "Great Society" programs left the coverage of the majority of Americans to the private market, and tens of millions remained uninsured while the costs of care skyrocketed. As the healthcare travails of our great neighbour intensified in the 1970s and 1980s, Canadians placed an increasingly high value on our more equitable and efficient model of coverage. This emphasis on US comparisons still figures prominently in Canadian healthcare discourse, but was misplaced from the outset.

Canada's move to universal coverage for hospital and physician services actually occurred at a slower pace than in many other nations. While Canadians basked in the sunshine of praise from US academics bemoaning the flaws in their own healthcare system, European and UK researchers were already far down the road, examining the worrisome disparities in health status that persisted across socioeconomic strata even decades after universal coverage had become a reality.[4]

Of course, Canadians did and still can take pride in the much lower average cost per capita of health services here as compared to the US. However, even this comparison may be somewhat misleading. Our spending per capita today is higher than a number of other nations that have equal or better performance in a range of healthcare measures,[5] as Chapter 2 will discuss in some detail.

This trend is clearly not attributable to a lack of talent. Canada has no shortage of innovative healthcare thinkers, world-class health researchers, capable executives, or dynamic entrepreneurs who see opportunity in the health sphere. Our health professionals and executives are also among the best educated and most skilled in the world. It is true that on a per capita basis, Canada's ratios of active nurses and doctors are lower than many OECD nations. However, the numbers of doctors and nurses are rising steadily[6,7] – and distribution across the country, particularly to rural and remote areas, is arguably the main issue.

If one accepts that the solution does not lie in more money or more or better talent, what is holding Canada back?

One observation that has been made repeatedly is that Canada's approach to the finance and organization of health services is very poorly integrated. The theme of improved integration of care will recur throughout this report and needs only a brief introduction here.

As one example of poor integration, physicians and hospitals are funded through separate budgets in Canadian healthcare systems. This makes little sense for the majority of specialists, given the substantial influence they have over hospital expenditures. Indeed, under the current fee-for-service payment system, most of these superbly-trained professionals have no specific financial rewards for quality of care or responsible stewardship of scarce healthcare resources.

The lack of integration of healthcare services also reinforces Canada's narrow scope of public coverage, and vice versa. Provinces and territories are justifiably uneasy about the cost implications of adding on more budgetary silos to pay other professionals for needed care or to assume full financial responsibility for covering pharmaceuticals, even though careful spending on these goods and services could more than offset other costs in fully integrated budgets.

Meanwhile, consider the fate of a fellow Canadian badly injured in a motor vehicle accident. He or she could well need acute in-patient care, the services of physicians working in many specialties, rehabilitation hospital care, home care, outpatient physical and occupational therapy, drugs, dental services, psychological counselling, and assistive devices. The current reality across Canada is that care for this citizen would involve tapping into a dozen separate private and public programs, with varying degrees of coverage and incomplete sharing of clinical information across programs, institutions, and providers. Such a patchwork can hardly operate in the best interests of the patient and his or her family.

Advisory Panel Mandate and Definitions

Just as Canadians' views of their healthcare systems appear to be shifting, so also are healthcare policymakers and leaders across the provinces and territories showing an unprecedented level of resolve to make changes. In launching the Advisory Panel on Healthcare Innovation, the Honourable Rona Ambrose acknowledged the actions taken by provinces and territories to slow the growth of healthcare spending and their efforts, individually and

collectively, to innovate in healthcare delivery. The Minister added:

> As jurisdictions accelerate their efforts to transform their healthcare systems to achieve the 'triple aim' of improving patient care and health outcomes while reducing costs, it is time to take stock of where progress has been made in Canada and around the world. This is essential if we are to accelerate the pace of healthcare innovation and ensure the long-term sustainability of Canada's healthcare system.[8]

Before elaborating on the Panel's mandate, some definitions seem in order.

Innovation has become a buzzword with varied meanings. Throughout its consultations, for example, the Panel noted persistent confusion between research and innovation in the health sphere. As research becomes more applied, the findings may lend themselves to faster uptake and wider adoption. But as the case of the nurse practitioner illustrates, even practical and definitive findings do not spark widespread innovation in the absence of winning conditions in the healthcare system. The frustrating reality is that many excellent ideas or inventions are never translated into saleable or scalable innovations.

What, then, is innovation? A brief but broad definition was offered by the Council of Canadian Academies in their 2009 report on innovation: "new or better ways of doing valued things."[9] The Conference Board of Canada is more specific, defining innovation "as the process through which economic and social value is extracted from knowledge through the generation, development, and implementation of ideas to produce new or improved strategies, capabilities, products, services, or processes."[10] For healthcare innovation, the definition used by the Panel in its consultations included the concept of activities that "generate value in terms of quality and safety of care, administrative efficiency, the patient experience, and patient outcomes."[11]

These varied definitions underscore that innovation in healthcare should not be confused with invention in general or the creation of new technologies in particular. Innovation is instead an activity defined more by intent – the creation of economic and social value – than by form or process.

These definitions also meant that the Panel's mandate covered a wide spectrum of activities. Technological innovation anchored one end, e.g. consideration of how new genomic concepts or precision medicine should be introduced safely, effectively and efficiently into Canada's healthcare systems. Social and policy innovation anchored the other, e.g. new ways for professionals to work together, new ways of engaging patients, and new ways of financing and organizing health services.

Minister Ambrose recognized the potentially daunting scope of the Panel's remit, not least on an eleven-month timeline. The Minister eliminated one area of contention by specifying that the *Canada Health Act* should govern all its recommendations. As noted above, she also narrowed the Panel's task to delineating five priority areas for innovation and a handful of recommendations to the federal government on how to support innovation in each of those areas.

For its part, the Panel was privileged to receive input from hundreds of interested individuals and scores of organizations. Their submissions and suggestions pointed out the merits of a wide variety of innovation themes and related actions. In this report, consistent with its mandate, the Panel focuses on the five major areas of innovation that appeared most likely to make Canadian healthcare more effective and sustainable. The report also recommends a number of strategies for enabling the relevant changes in healthcare, some specific, and some cross-cutting.

Panel Consultations and Commissioned Research

As suggested above, the members of the Advisory Panel are indebted to a very large number of individuals who shared their insights, concerns, and ideas with Panel members. Appendices to this report provide detailed lists of submissions and attendees at various meetings. For now, a brief summary will suffice.

Over the course of the last year, the Panel heard from a great many groups and individuals, both in person and online. Some 180 stakeholders, including all the largest provider associations, made formal submissions, and about 260 members of the public responded online to a general call for commentary. To draw in younger voices, the Panel asked the Students Commission of Canada to conduct youth engagement activities, including two webinars and a number of interviews.

The Panel held in-person consultation sessions in Vancouver, Edmonton, Regina, Winnipeg, Toronto, Ottawa, and Halifax.

At those sessions, Panel members met with stakeholders from across the healthcare spectrum – policymakers, providers, researchers, industry leaders, patients, and innovators. Members supplemented their consultations with focused visits to the Northwest Territories, Yukon, Nunavut, New Brunswick, and Newfoundland. The Panel's Deputy Chair also convened roundtable meetings with academics/ stakeholders in Montreal.

On their travels, Panel representatives met individually and/or collectively with high-level officials from every province and territory in various venues. This collaborative approach was established from the outset. Within approximately a month of the Panel launch, the Chair spoke with provincial and territorial Health Ministers by teleconference and met with federal, provincial and territorial Deputy Ministers. The Chair also met with Ministers and Deputy Ministers at the annual Federal, Provincial and Territorial Health Ministers Conference in October 2014.

In like fashion, the Panel Chair and Executive Director met with the Assembly of First Nations' (AFN) National First Nations Health Technicians Network. Panel members also met with the Vice President of Nunavut Tunngavik Inc. (while in Nunavut), heard from First Nations stakeholders in Whitehorse and Yellowknife, and met with representatives from the First Nations and Inuit Health Branch at Health Canada to learn about the unique challenges faced by Aboriginal communities.

At its regular meetings, the Panel received presentations from the Canadian Institutes of Health Research (CIHR), with a special emphasis on the Strategy for Patient-Oriented Research, as well as several Pan-Canadian healthcare agencies: the Canadian Institute for Healthcare Information, Canada Health Infoway, the Canadian Patient Safety Institute, the Canadian Foundation for Healthcare Improvement, the Canadian Agency for Drugs and Technologies in Health, the Mental Health Commission of Canada, and the Canadian Partnership Against Cancer.

The Panel also held targeted consultations with key stakeholders on specific issues of interest. CIHR facilitated a Best Brains Exchange on the topic of personalized and precision medicine. Attendees included leading Canadian researchers and entrepreneurs in the field. Panel members participated in a tax policy roundtable with economic experts and health industry leaders organized under the auspices of the University of Calgary's School of Public Policy. The Canadian Council of Chief Executives facilitated a meeting of panelists with senior leaders of major industries with a special interest or stake in healthcare. An Industry-Government Collaboration roundtable was organized by the Institute of Health Economics, and attended by senior representatives from industry and the public sector, including several entrepreneurs. As well, a roundtable was organized to obtain patient, family and caregiver perspectives on healthcare innovation. This valuable meeting was facilitated by the Canadian Foundation for Healthcare Improvement and the Change Foundation.

In the Washington, D.C. area, the Panel visited health policy experts at Johns Hopkins University, the Commonwealth Fund, the Center for Medicare and Medicaid Innovation, the Agency for Healthcare Research and Quality, and the Brookings Institution. To better understand high-performing health systems, the Panel also convened a summit with leading experts from the Netherlands, the UK, the US (Kaiser Permanente), Denmark and Australia. Deputy Ministers of Health from across Canada joined panelists and secretariat staff for this very informative day of presentations and discussion.

As well, the Panel commissioned original research on number of topics. These include:

- A survey of federal, provincial and territorial healthcare innovation support
- The effect of different types of innovation on expenditure growth
- Implications of privacy regulations for electronic health records and patient portals
- Tax credits for non-insured healthcare services and tax-assisted healthcare savings plans
- Bundled payments for health services
- Trends and potential impact of more patient-centred care
- Cross-Canada survey of provincial and territorial informants to capture flagship innovations

A full list of research report titles and authors can be found in appendix 3.

What the Panel Heard and Read: A Tasting Menu

From the foregoing, it will be evident that the input and advice offered to the Panel was remarkable in breadth and depth. The commentary and analysis also contained a striking blend of negative and positive elements.

On the negative side, Panel members heard about the frustration of many stakeholders.

Patients told us about limited access to a variety of services. They lamented the barriers that were still consistently being erected to keep them from accessing their own health records, and noted their advice is neither sought nor taken seriously as regards improvement in the delivery of care. They also observed that the narrow scope of Medicare led to large out-of-pocket expenses for many Canadians, particularly those without work-related private health insurance plans.

Decision-makers and administrators complained of policy and managerial gridlock, confiding on occasion that attempts at reform in the public interest were sometimes co-opted to the short-term benefit of providers or politicians. Policy experts emphasized the clumsiness of the current fee-for-service mode of remunerating physicians, and asked why Canada had failed to adopt integrated delivery subsystems, exemplified by leading American group health plans. Professionals highlighted the ways that cumbersome regulations and perverse incentives were stifling their creativity and ability to play a bigger role in Canada's healthcare systems.

Canadians working at all levels of healthcare observed that innovations of proven worth were not being scaled up and spread across the nation. For their part, entrepreneurs asked why it was harder to penetrate the Canadian healthcare market than to sell their ideas, products, and services abroad. While the Panel did hear complaints about the levels of funding available for healthcare, a surprising number of stakeholders echoed the growing public sentiment that a lack of operating dollars was not the primary problem.

On the positive side, as already indicated, there was an extraordinary consistency of resolve that real change in healthcare was greatly overdue. Front-line healthcare leaders, policymakers, and other stakeholders across the country were utterly consistent in this regard. While no one offered up a simple recipe for an excellent healthcare system, many themes recurred.

Here is a partial list:

- Movement is being made to integrate services and budgets around patients, but far more work needs to be done to continue breaking down the silos that impede the achievement of patient-centred care.

- Non-physician scopes of practice are evolving and expanding throughout Canada, but wide variation exists across the country. Canada should emulate jurisdictions like Australia and the Netherlands that have promoted greater role flexibility on a national level and thereby enabled the emergence of stronger multi-professional teams.

- Canada's health info-structure has come a long way over the past decade, but we also started a very long way behind peer nations. Now the time has come to accelerate and catch up with nations such as Denmark and others that have deployed health information and communications technology to improve care and contain costs.

- With Canada's huge landmass and thin population density, as well as our longstanding commitment to telehealth, Canada should lead the world in mobile health and virtual care.

- Canada's physicians have made huge contributions to healthcare, but the current mode of organizing and funding healthcare is holding them back from a larger leadership role.

- The US, like Canada, is struggling to scale up healthcare innovation. However, tremendous creativity has been unleashed by 'Obamacare' payment reforms that offer multi-provider incentives based on both quality and efficiency of care. Only a few provinces have made small steps towards this type of "bundled payment" for services. Canada needs to get moving much faster with funding reforms.

- Given its continued challenges, the US system as a whole was not held up as a model; however, leading organizations and best practices within it were repeatedly singled out. For example, stakeholders urged Canada to learn from Intermountain Healthcare's approach to efficient processes of care, and Kaiser Permanente's strong orientation to multi-professional primary care teams and successful health promotion strategies.

Many other opportunities for improvement were flagged, of course. But so too were threats to the stability and sustainability of Canada's healthcare systems. Calling for Canada to put its healthcare house in order, stakeholders foresaw that our varied healthcare systems would be buffeted by forces such as demographic pressures, the advent of precision medicine and mobile health applications, consumer demands for participation in decisions about their healthcare, and societal expectations of greater transparency.

While stakeholders expressed concerns and called for reforms, they also urged that the Panel refrain from drive-by criticism of the efforts of specific institutions or regions. Instead, what they most commonly asked of the Panel were three things:

- The first was recognition of local and regional successes in improving healthcare, together with mechanisms to ensure wider adoption of such innovations. The Panel has been delighted to showcase in these pages what is only a very small sampling of the creativity of Canadians working in the healthcare realm. The Panel also proposes a major new mechanism to accelerate the evaluation and scaling-up of the innovative ideas of their fellow citizens.

- The second was a renewed federal, provincial and territorial partnership, ideally catalyzed by a new national innovation fund that would be distinct from the usual federal transfers. Panel members struggled to reconcile this request with federal fiscal constraints. As will become clear, their final and considered advice is that, without such a catalytic investment by the federal government, fiscal pressures on all Canada's healthcare systems will mount and become very difficult to manage. Either jurisdictions will do less of the same, with adverse impacts on quality and accessibility, or there will be escalating tensions around the ever-contentious elements of fiscal federalism.

- The third was that Canada's national government return to the table and help galvanize a consensus – or at least coalitions of willing jurisdictions – around elements of the structural reforms that many provinces and territories are currently attempting to advance. To be clear, this was not a call for Ottawa to over-step constitutional boundaries, or to posture *in loco parentis*. The provinces and territories carefully highlighted to the Panel the varied ways in which they are already working together.

That said, capacity to drive reform varies across jurisdictions. Ottawa itself has a larger direct healthcare delivery budget than several provinces and territories. The federal government has jurisdiction over certain matters that bear on health and healthcare innovation, not least research and development. Furthermore, effective in 2017-18, Ottawa has changed the formula for the escalator on its health transfers to provinces and territories. Instead of rising six percent per annum, transfers will grow at the rate of GDP expansion or at three percent, whichever is higher. While this move provides an important signal of fiscal discipline, it also reduces the financial flexibility of all provinces and territories to implement reforms.

To all these points in favour of a renewed federal investment and new federal role, the Panel members would respectfully add the following: We are all Canadians. Our nation has made a commitment to universal healthcare, and it is entirely reasonable to expect our national government to play a major and facilitative role in strengthening Canadians' confidence in their healthcare systems. More importantly, Canadian patients and taxpayers have every right to ask that *all* levels of government collaborate fully in restoring Canada to the international leadership position in healthcare that this country once proudly held.

Chapter 2

Trending Down or Scaling Up: Canada's Healthcare Choice

"Processes of scaling up are constrained by structures and cultures, and vested interests that are embedded at the system level."[12]

Dirk Essink

"I have witnessed countless cases of healthcare providers knowing what should be done, but having no way to make it happen from their position."

Public Submission

Trending Down or Scaling Up: Canada's Healthcare Choice

As summarized in Chapter 1, Canadians have long considered Medicare to be one of our nation's crowning achievements. It may be a purely continental conceit, but Medicare resonates for us as a statement of our values and our national identity. However, if the pollsters have it right, around 50 percent of the population thinks the system is currently "in crisis." Moreover, various third-party reports have suggested that, compared to Organisation for Economic Co-operation and Development (OECD) peers, Canada's healthcare systems on average are losing ground.[13,14] The Panel accordingly was very interested in understanding just how Canada's healthcare systems measured up.

If, as will become clear, Canadian healthcare systems are lagging, then several issues logically arise, and are also addressed in this chapter.

First, is there a 'model' system that we might choose from among the higher-performing systems? As it turns out, there is not. That simple fact puts an even greater premium on learning about grass-roots or bottom-up innovation in Canadian healthcare.

This chapter therefore turns to a tiny sampling of the front-line innovations that Panel members variously saw first-hand, or read or heard about in their consultations.[iv] This sampling is intended only to give readers a sense of the creative energy in Canadian healthcare, and reinforces the relevance of the final issue.

If, as seems to be the general view, these varied innovations are not spreading or scaling up across Canada, why not? To this end, the chapter also summarizes the barriers to wider adoption of innovations that stakeholders most often identified, and considers some international experience with scaling up healthcare innovations.

Perspectives on the Performance of Canada's Healthcare Systems

Some caveats are in order before commencing this brief review of a number of performance measures.

Rankings and league tables of all types appeal to the public and the media for a simple reason: they take that which is complex and abstract and render it accessible and understandable. By design, they carry risks of over-simplification. These rankings can also be misleading for other reasons. In that respect, healthcare leaders and providers justifiably worry whether data are being interpreted correctly, whether the indicators are the right ones, or whether there is gaming of the numbers. Administrators and policy-makers fuss, too, about untoward side-effects – the phenomenon that "what matters is what's measured," not least what gets reported in the media. More generally, comparing health systems gives new life to time-worn clichés about comparing apples and oranges.[15]

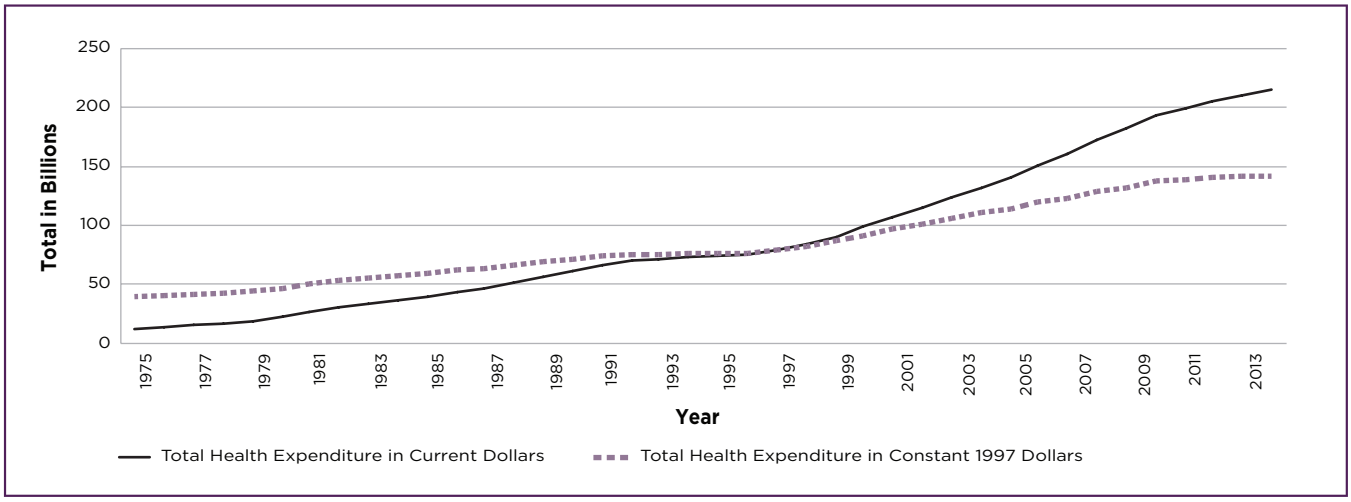
All that said, the Panel sees an unsettling convergence of findings in the results below.

Health Spending

Since the 1970s, distinct spending trends have been observed not only in Canada, but across all industrialized nations in the OECD. All nations have experienced rates of increase in the cost of healthcare that have outpaced the rate of economic growth. In Canada, a sharp upward spending trend has continued with the exception of brief periods in the 1990s where growth was flat (see figure 2.1). However, measured as a percentage of GDP, health spending in Canada has outpaced many other countries in the OECD.[5] As shown in figure 2.2, Canada is among the higher spenders in OECD countries at 10.2 percent of GDP in 2013 and, with adjustment for purchasing power, US$4,351 per person in 2013. This compares to an OECD average of 8.9 percent and a similarly adjusted US$3,453.[16]

iv Later chapters will profile other innovations.

Figure 2.1 Total Health Expenditures, Canada 1975-2014



Source: Adapted from Canadian Institute for Health Information (CIHI). National Health Expenditure Trends, 1975 to 2014. Ottawa: CIHI; 2014. Available from: http://www.cihi.ca/CIHI-ext-portal/pdf/internet/nhex_2014_report_en

Figure 2.2 International comparison of health spending[v]

	CANADA	OECD AVERAGE	CANADA'S OECD RANKING	CANADA'S RANK AMONG PEER COUNTRIES
TOTAL HEALTH EXPENDITURE AS A % OF GDP	10.2	8.9	10/34	7/11
TOTAL HEALTH EXPENDITURE PER CAPITA	$4,351	$3,453	10/34	7/11
PUBLIC EXPENDITURE ON HEALTH PER CAPITA	$3,074	$2,535	13/34	8/11
PUBLIC SHARE OF TOTAL HEALTH EXPENDITURE	70.6%	72.7 %	22/34	8/11
HOSPITAL EXPENDITURE PER CAPITA	$1,338	$1,316	15/29	9/9
PHYSICIAN EXPENDITURE PER CAPITA	$720	$421	4/27	4/8
DRUG EXPENDITURE PER CAPITA	$761	$517	2/31	2/9

Notes: Peer countries consist of Australia, France, Germany, Netherlands, New Zealand, Norway, Sweden, Switzerland, US, and UK; Rankings are ordered from highest to lowest expenditure; Based on 2013 data where available or next available preceding year; All figures are in $US and adjusted for purchasing power parity.

Source: OECD Health Statistics 2015

v Figure 2.2 and related paragraphs updated to reflect 2015 OECD data (where available), which was released at the time this report was going to press. The remainder of this report has not been updated to reflect the 2015 data.

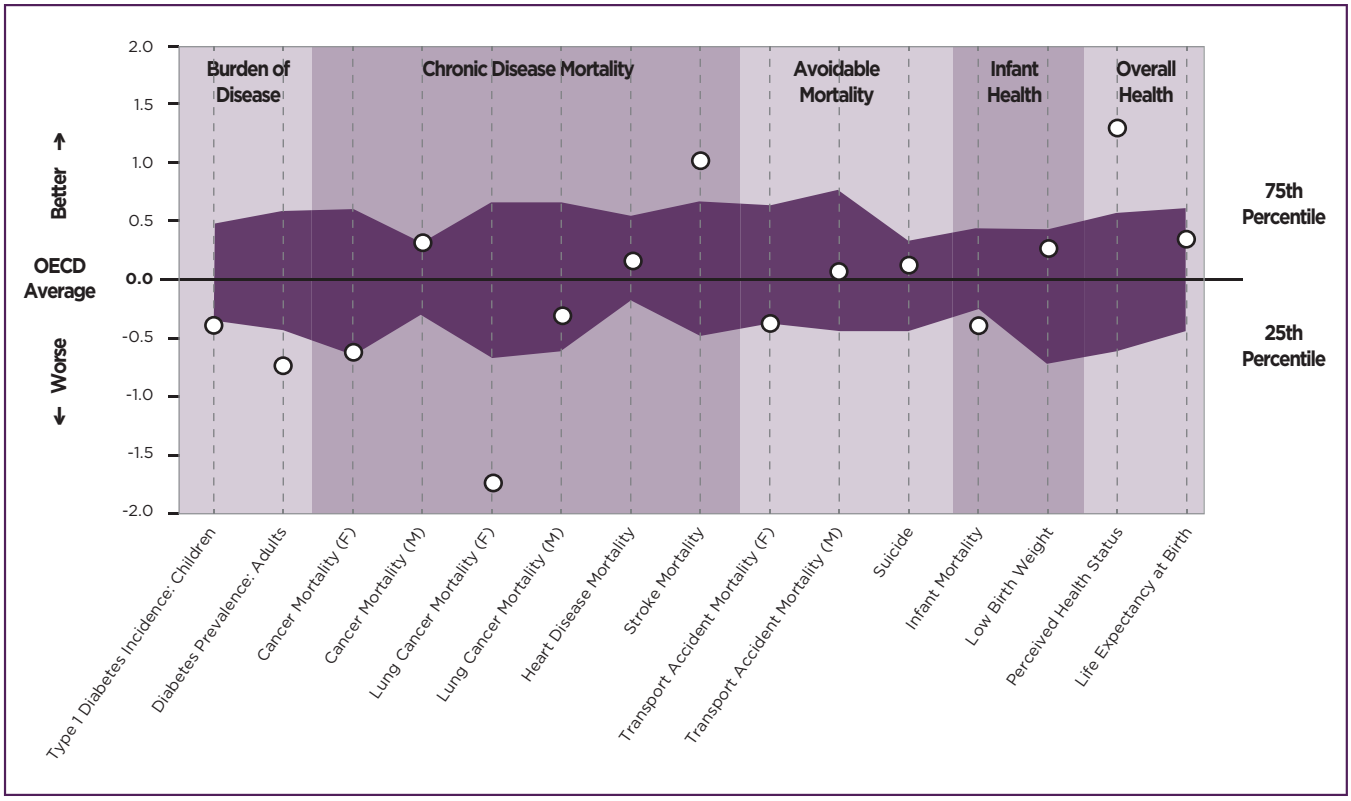
Given the number and diversity of OECD members, most Canadian benchmarking exercises use a smaller subset of "peer countries" such as Australia, France, Germany, Netherlands, New Zealand, Norway, Sweden, Switzerland, US, and UK. These comparisons seem more plausible but Canada still spends more than some peers.

On the bright side, the absolute increases in health spending in Canada have slowed over the past five years, and have been outpaced by GDP growth.[5] This pattern, however, is not unique. A similar trend became apparent across the OECD after the onset of the global financial crisis in 2008.[17,18] Moreover, spending may be starting to rise again, although not at rates seen before the global recession.[19]

Canada falls slightly below the OECD average and ranks 22nd out of 34 countries in terms of its public share of total health expenditure. This is due to Canada's heavy reliance on private health insurance and out-of-pocket spending to finance prescription drugs, and other services. However, while that ranking on its face appears to favour greater public coverage, it is also misleading in one key respect. Because Canada spends more overall than most OECD countries, its public spending in absolute per capita terms is still well above the OECD average.

Canada also has an unusual pattern of spending across major sectors of healthcare. It stands out from peers for very high drug prices and total drug spending. As shown in figure 2.2, on a per capita basis, Canada ranks second to what the US spends on prescription drugs. Canada's spending on physician services is also significantly above the OECD average, placing it fourth out of 27 countries with comparable data. Canada's relatively high spending on drugs and doctors occurs despite very different pricing and purchasing mechanisms for these two healthcare sectors, underscoring that single-payer systems in

Figure 2.3 Health Status Performance Profile, Canada



Note: The white dots represent Canada's overall performance relative to the OECD average. Source: Adapted from Canadian Institute for Health Information (CIHI). Benchmarking Canada's Health System: International Comparisons. Ottawa: CIHI; 2013. Available from: https://secure.cihi.ca/free_products/Benchmarking_Canadas_Health_System-International_Comparisons_EN.pdf
Source: Canadian Institute for Health Information

themselves do not guarantee cost containment. Hospital expenditure is the only sector where Canada's spending is on par with the OECD average and ranks favourably relative to peer countries.

Health Outcomes

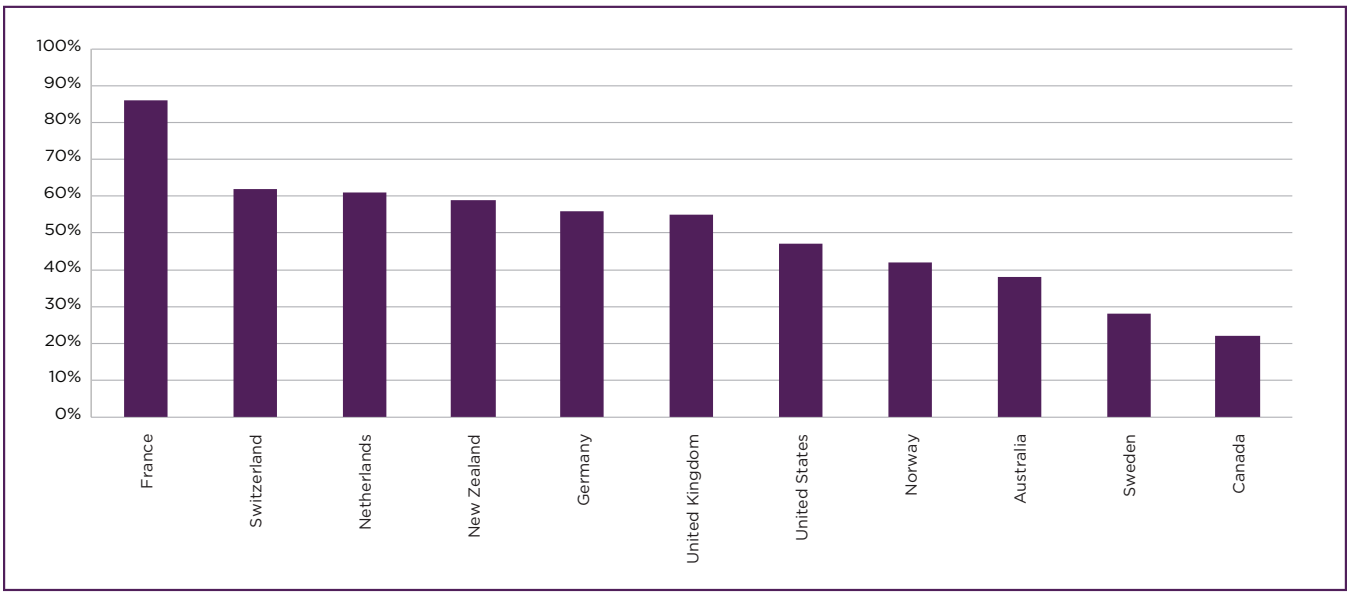
A key issue for Canadians is whether all these billions of dollars are buying better health for the population. International evidence does suggest there is some relationship between higher health spending and better health outcomes. The problem is that the marginal return on these investments seems to diminish as countries spend more on healthcare.[14] This underscores the hard choices already confronting provinces and territories, namely whether to spend more on healthcare or on social determinants of health and well-being such as education and homelessness.

On a related point, measures such as life expectancy at birth are often cited in rankings. Canadian life expectancy was 81.5 years in 2011, more than a year higher than the OECD average, three years longer than the US, but shorter than residents of Japan, Switzerland, Iceland and Spain.[20]

Life expectancy arguably sheds limited light on healthcare system performance because it is influenced by social determinants and behavioural choices – a caveat that also applies for perceived health status. Examining more specific and pertinent measures (see figure 2.3), one sees that Canada outperforms OECD peers on many measures (e.g. stroke mortality, cancer mortality for men), while in others it does not compare well (e.g. cancer mortality for women, especially for lung cancer).[21] The overall conclusion seems to be that, for broad population health outcomes, Canada's healthcare systems register results consistent with OECD averages.

As to health promotion and behavioural choices, Canada has made significant progress in reducing tobacco consumption: the rate of daily smokers among adults has fallen from 22 percent in 2001 to 16 percent in 2012. However, the proportion of obese Canadians has risen over the past decade, with 25 percent of adults meeting height and weight criteria for obesity.[22] That proportion remains lower than in the US (35 percent in 2012) and Australia (28 percent),[23,24] but its rise foreshadows increases in chronic health problems such as diabetes, cardiovascular diseases, and arthritis – along with higher healthcare costs.

Figure 2.4: Percentage of Doctors Reporting That "Almost All" Their Patients Can Get a Same or Next-Day Appointment



Source: Adapted from Schoen C, Osborn R. The Commonwealth Fund 2012 International Health Policy Survey of Primary Care Physicians. New York (United States): The Commonwealth Fund; 2012.

Available from: www.commonwealthfund.org/~/media/Files/Publications/In%20the%20Literature/2012/Nov/PDF_2012_IHP_survey_chartpack.pdfCommonwealth Fund

Access to Healthcare in Canada

Notwithstanding the obvious importance of outcomes, access to care may be the aspect of healthcare that matters most to patients and their families. Access has been an ongoing public concern for the past two decades. Interest peaked in the late 1990s and early 2000s when stories about waiting times for a variety of specialized services drew wide media coverage.

In response, the 2004 intergovernmental health accord included $5.5 billion in federal funding over 10 years to address wait times for five priority clinical areas: cancer, heart, diagnostic imaging, joint replacement and sight restoration (cataract surgery).[25] Provinces and territories reinforced this commitment with their own operating funds, and gave special attention to these priorities, with tangible results. For example, during the last five years the number of radiation treatments has risen 34 percent across Canada, while hip replacements are up 28 percent and knee replacements up 24 percent. About eight out of 10 patients have received these procedures within benchmark waiting times. Notably, 98 percent of radiation therapy was delivered within the benchmark of 28 days.[26] In these areas, Canada compares favourably with peer countries across the OECD.[21]

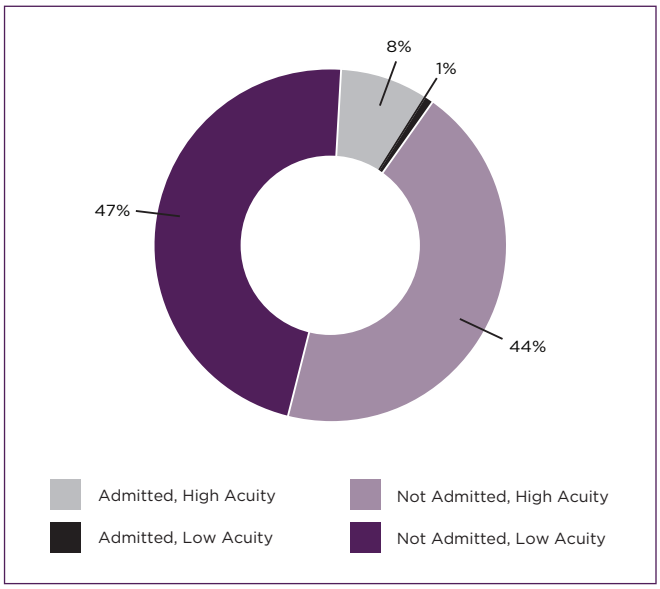
On the other hand, it appears that Canadians still have suboptimal access to ambulatory care – including family doctors, various specialists, nurse practitioners and nurses, non-physician psychotherapists, and physiotherapists. Access to basic primary care in particular compares poorly to other nations. For example, a 2012 study of 10 nations conducted by the US-based Commonwealth Fund found that only 22 percent of Canadian doctors say their patients can get an appointment the same or next day they call (compared to 38 percent in Australia and 55 percent in the UK) and only 45 percent of doctors have a family practice that provides for after-hours care (compared to 95 percent in the UK and 81 percent in Australia).[27]

The lack of access to community-based care represents a lost opportunity for upstream interventions that can improve patients' quality of life, as well as prevent costly hospitalizations. It also underscores questions raised by some provincial governments about their return on major investments in primary care reform.

Five years ago, the Commonwealth Fund found that, in comparison to citizens in Australia, New Zealand, Germany, US and the UK, Canadians were most likely to visit hospital emergency rooms for conditions amenable to care by a family doctor or primary care nurse.[28] Two years later, an analysis from the National Ambulatory Care Reporting system showed that half of the people in Canadian emergency rooms were deemed to have non-urgent low-acuity conditions (see figure 2.5).[29] It is convenient to blame patients for these visits, but a more likely explanation is that access to primary and ambulatory care (for example, care after hours) remains suboptimal. The Panel suspects that some of this shortfall could be addressed by greater use of nurse practitioners for primary and specialty care, but has also been struck that health human resource planning in Canada reflects the same stovepipe approach that bedevils the system as a whole.

While access is understandably top of mind for many Canadians, there is another vital dimension of healthcare performance. How good is the quality of the healthcare once Canadians access it? Answering that question requires more specific measures than broad population health outcomes.

Figure 2.5 Relative Percentages of Emergency Department Patients Who Were Admitted or Not Admitted to Inpatient Care, by Acuity Level, 2010-2011



Source: Canadian Institute for Health Information (CIHI). Health Care in Canada, 2012: A Focus on Wait Times. Ottawa: (CIHI); 2012.

Available from: http://www.cihi.ca/cihi-ext-portal/pdf/internet/HCIC2012_CH2_EN

Figure 2.6 Nation Summary Scores on Health Systems Performance

	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING	**4**	**10**	**9**	**5**	**5**	**7**	**7**	**3**	**2**	**1**	**11**
Quality Care	**2**	**9**	**8**	**7**	**5**	**4**	**11**	**10**	**3**	**1**	**5**
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
Access	**8**	**9**	**11**	**2**	**4**	**7**	**6**	**4**	**2**	**1**	**9**
Cost-Related Access Problems	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	**4**	**10**	**8**	**9**	**7**	**3**	**4**	**2**	**6**	**1**	**11**
Equity	**5**	**9**	**7**	**4**	**8**	**10**	**6**	**1**	**2**	**2**	**11**
Healthy Lives	**4**	**8**	**1**	**7**	**5**	**9**	**6**	**2**	**3**	**10**	**11**
Health Expenditures per Capita, 2011*	$3,800	$4,522	$4,118	$4,495	$5,099	$3,182	$5,669	$3,925	$5,643	$3,405	$8,508

*Expenditures shown is $US PPP (purchasing power parity); data for Australia from 2010.

Data: OECD, *OECD Health Data, 2013* (Nov. 2013).

Adapted from Davis K, Stremikis K, Squires D, et al. Mirror, Mirror on the Wall: How Performance of the U.S. Health Care System Compares Internationally. New York (United States): The Commonwealth Fund; 2014. Available from: http://www.commonwealthfund.org/~/media/files/publications/fund-report/2014/jun/1755_davis_mirror_mirror_2014.pdf

Quality of Care

On several key measures of quality of care, Canada performs well. For example, survival rates in the 30 days following a heart attack are better than the OECD average,[30] as are survival rates after treatment of breast and colorectal cancer. On the other hand, the rate of post-operative pulmonary embolism or deep vein thrombosis for hip or knee replacement surgery is higher than elsewhere in the OECD, as is the rate of obstetrical trauma.[31] The overall picture suggests that condition-specific quality of care in Canada may be somewhat above average for the entirety of the OECD.

As depicted in figure 2.6, however, in comparison to peer nations with high-performing healthcare systems, Canada lags in terms of overall quality of care. In the 2014 Commonwealth Fund ranking, Canada ranked between 7th and 10th on key indicators of quality. Our overall ranking at 10th out of 11 nations is also sobering.

The Myth of the 'Miracle System'

The most plausible interpretation of the foregoing profiles is that Canada has been spending relatively more money for thoroughly middling performance. Are there other nations that provide plausible examples to show we could be doing better?

The experience of the UK is one. Governance of the UK's National Health Service (NHS) has been devolved by jurisdiction to England, Wales, Northern Ireland, and Scotland. However, the combined effects of reinvestment and restructuring have been dramatic. The result is that the NHS, once perceived to be in chronic crisis, now tops most rankings, while spending much less per capita than Canada.[13]

Australia is another strong performer.[13] For many years Australia ranked near the bottom of the top 10 in the OECD healthcare league tables. Today, it sits within the

top three or five on most measures, and outperforms Canada on many major health outcome indicators (e.g. life expectancy, infant mortality rates, mortality amenable to healthcare, diabetes prevalence and suicide rates per 100,000).[14,32] This has been achieved while constraining healthcare spending in 2012 to 9.1 percent of GDP[vi], well below Canadian spending.[23]

The problem for those seeking a single model system, however, is that Australia could not be more different from the UK.

The UK depends on four unitary health services, with avoidance of charges at most points of care. The latter ethos will be familiar to Canadians. Specialists within the National Health Services are paid by salary and employed by regional trusts. They have limited opportunity to engage in private practice. Family physicians – or general practitioners (GPs) as they are better known – are paid on a per-patient or capitated basis. Integration of GPs with the wider system is promoted by their involvement in commissioning a range of other services.

Australia, in contrast, relies on a complex web of public and private insurance plans and institutions. Basic coverage for public hospitals, physician services, and drugs is provided in a national Medicare program sponsored by the federal government. However, about half the population has additional private insurance, and private hospitals are well-established.[33] Co-payments at point of service are common, although protections are provided for low-income patients. Overall hospital budgeting is activity based, with state-level oversight but funding through federal, state and territory budgets. Last, while some specialists are salaried, the majority of physicians work on a fee-for-service basis and have considerable latitude to set their own fees.

The differences between the UK and Australia are revealing in other ways. As noted above, Canada's public-private mix in healthcare finance is 70:30, giving rise intuitively to concerns that our lower proportion of public spending contributes to our underperformance. However, while the UK has an 84:16 public-private split in spending, Australia's split is 68:32.

The example of the UK also underscores the earlier caveat about absolute spending levels. Despite its much lower proportion of private spending, the UK's adjusted level of public spending in 2012 was about US$2,750 per capita. Canada's adjusted public spend was about US$3,200 per capita – approximately 20% more and a massive difference when scaled up nationally.

The contrast in these two high-performing universal systems underscores that there is no plug-and-play healthcare model. Healthcare systems instead arise from a socio-political, economic, and demographic context.[34] Of course, specific lessons can be learned from high-performing systems; some of those programs and principles will be covered in later chapters. However, there are two implications worthy of mention now. First, in learning from other nations Canada will need to adapt flexibly rather than adopt slavishly. And second, the lack of an off-the-shelf 'miracle system' lends additional importance to Canadian healthcare innovation at a grass-roots level.

Innovative Energy on the Front Lines

As noted earlier, members of the Panel were often inspired and somewhat overwhelmed by the number of impressive improvements that Canadians are busy making in their local and regional healthcare systems. This extremely abbreviated sampling is intended only to provide a sense of the scope of activity.

The Panel heard many examples of *creative use of technology*, not least in addressing the special challenges of rural and remote communities. For example:

- The use of "doctor in a box" robotics technology in northern Saskatchewan is enhancing long-distance communication between patients and providers, and improving clinical consultations with bedside photo and video capabilities. Likewise, the University of Saskatchewan's College of Nursing's use of robotics for teaching has been effective and efficient in serving nursing students living in northern communities.

- The Northwest Territories' Med-Response initiative is a new call centre service that provides a single point of contact for healthcare practitioners in remote communities to readily access clinical expertise and triage-related advice during emergencies, along with air ambulance dispatch services when needed.

vi The discussion below is based on the 2014 OECD report and primarily draws on 2012 data.

- Newfoundland has partnered with CIHR and private industry – including IBM – to launch the Translational and Personalized Medicine Initiative. Discussed further in Chapter 7, this initiative will harness big data analytics, top genetic and genomic research expertise, and Newfoundland's unique population with a view to reducing healthcare costs and improving patient outcomes through precision medicine approaches.

- Nunavut Telehealth is working with the Tele-Link Mental Health Program at the Hospital for Sick Children in Toronto to improve access to specialized mental health services for children and youth. Through the use of videoconferencing, mental health workers in Nunavut will be able to connect with each other, as well as consult with specialists in other provinces in order to provide comprehensive clinical psychiatric and psychological assessments.

- Known as the "hospital without walls," New Brunswick's Extra Mural Program continues to be recognized as an innovative publicly funded program that provides comprehensive health services to individuals living in their homes or communities. Since its inception in 1981, the program continues to evolve, most recently adopting the use of telehealth and patient education to enhance communication with providers and support self-care.

More broadly in health information technology, literally scores of projects were brought to the Panel's attention, ranging from scaling-up of patient portals in Nova Scotia, to the near-universal adoption of electronic medical records by physicians across BC and Alberta.

The Panel heard and read, too, about the development of a number of *new healthcare delivery models*, where groups of stakeholders – professionals, institutions, communities, or industry – are working together in novel ways to deliver more comprehensive and effective care to patients. Among them:

- In Nova Scotia, Manitoba and BC, paramedics are being deployed in new extended roles – for instance, home visits to assist with providing primary healthcare for patients who are housebound.

- In Alberta, Strategic Clinical Networks have grown rapidly as "bottom-up networks" that foster inter-professional and clinical/academic collaboration to meet the specialized needs of patients, both upstream and downstream.

- In BC, taking a leaf from the Australian playbook, regional Divisions of Family Practice are facilitating integration and coordination of primary care for patients, as well as strengthening support for family doctors and communities through recruitment and retention efforts.

- The Yukon Lands and Culture Base Healing Model, developed by Kwanlin Dün First Nation Health Department, is a holistic model that integrates traditional and modern approaches to health. A range of practitioners provide integrated care including health promotion and prevention activities, treatment on the land and in the community, and traditional knowledge sharing.

- PEI has partnered with the Quebec-based pharmaceutical company AbbVie to develop and implement a province-wide hepatitis C management strategy, which will provide access to newer, more effective drug therapy; strengthen screening and referral processes; and enable more seamless care for patients living with hepatitis C.

- In Québec, l'Hôpital du Sacré-Cœur de Montréal pairs undergraduate nursing students from the Université de Montréal and the Université du Québec en Outaouais with experienced critical care nurses in a six month residency program. This program has dramatically improved the competencies of new nurses, as well as their recruitment and retention at the hospital.

The Panel also heard and read about a number of creative approaches to *community outreach programming*. These programs support experimentation and evaluation to help patients navigate the system and plan for their own care. As one example, the INSPIRED™ program has been providing outreach and support to Halifax patients living with Chronic Obstructive Pulmonary Disease. Results from 2012 showed dramatic reductions in emergency department visits and hospitalizations. Harder to measure is the peace of mind that both patients and their families report from a better understanding of the disease, its management, and its usual course. Other encouraging examples will be presented in Chapter 5.

From a more systemic perspective, the Panel was informed about a number of initiatives that provided *public sector support for innovation efforts* and related culture change. Among the many notable efforts:

- The BC government has made significant investments in health data and research, and set innovation goals for the healthcare system as part of the province's Innovation and Change Agenda, introduced in 2009.

- Alberta Innovates – Health Solutions has focused its efforts on marrying applied healthcare research to grass-roots innovation, with many successes to date.

- In Ontario, a very dynamic environment for healthcare innovation has been fostered in Toronto by the convergent work, collaboration, and in some cases co-location of a variety of organizations, including the University Health Network, MaRS Discovery District, the Women's College Hospital, the University of Toronto, and Saint Elizabeth Health Care.

As the lists of projects grew in the course of the Panel's travels, members were reminded of this country's heritage of caring and the 'can-do' attitude that has long been a source of pride for Canadians. They also found themselves increasingly puzzled as to how and why Canada's healthcare performance was lagging.

Barriers to the Scaling-Up of Innovative Ideas

Consultations with stakeholders and citizens again proved illuminating. Many submissions and discussions converged on the significant barriers confronting those trying to initiate, evaluate, and ultimately scale up innovations in healthcare.

"There is a lack of funding opportunities to support successful regional initiatives to become national initiatives. While economies of scale work in favour of national incentives, lack of stable operating funding at the national level impede these efficiencies. Turning a successful regional pilot into a successful national initiative requires the commitment of a stable funder."

Stakeholder Submission

The barriers most commonly identified are summarized below:

Lack of meaningful patient engagement: Many stakeholders observed that patient and family engagement (as part of patient-centred care) is important to fostering healthcare innovation, but under-developed in Canada. Chapter 5 deals in detail with this issue.

Outmoded human resource models: Time and again, the Panel heard that Canada's physicians are a superb national resource, but our healthcare systems have been organized around and under them in dysfunctional ways. The result is a waste of talent in all directions. Systems make suboptimal use of the special training and skills not only of physicians, but a wide range of other healthcare professionals. This issue receives attention in Chapters 5 and 6.

"We need to connect the dots. It's one of our greatest weaknesses... We have some of the greatest programs in the world, but we need to bring them together."

Stakeholder Submission

System fragmentation: Many saw the system to be burdened by a lack of integration that effectively stifles innovation, particularly the spread of innovation between organizations and across jurisdictions. Managers and professionals in one region after another acknowledged that patients and families lose the most in a poorly-coordinated system. However, they also lamented how the non-alignment of incentives undercut both strategic purchasing and efficient management. This factor – lack of integration – emerged time and again as the single most important barrier to innovation. Chapter 6 is devoted to the nexus of integration and innovation.

Inadequate health data and information management capacity: High-performing healthcare systems generate large volumes of data and turn those data into useful information for payers, providers, patients, and industry partners. Canada still lags in this regard. Chapter 7 offers a more detailed response to this challenge.

Lack of effective deployment of digital technology: Canada is playing catch-up compared to high-performing OECD peers in the deployment and meaningful use of electronic medical and health records. These factors underpin the lag in health data generation and information management capacity noted immediately above, and reduce the responsiveness of our healthcare systems to innovation.

Barriers for entrepreneurs: It appears that entrepreneurs across Canada are finding it difficult to introduce, sustain and scale up their innovations in the healthcare system. Leaders of companies – particularly smaller enterprises – complained about cumbersome approval processes, diffuse accountability, opaque and fragmented purchasing processes, mistrust of the private sector, and a perverse unwillingness to buy Canadian. Stakeholders with international experience argued that these barriers are much more prevalent in Canada than in other countries, where private enterprise is welcomed as a risk-sharing partner. Chapter 9 returns to this issue.

A risk-averse culture: It is unsurprising that healthcare delivery systems are risk-averse. Mistakes can be fatal. However, some stakeholders argued that the precautionary principle in clinical care had pervaded the organization and finance of the system as a whole, contributing to stasis and impeding the spread of innovation. Until a change in culture is signalled, they argued, leaders in the system may be reluctant to confront those who have a vested interest in the status quo, or who simply have what was described as "NIH syndrome" – a pathological suspicion of anything that is 'Not Invented Here.' The Panel supports these concerns.

Inadequate focus on understanding and optimizing innovation: Stakeholders told the Panel that healthcare systems leaders make too many decisions that are short-term and politicized. They observed a lack of overarching vision for Canada's healthcare systems, and called for greater clarity of objectives and firmer follow-through on priorities for innovation, architectural changes to the system, and rules of engagement for participation by innovators from the public and private sectors alike. Stakeholders also noted the limited funding for pragmatic evaluation as distinct from academic research, and lack of both mechanisms and the political will to spread, scale up, and sustain high-potential innovations.

This list of barriers may explain why a former federal health minister once famously characterized Canada as "a country of perpetual pilot projects."[35] Certainly the combination of creative energy and substantial barriers would also explain the frustration among stakeholders cited in Chapter 1.

Can Spread and Scaling-Up Win the Day?

Many stakeholders advised the Panel that the gridlock in Canadian healthcare could be meaningfully improved simply by finding better ways to spread and scale up all the initiatives and programs that are currently working well but have not been widely adopted.

What exactly is meant by these terms? "Innovation spread" is primarily a diffusion exercise, involving sharing and learning among relatively homogeneous groups of practitioners or settings. For example, studies dating to the 1950s have identified the factors involved in doctors being slow or rapid adopters of innovations, along with possible modalities for speeding up adoption.[36]

> "We have the best pilots and studies, but we don't seem to take it to the next step… innovation isn't just coming up with an idea, it's about making it sustainable."
>
> *Participant at Regional Consultation*

This diffusion approach is largely what the Panel witnessed in Canada – a strategy of engaging professionals and managers, and sometimes entire organizations, to move slowly in a positive direction. A provincial quality council might speed up the adoption of surgical checklists or process-of-care improvements. At other times, a searchable repository of promising practices might be put into play, with positive results. This is all important work, but given the identified barriers, unlikely to precipitate rapid changes in Canadian healthcare.

"Scaling up," in contrast, implies taking a system-wide perspective on adoption. "Scaling up means expanding, adapting and sustaining successful policies, programs or projects in different places and over time to reach a greater number of people."[37] This requires thinking less about small collaborative approaches and more about long-term vision, the use of financial incentives (or removal of perverse ones), changes to laws and regulations, and other interventions that might spur system-wide adoption.

"When we try to spread innovation within a region or between regions, we fail day in and day out. We don't do well… we haven't figured out what the barriers are."

Participant at Regional Consultation

The World Health Organization deepens this definition by warning that more resources alone are rarely enough to ensure successful scaling-up. Scaling-up instead requires a dedicated focus on removing constraints, which may include weak management systems. Success factors include: [38]

- *A partnership of organizations* working on service delivery, financing and/or stewardship (co-ordination, regulation etc.)
- *A highly committed group of individuals* to push it along
- *Monitoring implementation*, in order to assess progress relative to objectives and for identifying aspects of the scale-up which are not working well, often a neglected component of efforts to scale up

Though explicit scaling-up strategies are uncommon in the healthcare systems of the OECD, the Panel did learn of examples where high-performing health systems had invested to take successful local experiments and scale them up to the level of regional or even national health systems:

- England's National Health Service has recently established a formal NHS Innovation Accelerator program, established with the goal of "giving patients more equitable access to cutting edge, high impact products, processes and technologies, by focusing on the conditions and cultural change needed to enable the NHS to adopt innovations that matter to patients, at scale and pace."[39] This program, launched in January 2015, will select up to twenty pioneers to bring into play tried and tested innovations from the UK and around the world. The chosen innovations will be strategically scaled up across parts of the NHS to improve care and reduce costs. The program is run as a partnership between the National Health Service, UCL Partners and the Health Foundation.
- Many non-profit group health plans in the US have taken steps to scale up innovation within their integrated delivery systems.[40] For example, Kaiser Permanente, the largest managed care organization in the US with more than 35 medical centres and 150,000 employees, constantly uses its varied operations to test new ways of delivering healthcare. If the results are positive for patients, Kaiser rapidly adapts and scales up the resulting innovations to reach its almost 10 million subscribers.
- Last, the Panel was impressed by the iterative approach to innovation being taken by the Center for Medicare and Medicaid Innovation (CMMI) in the US healthcare system. Under the 2010 *Affordable Care Act*, the Medicare and Medicaid administration has wide latitude to amend payment programs, so long as the Center has evaluated a particular payment innovation and found, in a rigorous "signature test," that it increases the value of the affected services.[vii] The CMMI is particularly interested in models that consolidate funding across service lines – in other words, integrating budgets to move the focus towards patients and populations. This work will be revisited in Chapter 6. For now, it is worth noting that, even with an approach based on rapid-cycle iterations to refine payment models, scaling up has been challenging. Studies are now designed to assess not only the processes and outcomes of care, but also the factors that might enable rapid scaling-up of a given payment model.

"Our landscape is littered with clever innovative boutiques, and when we try to scale them they remain clever innovative boutiques. They can only be run by people like those who started them and in places like where they were started. What we imagined was taking those boutiques and scaling them into a chain of healthcare Walmarts. In reality, what we may need to do is develop a franchising strategy first."

US Health & Human Services Official, commenting on payment reform under 'Obamacare,' June 2015

vii Any new model can be scaled up if it: a) "reduces spending while maintaining or improving quality, or improves quality without raising spending, taking into account a formal certification by the Center for Medicare and Medicaid Services Chief Actuary," and b) "does not adversely affect the coverage or provision of benefits."

The Panel was encouraged by these activities, chastened by the clarity and focus of the work being undertaken, and also mindful that these initiatives were all unfolding in healthcare systems with a different architecture.

How in Canada can one reconcile the evidence on factors that allow effective scaling-up with the many barriers the Panel identified in its consultations? The answer, bluntly, is that reconciliation is impossible without a new approach. Too many of the barriers are systemic, not least the fragmentation of Canadian healthcare. As will become clear, the Panel believes that more effective scaling-up can only occur with new federal investments deployed through new mechanisms, the adaptation of existing machinery, a commitment to scaling up on the part of provinces and territories, a new culture of collaboration among jurisdictions, and a concerted national drive towards system reforms that integrate budgets, align incentives around quality and value, and sharpen provider accountabilities. That leads logically to the question of the federal government's role and its current healthcare machinery.

Chapter 3

The Evolving Federal Role in Canadian Healthcare

"Contrary to popular opinion, healthcare is not an exclusive provincial responsibility under the Canadian constitution… Over time, a complex system has evolved in which the federal and provincial governments each have specific regulatory and administrative roles. To deal with the inevitable policy overlaps and interdependencies, a thick system of intergovernmental processes and institutions has grown up over the last decades." [41]

Gregory P. Marchildon

"Canada's size and federated structure (with 14 different healthcare delivery systems) creates barriers. It has often been said that Canada is a nation of pilot studies because brilliant, local initiatives that show tremendous promise tend to be very time-limited, are not adequately funded to include a phase of scaling-up and spreading of the knowledge, and/or are shared through mechanisms such as academic journals that have a limited reach to the front lines where innovation can grow."

Stakeholder Submission

The Evolving Federal Role in Canadian Healthcare

Medicare remains Canada's most iconic social program, and continues to make a difference to the lives of millions of Canadians. However, to recapitulate, three disconcerting themes have emerged from the foregoing chapters:

- International comparisons show that Medicare is aging badly.
- A wide range of Canadians working in and around our healthcare systems have launched impressive innovations at the local and regional level, but spread and scaling-up of these improvements are slowed by a number of barriers, many of which are systemic.
- Finally, while the programmatic architecture of Medicare initially helped Canada to achieve universal access to high-quality hospital and physician services, that structure has now become one of the major barriers to transformation of our healthcare systems.

Another layer of complexity in healthcare reform is Canada's unique combination of constitutional, political, and cultural specificities. That is a logical segue to the themes of this chapter: the evolving federal role in healthcare, and the relevant machinery of the Government of Canada as it intersects the healthcare realm. Before going down that path, it seems both informative and duly respectful to review and reflect on the work of past advisory bodies and commissions.

A Common Diagnosis From Health System Reviews

Canadian healthcare has been studied over the past 25 years by a multitude of task forces, royal commissions and inquiries on healthcare across provinces and nationally.[42] The most prominent provincial reviews, arguably, were Seaton in BC,[43] Mazankowski in Alberta,[44] Fyke[45] and Dagnone[46] in Saskatchewan, Sinclair[47] and Drummond[48] in Ontario, and Clair[49] in Quebec. However, there have been many other provincial task forces and committees. At the national or federal level, key reviews included the National Forum on Health,[50] the Romanow Commission,[51] the Kirby Senate Committee,[52] and most recently, at the inter-provincial level, the Council of the Federation's Health Care Innovation Working Group.[53]

With so many reviews arising at different times and places, some divergence occurs in the analyses and recommendations, as would be expected. However, what is more striking is the consistency in both diagnoses and prescriptions for change. Similar themes emerge again and again, including:

- the lack of an integrated and patient-centred healthcare system,
- the importance of efficiency and value-for-money in ensuring system sustainability, and
- the need to build a shared knowledge-base and learn from it to improve services for patients and overall system management.

These reviews have also reaffirmed the values of universal, portable public insurance for healthcare, and the principle of access based on need rather than ability to pay. Greater private financing has been consistently rejected due to equity and efficiency concerns.[50]

All these task forces, inquiries, and commissions have added positive momentum for improvements in Canadian healthcare. Yet, they have not resulted in fundamental change to the system's architecture, such as modernizing provider incentives and accountabilities or extending coverage beyond physician and hospital services. This phenomenon is so pronounced that it galvanized publication in 2013 of a scholarly book, entitled *Paradigm Freeze: Why it is so hard to reform health-care policy in Canada*.[54] Whatever the causes of that "freeze," jurisdictions seem hesitant to go it alone in making changes needed to effect a general thaw. Coalitions of jurisdictions may therefore be essential for change to occur, but building such alliances is no easy task in our federation.

Facing Constitutional Realities

Canada by any measure has a decentralized healthcare system. This reflects a constitutional reality, wherein provinces and territories have primary responsibility for laws and regulations governing the administration and delivery of healthcare services to their residents.

It is true that the *Constitution Act* of 1867 is practically devoid of references to health and healthcare. Section 91(11) assigns responsibility for "quarantine and the establishment and maintenance of marine hospitals" to the federal government, while Section 92(7) assigns responsibility for all other hospitals to the provinces. That is the extent of direct commentary on healthcare in our nation's founding law. However, the Constitution also assigns powers over property and civil rights (section 92(13)) and matters of "a merely local or private nature" (section 92(16)) to provinces.[55] Together, these sections have been interpreted by the courts to mean that provinces have "exclusive … responsibility for direct delivery of most medical services, the education of physicians and numerous other related functions". The courts have also reaffirmed the federal role in certain aspects of health and healthcare, rooted primarily in federal jurisdiction over criminal law and federal spending powers. In particular, "the federal government uses its spending power to play a strong role in the Canadian Medicare system through its financial contributions and by setting certain national standards by means of the *Canada Health Act*".[56]

This constitutional construct has the advantage of placing delivery of a 'high-touch' service in the hands of an order of government that is closer to citizens. It allows for the regional variation in policies that is essential in a country with such geographic and demographic diversity. And, as a happy side-effect, it promotes a degree of pluralism, allowing each sub-national jurisdiction to be a living laboratory for healthcare innovation.

Looking internationally, other federations have struck a different balance.

For example, in the US, the federal administration wields considerable influence on healthcare financing and delivery through its responsibility for healthcare for seniors and its conditional cost-sharing of state-level programs for low-income individual and families. Robust federal entities also provide strong national leadership in the spheres of veterans' healthcare, health research, drug regulation, and public health.[57] As noted in the preceding chapters, the American federal government has used these powers to make an unprecedented push for innovation over the past few years under the banner of the 2010 *Patient Protection and Affordable Care Act*.[58]

In Australia, the Commonwealth government has a prominent role that includes: administering Medicare – the national medical insurance scheme; supplying pharmaceutical benefits; and funding of both public hospitals and population health programs (along with the states and territories). It regulates "much of the healthcare system, including private health insurance, pharmaceuticals, and medical services; and has the main funding and regulatory responsibility for government-subsidized residential care facilities."[59] Significant reforms have been implemented in recent years, touching on everything from primary care and hospital funding to incentives for private insurance, often with close federal-state collaboration.

Such comparisons are not meant to imply that Canada is condemned to underperform in healthcare because it lacks sufficiently strong levers at the national level. On the contrary, Canada has achieved a surprisingly high degree of inter-jurisdictional comparability in coverage for medically-necessary hospital and physician services. What one might instead conclude is that Canada has a demonstrated capacity for creative work-arounds to move healthcare forward – and progress in future will likely be made in a similar vein.

The Canadian Way: Visionary Incrementalism

In Chapter 1, the story of Medicare was sketched in iconographic terms with heroic figures. One might also portray Medicare as a story of visionary incrementalism. Dating back decades, the vision of many advocates was that Canadians should have reasonably comparable access to healthcare based on need alone. Getting there required patience and a careful mix of small and big steps.

Top-down Federalism: the Federal Spending Power

Much has been written about how the federal government has used its spending power[viii] to shape Canada's healthcare system. Federal grants were used to support the construction of hospitals and medical schools in the 1940s and 1950s. As outlined in Chapter 1, during the 1950s and 1960s, federal cost-sharing with provinces allowed the adoption of universal public hospital insurance across the country, followed by the adoption of cost-shared universal public medical insurance in the 1960s and 1970s.[60]

viii The federal spending power is inferred from Parliament's jurisdiction over public debt and property (section 91(1A)) and its general taxing power (section 91(3)), effectively giving the federal government the ability to tax and spend as it sees fit. (*Constitution Act of 1867*).

In the 1980s, when concerns about extra-billing by doctors and hospital user fees threatened the Medicare vision, Ottawa introduced the *Canada Health Act.*[61] As already noted, that law made federal transfers conditional on provincial and territorial health insurance plans meeting certain criteria and conditions. It restored some of the leverage that had been lost when the federal and provincial governments agreed in 1977 to shift from cost-shared arrangements to formulaic block transfers for health and post-secondary education.[60] The *Canada Health Act* remains in force today, although its role and relevance remains the subject of debate

The federal spending power has often been a source of inter-jurisdictional controversy. Provinces seized the opportunity when the federal government offered them more autonomy in funding and steering healthcare with block funding in the 1970s. Tensions rose when the federal government unilaterally reduced the growth of health transfers in the early 1980s, followed by a freeze, and then a cut to cash transfers of more than 30 percent in the 1995 federal budget.[62] After that, provinces and territories saw the federal government as an unreliable funding partner, and vowed never again to place themselves in the position of making promises to their residents that they might not have the resources to meet. Though never codified in an enforceable way, a new approach was agreed in the aftermath of the failed Meech Lake and Charlottetown constitutional renewal processes. In effect, the federal government is now precluded from using its spending powers to create new social programs in areas of provincial jurisdiction unless there is broad support from provincial and territorial governments.[ix]

As a result, the Panel observes that federal spending power has evolved into quite a lot of spending and not much power.

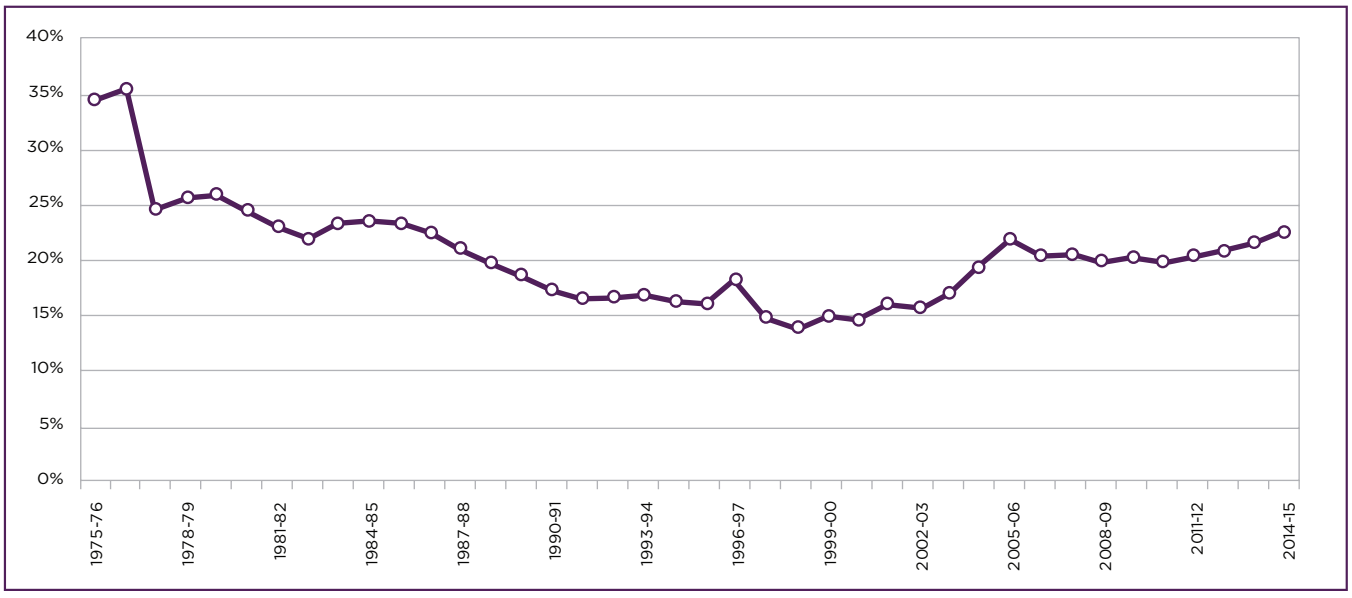
How much spending? In 2015-16, the Canada Health Transfer (CHT) will provide $34 billion in cash support to the provinces and territories for their role in administering and delivering healthcare.[63] Figure 3.1[64] shows that federal health transfers account for an average of 23 percent of provincial/territorial spending on healthcare.[x] From an historical perspective, federal health transfers as a share of provincial health spending are now almost as high as when the *Canada Health Act* was introduced in 1984.

Even under the cost-sharing agreements of the 1970s, the overall federal share of provincial health spending never approached 50 percent as is sometimes asserted. This is because cost-sharing only applied to hospital and physician services and not to other services funded by provincial

ix These rules were made explicit in the intergovernmental Social Union Framework Agreement of 1999, which set the stage for federal reinvestment in healthcare following cuts to fiscal transfers.

x This does not include support provided to "have-not" provinces through the Equalization program and to territories through Territorial Formula Funding, a sizeable portion of which is allocated to healthcare.

Figure 3.1 Cash Health Transfer as a % of PT Government Sector Health Expenditures (Total Canada)



health plans.[xi] Moreover, there is no agreed benchmark, historical or otherwise, for what a fair share would be.

The federal government for its part has clearly decided to step away from using health transfers as a way to steer the next generation of healthcare reforms. That much was signalled in December 2011 when, as outlined earlier, the government decided to tie the Canada Health Transfer escalator to nominal GDP growth beginning in 2017-18, with a minimum three percent increase per year, and no conditions beyond meeting the terms of the *Canada Health Act*.[65]

Bottom-up Federalism: Experimentation and Pilot Projects

Federal support for capacity-building and pilot projects in healthcare delivery has also been part of the Government of Canada's approach over the past two decades. The basic justification was that resources to innovate are difficult to find in provincial and territorial health ministries that are under constant pressure to invest every tax dollar into front-line services – a rationale that remains relevant today.

Among the notable federal programs created since the mid-1990s were the 1997 Health Transition Fund ($150 million over three years),[66] the 2000 Primary Health Care Transition Fund ($800 million over five years),[67] and the 2007 Patient Wait Times Guarantee Pilot Project Fund ($30 million over three years).[68]

The Panel respects the fine work flowing out of these initiatives, but also offers a number of observations about this strategy.

First, the largest fund by far was the Primary Health Care Transition Fund. In it, the vast majority of funding was allocated on a per-capita jurisdictional basis. Such allocations tend to undercut the concept of allocation based on the merits of an initiative and its scalability nation-wide. The largest single commitment went to support primary care "transformation" in Ontario.

Primary care reform in Ontario has been a massive endeavour that, over many years, has unequivocally succeeded in shifting payment modalities and raising incomes for thousands of family physicians. However, as a 2014 review by Sweetman and Buckley shows, while a number of innovative models for primary care have been rolled out, there is thus far surprisingly limited evidence for a transformative change in quality, accessibility, or cost-effectiveness of primary care.[69] Similarly, in British Columbia, challenges related to comprehensiveness and access to primary care have persisted, despite the implementation of new fee codes (on top of regular fees) that were intended to address these issues.[70]

Examining the record of all three of these funds, one sees many exciting projects. However, a number have a strongly academic flavour or consist of pilot projects of uncertain generalizability. There is also little sense of follow-on projects focusing on spreading or scaling-up of these initiatives within a jurisdiction, let alone on a wider geographic basis. Here the Panel emphasizes that, notwithstanding laments about the pervasiveness of pilot projects in Canada, creating and sharing knowledge through such projects is desirable. The real failing has been in the capacity of our healthcare systems to spread or scale up the best ideas from those projects.

On the other side of the coin, pilot projects are less likely to have impact or uptake unless they: i) enjoy wide stakeholder support and address pressing health system needs; ii) act to link multiple segments of the system and/or align incentives around change; iii) take into account from the outset all the systemic barriers that prevent new approaches from being successfully adopted in the pilot project, let alone spread passively and scaled up actively; and iv) are consistent with a vision of healthcare delivery reform at the upper reaches of government, and therefore supported by both funding and political will.

There are currently no active federal programs with a focused mandate to support pilot projects in healthcare. However, Health Canada continues to support capacity-building across the country through existing contributions programs, such as the Health Care Policy Contribution Program ($25 million per year).

Health accords: Setting Goals, Measuring Progress and Following the Money

The recession of the 1990s saw significant fiscal restraint at both the federal and provincial/territorial levels. By the end of the decade, with economic growth on the upswing and concerns about access and wait times for healthcare

xi The big drop in cash transfers that occurred in the late 1970s reflects the transfer of tax points to provinces under Established Programs Financing.

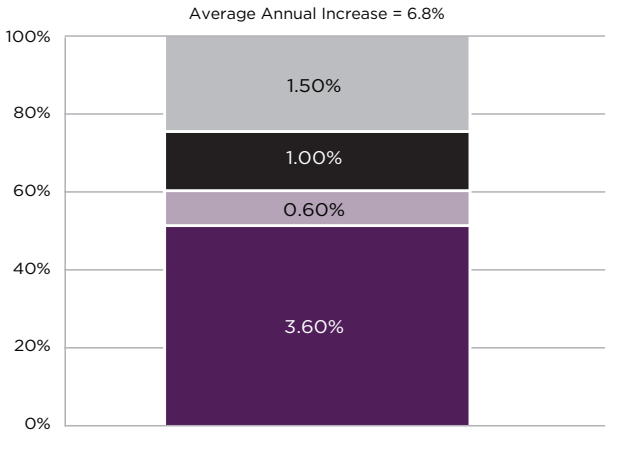
boiling over, governments were poised to make significant reinvestments. This sparked a new era of federal-provincial health accords with unprecedented investments by both orders of government. The menu for shared renewal varied with the accord, but rolled up to an ambitious agenda: improved access to care and diagnostic services, reduced wait times for surgical interventions as noted in Chapter 2, the rolling out of electronic health records, alleviation of health human resource shortages, reforms to primary healthcare, investments in home care, and implementation of a national pharmaceutical strategy. In keeping with the prevailing intergovernmental ethos, the health accords set out shared principles and objectives, and committed all jurisdictions to measure progress and report publicly on the results achieved. That is, governments would not be accountable to each other, but rather to the citizens they serve.[71,72]

It may be still too early to pronounce in any definitive manner on the long-term legacy of the health accord period. Progress was certainly made on many fronts. However, there were also disappointments, including unfulfilled promises to create a national pharmaceutical strategy and a national approach to address home care, as well as limited progress in transforming primary healthcare.

More fundamentally, with the benefit of hindsight, it appears that much of the increased federal investment during this period was absorbed into the system in the form of increased compensation for physicians, higher wages for healthcare providers, and increases in the volume of services provided. For instance, as shown in figure 3.2, CIHI's analysis of physician cost drivers in 2011 indicated that between 1998 and 2008 "physician fee increases (average annual increase of 3.6 percent) were the main cost driver during this period, accounting for approximately one-half of annual growth in expenditure."[5]

In other words, it is arguable that, rather than buying change, federal reinvestments bought more of the same. To that implied criticism, those involved might well reply: buying more was always the primary objective. Nonetheless, an opportunity was missed. Priorities shifted, federal-provincial-territorial goodwill defaulted back to jurisdictional positioning, and then the global economy went into a tailspin. We now have a vastly different environment in healthcare. The question for the federal government is how to make the most of its role and levers to support the next generation of improvements to healthcare in Canada.

Figure 3.2 Cost Driver Contributions to Physician Expenditure, 1998 to 2008



Source: adapted from Canadian Institute for Health Information (CIHI). Health Care Cost Drivers: The Facts. Ottawa (CIHI); 2011. Available from https://secure.cihi.ca/free_products/health_care_cost_drivers_the_facts_en.pdf

National Machinery to Support Partnerships and Collaboration

One approach to supporting innovation and reform in Canada's decentralized healthcare system has been the development of national agencies to support pan-Canadian collaboration. Health Canada currently provides sustaining funding for eight national arm's length health organizations that have inter-jurisdictional collaboration as a central part of their mandates.

Pan-Canadian health organizations (PCHOs) have shown themselves able to function across jurisdictions, bridge federal-provincial-territorial sensitivities in healthcare, and, albeit with uneven success, provide leadership and coordination in important areas. Their legitimacy arises in part because they have been established as not-for-profit corporations at arm's length from the federal government. PCHOs have varied approaches to shared governance that include representation from governments, experts and stakeholders. This helps PCHOs to pursue partnerships and shared objectives in a way that meets public and stakeholder expectations for national coherence with less political friction than would occur with direct federal engagement.

Figure 3.3: Pan-Canadian Health Organizations Funded by the Federal Government

Pan-Canadian Health Organization	Description	Origin	Federal Funding $M/y 2014-15[73]	FTEs[74]
Canadian Institute for Health Information (CIHI)	Holds much of Canada's healthcare data and measures and reports on health system performance.	1992	77.7	675
Canadian Agency for Drugs and Technologies in Health (CADTH)	Assesses and advises governments on the cost-effectiveness of drugs and technologies, to aid in decisions on coverage and reimbursement.	1989	16	145
Canada Health Infoway	Makes joint investments with provinces and territories to implement health information and communication technologies, and support their uptake.	2001	88.4[xii]	140
Canadian Foundation for Healthcare Improvement (CFHI)	Accelerates healthcare improvement efforts through partnerships and knowledge-sharing activities.	1996	11.6[xiii]	43
Canadian Partnership Against Cancer (CPAC)	Coordinates implementation of a national strategy on cancer prevention and control.	2006	47.5	95
Mental Health Commission of Canada (MHCC)	Acts as a catalyst for improving the mental health system and changing the attitudes and behaviours of Canadians around mental health issues.	2007	14.3	90
Canadian Patient Safety Institute (CPSI)	Develops tools and partnerships to advance a culture of patient safety.	2003	7.6	35
Canadian Centre for Substance Abuse (CCSA)	Uses evidence to inform development of strategies and partnerships to address substance abuse.	1988	6.8	50
	TOTAL		**269.9**	**1273**

xii 2013-14 draw down on 2007/2010 allocations.

xiii Estimated 2014 expenditures from endowment.

Figure 3.3 illustrates how PCHOs vary in terms of funding, mandates and structures. The first was established in the late 1980s. Some were the subject of federal-provincial-territorial agreements, while others were launched when the government of the day chose to shine a light on a particular issue. Some represent fairly large contributions from Health Canada (e.g. CIHI at $77.7 million annually), while others are small (CPSI at $7.6 million). Some have boards with representation from Deputy Health Ministers across Canada (Infoway), while others consist of members-at-large (CFHI) and others are a blend of the two (CIHI). Some are cost-shared with provinces to a greater or lesser degree (CIHI, Infoway), while others cost share on a minimal basis, often project-by-project (CFHI, CPSI).

Taken together, these pan-Canadian health organizations represent a federal investment of some $270 million per year and employ over 1200 personnel. This is very small relative to a healthcare system that spends over $215 billion annually, but does constitute a significant resource for pan-Canadian collaboration.

As discussed in Chapter 4 and elsewhere in this report, the Panel sees PCHOs as building blocks for a collaborative approach to healthcare innovation. Most of these organizations have had the opportunity to interact with the Panel over the course of the past year. Each has demonstrated a strong commitment to supporting change in their respective spheres of activity. In its recommendations on PCHOs, the Panel has taken the view that a more

integrated suite of agencies is desirable to create critical mass while reinforcing the importance of breaking down existing silos. In other words, what is good for each healthcare system in terms of greater integration and collaboration is also good for the machinery supporting pan-Canadian innovation in healthcare.

Research in Support of Collaboration

The federal government is a key player in health research, which in turn is an important input into the innovation process. The Canadian Institutes of Health Research (CIHR) is Canada's premier health research funding agency, created in 2000 as an independent agency that is accountable to Parliament through the Minister of Health. With an annual budget of nearly $1 billion, CIHR supports peer-reviewed research across four main 'pillars': basic science, clinical, health services and policy, and population and public health. The CIHR model – with 13 distinct institutes across a range of health disciplines – was itself an innovation that has drawn praise and interest from other countries.[75]

Research in basic science was the primary focus of CIHR's predecessor organization, the Medical Research Council of Canada. The addition of the other three pillars has broadened CIHR's mandate. However, an external review in 2012 showed that, over the course of a decade, basic science has continued to receive about 80% of all funds awarded through open grant competitions. The smallest proportion in that period has been awarded to health services and policy. Grantees from this pillar also consistently reported the highest proportion of research studies that led to changes in healthcare programs or policies.[76]

Partly in response to the need for research that would be more relevant to patients, front-line clinicians and healthcare system managers, CIHR launched the Strategy for Patient-Oriented Research (SPOR) in 2012. The SPOR initiative brings together federal, provincial and territorial partners with the goal of integrating their research into care and ensuring that the right patient receives the right intervention at the right time. The strategy is comprised of five elements – SUPPORT units, networks, capacity development, patient engagement and improving Canada's competitiveness in conducting clinical trials.[77] To date SUPPORT units have been created in several jurisdictions with matching funding from provinces, and three networks have been launched in: youth and adolescent mental health, primary and integrated healthcare innovation, and chronic diseases.[78,79] Though it is early days, the Panel sees SPOR as synergistic with some of the objectives delineated in its report, and addresses possible future directions for and collaboration with SPOR in Chapters 4 and 7.

In addition to CIHR, the federal government supports health research through the Canadian Foundation for Innovation (CFI) and Genome Canada. CFI is an independent corporation that provides infrastructure funding to support leading-edge research and development in Canada.[80] Genome Canada is a non-profit corporation that invests and manages large-scale research projects in priority areas including health (e.g. personalized medicine, bioinformatics, etc.).[81] While CIHR reports to the federal health minister, CFI and Genome Canada are part of the industry portfolio.

Federal Health Levers: Beyond the Usual Suspects

Beyond the big, visible levers reviewed in the previous section, there is a second tier of federal responsibilities and levers that have the potential to make a significant contribution to healthcare innovation in Canada. Most of these fall under the responsibility of the federal health minister, but some are housed in other ministries.

Regulation of Health Products, Food, and Risks to Health

Although Health Canada is responsible for regulating a range of products, tobacco and controlled substances and risks posed by environmental factors,[82] the regulation of pharmaceuticals and medical devices is of particular interest to the Panel given the link to healthcare innovation.

Health Canada has responsibility for regulating pharmaceuticals, including the assessment of the safety, efficacy and quality of drugs before approval of sale in Canada, and is also responsible for monitoring post-market safety of drugs. The federal government also regulates the price of patented drugs in Canada through the Patented Medicine Prices Review Board (PMPRB) by virtue of authorities set out in the *Patent Act*.[83] The PMPRB ostensibly regulates patented drug prices to ensure that prices are "not excessive" by limiting increases in the price of existing patented drugs to the rate of general

inflation, and by benchmarking the price of new patented drugs against comparable drugs already on the Canadian market or, in the case of breakthrough drugs, to a basket of comparator countries.[84]

Health Canada also oversees the regulatory framework for medical devices, which includes medical devices used in the treatment, mitigation, diagnosis, or prevention of disease. The department is responsible for assessing the safety, effectiveness and quality of medical devices through pre-market review, post-approval surveillance and quality systems in the manufacturing process.[85]

The Panel has heard a range of views from stakeholders about the effectiveness of these levers and has set out its analysis and recommendations in Chapters 8 and 9.

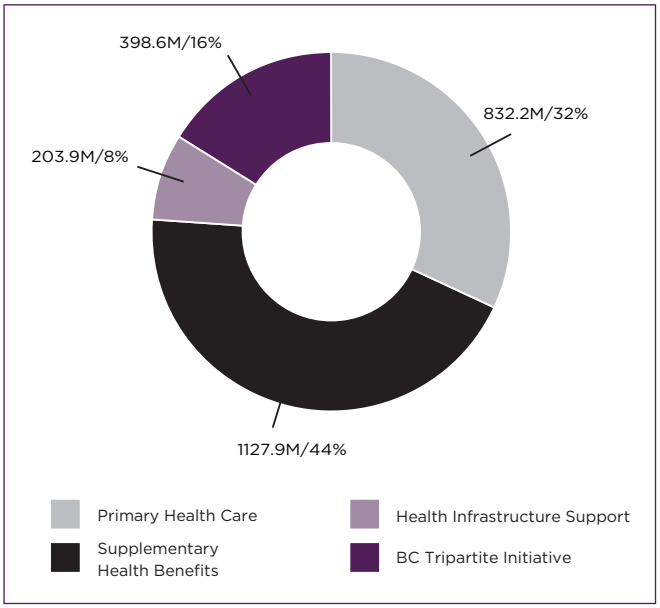
Health Services for First Nations, Inuit, and Other Federal Populations

The federal government is responsible for provision of health services to a number of federal populations, including First Nations and Inuit, the Canadian Forces and veterans, prisoners of federal penitentiaries, and some refugee claimants. Taken together, these programs account for nearly $4.5 billion in annual spending, as shown in figure 3.4.[86] Observers have remarked that this makes the federal government the fifth largest healthcare system in the country. In reality, however, these programs are all managed independently by different departments – a fact that leads the Panel to question the absence of a coordinating function and the extent of group procurement. In any case, none of these programs constitutes a proper healthcare system, since many of the services these groups receive are delivered through provincial and territorial healthcare systems, albeit in some instances funded by the federal government.

Figure 3.4: Spending on Health Services for First Nations, Inuit, and Other Federal Populations in 2014/15 (in $ Millions)[xiv]

First Nations and Inuit Health	2563
Correctional Service of Canada	189
Citizenship and Immigration	58
National Defence	537
Veterans Affairs	1100
TOTAL	**4447**

Figure 3.5: First Nations and Inuit Health Branch Budget, 2014-15



xiv Kapelus M. Presentation to the Advisory Panel on Healthcare Innovation. Ottawa: First Nations and Inuit Health Branch: Health Canada; 2015. Correctional Service of Canada. 2014-15 Report on Plans and Priorities. Ottawa: Correctional Service of Canada; 2014. Available from: http://www.csc-scc.gc.ca/publications/092/005007-2602-eng.pdf;

Citizenship and Immigration Canada. Report on Plans and Priorities 2014-15. Ottawa: Citizenship and Immigration Canada; 2014. Available from: http://www.cic.gc.ca/english/resources/publications/rpp/2014-2015/;

Department of National Defence. 2014-15 Report on plans and priorities. Ottawa: Citizenship and Immigration Canada; 2014. Available from: http://www.forces.gc.ca/assets/FORCES_Internet/docs/en/DND-RPP-2014-15.pdf;

Health Canada, Report on Plans and Priorities 2014-15. Ottawa: Health Canada; 2014. Available from http://www.hc-sc.gc.ca/ahc-asc/performance/estim-previs/plans-prior/2014-2015/report-rapport-eng.php

Veterans Affairs Canada. Report on Plans and Priorities 2014-15. Ottawa: Veterans Affairs Canada; 2014. Available from: http://www.veterans.gc.ca/eng/about-us/reports/report-on-plans-and-priorities/2014-2015/report/2-0#prog133

Health Canada's First Nations and Inuit Health Branch (FNIHB) is a key provider and funder of health services for First Nations and Inuit communities, with an annual outlay of nearly $2.6 billion, as depicted in figure 3.4. FNIHB provides and/or funds a range of programs and services that supplement those provided by provinces and territories, including community-based health promotion and disease prevention programs, primary care services, programs to control communicable diseases and address environmental health issues, and health infrastructure support. FNIHB also oversees the Non-Insured Health Benefits program. This program provides supplementary health insurance for First Nations registered under the *Indian Act*[87] and eligible Inuit regardless of where they live. It covers medically necessary goods and services not covered by private or provincial/territorial programs.[88,89]

How these programs are delivered varies considerably across communities. While FNIHB is responsible for the administration and delivery of these programs in some First Nations and Inuit communities, other communities are responsible for the administration of these health services through contribution agreements and Health Service Transfer Agreements with FNIHB. The latter reflect alternative health governance arrangements that have been established either through land-claim agreements, or through other agreements reached between Aboriginal communities and federal, provincial and territorial governments.[89]

Given that these services fall directly within federal responsibility, the Panel felt it was important to engage with key stakeholders and advise if possible on strategies that might help address what are clearly pressing problems. Members did so with trepidation in light of the significant health challenges facing all Aboriginal communities, the evolving self-governance landscape, and the time constraints of their mandate. The healthcare arrangements for First Nations struck the Panel as particularly fragmented. This situation is a function of the number of self-governing First Nations, total population size and presence across the provinces and two of three northern territories, and diversity of living circumstances. That said, observations and recommendations have been advanced that arguably can be generalized in some measure to healthcare for all of Canada's Aboriginal peoples. These are set out in Chapter 6.

Prevention and Public Health

Responsibility for public health is shared among all levels of government, as well as the private sector, non-profit organizations, health professionals, and the public. The Public Health Agency of Canada (PHAC) was created in 2004 within the Health Portfolio to respond to the federal government's "commitment to increase its focus on public health in order to help protect and improve the health and safety of all Canadians and to contribute to strengthening public health capacities across Canada."[90]

The Public Health Agency of Canada, with expenditures exceeding $600 million in 2013-14, is broadly responsible for: contributing to the prevention of disease and injury, as well as promoting health; enhancing surveillance information and expanding knowledge related to disease and injury; providing federal leadership and accountability in handling national public health events; strengthening intergovernmental collaboration and national approaches to public health policy/planning; and supporting international collaboration in public health and the sharing of Canada's expertise.[91]

In their written submissions, some stakeholders and members of the public identified the need for a greater focus on disease prevention and health promotion, and some also urged that the Public Health Agency of Canada should play a larger role in these respects. The Panel, in response, observes that PHAC has a very broad mission. Local health units under provincial and territorial jurisdiction are much more often engaged with healthcare providers than the national agency can or should be. The underlying issue – better integration of healthcare with community health promotion and social development – is revisited in subsequent chapters.

Health-related Tax Policy

A number of federal tax measures relate directly to healthcare.[90] Federal tax measures are also in place to help individuals and their families offset out-of-pocket healthcare costs that are not covered by public or private health insurance plans. Other federal tax measures are intended to provide support for families caring for individuals at home. In addition, sales tax exemptions are provided for: the services provided by certain healthcare professionals, medical devices and products, prescription drugs, and hospital parking. As well, hospitals receive a GST/HST rebate on eligible purchases.

More generally, the health sector benefits from certain broad-based tax measures. For example, pharmaceutical companies benefit from the Scientific Research and Experimental Development Program, which supports Canadian businesses in all sectors to conduct research and development in Canada. Health sector charities and their diverse causes also benefit significantly from tax measures to support charitable giving.[91]

In the Panel's view, health-related tax measures represent a significant outlay of federal resources that should be part of a federal healthcare innovation agenda. The role of tax policy is explored in detail in Chapter 10.

Economic Development in the Health Sector

During its consultations, the Panel heard about several programs supporting healthcare innovation that are delivered through the industry portfolio:

- The National Research Council attempts to bridge the innovation gap between early stage research and development (R&D) and commercialization, focusing on socio-economic benefits for Canada and increasing national performance in business-led R&D and innovation.[92] Current health-related initiatives are focused on human health therapeutics, medical devices, and digital health.

- The National Research Council's Industrial Research Assistance Program provides assistance in the form of advice and funding to help small and medium-sized companies build their innovation capacity.[93]

- The Networks of Centres of Excellence Canada is jointly administered by the three national granting councils (CIHR, Natural Sciences and Engineering Research Council, Social Sciences and Humanities Research Council), in partnership with Health Canada and Industry Canada. The aim is to create innovative partnerships that "mobilize Canada's best research and development talent to build a more advanced, healthy, competitive, and prosperous Canada."[94]

In consultations, healthcare innovators and entrepreneurs also emphasized the role of Export Development Canada and the Business Development Bank of Canada as well as regional development agencies in supporting small and medium-sized enterprises in the health sector to develop and commercialize their products.

Although healthcare innovators do seek federal support through various economic development agencies and programs, the Panel concluded that federal departments, notably Health Canada and Industry Canada, need to work together more closely to assist healthcare entrepreneurs.

To recapitulate briefly, this chapter has offered an overview of the federal machinery in the healthcare field. It emphasized that the Government of Canada has steadily migrated away from the conditional cost-sharing arrangements that prevailed in the 1950s and 1960s. Today, the Canada Health Transfer is set to escalate in lockstep with GDP growth and has no conditions other than compliance with the *Canada Health Act*. Given this new reality, the patchy record of previous arrangements, and the evidence of declining performance by Canada's healthcare systems, the question before the Panel rapidly became: Is there a new model for strategic federal funding that could build true collaboration, create a vision for innovation, and break the current healthcare policy gridlock?

This chapter's review also summarized many federal investments already in place across a range of areas linked to healthcare innovation, and highlighted a number of lesser known federal levers. Thus, a related question for the Panel was: can this machinery be part of the solution to Canada's healthcare innovation gap?

These questions are addressed in Chapter 4.

Chapter 4

Breaking the Gridlock

"Scaling up to meet the need is equivalent to when a large group of people must use a bus to undertake a crucial journey. If the bus is too small, or it goes too slowly, or it takes a wrong turn, or its mechanical problems are not fixed, or it is badly driven, it won't reach its destination in time. Simply pouring in more fuel won't resolve these problems. Governments and other players in the countries involved must deal with all the issues if the journey is to succeed." [95]

Bernard Rivers

"There should be a vehicle in place – a cheerleader – that would be willing to accept risks and potentially fail. This could be a credible and independent 'Centre for Innovation' in Canada to transmit on-the-ground lessons, versus high-level discussions, so that the wheel is not constantly being reinvented."

Stakeholder Submission

Breaking the Gridlock

The preceding chapters have presented good news and bad news. The good news is that Canada's healthcare systems have formidable assets: a dedicated and well-trained workforce, that, along with reputable institutions and agencies, delivers care to countless Canadians every day; a societal consensus on the value of making health services available to all Canadians on the basis of need; and a strong spirit of innovation at all levels of every system. Chapter 3 further illustrated that, notwithstanding constitutional realities and political conflicts, Canadian governments have often worked around the existing constraints to create new funding arrangements, necessary partnerships, and supporting national machinery.

That said, the bad news is that our performance is slipping in international league tables. Substantial numbers of Canadians are concerned about the state of healthcare in their respective jurisdictions. We are paying a lot for a relatively narrow bundle of publicly-insured services. Although there are many great ideas in circulation and extraordinary pockets of innovative activity across the country, Canada has not been successful in mobilizing large scale change at the system level.

This chapter accordingly examines some of the forces shaping healthcare, in two respects: how innovation is fostered in high-performing healthcare systems, and what global trends are forcing even more rapid-cycle innovation in healthcare. Above all, the chapter sets out the rationale and substance of a set of recommendations that the Panel views as essential to creating a new model of inter-jurisdictional and multi-stakeholder collaboration, leading to improved scaling-up of innovation and, in time, much stronger healthcare systems for all Canadians.

Bottom-up and Top-Down Innovation

To assist in its deliberations, the Panel had the benefit of digesting a large number of scholarly reports on high-performing healthcare systems, and as noted earlier, spending a day with leading experts from the UK, the US (Kaiser Permanente), Australia, the Netherlands, and Denmark. These inputs led to a simple but useful insight. Every high-performing healthcare system encourages front-line staff to innovate on a bottom-up basis. Every high-performing system also depends on leaders to play a crucial role in setting the vision and direction for change, and rewards those leaders for judicious use of their authority to support the testing and scaling-up of promising ideas from any source.

Earlier chapters have emphasized the growing momentum for bottom-up innovation across Canada. The Panel also heard about supportive top-down approaches across the country, with system leadership in multiple provinces that showed a commitment to accelerating innovation on the ground. These are promising developments.

At the same time, the Panel members were taken aback by the extent to which stakeholders focused on small differences between jurisdictions, regions and institutions. Whereas leaders of high-performing healthcare systems are open to adopting or adapting well-proven innovations from anywhere, some Canadian leaders seemed stricken with the "Not Invented Here syndrome" described in Chapter 2. The Panel's conclusion was that positive changes in Canadian healthcare systems could be accelerated by mechanisms that challenge our propensity to reinvent the healthcare wheel, city by city, and region by region. As the following review of wider pressures for change indicates, Canada is too short on both time and money to continue indulging in healthcare parochialism.

Turning Challenges into Opportunities for Change

The challenges facing Canada's healthcare system are not materially different from those facing high-performing systems in other countries. The difference is that high-performing systems are able to leverage these pressures into opportunities for change.

In this respect, the Panel sees the following challenges facing Canada's system as key opportunities for innovation:

- *Patients want "in."* As society becomes less hierarchical, patients want to take charge of their health and healthcare. They increasingly see themselves as partners in their own care and are less willing to accept poor customer service, including communication gaps and outdated communication technology, long waiting times, and poorly integrated services. They expect to interact with a responsive system that is designed

around their needs, not around the needs of providers and system managers. While these expectations increase the pressure on providers and systems, they also provide an opportunity to give patients greater responsibility for their own health and healthcare. This, in turn, can be leveraged to improve quality and potentially reduce the cost of care.

- *Canada's population is changing rapidly*. Nearly one quarter of Canada's population is projected to be over the age of 65 in 2036,[96] with significant variation across provinces and territories. Atlantic Canada, in particular, is aging at a faster pace than the rest of the country. At the same time, the prevalence of many diseases increases with age, suggesting that as the population grows older, the burden of chronic illness will also rise[97,98,99]

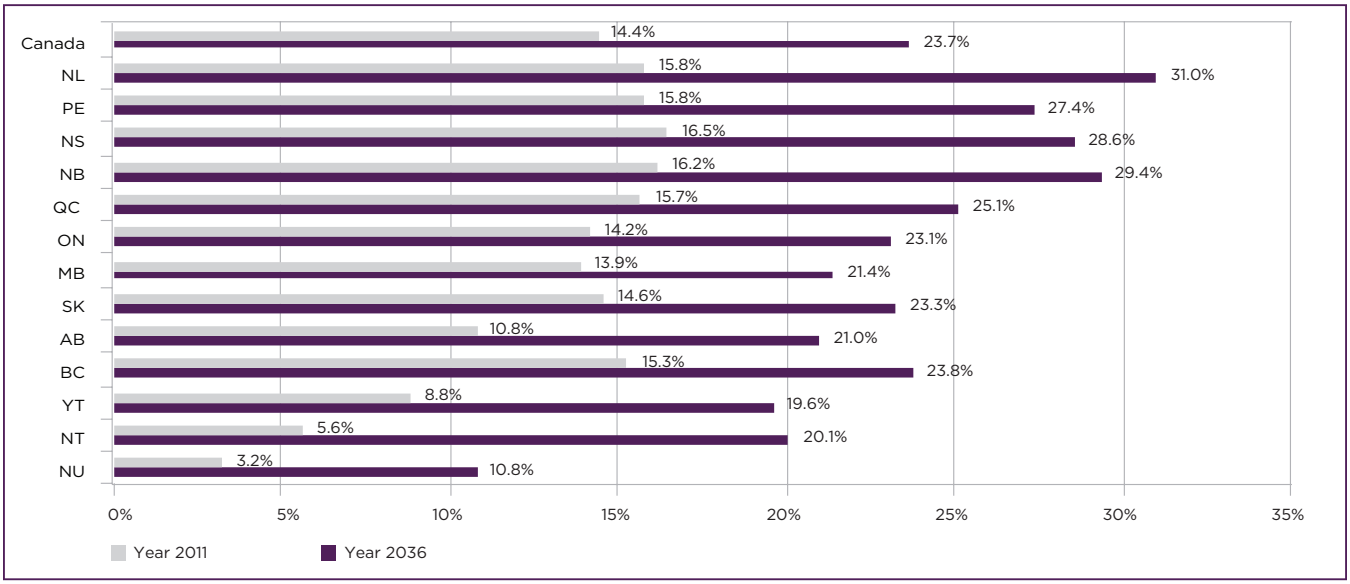
  While seniors are most often front and centre, there are other demographic trends to consider. In some provinces (e.g. Manitoba and Saskatchewan) the absolute numbers and relative proportions of Aboriginal peoples are expanding rapidly.[100] One in four children in Canada is now overweight or obese, increasing lifetime risks for many chronic health conditions.[101] Some see these demographic and disease trends as a threat to the sustainability of the healthcare system. However, they are only a threat to sustainability if the system remains organized in silos. A more integrated system that can effectively wrap itself around the needs of the patient could deliver better care and better outcomes at a lower cost – not just for seniors, whose growing numbers may propel the change, but for all Canadians.

- *The digital revolution is now disrupting healthcare.* A vast amount of health-related data is being generated on a daily basis in Canada through clinical encounters, administrative processes, and clinical research activity. With the rapid pace, spread and reach of information and communications technologies – such as remote monitoring, mHealth[xv] tools, and 'wearables' – information about health and healthcare will grow exponentially. This offers potential for smarter clinical decision-making, better research and evaluation, and more informed and engaged patients. However, it also requires critical supports in order to channel and focus this deluge of data into actionable intelligence that patients, providers, and system decision-makers can use.

  Similarly, society's knowledge and understanding of disease is rapidly changing thanks to new developments

xv Mobile health.

Figure 4.1: Population 65 Years and Over, by Region, 2011 and Projected 2036 (%)



Source: Adapted from Employment and Social Development Canada calculations based on Statistics Canada. *Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual* (CANSIM Table 051-0001); and Statistics Canada. *Projected population, by projection scenario, sex and age group as of July 1, Canada, provinces and territories, annual* (CANSIM table 052-0005). Ottawa: Statistics Canada; 2011.

in biotechnology. Precision medicine heralds a new era for diagnosing, treating and preventing disease that will move away from a 'one size fits all' strategy to a more individualized approach based on a patient's genetic makeup. It offers an opportunity to dramatically improve the effectiveness of healthcare by pinpointing the right treatment at the right time in the right dose with reduced side-effects and maximum efficiency. The incorporation of this new paradigm into Canadian healthcare must be swift, strategic, and, where appropriate, sceptical, so that we can maximize its benefits in a cost-effective manner.

- *The era of rapid growth in healthcare spending is over*. Federal transfers are moving to a formula driven by GDP growth, and provinces and territories have reined in spending.[102] Some critics view this as a heavy-handed tactic by governments to fund tax cuts on the backs of healthcare providers and patients. This shift, however, can also be viewed as an opportunity to introduce overdue changes, i.e., changes in payment models that reward value rather than volume; changes in how drugs and medical devices are regulated, reimbursed and managed; and changes to help healthcare systems become leaner, more productive, and less wasteful of tax-payer dollars. Canadians also face increasing direct financial pressures as the system shifts towards goods and services – such as drugs, devices, and home care – that fall outside the traditional Medicare envelope. Out-of-pocket expenditures for health have risen from $277 per capita to $840 over the past two decades, representing a 4.7 percent annual growth.[5] This presents an opportunity to innovate in how we finance care beyond hospitals and physician services.

- *Healthcare has become both a social program and an economic asset*. The health sector directly and indirectly supports more than two million workers in hundreds of communities across the country,[103] oversees sophisticated infrastructure and procurement of advanced technology, and supports leading-edge research with significant commercial potential. In Canada, the notion of partnering with the private sector to improve the healthcare system has gained little traction. Some see this as anathema to the underlying values of Canadian Medicare. Others see the potential to reap economic benefits for Canadians while improving the quality and sustainability of the healthcare system. Leading systems in other countries are taking the latter position, and Canada should follow suit.

Chapters 5 through 9 delve into each of these areas in further detail and set out recommendations to the federal government. But knowing where to focus is only part of the challenge. Knowing how to move forward is the other, perhaps more challenging task.

Towards a More Productive Environment for Collaboration

As discussed in Chapter 3, there have been highs and lows in collaboration on healthcare across the federation. When the federal government announced in December 2011 its plan to unilaterally renew the Canada Health Transfer (CHT) for the period of 2014 to 2024, thereby pre-empting intergovernmental negotiations on a new health accord, provinces and territories were understandably stunned.[104,105] The immediate result was retrenchment on the part of provincial and territorial governments. If the federal government was not going to engage with provinces and territories to discuss how renewal of health transfers could be linked to healthcare renewal, then provinces and territories would go it alone.

Under the auspices of the Council of the Federation, provinces and territories created the Health Care Innovation Working Group in 2012. This group was initially chaired by the premiers of Saskatchewan and PEI and its membership was comprised of provincial and territorial health ministers. It quickly created theme groups to focus on team-based models and scopes of practice, clinical practice guidelines and health human resources. It next produced a comprehensive report in 2012 profiling best practices across jurisdictions, and identifying priority areas for further work.[106] Currently, the Working Group is focusing on three areas for collaboration: pharmaceuticals, appropriateness of care and seniors' care.[107]

The pan-Canadian Pharmaceutical Alliance (pCPA) has already emerged as one of the key outputs. pCPA is undertaking joint provincial/territorial negotiations for brand name drugs in Canada, and getting better value for provincial and territorial drug plans.

On the one hand, the decisive actions taken by provinces and territories may be seen as a validation of the federal government's shift in strategy. Growth in provincial and territorial health spending has dropped to levels not seen since the mid-1990s.[5] Significant savings have been achieved in the pricing of generic and brand name drugs.[108] Experiments with novel payment mechanisms

are finally and urgently being undertaken, and in some jurisdictions the scope of practice of non-physician providers is expanding.

On the other hand, this new incarnation of 'two solitudes' strikes the Panel as suboptimal – and likely to disappoint those Canadians who expect their governments to collaborate in solving pressing national problems.

The first limitation of the current provincial/territorial approach is that it requires time, effort, and money that may be in short supply. Convening meetings, commissioning studies, and engaging stakeholders is costly and time-consuming. It is challenging for provinces and territories to do this at the national level, not least because, as one deputy minister told the Panel, "the clinical lion feeds first." Apart from the primacy of local service demands, there are also sharp inter-jurisdictional differences in size and scope for these activities.

Second, joint work is targeted to select areas where there is full agreement among provincial and territorial governments to move forward. As a result, the scope of activity may be narrow relative to the extant challenges, and collaborations between subsets of jurisdictions are not supported under this model.

A final limitation is that there is no available source of long-term working capital. Cost pressures are sufficiently intense that jurisdictions may be challenged to free up funds apart from those focused on the realization of immediate results. On a related point, although various provinces have provided ad hoc support for the activities of the Health Care Innovation Working Group, it seems more than likely that these efforts could move much faster with stable personnel and dedicated funding.

In short, the existing provincial and territorial collaboration for healthcare innovation is a positive step, and could be greatly accelerated by increased federal engagement on two practical levels. The federal government has the ability to fund longer-term machinery at the national level to support the creation of partnerships and 'coalitions of the willing.' It can also mobilize resources to support experimentation, evaluation and scaling-up in a more systematic and efficient fashion.

Apart from these pragmatic considerations, engagement by the federal government might facilitate the development of a shared vision for reform. Obviously, such a vision must respect jurisdictional responsibilities and sensitivities. On the other hand, as noted earlier, going it alone in making fundamental changes to healthcare is a daunting political challenge. Moreover, a national vision could give voice to the legitimate expectations of Canadians for a suite of healthcare systems that deliver excellent and reasonably comparable services across the country.

Healthcare Innovation Fund

For reasons already given, the Panel heard persistent calls from stakeholders across the country for a national strategy along with concrete action to support and accelerate innovation in Canada's healthcare systems through creation of a catalytic fund. After extensive deliberation, the Panel concurred that a protected source of capital that dedicates funds toward innovation is not only desirable but essential to sustain momentum for change across jurisdictions. Accordingly, the Panel is recommending the creation of a multi-year Healthcare Innovation Fund.

The overall aim of the Healthcare Innovation Fund would be to enhance the quality and value of healthcare provided to Canadians, while improving the performance of Canada's healthcare systems as measured against their international peers. To provide predictable funding and time for major initiatives across multiple jurisdictions, the Panel believes that the Fund should be created with an initial term of ten years.

"The federal government should establish a National Health System Innovation Fund targeted to provinces and territories to support the adoption of health system innovations. Funding criteria should be designed to not only support the development of these innovations but to incent their adoption on a scaled-up basis."

Stakeholder Submission

A federal Healthcare Innovation Fund would therefore be positioned to act as a strategic investor with a long-term view. It would support coalitions of willing partners from various sectors – i.e. federal, provincial and territorial governments, patients, providers, and industry representatives – in developing, testing, and evaluating new models of care. In keeping with widespread concerns about fragmentation of accountability and budgets in healthcare, an obvious priority would be large-scale demonstrations that promote integration of care and remove structural barriers to innovation. A second critical focus would be support for the further adaptation, spread and scaling-up of the most promising ideas and approaches to improving Canadian healthcare.

The Panel understands that many of the best prospects for investment will come from those on or near the front-lines of healthcare. Other ideas, however, may come from examining healthcare systems at the proverbial 35,000-foot level, or by studying international successes. While priorities for the Healthcare Innovation Fund will therefore evolve over time, the Panel has made a number of initial recommendations for high-impact initiatives that can accelerate work within each of the innovation themes highlighted in Chapters 5 through 9.

"What we'd like to focus on is, over and above the transfer, is the federal government going to be interested in partnering with provinces on outcomes-specific innovations that we propose?"

Saskatchewan Premier Brad Wall, January 2012

Taber J. *Brad Wall prescribes collaborative federalism to improve healthcare.* Globe and Mail; 2012 Jan. http://www.theglobeandmail.com/news/politics/brad-wall-prescribes-collaborative-federalism-to-improve-health-care/article1358383/

The Panel has also carefully considered the nature and sources of funding, the scale of investment, general operating principles, and modes of oversight for this new initiative. It begins by observing that every successful knowledge-based enterprise makes strategic investments in research, development, and innovation. The challenge in the health sphere internationally has been that research tends to draw the largest share of support, development follows at some distance, and funding of front-line innovation is often an afterthought. In like fashion, what has been missing in Canada is a pool of funds to support change agents as they seek to develop and implement both incremental and disruptive innovations in the organization and delivery of healthcare.

The Panel emphasizes in this regard that the creation of CIHR has been a very significant achievement. As described in Chapter 3, CIHR's mandate was built around a wider scope for academic inquiry than its predecessor organization. CIHR was also expected to do some bridging from research to development through initiatives in knowledge translation and commercialization. However, CIHR was never intended to engage in non-academic scaling-up of innovation, or to pursue the type of iterative evaluation of payment models undertaken by the US Center for Medicare and Medicaid Innovation. CIHR's SPOR initiative, as noted earlier, now has exciting projects underway that bridge research and development. It thereby bolsters what is a woefully under-invested field in Canada, and does so in positive partnerships with provinces and territories. However, the investments remain modest, and debate understandably continues among stakeholders as to how much support CIHR should direct to this type of development, let alone innovation and implementation, as opposed to primary academic research.

Indeed, coinciding with the creation of CIHR, the pragmatic front-line work to apply new knowledge to practice and policy-making was explicitly hived off to a new but small agency called the Canadian Health Services Research Foundation. The Canadian Foundation for Healthcare Improvement (CFHI), described in Chapter 3, is the direct successor and latest incarnation of that effort, with a budget of approximately $10 million per year – 0.005% of total healthcare spending in Canada. CFHI punches above its weight in scaling up innovation but has nothing like the required heft to transform Canada's healthcare systems.

All things considered, the Panel had no trouble concluding that the goals to be accomplished through creation of a Healthcare Innovation Fund are not remotely achievable within any existing research agency's mandates, machinery or relevant budgets. To repeat: the Fund's primary rationale is to support activities that lead to scalable improvements in healthcare, *not* to generate academic research. That said, experience in the US and UK suggests that secondary academic partnerships and by-products may well occur, as work unfolds to reinvent aspects of front-line healthcare. Partnerships with SPOR, as noted in Chapter 3, are very likely to be mutually advantageous.

Additionally, the Panel stipulates that the Healthcare Innovation Fund should not support provision of currently insured healthcare services nor should its resources be allocated on the basis of formulas currently or previously used to govern pilot project funding or transfers to provinces. Rather, allocations from the Fund would result from rigorous adjudication against a set of transparent specifications and goals as set out above. Flow of funds, moreover, should be conditional on commitments by partners to sustain successful demonstrations, and on meeting milestones. The results from and return on these investments should be assessed against those milestones and reported publicly.

The Panel also considered potential sources of funding.

Reallocation of current investments in federal health transfers was ruled out for obvious reasons. Pressing CIHR to direct more funds to front-line healthcare innovation struck the Panel as wrong-headed on three scores. First, CIHR rightly has academic DNA – and diffusing its focus is unhelpful. Second, a team with very different skills will be required to oversee the disbursement of the Fund, to support a range of innovators at a remove and on the front-lines, and to assess the return on investments from the Fund. (A means to build this capacity is set out below.) Third, CIHR's investigative community is already facing intense global competition. For example, in the UK, the Medical Research Council spent £845.3 million ($1.6 billion) in 2013-14, while the Wellcome Trust disbursed a further £674 million ($1.287 billion), both with priorities similar to CIHR's.

The Panel is aware that provincial and territorial governments provide matching funds for programs such as SPOR and Infoway. Such matching arrangements could well continue to the extent that the Healthcare Innovation Fund becomes a co-funding vehicle with SPOR or the primary federal funder for digital health projects (see below) undertaken in partnership with provinces and territories. However, implementing and evaluating front-line innovations in healthcare delivery – and even more significantly, scaling up these efforts – will invariably require significant in-kind contributions from provincial and territorial healthcare systems. The Panel members accordingly caution against building in rigid cost-sharing provisions that could undermine the objectives of the Fund and preclude collaboration.

The Panel therefore concludes that existing sources of funding can make only a very limited contribution, and substantial new federal funding is required to create a robust Healthcare Innovation Fund and grow it over time.

The next question for the Panel was the scale of investment needed. The Panel's deliberations on this front were informed by its international research and discussions, examination of the scope and merits of previous federal investments, and consideration of private sector approaches.

First, international research demonstrates that all efforts to galvanize large-scale changes in complex healthcare systems are costly. There is no one-size-fits-all solution as different healthcare systems have different structures and levers on which to pull. Nonetheless, the Panel did consider the relative size of innovation allocations in other countries. As one bellwether, the Center for Medicare and Medicaid Innovation in the US received an appropriation of US$10 billion under the *Patient Protection and Affordable Care Act* (2010) for 2011-2019. That Center, as described earlier, is driving a highly innovative agenda of payment and organizational reforms in US publicly-financed health services. While some of its funds flow into direct support of experimental models, the Center is able to leverage significant resources through its position inside the Centers for Medicare and Medicaid Services, the federal administrator of the massive operating budgets (about US$1 trillion in 2013) for those programs. The Innovation Center is also able to leverage datasets and expertise from the nearby Agency for Healthcare Research and Quality; in 2015 the latter agency has a budget of US$465 million.

Despite these resources, as noted in Chapter 2, the Innovation Center is struggling to scale up some of its models. This point underscores the challenge Canada faces. Even with provinces and territories providing substantial support in kind, additional investments will be needed in some cases to move new models of care from demonstration projects into usual and customary practice.

Further comparators are hard to find. The UK, for example, operates differently on two levels. First, changes in NHS operating models are often driven top-down by administrative fiat. Second, the talent and machinery to respond to these shifts is being developed through the relatively new National Institute of Health Research. Created in 2006, this entity does fund some translational research and clinical trials. However, it is overwhelmingly focused on building capacity for applied research that will improve care in the NHS. Its broad scope also includes

activities similar to some of the pan-Canadian healthcare organizations reviewed in Chapter 3. In 2013-14, the NIHR's turnover was £1,014 billion, or $1.935 billion.[xvi]

From the standpoint of domestic precedents, the Panel observes that the federal government has used targeted funds on multiple occasions over the past 15 years to support healthcare reform and renewal. The size and nature of these investments provides a useful benchmark for the Healthcare Innovation Fund. The most significant of these initiatives, in descending order of value, are shown in Figure 4.2. Most of these initiatives were targeted to a specific dimension or sector of healthcare. In contrast, the Healthcare Innovation Fund is intended to support a broad portfolio of investments and requires a wider funding base. The closest analogue is accordingly the Health Reform Transfer ($3.2 billion/year). As well, many of the above initiatives were intended to support service delivery and were therefore allocated to jurisdictions on a per capita basis. In contrast, since the Healthcare Innovation Fund is intended to act as a catalyst for fundamental change, the Panel has, as noted earlier, rejected formula-based allocation in favour of a more strategic approach involving rigorous adjudication, milestones, conditional funding and reporting so that the impact of taxpayers' funds will be maximized.

xvi The closest analogue to NIHR in Canada is Alberta Innovates – Health Solutions, with a budget in 2014-15 of $95.9M.

For further benchmarking, the Panel considered how the private sector approaches research, development, and innovation. It is not unusual to see knowledge-intensive global companies devote 10 percent of revenue to these three domains. In contrast, the most recent estimates suggest that health-related research and development expenditures account for about three percent of total health sector expenditures,[109] with the lion's share of these resources invested in basic medical and clinical research performed by academic investigators, and in pharmaceutical research and development by the private sector. None of these expenditures have goals comparable to those proposed for the Healthcare Innovation Fund.

Next, the Panel considered the types of projects that the Fund would support. The amounts available annually would need to be large enough to catalyze the scope and breadth of activities identified elsewhere in the report, including multiple large scale cross-sectoral demonstration projects, investments in digital health and implementation of precision medicine, and scaling-up across jurisdictions of diverse programs to improve healthcare.

Putting all these elements together, the Panel has concluded that, once a steady state is reached, the target outlay for a Healthcare Innovation Fund should be set at $1 billion per annum. This will mirror the current federal

Figure 4.2 Federal Support for Healthcare Reform and Renewal since 2000

Amount	Description
$16 billion over 5 years	*Health Reform Transfer* Disbursed to provinces and territories from 2003-04 to 2007-08 to support improved access to primary care, home care, and catastrophic drug coverage (this fund was merged into the Canada Health Transfer in 2005-06)
$5.5 billion over 10 years	*Wait Times Reduction Fund* Disbursed to provinces and territories between 2004-05 and 2013-14 to support strategies to reduce wait times in five priority areas
$2.5 billion over 5 years	*Medical Equipment Fund/Diagnostic and Medical Equipment Fund* Disbursed to provinces and territories on a per capita basis to support the purchase of diagnostic and medical equipment from 2000-01 to 2005-06
$2.1 billion	*Canada Health Infoway* Allocated to projects on the basis of merit with cost-sharing requirements and no predetermined jurisdictional shares
$800 million over 5 years	*Primary Health Care Transition Fund* $560 million allocated on a per capita basis to support jurisdiction-specific projects and the remaining $240 million allocated to cross-jurisdictional initiatives
$612 million over 3 years	*Patient Wait Times Guarantee Trust* $112 million in base funding of $10 million per province and $4 million per territory, and the remaining $500 million allocated to provinces and territories on a per capita basis from 2007-08 to 2009-10 to support the adoption of wait time guarantees across jurisdictions

investment in research through CIHR of $1 billion per annum. An annual investment of $1 billion also represents half of one percent (0.5 percent) of total health expenditures in Canada, which are estimated at $215 billion for 2014. Moreover, it is an even smaller fraction of the total federal budget, which in 2014 was $280 billion -- $250 billion of which was in program spending.

The Panel recognizes that the proposed approach is novel. Funding will flow in meaningful measure based on initiatives identified by coalitions of willing partners rather than traditional per capita transfers negotiated through formal federal, provincial, territorial discussions. Unlike systems such as the NHS with its unitary corporate structure, or the US where the federal role is much stronger, Canada's highly decentralized arrangements mean that it will take time to build coalitions across jurisdictions and stakeholders, as well as to develop sound plans for projects and initiatives. Thus, while a case may emerge over time for an even more sizeable investment, the Panel endorses a prudent approach wherein investment in and by the Fund ramps up gradually. A gradual ramp-up not only reduces the risks of suboptimal early spending as sometimes occurs with new programs and agencies. It also allows for creation of a new federal agency that will provide an oversight mechanism to ensure responsible allocation of the funds and be a resource to accelerate innovation across all of Canada's healthcare systems. In sum the Panel recommends that funding ramp-up commencing in 2015-16, with a view to reaching an outlay of $1 billion per annum within four to five years.

The Panel's recommendation of a substantial investment has been made with due regard to the current economic context. As noted in chapter 3, the federal government's decision to reduce the rate of growth of the Canada Health Transfer from six percent per annum to the nominal GDP growth rate starting in 2017-18 opened the door to a new model for inter-jurisdictional collaboration. It also provided the Federal Government with some fiscal capacity for reinvestment in healthcare. This Fund can accordingly be seen as the bookend to the 2011 decision.

On that latter note, the Panel reiterates that the Government of Canada in two momentous steps induced all provinces to adopt universal healthcare programs through cost-sharing provisions. Given the frustrations of fiscal federalism and size of the previous escalator in a period of slow economic growth, the Panel understands the logic of capping the Canada Health Transfer to match GDP growth. That approach also has immediate advantages for the federal government: it disentangles Ottawa from programs that it does not manage, while giving the provinces and territories responsibility for hard choices, e.g., make unpopular tax hikes, and/or cut other social programs and/or rein in healthcare spending. However, as many stakeholders observed, that approach may also be a prescription for further inter-jurisdictional wrangling, a continued decline in the quality of Canada's healthcare systems, or a retreat from the core principles of Canadian Medicare. It seems very likely that Canadians will justifiably call not only provincial governments but the Government of Canada to account if any of those developments were to ensue.

A Healthcare Innovation Agency

The Panel carefully examined a range of options for overseeing the administration of the Healthcare Innovation Fund and an agenda of major change in Canadian healthcare, supported by the Fund. Key considerations included the need to avoid creating new pan-Canadian machinery that would add to the already extensive array of pan-Canadian healthcare organizations, and the need to have a governance mechanism that would be removed from the cut and thrust of inter-jurisdictional decision-making.

"The federal government must play a leadership role in collaborating with jurisdictional counterparts in the formation of a pan-Canadian health mechanism to identify, promote and advance needed healthcare innovation."

Stakeholder Submission

The Panel looked at the existing array of pan-Canadian health organizations to ascertain whether one of these organizations might be well positioned to oversee the proposed Healthcare Innovation Fund. The most obvious candidates were the Canadian Foundation for Healthcare Improvement (CFHI), Canada Health Infoway, and the Canadian Patient Safety Institute (CPSI). The Panel's assessment is that while each of these organizations has considerable strengths, none has the governance, size, and expertise needed to oversee a large-scale fund that supports system-wide improvement.

The Panel is therefore recommending the creation a new agency that will fold in the expertise and focus of CFHI, CPSI and eventually Canada Health Infoway. The inclusion of the first two of these fine organizations reflects the fact that healthcare improvement, quality and safety would both be core to the mandate of the new organization with the addition of a much more significant focus on scaling up and spreading innovations. An orderly wind-down of CFHI and CPSI would enable the appropriate transfer of staff and budget lines to a new Healthcare Innovation Agency of Canada (HIAC).[xvii]

As for Canada Health Infoway, the Panel's assessment is that it should remain in place as a separate entity only to complete its current mandate[xviii] or until the Fund and new Agency are established. Infoway can claim an important legacy of building essential foundations for electronic health record-keeping. With the rapid shifts in information technology and a greater emphasis on meaningful use of those tools, the playing field has changed, and a more integrated approach seems timely. Thus, the Panel is recommending that any new federal support for eHealth projects beyond existing commitments would flow through the Fund, and that Infoway should fold into the Agency within two to three years. The Panel has elaborated on its perspective on Infoway and eHealth more generally, in Chapter 7.

The Agency would work with a range of stakeholders and governments to frame a practical agenda for improved care and value, along with healthcare innovation goals across the Panel's proposed five areas of focus. As noted above, the core operating budget for the Agency would be drawn from the Healthcare Innovation Fund. The Agency would also provide oversight and expertise for deployment of the Fund to projects on the front-lines of healthcare. All uses of the Fund, and the work of the Agency, should seek to advance the twin goals of removing structural barriers to innovation in Canadian healthcare, and supporting spread and scale-up of proven models and modalities of care. The Agency's mission, exactly as for the Fund, would be to support on-the-ground efforts to enhance the quality and value of the healthcare provided to Canadians, while improving the overall performance of Canada's healthcare systems as measured against their international peers.

To ensure that a shared vision, broad strategy, and innovation goals can be adapted to the evolving healthcare context, HIAC would have a healthcare forecasting and planning stream. As discussed further in Chapters 8 and 9, it would house a Healthcare Innovation Accelerator Office. This Office among other roles would facilitate the more rapid adoption of healthcare innovations that promise high-impact in terms of quality and cost-effectiveness. Finally, given the gaps in health services and outcomes between First Nations and Inuit and the rest of Canadians, HIAC would link closely with the work of the First Nations Health Quality Council and any related Inuit liaison committees, as described in Chapter 6.

To carry out this work, HIAC would have resident expertise in core areas such as: innovation spread and scale-up; quality improvement and patient safety; health data analytics; and digital health. Staffing must be lean, but benchmarking in that regard should be done with care. On the one hand, the staffing and related overhead costs of excellent grant-making bodies are typically five percent of their total annual budgets in steady state. On the other, the new Agency's mandate is sharply different from, say, CIHR. It is concerned not with making grants and awaiting the eventual publication of results, but facilitating timely and meaningful change in policy, in system design, and in front-line practices. This work is informed by research, but it is not research. As such, the Agency must be results-driven, and engaged closely with partners to effect improvements in healthcare. The flow of analysis, writing, and consultation will be continuous. This presumably explains why higher levels of internal spending are seen in entities like the Center for Medicare and Medicaid Innovation.

The Panel notes further that many of HIAC's staff will be on the road frequently to work alongside partners on major projects. This suggests that a multi-nodal structure may be appropriate – and would also send a collaborative message to provinces and territories.

The Panel foresees that international recruitment will be essential to ensure that the leadership of the Agency has both relevant experience and a willingness to challenge Canadian healthcare dogma and risk-averse attitudes. Above all, the culture of the Agency should be one of partnership with, support for, and facilitation of the work of a range of stakeholders who bear the primary responsibility for delivering healthcare to Canadians.

xvii This moniker is a placeholder for clarity. Given the unified purpose and likely co-governance of the Fund and Agency, the term Health Innovation Canada might be appropriate as a joint name for both initiatives.

xviii In addition to completing existing Infoway projects, some legacy activities could be considered for support from the Innovation Fund to provide a further brief window of opportunity to jurisdictions that have lagged in info-structure development.

Provinces and territories would obviously be key partners. At the same time, priorities for the Agency and the Fund cannot be set by jurisdictional vote-counting, by political posturing, or by expectations that these instruments will serve fire-fighting and first-responder functions for regional flashpoints. To repeat a point made earlier, the Agency's work should be driven by pressing priorities of wide relevance to the health services and health status of Canadians, and implemented by broad coalitions of the willing.

HIAC would be established as an arm's length organization, budgeted through the Healthcare Innovation Fund by the federal government. Its corporate structure should enable it to provide robust, independent oversight and direction for the Fund. The Agency would be governed by a group of eminent Canadians, supported by one or more advisory committees composed of representatives of a range of stakeholders (provincial/territorial governments, patients, providers, industry, and others).

There are two potential models of governance for HIAC. One would be to create the Agency as a federal government entity similar to CIHR, at arm's length from the Minister but still within the federal administration and subject to Governor-in-Council or ministerial appointments to the governance body. The second approach would be to create a not-for-profit corporation similar to other pan-Canadian healthcare organizations with the federal government as the main funder.

Both options have strengths and weaknesses. A standard federal agency could present advantages in terms of forging ahead and accountability for a substantial budget. However, this structure runs the risk of being perceived as too close to the federal government and too far from provinces and territories. A not-for-profit corporation would be able to flow the funds more quickly as well as work more easily and directly with a range of stakeholders. However, it could also be more easily captured by inter-jurisdictional politics, with subsequent redirection of priorities and allocation of funds. A hybrid may be feasible so long as two objectives are kept front and centre. First, the board must be truly independent and non-partisan, ideally with some international members. All members must be seen to have substantial and relevant qualifications. The slightest whiff of cronyism or box-tick appointments will kill the credibility of the exercise from the outset. Second, howsoever the organization is structured, a very high priority must be the creation of a constructive climate for change and for renewed collaboration.

In sum, Canadians have every right to expect excellent care and better value for the money they spend on healthcare, and to ask that all jurisdictions and providers collaborate fully to that end. A new model of collaboration is particularly important at this juncture when Canada's healthcare systems face significant pressures. As noted, those pressures also present significant opportunities for innovation. A federal commitment to provide meaningful working capital in the form of a Healthcare Innovation Fund, combined with national machinery that consolidates existing organizations, would serve as a critical catalyst for improvements in healthcare. Bold steps in this regard would have the further benefit of resetting the federal-provincial-territorial dynamic around healthcare, and restarting a working partnership based around the needs of Canadians.

The next five chapters explore five priority areas of innovation for Canada. In the Panel's opinion, these should be taken as priority areas for the new federal Healthcare Innovation Fund and new Healthcare Innovation Agency of Canada.

Recommendations to the Federal Government

4.1 Starting in 2015-16, create a ten-year Healthcare Innovation Fund with a gradual ramp-up, ideally reaching steady-state by 2020.

- The Fund's broad objectives would be to effect sustainable and systemic changes in the delivery of health services to Canadians. Its general goals would be: to support high-impact initiatives proposed by governments and stakeholders, to break down structural barriers to change, and to accelerate the spread and scale-up of promising innovations.

- The Fund will not be allocated on the basis of any existing transfer formulae, nor will its resources be used to fund provision of health services that are currently insured under federal, provincial and territorial plans. Funds will be allocated on the basis of rigorous adjudication against transparent specifications, having particular regard for measurable impacts on health outcomes, creation of economic and social value, sustainability, scalability, and commitment

of relevant stakeholders to sustaining successful initiatives.

- The annual outlay from the Fund should rise over time towards a target of $1 billion per annum, derived primarily from new federal commitments.
- The Fund's initiatives will be grouped under five priority themes:
    - patient engagement and empowerment
    - health systems integration with workforce modernization
    - technological transformation via digital health and precision medicine
    - better value from procurement, reimbursement and regulation
    - industry as an economic driver and innovation catalyst

4.2 Create the Healthcare Innovation Agency of Canada to work with a range of stakeholders as well as governments to set the long-term vision for the healthcare system and healthcare innovation goals across the Panel's proposed five areas of focus.

- The Agency should provide oversight and expertise for the Fund, in keeping with the twin goals of removing structural barriers and supporting spread and scale-up, with the long-term aim of improving Canada's standing internationally on key metrics of health system performance.
- The Agency should be an arm's length organization, funded by the federal government. It should be governed by a group of eminent Canadians, who would be supported by one or more advisory committees composed of representatives of a range of stakeholders (provincial and territorial governments, patients, providers, industry and others). Its corporate structure should enable it to provide robust, independent oversight and direction for the Fund.
- The Agency should catalyze and coordinate collaboration with the pan-Canadian health agencies and the Canadian Institutes for Health Research to ensure alignment of activities.

4.3 Shift funding and staff for both the Canadian Foundation for Healthcare Improvement and the Canadian Patient Safety Institute to the new Healthcare Innovation Agency of Canada.

- This recommendation reflects the relevance of the mandates of both organizations to the promotion of healthcare innovation. It will also reduce duplication, provide some economies of scale for the federal government, and streamline a crowded pan-Canadian health organization field.

4.4 Continue Canada Health Infoway *pro tem* as a separate organization with staffing to complete projects currently underway. Once the new Agency is established, fold relevant functions from Infoway into the Agency, and flow future federal funding for digital health through the Innovation Fund.

Chapter 5

Patient Partnership, Public Empowerment

"When you have a serious chronic illness, like I do, you have to see specialists in isolation. They never seem to have the full picture and as a result I feel responsible for keeping my own record to carry to each of these appointments. They don't trust the documents I carry but currently I am working with a family doctor, a rheumatologist, a respirologist, a gastroenterologist and a cardiologist. Yet, when I get into trouble, I end [up] in the emergency room and they always want to know why I did not go and see my own doctor…you can't win as a patient. I wish they would all get in the same room at the same time, with me present, and talk about what is going on and what the best plan of care should be."

Public Submission

"Too often the customer service motto in healthcare seems to be… 'we aren't happy until you aren't happy'"

Participant at Regional Consultation

Patient Partnership, Public Empowerment

In the Panel's consultations, an unsettling theme recurred often across the country. Not just patient advocates, but professionals, administrators, and policymakers expressed concern about an increasingly complex and disjointed system that frustrates the best intentions of providers and projects a fundamental lack of respect for patients and their families. One stakeholder observed that untold billions of dollars of productivity are lost each year in Canada as citizens sit idle, waiting to see doctors in clinics and offices. Patients also complained of feeling that they were treated as parts on an assembly line, moving slowly through an opaque quasi-system that they saw as more "provider-centric" than "patient-centred." Providers who shared these concerns reported that many professionals and managers are so stretched that they can do little other than meet the demands for their own expertise. Some professionals observed that their efforts to propose even modest improvements at the institutional level were politely heard and pointedly ignored by management. Finally, patients and providers alike consistently flagged their challenges in navigating the system and its complex web of services across a range of sectors. In short, Canada's healthcare systems sometimes look and feel as if they have forgotten who they serve.

This chapter provides an overview of some developments in patient-centred care. Throughout, the Panel has been particularly concerned to profile patient engagement at multiple levels: in self-care or as a caregiver to a loved one, in hospitals and similar institutions, in educational settings, and in co-design of healthcare systems more broadly. The resulting focus is unabashedly high-touch rather than high-tech. The Panel respects leading thinkers who envisage more personalized care based on extensive self-monitoring through mobile devices and detailed biological profiles. For example, Dr. Eric Topol has noted "[w]here today people surf the Web and check their email on their cell phones, tomorrow they will be checking their vital signs".[110] However, for countless Canadians now living with chronic diseases, this positive vision must seem far removed from their daily struggles in navigating our healthcare systems.

Patient-centred Care: Ideal and Reality

Patient-centred care has been defined as "care that is respectful of and responsive to individual patient preferences, needs and values," wherein "patient values guide all clinical decisions."[111] Healthcare professionals might reasonably argue that their goal has always been to deliver patient-centred care. Literature to that effect certainly dates back centuries. Recent incarnations of this ancient ethos began in the 1980s[111] amidst concerns about the rising complexity and increasing discontinuity of healthcare in an era of chronic disease.

Patient engagement is a term that encompasses the important role of the patient as end-user: i.e., "starting from the premise of expertise by experience, patient engagement involves the collaboration and partnership with professionals."[111] In Canada, a number of health commissions have highlighted the importance of refocusing the healthcare system to centre on the patient.[xix] For example, Recommendation 1 of Saskatchewan's Patients First Review stipulated that "the health system make patient and family-centred care the foundation and principal aim of the Saskatchewan health system, through a broad policy framework to be adopted system-wide. Developed in collaboration with patients, families, providers and health system leaders, this policy framework should serve as an overarching guide for health care organizations, professional groups and others to make the Patient First philosophy a reality in all work places."[46]

Providers and administrators consistently acknowledge that patients and their perspectives and experiences should be the guiding factor in clinical care. However, the degree to which the patient is engaged in his or her care is variable. Most institutions do survey their patients; most professionals use hand-outs to fill in information about a diagnosis and journey

xix In October 2009, Commissioner Tony Dagnone presented the findings of the Patients First Review of Saskatchewan's healthcare system. His report *For Patients' Sake*, was a first in healthcare reform efforts, as its findings and recommendations were intended to reflect patients' experiences of the healthcare system. The report aimed "to realign the values of Saskatchewan's health system so that the patient is again made the centre of attention." (p.3) While unique in its approach, its call for a healthcare system oriented around the needs of patients and their families was not. Rather, it echoed the findings of earlier healthcare commissions and inquiries: Commission on the Future of Health Care in Canada, Building on Values: The Future of Health Care in Canada: Final Report, 2002; Alberta's Premier's Advisory Council on Health, A Framework for Reform: Report of the Premier's Advisory Council on Health, 2001; The Ontario Health Services Restructuring Commission, A Legacy Report: Looking Back, Looking Forward, March 2000; Commission d'étude sur les services de santé et les services sociaux, Emerging Solutions : Report and Recommendations, 2000.

of care, and make time to field questions in person or online. However, many patients expect a much wider agenda of involvement. Patients expressed a desire for: better access to collaborative, integrated care where their needs are respected; improved communications with providers, including two-way information sharing that would permit them to better manage their own health; and engagement as partners in all decision-making processes related to their healthcare.

Patient advocates also emphasized the importance of patient input to guide future decision-making around the types of services that they and similarly afflicted individuals may need now and in the future.

Evidence indicates that where "patients and families are actively engaged in their health, patient outcomes, experience of care and economic outcomes can be substantially improved."[111] Canadian healthcare leaders and professionals are clearly taking steps to reorient the system around patients' priorities. However, as noted in chapter 2, the 2014 Commonwealth Fund ranking found that in comparison to ten other countries, Canada lags on a range of measures related to patient experience, including patient-centred care (8th out of 11 countries), timeliness of care (11th out of 11), coordinated care (8th out of 11) and safe care (10th out of 11).[27]

Canada's aging population will intensify the pressures for change. More patients with chronic disease will expect to be partners in their own care. Furthermore, there will be greater impetus for providers to take a holistic approach that promotes healthy aging,[xx,112] both to respect patient's wishes for independence, and as a way of reducing demands on the healthcare system. In this vein, care will need to be accessible at home (e.g., through virtual care and self-management of conditions) so that more seniors can live independently for as long as possible. Thus, as with the move away from institution-centred care, the so-called "Grey Tsunami" may catalyze a shift towards patient engagement that benefits all Canadians.

These changes will need to take place at different levels:[111]

- At the individual level, patients can be supported to engage in their own care by consumer health technologies and better access to information, including their own health records.
- At the organizational level, staff can be educated to approach their daily work with respect for principles of patient and family-centred care, while also providing patients with a say in improving the local organization of care.
- At the system level, policymakers and leaders can involve patients in designing services that go beyond institutional walls and span the continuum of care. This also means engaging patient advocates – and the broader public – in a dialogue about the types of care we need now and into the future.

Tools to Enable Patients to Manage Their Own Care

Digital health technology offers patients access to health information online through patient health portals. Patients can also monitor their health status through health apps or devices. Known collectively as consumer digital health solutions, these tools encompass a range of information technology products and serve a variety of functions:[113]

- administrative tools that simplify patient interactions with the healthcare system (e.g. e-scheduling and e-prescribing),
- information management and communication tools that permit patients to be informed partners in their care (e.g. patient portals or personal health records[xxi]), and
- virtual care, that enables the delivery of healthcare to patients outside of the clinic or physician's office, using technological applications or devices (e.g. remote patient monitoring).

xx Defined as the "process of optimizing opportunities for physical, social and mental health to enable seniors to take an active part in society without discrimination and to enjoy independence and quality of life."

xxi "A Personal Health Record is a complete or partial electronic health record under the custodianship of a patient or family member, that holds all or a portion of the relevant health information about a person over their lifetime." Stylus Consulting. Nova Scotia Personal Health Record Demonstration Project: Benefits Evaluation Report. Ottawa: Canada Health Infoway; 2014. Available from: https://www.infoway-inforoute.ca/en/component/edocman/1995-nova-scotia-personal-health-record-demonstration-project-benefits-evaluation-report/view-document

A patient portal is a secure website through which patients can access their health information as well as carry out administrative tasks such as completing forms online, communicating with their providers, requesting prescription refills, reviewing lab results or scheduling medical appointments. What is a patient portal? [Internet]. Washington: U.S Health and Social Services; Available from: http://www.healthit.gov/providers-professionals/faqs/what-patient-portal

These tools can increase patient satisfaction and autonomy, while allowing care at home. Other anticipated outcomes include reduced emergency room visits, hospital admissions and bed stays.[114] Consumer digital solutions can also increase provider satisfaction and improve provider productivity. For example, e-scheduling has been shown to reduce appointment no-show rates and time spent booking appointments.[115]

A number of healthcare systems have successfully adopted such tools. For example:

- Denmark has made leading in information technologies a political priority. Since 2003, patients in Denmark have had access to their own health information through a national public, internet-based portal called www.sundhed.dk.[116] Each citizen has a personal page that sets out his/her health information, and allows communication with health professionals, renewal of prescription medicines, and viewing of waiting times for operations and quality ratings of hospitals. The portal also supports self-management of disease and conditions by providing patients with access to local disease management systems, as well as chat rooms for patients with specific disease and conditions.[117]

- In 2004, France implemented a voluntary electronic health record system called the Dossier Médical Personnel, which became electronically accessible to patients through a secure patient portal in 2011.[116] Through the portal, patients are able to access their electronic record; view all documents except those deemed sensitive by their author; prevent certain documents from being seen by different care providers; request the destruction of health documents, as well as add personal health information that they feel is relevant. They are also able to manage which healthcare providers have access to their personal health information and under which circumstances, as well as view the activities healthcare providers within their Dossier.

In contrast, Canada's progress in rolling out consumer health technologies to all patients has been slow. For example, while 80 percent of Canadians would like access to their health information online, surveys conducted by Ipsos Reid in 2010 and 2013 indicate that only four percent of Canadians currently had such access.[118] From what the Panel heard and read, a number of structural and cultural barriers are slowing progress on this front. In particular:

- Through Canada Health Infoway, Canada is still building health info-structure, even as the number of wireless consumer digital solutions grows daily. These digital health solutions, however, depend on interoperable electronic medical and health records systems.[113] Canada is being held back by incomplete interoperability, as well as gaps in uptake of electronic medical records in primary and ambulatory care settings.[119]

"As a specialist in a major urban centre, I provide services to First Nations on reserve who are flown down for care. I know of three communities up North where the nursing stations have digital X-ray capability, with the scans stored on a secure server. However, this secure server does not link up to any servers in the province because of concerns about federal privacy laws. This means that specialists like me cannot access the patients' films. Sometimes when patients comes down for care, the nursing station will can give them a CD, which is easily lost and can be opened by anyone. So, either I don't get the scan or nurses at the nursing station take a photo of the X-ray and text it to me. Either way, this is not good quality care."

Stakeholder Submission

- The Supreme Court of Canada confirmed in 1992 that patients have the right to access their personal health information. However, misunderstandings by practitioners, institutions, and jurisdictions persist on this score, and are amplified by unsupported liability concerns.[120]

- Stakeholders across Canada cited a lack of clarity about the scope and reach of privacy legislation, coupled with a risk-averse culture, as impeding virtual care and access by patients to their own personal health records.

- Patient access to, and co-ownership of, their own records is a significant cultural shift for providers who have traditionally been custodians of health records. This may require training and support in making the change, e.g. guidance on how to share clinical notes with potentially alarming but still incomplete information.[121] Currently, many patients experience unreasonable delays or confiscatory charges when they seek access to and control over their own records.[122]

"We need to educate providers and patients in the areas of patient safety and engagement. It's crucial that both parties come together as one unit and balance the gap between the two. Patients, especially ones who have been harmed by the "the system" have a very unique perspective which offers valuable insight for providers. What may seem appropriate for providers may be the complete opposite of what patients are wanting/ needing."

"We may not need more doctors or more testing. We may need better communication between professionals and better communications with patients."

Public Submissions

- Reimbursement processes have not kept up with technological developments. Provincial payers are justifiably wary that new fee codes for digital encounters could escalate rather than reduce costs – another signpost of the need to create blended payment systems for physicians. On the other side of the coin, the healthcare system provides little incentive for physicians to adopt these new tools, particularly when it is the patient, healthcare institutions, and the system in general that realize the benefit.[113]

Notwithstanding these challenges, some jurisdictions in Canada are moving forward with the roll-out of consumer digital health technologies. Alberta, Saskatchewan, and Nova Scotia are all pursuing provincial roll-outs of personal health records and/or portals.[123] BC is providing patients with electronic access to lab results. In Ontario, adoption of personal health records and patient portals is being driven at the institutional and organizational level, e.g. by Sunnybrook Hospital's My Chart and McMaster University's Personal Health Record.[xxii]

Access to virtual care services in Canada is also improving, particularly with respect to remote patient monitoring for individuals with chronic diseases and those recently discharged from hospital.[124] A recent pan-Canadian study found that many regional health bodies or providers are adopting remote patient monitoring. Such monitoring is regarded increasingly as the standard of care for particular patient groups.[124] Last, as evidenced by the examples provided in Chapter 2, virtual care is also helping to extend services to rural, remote and underserviced areas.[125]

Organizational and Culture Change

At the organizational level, shifting to patient and family-centred care has serious implications. It means adopting a different way of working – one that truly integrates patients' values, experiences and perspectives.[111] This requires firm leadership, engagement of staff through coaching and training, and enlisting and preparing patients to act as advisors.[126]

Through its consultations and commissioned research, the Panel learned that healthcare organizations in jurisdictions across the country are beginning to take these steps. For example, Kingston General Hospital in Ontario first formally adopted an institution-wide policy of patient and family engagement in 2010.[111] Today, the hospital involves patients and families as advisors in all major committees, hiring decisions, staff orientation, and health professional education. Hospital leaders credit these efforts, along with staff commitment, for significant improvements in patient and health system outcomes, including improvements in indices of patient satisfaction and institutional reputation.[111]

xxii Ontario is also rolling out a comprehensive web-accessible electronic health record, based on major upgrades of a longstanding platform in Southwestern Ontario. The platform is nearing launch for about 6.75 million residents of the Greater Toronto Area, and will scale up from there. Patient portals will be activated in the second phase of the effort.

"Patients need to be seen and treated as individuals and not just as a body or a condition. There needs to be recognition of and sensitivity to their personal circumstances and life situation."

Participant at Patient Roundtable

"There is considerable lip service to team approaches, interdisciplinary and high-quality care for older people but it is simply not a reality in practice."

Stakeholder Submission

The Université de Montréal (U de M), understandably, has taken a more pedagogical focus. It is embedding patients in the education and training of health professionals. The goal is to galvanize movement to a new model of care that sees the patient as an equally valued member of the healthcare team.[127] To this end, patients have been strongly engaged in the redesign of U de M's Interprofessional Collaborative Education curriculum – a core component for some 1500 students in health sciences and psychosocial science programs. Patients are also trained and paired with educators to become co-trainers in Interprofessional Collaborative Education workshops that all students attend. This helps students understand the patient's perspective and experiences, as well as the value of partnering meaningfully with patients in clinical practice.

These and other pockets of success demonstrate the potential for shifting organizational culture and provider attitudes and practices. However, as noted, many Canadians expressed concern to panelists about the disjointed design of healthcare delivery at the systems level – a topic to which this chapter now turns.

A Systems Level Focus on Patient and Family Care

In an ideal world, healthcare delivery would be organized around a defined set of patient needs over the full continuum of care; and patients would be attended by interdisciplinary healthcare teams custom-designed to anticipate and meet their needs throughout any given journey of care.[128] The patient perspective would also be solicited and incorporated into the design of care, from the research that informs it to the technologies that help deliver it. As the Panel heard at a patient roundtable discussion, involving patients in the design of some or all segments of the healthcare system changes the conversation. Indeed, their very participation can be a disruptive innovation that accelerates healthcare system reform.[129]

Internationally, this latter message is being heard as health professionals engage patients in what has been termed experience-based co-design.[111] The US Collaborative Chronic Care Network (C3N) is internationally lauded as exemplifying this disruptive approach. A prototype of the Institute of Medicine's vision of a learning healthcare system, C3N aims to transform care for children with Inflammatory Bowel Disease through a "large-scale'wrap around' network of care that connects patients, parents, caregivers, clinicians and researchers to partner and co-design improvements".[111] Working with multiple industry partners, C3N has created patient and parent workgroups, apps and technologies, and developed a community across 73 sites involving 450 gastroenterologists and one third of all paediatric patients with inflammatory bowel disease in the US. This network is expanding into the UK and a new C3N is in the works for patients with cystic fibrosis. Participating clinics have seen remissions for their patients increase from 55 percent to 77 percent over a five-year period, along with increases in patient satisfaction and overall happiness.

Bridgepoint Active Healthcare specializes in caring for patients with complex chronic health conditions. Through a 'living laboratory' approach, clinicians and researchers at Bridgepoint connect directly with patients and their families to better understand their experiences of care. This close link with patients provides researchers with the opportunity to model, test and evaluate new approaches on a rapid basis, with a view to optimizing clinical services, making system-level improvements, and using design principles to improve health outcomes for individuals who often must transition between home and both general and rehabilitation hospital settings. To ensure better institutional integration on that latter score, Bridgepoint has recently merged with Mount Sinai Hospital to form the Sinai Health System.

Source: About us. Toronto: Bridgepoint Active Healthcare; c2014. Available from: http://www.bridgepointhealth.ca/en/who-we-are/about-us.asp

In Canada, too, there are pockets of innovation where services for specific populations are being re-designed around the needs and experiences of patients. While different in ambition from the C3N model, they embody a similar commitment to thinking beyond a single clinic, institution, or service. For example:

- Community social pediatrics is an integrated approach to care that focuses on underserved or vulnerable children and youth.[130] Founded in Canada by Dr. Gilles Julien in the 1990s, this approach integrates care for patients and families across both the health and social services sectors. Healthcare providers deliver pediatric services and work with families and other community-based professionals including educators, social workers, legal aid, and law enforcement, to provide children with the support they need to flourish. Currently, there are 16 clinics in Quebec, serving approximately 4,000 children and their families. Community social pediatrics is on track to being spread more widely in Quebec through partnerships among the Université de Montréal, McGill University and the Fondation de l'hôpital de Montréal, as well as a $22 million investment by the Government of Quebec.[131] The goal is to serve 20,000 vulnerable children in Quebec by 2020. The organization representing Quebec's nurses has announced that it will be providing a $250,000 grant to support clinical nurse training in these centres.[132]

- First launched in 2012, Community Health Links is a program run by the Ontario Ministry of Health and Long-Term Care that supports the coordination of care for high needs patients such as seniors and people with multiple conditions.[133] Healthcare organizations that are part of Health Links must work with other sectors in the healthcare system to develop and oversee coordinated care plans for complex patients. Patients are assigned a designated provider that they know and can contact regularly. Collaboration by members of Health Links across health sectors is enabled by digital technology, which also allows them to track and measure their results.

Several promising initiatives that empower seniors were highlighted during the Panel's consultations. As one example, Teams Advancing Patient Experience – better known as TAPESTRY – is a program in Hamilton, Ontario that enlists and trains volunteers to help older adults identify and meet their health goals, as well as manage their own care. The volunteers, in turn, are engaged with an inter-professional healthcare team.[134]

Whereas these innovations are localized, wider-angle engagement of patients in overall system design is also underway. Alberta's Patient and Family Advisory Group partners with leaders across the health department to review policies and initiatives and share insights from the patient and family perspective for the planning and delivery of quality healthcare services.[135] The BC Patients as Partners initiative is a formal partnership among the Ministry of Health, healthcare providers, universities, healthcare not-for-profits and non-governmental organizations.[136] All these provincial organizations work together to include the patient voice, choice, and representation in healthcare improvement.

The credo driving the BC Patients as Partners initiative is "nothing about me without me."[136] That motto might be adopted more generally by patients and families in dealing with healthcare across Canada. Nowhere is it more applicable than in the case of Canada's Aboriginal peoples.

Patient and community engagement are exemplified in the All Nations' Healing Hospital in Fort Qu'Appelle, Saskatchewan, one of the first healthcare facilities in Canada owned and operated by First Nations' governments. The All Nations' Healing Hospital provides culturally relevant healthcare in a team environment,[137] including maternal-child services and a wide range of counselling, mental health, and addictions services. All these programs carefully integrate the best of mainstream therapeutic techniques with traditional First Nations healing practices.

The Panel learned about many other examples of facilities and programs run by First Nations, and was encouraged by the growing movement across Canada to offer culturally appropriate, patient-centred care for Aboriginal peoples. In this regard, the Panel urges all governments to accelerate such efforts in partnership with Canada's Aboriginal peoples, and returns to this topic in Chapter 6.

The Societal Dimension

As noted in Chapter 4, the Canadian healthcare system is facing a period of accelerating change with population aging, demands for consumer autonomy, the rapid emergence of precision medicine, and an explosion of genetic information about individuals and populations. These issues give rise to a range of social and ethical issues and have created new imperatives for sharing information and respecting the views of patients, families, and, more broadly the Canadian public.

End-of-life care exemplifies some of these challenges. The Supreme Court of Canada decision in *Carter v. Canada*[138] has been widely interpreted as decriminalizing physician assistance in dying. In responding, governments will need to balance the needs of the patients with protection of the vulnerable. As seems to be the rule in Canada, there are also jurisdictional complexities. Regulation of medical services falls within the constitutional jurisdiction of provinces and territories. Absent federal revisions to the *Criminal Code*,[139] some provinces and territories will move ahead with regulations while others take a "wait and see" approach – a situation that puts terminally ill Canadians on an uneven playing field.

As governments grapple with the Supreme Court of Canada decision, there is widespread acknowledgment that we need to strengthen palliative care resources and services for Canadians. A novel approach has been taken by the Canadian Virtual Hospice (http://www.virtualhospice.ca) -- a comprehensive online resource that provides information on advanced illness, end-of-life care, and grieving to a wide audience.[140] The website features multi-media content, and also connects the public directly online to an inter-professional team of health experts who respond confidentially to questions. While it operates out of Winnipeg with support from the Government of Manitoba, it serves more than 21,000 unique visitors per day with Ontario, BC, Alberta and Quebec driving three-quarters of the traffic.

"Much of healthcare focuses on curing the incurable. I wonder about the cost and suffering caused by attempts to preserve life when quality will be limited. Now that is loaded, because I also realize that quality exists in many different packages and it is not my decision to determine this for others… Perhaps more conversations about 'expectations' and ethics could make some of the muddy waters clearer."

Public Submission

The success of the Canadian Virtual Hospice speaks to the broader issue of making objective and credible information on healthcare more accessible to all Canadians. Health literacy should be actively promoted through expanded use of digital resources and apps that provide patients and the public with customized, interactive sources of information and advice on health and healthcare services. For example, England's National Health Services Choices (www.nhs.uk) is a reliable, comprehensive source of health and social care information for the public. It aims to support the public in making choices about their health, from lifestyle choices to accessing NHS services in England.[141] It includes more than 20,000 regularly updated articles and more than 50 directories that allow people to find, choose and compare health services available in England. Rather than reinventing the wheel, the Healthcare Innovation Agency of Canada could play a useful role simply by aggregating links to the most reputable and relevant sites, thereby making it easier for Canadians to access health-related information.

"I am part of the Canadian Virtual Hospice team that has created an amazing free resource for people and their families who are coping with a life limiting illness like cancer."

"Much could be saved by funding national entities that provide information to patients and families. For example, each LHIN in Ontario is developing its own palliative care website. Duplication is a problem."

Public submissions

As well, information about the healthcare system and its performance in Canada is difficult to access for patients and the public. The Canadian Institute for Health Information (CIHI) does offer extensive information about comparative health system performance on its website, but the tools seem to be designed more for researchers, managers, and providers than for a wider audience. The Panel returns to this issue in Chapter 7.

In conclusion, the Panel has learned about many pockets of successful innovation to promote patient-centred care and patient and family engagement in healthcare and health professional education across Canada. Panel members commend the commitment and dedication of many individuals within the system who have advanced the patient engagement agenda. At this point, a more concerted and collaborative effort is needed to: spread and scale up these initial efforts; support and evaluate new initiatives for wider adoption; improve awareness of the relevant concepts; address structural barriers to innovation in patient-centred care; help Canadian governments to stay aligned in responding to the ethical, legal and social issues emerging in healthcare; and promote wider health literacy in an era of rapid innovation.

The following recommendations respond to these identified needs.

Recommendations to the Federal Government

5.1 Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund, pursue the following priorities:

- Develop and implement a strategy to promote patient and family-centred care in partnership with governments, patients, providers and others. Elements of this strategy would include:
  - Developing and implementing information tools that patients need;
  - Creating incentives for greater patient engagement at the organizational and system level, with the goal of improving models of care and system design;
  - Sourcing and supporting mobile and digital health solutions that meet needed common standards and interoperability requirements; and
  - Adopting and deploying best practices in the development and use of patient portals, including best practices internationally.
- Support the development of policy and legislative tools to enable patient access to, and co-ownership of, their own personal health records.
- As discussed in Chapter 6, support provinces, territories, and regional health authorities in undertaking large-scale projects that implement highly integrated delivery systems that test new forms of payment, where care is organized and financed around the needs of the patient.

5.2 Through Health Canada, take the lead in consultation and consensus building across provinces and territories on emerging ethical and legal issues arising from technological and social innovation in healthcare, and bring forward needed legislative changes in a timely fashion.

5.3 Through Health Canada, request the federal Privacy Commissioner to work with provincial and territorial privacy commissioners to develop a common understanding on how to protect privacy while enabling innovation (e.g. in precision medicine and genomics, mHealth, and various forms of digitized health records) across Canada.

- Privacy commissioners should be asked to consider how their respective legislative frameworks could be better harmonized across Canada to reduce any unnecessary duplication or confusion that could impede innovation.

Chapter 6

Integration and Innovation: The Virtuous Cycle of Seamless Care

"Canada does not have an integrated system. Canada has a series of disconnected parts, a hodge-podge patchwork, healthcare industry comprising hospitals, doctors' offices, group practices, community agencies, private sector organizations, public health departments and so on….The list of problems is long: uncoordinated care, underuse of non-medical practitioners, provider payment methods with perverse financial incentives, emphasis on disease treatment, unexplained variations in service utilization, geographical maldistribution of practitioners, little use of information and information technology, waits and other access problems, retarded dissemination of proven technology, little emphasis on consumer satisfaction, sparse evaluations of quality of care and outcomes, shortages of various health professionals, rigid role definitions that do not allow new models of care, and looming significant cost increases."[142]

Peggy Leatt, George Pink and Michael Guerriere

Integration and Innovation: The Virtuous Cycle of Seamless Care

Made-in-Canada models for integrated delivery systems were proposed almost twenty years ago.[143] At the time, the vision was that these systems might compete for patients in larger urban centres. Dr. Leatt and colleagues published their lament about lack of progress (quoted above) five years later. Another 15 years have passed, and most of the same criticisms still apply to Canada's healthcare systems.

Now, as then, there is no logic to the existing payment and accountability silos in our healthcare systems. Healthcare remains disjointed, with poor coordination and alignment within and across the various professions, acute and chronic care institutions and community care. Lack of integration is partly understandable where there is a multitude of payers (e.g., public insurance, private insurance, out-of-pocket spending). That services that are solely publicly funded are still arranged in stovepipes has been harder for the Panel to comprehend.

During Panel consultations, stakeholders repeatedly cited this fragmented financing as a barrier to the uptake of innovation, a frustration to entrepreneurs and industry, and an impediment to high-quality and cost-effective care. Moreover, as one might infer from Chapter 5, so long as the system is organized around providers and so long as those providers are paid out of separate funding envelopes, patient-centred care will be easy to announce and difficult to achieve.

This chapter first defines integrated models of care, and then reviews some of the relevant evidence and experience from the US from whence many of the key insights about integration models and methods have come. The chapter then briefly takes stock in Canada, before turning to the two strategic elements in achieving more integrated care for Canadians: alignment of payment systems and incentives, and development of new health human resource models. The Panel concludes the chapter with a discussion focused on First Nations, who currently navigate the least-integrated of any healthcare system in Canada.

What is an Integrated Model of Care?

Based on successful international models, the critical elements of a highly integrated system can be defined as follows: Inter-professional teams of providers collaborate to "provide a coordinated continuum of services" to individual patients, supported by information technologies that link providers and settings.[144] Operating revenues are derived by pooling funds across the involved sectors of the healthcare system. Whether in a single entity or organized in a network configuration, the providers must be "willing to be held clinically and fiscally accountable for the outcomes and the health status of the population being served."[145]

The degree to which different systems have integrated healthcare services varies, from comprehensive integration of services in the US Health Maintenance Organization (HMO) model (e.g. Group Health or Kaiser Permanente) to more focused integration strategies (e.g. regional commissioning in the UK National Health Service and some payment models being rolled out under US *Patient Protection and Affordable Care Act* reforms).

Evidence dating back forty years suggests that integration has benefits in terms of the patient experience and cost containment. Starting in the early 1970s, the landmark RAND Health Insurance Experiment[xxiii] compared patients enrolled in an integrated healthcare plan or HMO where professional staff were salaried, with those who received first-dollar coverage of care obtained from private fee-for-service physicians making referrals to independent hospitals. The results? Those receiving care in the integrated model had lower rates of hospitalization and received more preventive services. As a consequence of lower hospitalization, the cost per person was much lower. Those in the fee-for-service group fared slightly better on process and satisfaction measures because the patients in the integrated model were not guaranteed consistent access to their own physician of choice.

xxiii This randomized trial was primarily concerned to determine how different levels of co-payments (i.e. user fees at the point of service) affected use of medical care. Compared to patients with full coverage (or 'free care,' analogous to Canadian Medicare), those making co-payments definitively reduced their visits to physicians. Controversy has continued for decades as to the potential impact of those reductions on patients' long-term health outcomes.

Figure 6.1: Annual Rates of Service Utilization and Healthcare Costs

	Group Health Cooperative	Fee-for-Service	
		No Cost-Sharing	25% Cost-Sharing
Percent Using Service	87	85	76
Percent Hospitalized	7	11	9
Hospital Days/100 persons	49	83	87
Physician visits	4.3	4.2	3.5
Preventive visits	0.6	0.4	0.3
Annual costs/person	$439	$609	$620

Source: Adapted from: Wagner EH, Bledsoe T. The Rand Health Insurance Experiment and HMOs. Med Care. 1990 Mar; 28(3):191-200.

The RAND study involved Group Health, a well-known HMO that continues to operate successfully on a larger scale today. A similar organization, Kaiser Permanente, has been more closely studied and offers newer insights into the benefits of integrated delivery systems.

Kaiser Permanente

Kaiser Permanente serves approximately 10 million members throughout the southwest US.[146] It offers a very wide range of services, both directly and through contracts and networks. For example, Kaiser operates its own pharmacies and is the largest non-governmental purchaser of pharmaceuticals in the world.

In a comparison with the National Health Service (NHS) in 2002, Kaiser was found to perform better at roughly the same cost per capita. As well, its members "experienced more comprehensive and convenient primary care services and much more rapid access to specialist services and hospital admissions. Age adjusted rates of use of acute hospital services in Kaiser were one third of those in the NHS."[147] The study's authors concluded that "widely held beliefs that the NHS is efficient and that poor performance in certain areas is largely explained by underinvestment are not supported by this analysis."[148]

What are the critical elements to Kaiser's success? The authors of the 2002 study attributed much of Kaiser's success to real integration through partnerships between physicians and the administration. Related factors were system control and accountability across all components of the healthcare system, efficient management of hospital use, greater investment in information technology, and the motivation for continuous improvement provided by competition.[149]

As noted above, Kaiser engages physicians and other health professionals in the co-management of the system. While professionals are salaried, they receive bonuses for quality of care and effective stewardship of shared resources. Professionals also spend more time using their unique expertise and innovating at "the clinical coal-face," because clinical responsibilities are allocated to the most appropriate personnel. As the 2002 study noted, the integrated management and budgeting allows Kaiser "to manage patients in the most appropriate setting, implement disease management programmes for chronic conditions, and make trade-offs in expenditures based on appropriateness and cost effectiveness rather than artificial budget categories."[150]

"At Kaiser Permanente, there are many thousands of staff who have a major portion (15%) of their variable compensation tied to innovation contributions."

Stakeholder Submission

In 2005, Kaiser created a comprehensive personal health record called MyChart, which patients can access through a secure patient portal called My Health Manager.[151] Fully

integrated with existing information technologies, the portal permits secure messaging between patients and providers, e-scheduling and e-renewal of prescriptions. Since the implementation of the system, the number of digital encounters has risen from five percent to 67 percent, with 50 percent of all interactions between Kaiser patients and physicians occurring via secure messaging.[146] Overall, the number of physical visits (i.e., clinic visits, emergency department visits and hospital admissions) has dropped significantly.

Last, Kaiser's rich databanks are used to support quality improvement efforts, evaluate innovations in the delivery of care, find new efficiency opportunities, and facilitate academic health services research.[146] They also help identify patients at risk. In that regard, while Kaiser's low rates of hospitalization are largely a result of excellent primary care, effective deployment of multi-professional teams, and heavy use of virtual care, there is a strong emphasis on population health management and preventive care, including outreach to vulnerable subpopulations.

Kaiser's strength demonstrates the importance of learning from successes in any system. While the US is still struggling to contain healthcare costs, improve value, and deliver more equitable access, it is also a hotbed of healthcare innovation. Moreover, as discussed below, more systematic reforms are being attempted in American healthcare with the specific objective of enhanced integration of payments and services.

Accelerating Integration in US Healthcare Services

The *Patient Protection and Affordable Care Act* of 2010[152] (also known as the *Affordable Care Act* and widely called Obamacare) has garnered international headlines for its insurance reforms, particularly the extension of coverage to millions of uninsured Americans. Less well known are the integrative payment modalities that have been enabled by Obamacare, as briefly introduced in Chapter 2. Panel members reviewed key publications, commissioned research on payment modalities, and visited the Washington area to hear first-hand from policy experts as well as those involved in designing, driving, and evaluating these new remuneration and delivery mechanisms.

Two strategies that the *Affordable Care Act* has introduced bear brief notice here.

The first is the funding of Accountable Care Organizations. These are voluntary networks of providers that take responsibility for the costs and quality of a defined set of services for a given number of US Medicare recipients (persons 65 and over).[153] There is no predetermined mode of physician payment. The goal of Accountable Care Organizations is to drive down costs while maintaining quality.

The second strategy is bundling of payments. Bundled payments were defined by Jason Sutherland in a Panel research report as "single payments issued for a patient's entire episode of care for a health condition or procedure, potentially spanning multiple healthcare providers and settings".[154] This is some distance, obviously, from the fully integrated and comprehensive care provided in US group health plans such as Kaiser Permanente. However, as Sutherland notes, bundled payments offer "built-in financial incentives for coordination and integration of care between providers" and "more cost certainty across the continuum of care than traditional *a la carte* payments to multiple providers."[154] Indeed, by putting a single price on an entire episode of care, bundled payments offer "the equivalent of a 'care warranty,' where the financial consequences of any complications that occur within a defined period of time (such as unplanned readmissions) are the providers' responsibility."[154]

Sutherland notes that these payment changes have driven vertical integration of services and catalyzed a rapid increase in the number of US healthcare mergers.[155] On the other hand, as the US Society of General Internal Medicine's National Commission on Physician Payment Reform observed in 2013, neither of these models requires a shift from fee-for-service remuneration of individual doctors. Their primary recommendation follows: "Over time, payers should largely eliminate stand-alone fee-for-service payment to medical practices because of its inherent inefficiencies and problematic financial incentives."[156] Other recommendations urge rapid experimentation with new models of payment designed to reward quality and value, with a view to "broad adoption" of the best models within a decade.[157]

The Center for Medicare and Medicaid Innovation (CMMI) in the US has taken this advice seriously. Bundled and blended payment models that start to move physicians away from simple fee-for-service remuneration are now being rolled out.[158] These and other innovations in payment and organization of healthcare are being implemented for seniors through the federally-administered Medicare program, and for low-income Americans through

conditional cost-sharing and collaboration with state governments.

Both the CMMI and its sister organization, the Agency for Healthcare Research and Quality, are strongly committed to transparency. Data are shared widely with researchers, and CMMI staff actively study and refine all new models of care. As a result, a cycle of evaluation and iterative improvement to the *Affordable Care Act* reforms is unfolding publicly through an ever-growing number of articles in leading US medical journals.

Today, while the US faces huge healthcare challenges, it has also become a dynamic laboratory for healthcare innovation and integration. Scaling-up remains a challenge, as noted in Chapter 2. However, as Pierre-Gerlier Forest from Johns Hopkins University has rightly stated, "We would be fools not to try to learn from this colossal experiment."[159]

Limited Integration of Healthcare Services in Canada

Chapter 3 highlighted how frequently concerns about limited integration have surfaced in major healthcare reports. While many countries share the problem, Canadian healthcare appears to be particularly fragmented – and peculiarly resistant to reform in this regard.

The regionalization of healthcare that took place in most Canadian provinces during the 1990s is sometimes presented as a positive example of integration.[160] While governance was indeed notionally integrated, the impact was limited, in part because regional health authorities have generally lacked any authority over budgets for physician services and drugs, and in some instances, home care services as well.

Another widespread strategy has been to approach integration from the front-lines through primary care reform. For simplicity, initiatives in Canada's two largest provinces can serve as cases in point.

Quebec's Centres locaux de services communautaires (CLSC), for example, number over 140, date back to the early 1970s, and provide a focal point that integrates multidisciplinary primary care and social services.[161] This visionary initiative had the potential to link primary care with efforts to address the wider determinants of health. However, the proportion of CLSCs that have recruited family physicians unfortunately was and remains small. Quebec later underwrote a more traditional model – the Family Medicine Groups, launched in 2002.

"We need to shift from an emphasis on acute hospital care to community-based care based on inter-professional teams of healthcare providers working with other community social services in collaboration with specialists and hospitals - and also with municipalities, school boards, police and the business community to address the underlying causes of illness."

Public Submission

"We don't have a system. We have a collection of services and programs."

Participant at Regional Consultation

Ontario's Community Health Centres were also set up in the 1970s with salaried staff. They offer multi-professional primary care with an emphasis on health promotion and a strong community development orientation.[161] Policymakers considered scaling up this model because of its preventive possibilities. However, as occurred with CLSCs in Quebec, most family physicians elected instead to establish their own practices.

In the late 1990s, as noted in Chapter 3, Ontario began a wider initiative in primary care reform that has continued in waves ever since. New models of capitation funding have increased the number of primary care practitioners working in a range of new physician-led group practice models. [69] Over the years, these reform efforts have cost hundreds of millions of dollars in new spending.[69] Models vary in the amount of supplemental funding provided to broaden primary care teams. In an interesting nod to its own history, Ontario in 2007 created a set of Nurse Practitioner-led Clinics for patients who have trouble finding a family physician. About 25 of these clinics currently provide multi-professional team care to these vulnerable patients. Nurse practitioners also help these patients navigate the healthcare system.[162]

Five tangible outcomes of primary care reform have been a shift to capitation as the basis for remuneration of a substantial proportion of Ontario's family physicians, a sharp increase in the annual earnings of family physicians, a related rise in applications to family medicine residencies, growth in the employment of other health professionals in primary care settings, and, as noted in Chapter 3, encouraging but very modest improvements in a moderate number of performance measures.[69]

In sum, attempts to fully integrate primary care with social services have not met with great success. The full potential of multi-professional team care has not been consistently realized in reform initiatives. And, perhaps most importantly, integration of primary care with specialty care or with the institutional sector has been limited in most models.

Turning to patients with particular characteristics or conditions, Chapter 5 highlighted some pioneering efforts to make care more effective and patient-centred through integration. A similar motivation is evident in Alberta's Strategic Clinical Networks (SCN), introduced briefly in Chapter 3. To elaborate, these are province-wide teams comprised of healthcare professionals, researchers, community leaders, patients and policymakers. The teams are organized around a specific clinical focus with a view to enhancing the patient journey, improving health outcomes, and standardizing care delivery.[163] Ten SCNs are currently in place covering major clinical conditions, with six more slated for implementation over the next two years.[164] SCNs are expected to align their work with provincial priorities, develop a research and innovation program with academic partners, and attempt to identify and eliminate harmful, outdated, ineffective and/or inappropriate elements of care. The Panel was particularly encouraged to learn that each team is committed to the scaling-up of improved practices.[165,166]

Realigning Incentives and Physician Payment Systems

All these reform initiatives are praiseworthy. None, however, comes close to matching the type of alignment of incentives that occurs in the new payment programs being launched in the US Medicare and Medicaid programs – let alone the comprehensive level of integration seen in large group health plans south of the border. This continued weak integration of budgets and accountability may well be 'the fatal flaw' in Canadian healthcare.[167,158] One partial exception is the Integrated Comprehensive Care program at St. Joseph's Healthcare in Hamilton, Ontario. This initiative is unusual in that it uses a "bundled payment" approach for certain clinical streams, e.g. patients undergoing thoracic surgery or total joint replacement (hip and knee), as well as those hospitalized with conditions such as chronic obstructive pulmonary disease and congestive heart failure. Evaluation of the program has already shown improved continuity of care, evidenced by reduced readmission rates for target procedures, higher patient satisfaction, and positive perceptions on the part of patients and providers alike.[168] Ontario seems poised to scale this program up across the province – an important step forward.

At present, then, Canada still lags the US in tackling the hardest silo of all: the small business model of medical practice with its fee-for-service compensation system. The Panel encountered a range of opinion about what compensation methods would fairly reward doctors for the vitally important work they do. The rationale for a change, heard repeatedly in the Panel's consultations, is that physicians should be rewarded for clinical excellence and for generating value. Such goals are neither compatible with a simple salary model, nor with an unadulterated fee-for-service system that rewards volume and little else.

Even capitation payment in "reformed" primary care has only weak alignment with system-wide value generation. There is, however, very little imagination needed to come up with other modes of bundled payment that might engage primary care physicians and align incentives and outcomes in the interests of patients and taxpayers alike. For example, a number of studies have identified Ambulatory Care Sensitive Conditions – those where excellent primary care and, if needed, ambulatory specialist care, can reduce the rate of urgent hospitalization.

Panel members accordingly asked: Why not create bundled payments for primary care groups that offer incentives – and yes, some financial penalties – based on the number of patients at risk who are kept well enough to avoid hospital care? Why not devise, test, and as appropriate scale up other modalities, whereby other physicians can be compensated on a blended basis – partially through the fee schedule, and partially through bundled payments?

Reimagining the Healthcare Workforce

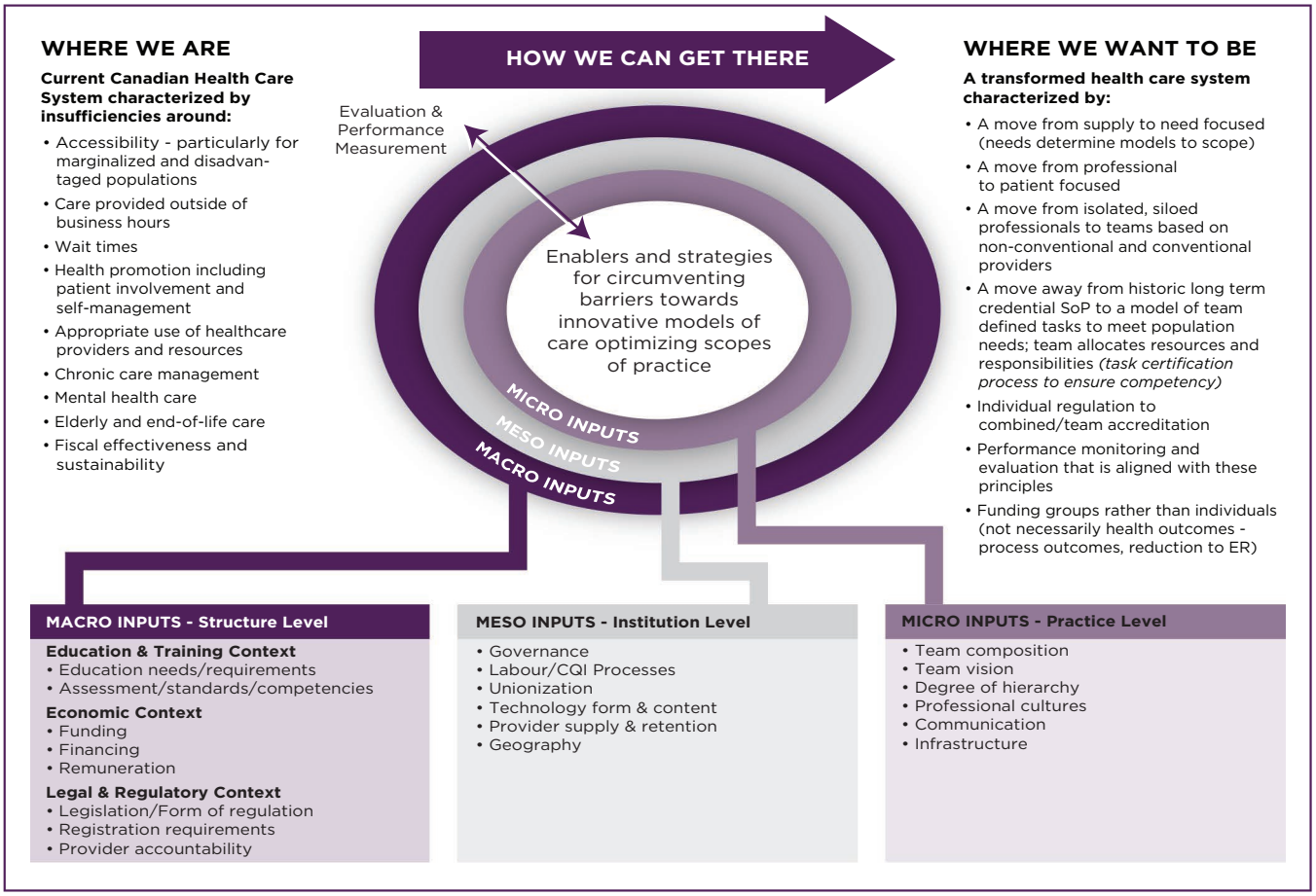
As discussed in Chapter 5, healthcare delivery in Canada needs to move from a provider-focused system to one that is based upon the needs of patients. This will involve organizing delivery over the full care cycle, with patients grouped based upon their healthcare needs and provider teams established to meet those needs.[128] Those teams can be enabled by a combination of changes in payment models and by optimizing the scopes of practice of health professionals – a topic to which the Panel turns now.

In 2014, the Canadian Academy of Health Sciences released its ground-breaking report on health human resources in Canada.[169] This wide-ranging review focused on the most effective scopes of practice to support integrated models of care in Canada. In the words of the report, there is an "emerging consensus that optimizing scopes of practice paired with supporting evolving models of shared care can provide a multidimensional approach to shift the healthcare system from one that is characteristically siloed to one that is collaborative and patient-focused."[169] The report assesses where Canada is right now, where it should aim to be and how to get there (see figure 6.2).

In its recommendations, the Canadian Academy of Health Sciences calls for "an integrative structural framework that supports the optimization of healthcare professional scopes of practice and innovative models of care."[169] This framework would recognize shared responsibility at the practice and institution levels with a regulatory model and a proposed accreditation structure.

The Panel strongly endorses the findings and recommendations of the Canadian Academy of Health

Figure 6.2: Scopes of Practice Supporting Innovative Models of Care



Source: Adapted from: Nelson S. et al. Optimizing Scopes of Practice: New Models for a New Health Care System. Ottawa: Canadian Academy of Health Sciences; 2014. Available here: http://www.cahs-acss.ca/wp-content/uploads/2014/08/Optimizing-Scopes-of-Practice_REPORT-English.pdf, p.10

Sciences and urges governments and providers to implement them in a timely fashion. In addition, the Healthcare Innovation Agency of Canada and the Healthcare Innovation Fund should play a supportive role in accelerating progress on this front, e.g. by supporting the development of a pan-Canadian mechanism to assess the value of healthcare services in terms of cost, provider role, and patient outcomes. This would help decision-makers determine fair and cost-effective payment strategies for different providers and enable the setting of prices that reflect value in terms of patient outcomes.

"The various elements of the current system were largely created to respond to acute, episodic care provided in hospitals and most often by individual physicians. Over the decades, these elements have become enshrined in legislative, regulatory, and financial schemes that challenge adaptation to shifts in population health care needs. Health care organizations and personnel seeking innovative solutions must often work around these barriers in order to optimize resources and improve quality of care."

Nelson S. et al. *Optimizing Scopes of Practice: New Models for a New Health Care System.* Ottawa: Canadian Academy of Health Sciences; 2014. Available here: http://www.cahs-acss.ca/wp-content/uploads/2014/08/Optimizing-Scopes-of-Practice_REPORT-English.pdf, p.10

Given the need for greater collaboration between provider groups, many health organizations have called for inter-professional education and training in collaborative practice for health professions.[170] The good news is that Canada has long been a leader in inter-professional education. The bad news is that the regulatory and payment environment is still a barrier to shared care. This must change.

Integrated Incentives and Shared Care

As argued above, the current segmented funding envelopes and budgetary silos create many perverse incentives in the deployment of health human resources. Among the bundled payment concepts that some have suggested would make a rapid difference to Canadians is the introduction of shared financial incentives for hospitals, physicians and community providers.[158] More generally, even without adopting the staffing model of large-scale US health plans, a range of approaches can be imagined that would create strong financial incentives for providers to coordinate their efforts, to assign responsibilities in a team to the most cost-effective professional, and to be rewarded for the quality and value of the services provided.

"Implementation and operation of an integrated health system requires leadership with vision as a well as an organizational culture that is congruent with the vision. Clashing cultures…is one of the reasons named for failed integration efforts"

Suter E, Oelke ND, Adair CE. Healthcare Q. 2009 Oct; 3(spec no): 16-23. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3004930/

"Nurse practitioners and doctors should work together to provide care to our patients. It's not a competition. There is a place for them to work collaboratively."

Public Submission

As noted, more integrated delivery systems, such as Accountable Care Organizations or the Kaiser model, go one step further and include risk sharing. System managers organize care across different institutions and different types of professional services with a view to optimizing safety, effectiveness and efficiency. Compensation for professionals is aligned with the objectives of the entire enterprise. Perhaps the single biggest barrier to these large-scale innovations is the unease of practising physicians – and their concerns should not be taken lightly.

The Panel returns here to a theme in the preceding section. No matter the approach, better integrating services through alignment of incentives will entail changes in physician payment and accountability structures. There is no doubt that a great many physicians are willing and more than able to take on a much larger leadership role in changing the healthcare system for the better. Their engagement is essential to the future of

Medicare. However, in the Panel's respectful view, physicians cannot readily join other health professionals in leading the system while standing guard in front of their traditional budgetary silos and related modes of remuneration.

Integrated Healthcare for Vulnerable Populations: The Case of First Nations

Nowhere are the impacts of a fragmented and disjointed healthcare system more keenly felt than with many of Canada's First Nations. The Panel had the opportunity to meet and learn from First Nations stakeholders in its consultation activities across Canada. It also had the opportunity to meet with the First Nations Health Technicians Network of the Assembly of First Nations, and with a senior representative from the First Nations and Inuit Health Branch of Health Canada.

Many Canadians are aware of the relatively poorer health status of First Nations and Inuit peoples.[xxiv] What is less well known is that First Nations living both on and off reserve must traverse a patchwork of health systems that includes multiple federal departments (Health Canada, Aboriginal Affairs and Northern Development Canada), provincial/territorial governments, and sometimes inter-provincial/territorial health authorities. The result is that the endemic lack of coordination in Canada's healthcare systems is exacerbated by jurisdictional ambiguity and inconsistencies.

One notable example of this phenomenon involved Jordan River Anderson, a five-year-old boy born with a rare muscular disorder requiring constant treatment. After two years in hospital, doctors felt Jordan could be treated at home. However, Jordan stayed in hospital for an additional two years, as the federal and provincial governments fought over whose responsibility it was to pay for his home care. Jordan died in hospital in 2005. In 2007, the House of Commons unanimously supported a Private Member's motion that "the government should immediately adopt a child first principle, based on Jordan's Principle, to resolve jurisdictional disputes involving the care of First Nations children."[171] However, in the Panel's consultations, it heard first hand that all First Nations, including children, continue to experience barriers in care, in part because of jurisdictional ambiguity and disagreements between provinces and territories and the federal government as to who should pay for what services. The Assembly of First Nations has been working with the federal government and other partners to address this critical issue.

> "I had a First Nations patient from up North who needed drainage of cancer-related fluid around the lungs. The patient was required to fly down weekly to my urban hospital to have the fluid drained despite the fact that this could be done at home with a catheter and the use of sealed bottles. I was told this was because there was no funding to pay for the bottles, but that in a different budget envelope there was funding for his medical transport. This meant that in his last six weeks of life, he had to be flown down once a week for care, rather than being looked after at home. On top of the impact that this had on his quality of care, the system should consider the cost. One of his six return trips alone would have more than paid for all of the bottles needed for caring for him at home."
>
> *Participant at Regional Consultation*

This situation highlights the imperative of designing and implementing integrated healthcare systems that respond to the unique needs and priorities identified by First Nations themselves and the related need for resolution through tripartite discussion.

One such model was created for BC in 2013. The BC First Nations Health Authority reflects a shared governance model that has integrated a broad range of services. This innovative initiative is now being evaluated on multiple levels to determine its strengths and weaknesses, but holds considerable promise.

xxiv On average, First Nations live about eight fewer years than the general Canadian population; First Nations infant mortality rate is declining but remains approximately 2 times higher. Compared with the overall tuberculosis incidence rate for Canada in 2012, the rate was 4.9 times higher among First Nations on reserve. Health Canada. First Nations and Inuit Health Fact Sheet. Ottawa: Health Canada; 2014 September.

The Alaska Native Tribal Health Consortium (ANTHC) is a non-profit organization which manages statewide health services for approximately 140,000 Alaska Natives and American Indians of Alaska. The ANTHC is managed and operated by the Alaska Native tribal governments and the regional health organizations. ANTHC delivers both upstream and downstream care; leads construction of water, sanitation and health facilities around Alaska; offers community health and research services; is at the forefront of innovative information technology; and, offers professional recruiting to partners across the state. ANTHC operates under a US $0.5 billion operating budget and employs approximately 2,000 people.

Source: About ANTHC. Anchorage: Alaska Native Tribal Consortium; c2005-2015. Available from: http://www.anthc.org/abt/

Transfer of some services to First Nations is also occurring at the local community level in both Yukon and the Northwest Territories. However, without adequate scale-up, these arrangements are likely to remain limited in scope and may be inefficient.

More generally, First Nations leaders expressed concern to the Panel that devolution could become a form of downloading. What seems essential is that all sides collaborate to ensure that resources and authority are aligned with responsibilities, and that there is perfect clarity about who does what in any tripartite arrangement. In particular, the federal government should take steps to ensure that health infrastructure and health human resource capacity are adequate to meet the needs of communities before devolution occurs.

In this regard, the Panel was also made aware of the unique challenges and importance of the development of health information technology for First Nations and Inuit. Health Canada has implemented the First Nations and Inuit eHealth Infostructure Program to support the development and adoption of information and communications technology systems that could improve First Nations and Inuit healthcare.[xxv] However, barriers still exist that impede further implementation, including:

- lack of available funding for eHealth capacity, implementation, and sustainability
- inadequate infrastructure to support eHealth projects, including basic broadband access
- First Nations' own fragmented healthcare governance structures
- weak communication about eHealth project planning among the First Nations and Inuit Health Branch, provinces and territories, and representatives of First Nations and Inuit[172]

On another front, however, responsibilities are clear. Health Canada's Non-insured Health Benefits (NIHB) program for registered members of First Nations and eligible Inuit covers various services that are not covered by provincial and territorial plans, such as drugs, dental and vision care, and medical travel. Total program spending in 2013-14 was over $1 billion, including $352 million for medical transportation.[173] While NIHB provides a critical support for First Nations and Inuit, during its consultations, the Panel heard a wide variety of complaints about the program.[174]

"Under the NIHB program with regard to dentistry, we have a predetermination system which is centralized and which takes weeks to provide decisions to dentists. This requires patients with complex issues to travel once for a diagnosis and a second time and possibly more to receive treatment."

Stakeholder Submission

xxv As First Nations and Inuit health is a federal program, it was not eligible for Canada Health Infoway funding.

Panel members are aware that the details of administration of these benefits are under review as part of a general assessment of how the First Nations and Inuit Health Branch discharges its responsibilities. However, Panel members remain troubled by the brief glimpse they were given into the state of First Nations and Inuit health and healthcare. The general recommendations offered below are therefore no more than a starting point for what must be a fundamental rethinking of how Canada's governments work with First Nations and Inuit communities to improve their health services and health status.

Recommendations to the Federal Government

6.1 Through the new Healthcare Innovation Agency of Canada, alongside federal investments from the Healthcare Innovation Fund, promote integrated delivery systems across Canada.

Relevant themes follow:

- Per Recommendation 5.1, support provinces, territories, and regional health authorities in undertaking large-scale projects that implement highly integrated delivery systems that test new forms of payment where care is organized and financed around the needs of the patient.

- Review and identify the best practices in inter-professional shared care, with specific reference to leading integrated delivery models. Promote adaptation, scaling-up and spreading of similar practices in Canadian jurisdictions.

- Develop, implement, and evaluate strategies for ensuring that integrated delivery arrangements in Canada address social needs and determinants of health, protect and promote health, and prevent disease.

- Support provinces, territories, and regional health authorities in adapting, scaling up and spreading partial integration models, e.g. primary care commissioning, portfolio funding for disease management, and assorted bundled payment strategies. Where possible, introduce elements of competition through tendering or bidding for care contracts.

- Support pan-Canadian multi-sectoral collaboration to implement the recommendations of the Canadian Academy of Health Sciences 2014 report *Optimizing Scopes of Practice.*

- Collaborate with provinces and territories, professional associations and others on a pan-Canadian pay commission to examine the relative value of healthcare services in terms of cost, provider activity and patient outcomes, thereby helping decision-makers evaluate professional roles, payments and prices.

6.2 Through the Canadian Institute for Health Information, in collaboration with interested provinces and territories, and with supplemental support from the Healthcare Innovation Fund as needed, pursue the following priorities:

- Expedite work to develop methodologies adaptable for use in physician capitation payment and in designing integrative or bundled payments based around common episodes of care.

- Accelerate work in the area of patient reported outcome measures (PROMs) and patient costing data, including case costing data, to create national risk-adjusted patient grouping methodologies and other tools.

6.3 Through Health Canada, and its First Nations and Inuit Health Branch, pursue the following priorities.

- Co-create a First Nations Health Quality Council, in partnership with First Nations representatives and patients, and with provincial and territorial governments. This Council would report on the quality and safety of care for First Nations across all sectors and regions. A priority for the First Nations Health Quality Council should be collaboration with CIHI for data development and collection relevant to First Nations (see Recommendation 7.6).

- Co-create a tripartite liaison committee with Inuit representatives and patients, and with the relevant provincial and territorial governments. The mission of this committee would parallel that of the First Nations Health Quality Council.

- Support First Nations leaders, together with willing provinces or territories and other partners, not least the Federal Government to initiate, evaluate and scale up new models of co-governed integrated care in varied locations across Canada. Managed by First Nations, these holistic entities should be modelled on international best practices, such as the Alaska Native Tribal Health Consortium or the Nuka System of Care.

- Facilitate the transfer of federal healthcare delivery programs to interested First Nations communities, working in partnership with First Nations leadership in those communities and the relevant province or territory, while ensuring that service transfers are accompanied by commensurate resources.

- Continuously monitor existing initiatives that transfer responsibility for services, such as the BC First Nations Health Authority, to ensure that devolution strategies are effective, efficient, and equitable.

- Improve the health infrastructure and health human resource capacity on reserve to meet patients' needs.

- Work with First Nations, Inuit, and other stakeholders to improve the management and responsiveness of the Non-Insured Health Benefits (NIHB) program to enhance access to care through digital technologies and ensure that it provides coverage comparable to other public and private plans.

    - To this end, the federal government should provide quasi-statutory authorities to Health Canada to adjust or expand health benefits offered through NIHB within an overall financial framework set by Parliament.

    - Through the combined resources of the Healthcare Innovation Fund, the Healthcare Innovation Agency of Canada, Health Canada, relevant provincial and territorial partners, First Nations and Inuit communities and others, develop new models of virtual and physical care to mitigate the hardships incurred by patients and families when First Nations and Inuit peoples travel to receive healthcare.

Chapter 7

Channeling the Data Deluge, Mapping the Knowledge Frontier

"Hiding within those mounds of data is knowledge that could change the life of a patient, or change the world." [175]

Atul Butte

Channeling the Data Deluge, Mapping the Knowledge Frontier

From diagnostic images to lab test results, we are now able to digitize more health-related data than ever before. There are also more data to digitize. For example, advances in medical genetics and related fields have generated reams of biological data about patients and populations, offering previously-unmatched insights into health status and disease risks. Add to this the growing capacity of remote monitoring and wearable technology to collect data on both behavioural patterns and their effect on heart rate, blood sugar and other biological parameters, and it has become clear that we are surrounded by health data, which offer massive potential for use in improving care.

Unfortunately, Canada has fallen behind in key areas of digital health and data-driven care. Earlier chapters have already highlighted that we are failing to make best use of data that are already available, and lagging in implementation of electronic health records (EHRs) – the secure and private lifetime records that describe a person's health history and care.

"Medical students and residents are currently handling patients with 1980s charts."

Participant at Regional Consultation

Canada is also woefully unprepared for the wave about to crest as the revolution in biological characterization of individuals ushers in the era of precision medicine. Precision medicine is an approach to medicine in which diagnostic, treatment, and prevention strategies are tailored to sub-populations of patients or even personalized at the individual level. Canada has global research leaders in various aspects of precision medicine, but as will be outlined below, we urgently need a strategy for moving precision medicine to the clinical front-lines, and for turning the sophisticated data arising from such clinical encounters back into generalizable research findings.

This chapter accordingly focuses on these two inter-related themes. It deals first with issues surrounding health and medical records under the prevailing medical paradigm, and then considers some of the challenges and opportunities that precision medicine will bring to Canadian healthcare systems. These two themes converge around the use of advanced analytics on these enriched databases to monitor and improve quality of care at all levels of Canada's healthcare systems, and to generate new insights into health and disease.

Turning Data into Knowledge

In 1991, the late Martin Wilk reported to the Government of Canada that health information was "in a deplorable state … like an unmapped forest with undefined boundaries."[176] A former chief statistician of Canada, Wilk concluded that the problem was one the Panel continues to see in Canadian healthcare – fragmented effort, and lack of collaboration and coordination. Wilk called for a single national agency that could foster "productive incrementalism."[176]

This work led to the creation in 1994 of the Canadian Institute for Health Information (CIHI), profiled briefly in Chapter 3. Today CIHI has a wide range of data holdings. Its profiles of health system performance have repeatedly informed this report, and have a wide impact nationally as governments, provider organizations and institutions, and researchers all use CIHI analyses and customized databases. The organization is respected domestically and abroad, and has maintained a high degree of inter-jurisdictional collaboration as well as positive stakeholder relations.

At the same time, healthcare data are collected and analyzed independently by many other players, including provinces and territories, health quality councils, regional health authorities, and individual healthcare organizations. While the Panel was gratified by evidence that Canada's healthcare systems are increasingly data-driven, stakeholders cautioned that these efforts remain fragmented.

Indeed, the Panel's review suggests that Canada's health data infrastructure needs to be enhanced. Specifically:

- The utility of existing performance measurement information is often limited due to lengthy data lags. Clinicians and administrators need real-time or near

real-time data and information in order to inform their decision-making.

- Providers and administrators are under increasing pressure to collect more data, but do not see returns in terms of meaningful and actionable clinical and administrative information.

- Performance and health outcome reporting efforts happen at multiple levels by multiple organizations, generating a deluge of information, a sense of indicator chaos, and uncertainty among providers and administrators on what is credible, what is a priority, and how to use the right information to make better decisions.

- Access to data and information among patients, providers, researchers, and policymakers is inconsistent. The Panel heard that data access is particularly difficult for clinicians and researchers in certain provinces who have no choice but to buy raw data or customized analyses from other jurisdictions.

- Data gaps still exist in important areas including but not limited to primary care, where the majority of interactions with the healthcare system occur. As already noted in Chapter 6, another serious gap occurs with First Nations and Inuit communities, where the lack of health outcomes and system performance data hinders resource planning and delivery. As well, healthcare purchased by individuals, private insurance companies, and employers makes up 30 percent of health spending in Canada.[5] This sector is very poorly understood at present.

Stakeholders expressed particular concern that the available information systems do not provide actionable intelligence. They made repeated calls for better data linkage – bringing together multiple sources of data that relate to the same individual, family, place or event. CIHI was acknowledged as a leader in creating high-quality data holdings, but lengthy delays in cleaning the data and standardizing reporting mean that the information that can be used is always retrospective, and not useful for real-time decision making.

The Panel's view is that many of these shortfalls relate not to back-end data usage but front-end data collection and standardization. Access to data in "real time" will only come from investments in ensuring that individual patient records are rapidly digitized in standard formats that permit easy and quick aggregation in servers for online access. This leads logically to the question of the status of digital health record-keeping in Canada.

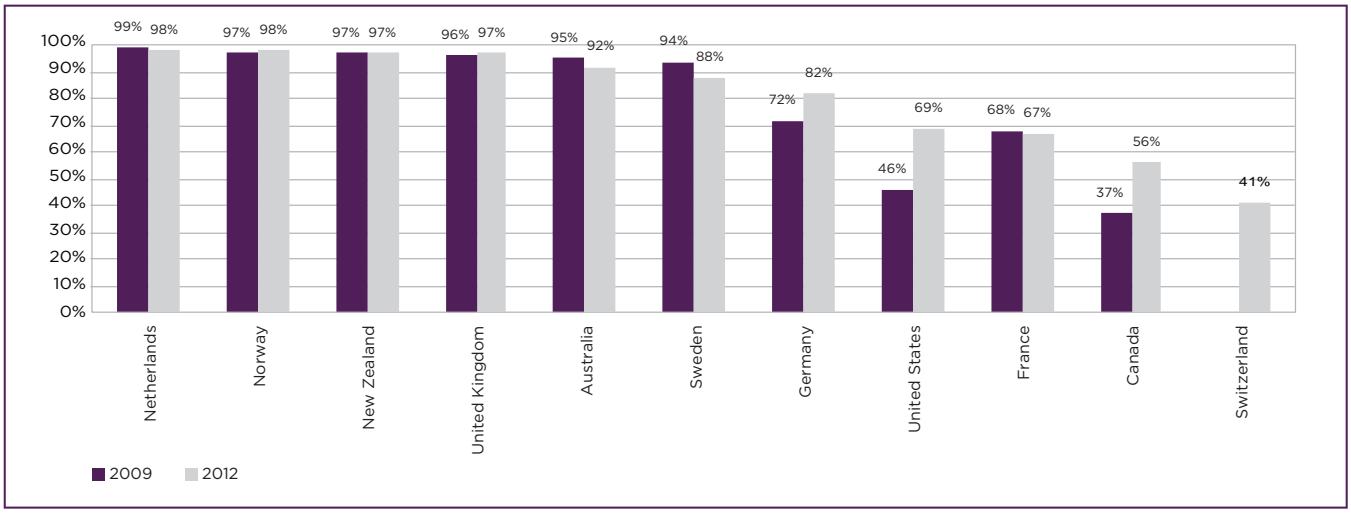
The Emergence of the Electronic Health Record

Unlike the consensus-based approaches that have guided the development of pan-Canadian health databases, the diffusion of electronic health and medical records has been based on centralized investment in large-scale projects by Canada Health Infoway. Infoway has partnered successfully with all jurisdictions to make big investments in health info-structure over the past fifteen years. Obvious progress has been made in developing a core backbone of health information and communications technology (ICT) across Canada (e.g., patient and physician registries, diagnostic imaging systems, lab information systems, etc.).

For clarity, the Panel notes that EHRs consist of information from a variety of sources, including hospitals, clinics, doctors, pharmacies, and laboratories.[177] EHRs can also be broadly understood to encompass electronic medical records (EMRs), which are the in-office systems used by healthcare providers to record information during a patient's visit. The progress in ICT implementation is clear: 56 percent of primary care physicians reported that they used EMRs in 2012, up from 37 percent in 2009 as noted in figure 7.1.[178] Although more recent information provided by Canada Health Infoway suggests this figure is now over 75 percent, Canada is still playing catch-up.

Not just in family physicians' offices, but more generally, Canada has not yet reached full deployment of EHRs across the continuum of care. The comparatively slow roll-out of EHRs has put Canada at a disadvantage compared to better-performing OECD peers. Shortfalls inevitably impede the quality and efficiency of front-line healthcare, leading to wasteful duplication of tests, incompletely informed clinical decisions, and medical errors. Limitations in EHR utilization also impede the development of higher level information systems and databases, with consequences for policy-making, quality management, healthcare research, and data-driven innovation.

Figure 7.1: Primary Care Physicians' Use of Electronic Medical Records in Their Practice, 2009 and 2012



Source: Adapted from: 2009 and 2012 Commonwealth Fund International Health Policy Survey of Primary Care Physicians. Available from: http://www.commonwealthfund.org/interactives-and-data/international-survey-data

"Outlaw the fax machine in doctors' offices … It is absolutely unacceptable that fax machines still exist in medicine, it is absolutely unacceptable that e-mail is not accepted in doctors' offices. These things must change and must change tomorrow as a national standard."

Participant at Industry/Government Roundtable

Given the rapid changes in health information technology (e.g., mobile health technologies and virtual care options) and the growing demand by patients to gain access and make use of their own health data (as discussed in chapter 5), it is fortunate that the adoption and use of EHRs is accelerating. However, other challenges persist:

- Point-of-care access to fully interoperable EHR is limited, restricting the ability of healthcare providers to seamlessly share patient health information with one another. A 2012 Commonwealth Fund survey found that only 14 percent of primary care physicians can electronically exchange patient summaries and test results with doctors outside their practice.[178] Progress is happening in pockets across Canada, such as ConnectGTA which aims to deliver a regional EHR for 6.75 million residents in the greater Toronto area, across hospitals, community care access centres, community health centres, long term care facilities, and others.

- Conformity in EHRs across jurisdictions is also mixed, as provinces and territories determine their own degree of adoption, standards and timelines, thereby impeding the ability for jurisdictions to share data and systems.[179,180]

- The lack of data harmonization and common data standards and elements between EHR systems limits the development and analysis of data sets that can be used for research, evaluation, predictive risk analysis, real time decision-making and quality improvement.

- Implementation of electronic records is not the same as meaningful use. A 2014 National Physician Survey found, for example, that out of all physicians who plan to use EMRs in the next two years, only 40.3 percent planned to use their EMRs for secure transfer of patient information, and only 52.3 percent for drug interaction warnings.[181]

Other jurisdictions have focused more closely on meaningful use of EHRs, as summarized in the next section.

Meaningful Use

As one stakeholder in the Panel's consultation put it, EHRs are not just a way for doctors to digitize the notes from their meetings with patients. To reap full benefit, healthcare providers – and others, such as payers – must also be able to use EHRs to their fullest extent "to improve quality, safety, efficiency, and reduce health disparities; engage patients and family; improve care coordination, and population and public health; and, maintain privacy and security of patient health information."[182]

"EHR adoption is not just having a computer in the office, but knowing how to use it."

Participant at Regional Consultation

This scope of use is achieved in only a few healthcare systems or plans. However, in many countries, including the US, a narrower definition of "meaningful use" is codified in law and achieved in stages. The first stage involves data capture and sharing (e.g., recording chart information). The second hinges on more advanced processing (e.g., using decision support to improve performance on high-priority conditions), while the third requires demonstration of improved patient outcomes.

Canada Health Infoway has also articulated levels of enhanced EHR use (called clinical value targets). Unlike the US which supports achievement of each stage with financial incentives to providers and healthcare organizations, there are few pan-Canadian incentive/disincentive structures in place for using/not using EHRs at these levels.[183]

This situation speaks to the changing priorities in the realm of health information technology. As already signalled in Chapter 4, the Panel doubts that Infoway in its current configuration will make an easy transition to mobile health and high-touch activities such as promoting meaningful use of EHRs with front-line providers (see Recommendation 4.4). Downstream integration with the proposed Healthcare Innovation Agency of Canada should prove synergistic.

Even the first stage of 'meaningful use' leads to the production of digitized records that, if compiled with common standards, can be aggregated for higher-level analysis by provider institutions and organizations. Such analyses can not only achieve the goals quoted above, but can also provide advanced business intelligence and predictive analytics. Here, the US Veterans Health Administration (VHA) is an instructive example of the power of interoperable, harmonized EHRs. Serving more than six million veterans across the country, the VHA has long been recognized as a pioneer in electronic health information systems. These systems now generate a wide variety of local and system-wide performance reports, covering clinical, financial and administrative matters – with the option to drill down to the level of individual providers and patients. More recently, the VHA has turned its attention to use of these data for more advanced analytics, including predictive analyses that enable better planning and earlier intervention in at-risk groups.[184]

The latter observations speak to the power of what is commonly termed Big Data.

Big Data in the Public Interest

The hype that has turned Big Data into a meme is unfortunate. Worldwide, the amount of digitized and stored data is indeed growing at a staggering rate. Not just information technology companies and other service enterprises, but governments and publicly-funded healthcare systems are accumulating truly massive amounts of stored data. All too often, however, no one has much idea how to make meaningful use of these collections or data sets. The data gathered are often illogically organized, complex, incompletely standardized, uneven in quality, and difficult to analyze.

These data sets have forced the development of hypothesis-free approaches to analytics based on pattern recognition. Canada has world leaders in this field, most notably Geoffrey Hinton, who now divides his time between the University of Toronto and Google. The challenge of sorting through these types of data sets also accounts for the phenomenon of hackathons, in which governments or industries open up anonymized or limited versions of their data sets, and convene a competition to see what individual or team can make the most creative use of the data at hand.[185,xxvi]

xxvi In another example of this trend, as this report was going to press, the Centers for Medicare and Medicaid Services announced that they would be opening up their data to innovators and entrepreneurs in order to drive transformation in the healthcare system. Centres for Medicare and Medicaid Services. CMS announces entrepreneurs and innovators to access Medicare data. Washington (United States): Centres for Medicare and Medicaid Services; 2015 June. Available from : http://cms.gov/Newsroom/MediaReleaseDatabase/Press-releases/2015-Press-releases-items/2015-06-02.html

While the excitement about advanced analytics and large data sets is justifiable, the Panel cautions that the strategic assembly of reliable data will usually trump self-defeating initiatives based on what might be termed,'endless heaping and random digging'. For example, by linking together several health administrative databases and studying physician referral patterns, researchers from the Institute for Clinical Evaluative Sciences were able to identify nearly 80 informal multispecialty physician networks or "self-organizing systems of care that collectively serve their large panels of patients."[186] This discovery formed the theoretical basis for the Ontario Community Health Links initiative described in Chapter 5, which funds and supports teams of networks of local healthcare providers to care for patients with chronic complex conditions.

Other provincial groups are also internationally recognized for leadership in linking health and social care data sets. In this regard, the Panel notes the success of initiatives such as PopData BC and the Manitoba Centre for Health Policy, long-time leaders in this area and well supported by governments. More recent initiatives include the Alberta Child and Youth Data Laboratory, a research initiative that links and analyzes administrative databases across multiple child- and youth-serving government ministries, including health, education, justice, and Aboriginal relations.[187] All these efforts have shown how big datasets can yield practical insights for innovation in policy and administration. The latter examples have the particular advantage of highlighting the interconnectedness of the health and social service sectors. As the Panel has noted, integration of health and social services remains a weak point of Canada's healthcare systems – one that will become more problematic as the proportion of seniors grows.

From an economic perspective, data-driven innovation is widely seen as holding potential for enhanced productivity, efficiency gains, and competitive advantages. The OECD has identified publicly administered sectors like healthcare and education as those standing to gain the most from this model of innovation: "These sectors employ the largest share of occupations which perform many tasks related to the collection and analysis of information with, however, a relative low level of computerisation."[188] The Panel agrees, and will return in its recommendations to steps that must be taken to ensure maximum impact from data-driven innovation in Canadian healthcare.

Patient-Centred Data

Just as earlier chapters have highlighted the need for patients to access their own health records and for healthcare systems to become more patient-centred in all dimensions, so too should health data be focused on patients.

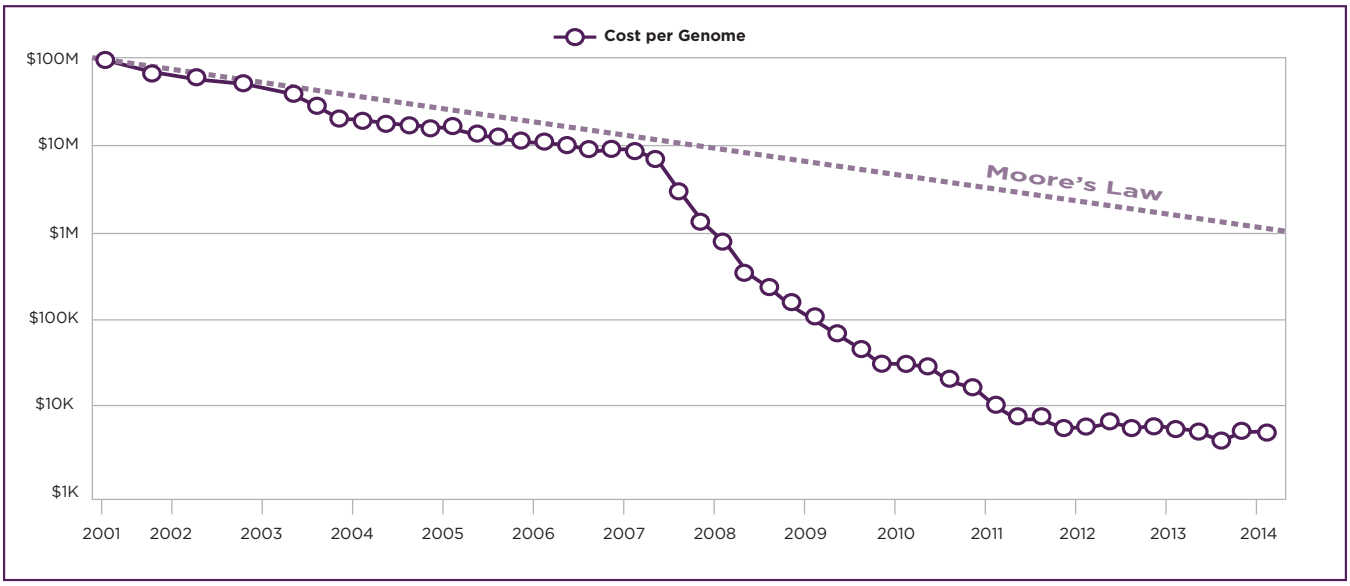
Patient Reported Experience Measures (PREMs) represent one tool. In the US, the Agency for Healthcare Research and Quality has had a voluntary, standardized patient experience survey program in place since 1995. The aggregate results are routinely made public. In contrast, patient experience surveys in Canada are administered using many different tools and data collection methods, and cannot be aggregated for comparative purposes.

The Panel was encouraged to learn about the emergence of the Canadian Patient Experience Initiative, a collaboration between the CIHI, Accreditation Canada, The Change Foundation, the Canadian Patient Safety Institute, members of an inter-jurisdictional committee, and experts in the field. CIHI is also collaborating with several provinces to develop patient experience indicators that can inform performance improvements over time and support benchmarking across Canada.

Similarly, Canada's collection of healthcare data would be enriched by use of Patient-Reported Outcome Measures (PROMs). Patient-reported outcomes "are any reports coming directly from patients about how they function or feel in relation to a health condition and its therapy, without interpretation of the patient's responses by a clinician, or anyone else."[189] PROMs, currently under development at CIHI, are an alternative to more traditional health outcomes measures such as mortality or morbidity. When collected in a systematic fashion, as is done within the England's National Health Service for patients undergoing selected elective surgeries, PROMs can offer valuable performance improvement data.[190,191]

The collection and analysis of reliable, comparable, actionable data on patient experience and patient-reported outcome measures is an essential to Canadian efforts aimed at making our healthcare systems more patient-centred.[111] The Panel urges intensification of all these efforts, consistent with recommendation 6.2 above.

Figure 7.2: Genome Sequencing Costs over Time



Source: Adapted from DNA Sequencing Costs [Internet]. Bethseda (United States): National Human Genome Research Institute; 2014 Oct 31. Available from: http://www.genome.gov/sequencingcosts/

Precision Medicine: A Data-rich Knowledge Frontier

As noted above, precision medicine has been enabled by breakthroughs in biology that accelerate unprecedented characterization of individuals. The goal is that diagnostic, treatment and prevention strategies will be tailored increasingly to sub-populations of patients or even individuals, by combining standard clinical, laboratory, and psychosocial assessments with measurements of a range of sophisticated biomarkers.

A key step was the completion of the Human Genome Project in 2003. Since then, improvements in technology have dramatically reduced the costs and time required for genetic testing and genomic sequencing (as illustrated in figure 7.2), broadening their potential to a wider range of applications and exponentially increasing the potential amount of genetic information available to clinicians and researchers.

Four other areas of development have accelerated this transformation. First, more sophisticated medical imaging is offering unprecedented clarity about not just internal body structures but their function. Second, the inter-related areas of stem cell science, tissue engineering and regenerative medicine have opened up new therapeutic vistas. Third, chemistry and biotechnology have converged, allowing the production of an enormous range of bespoke therapeutic molecules. And fourth, biomedicine's ability to manipulate the body's own immune and inflammatory responses has grown exponentially – a critical factor in curing or controlling a wide range of diseases.

With all these advances, what was once a single condition, defined by clinical features, is often found to be several different disorders that happen to look roughly similar at the bedside or with standard laboratory tests. A patient with a cancer that has stopped responding to intravenous chemotherapy can now contemplate surprising and truly personalized options, such as oral treatment with a drug used for high blood pressure or a now little-used antibiotic.

This represents a radical shift in thinking. In healthcare evaluation, pioneering approaches in health technology assessment and evidence-based medicine were predicated on creating standardized treatment pathways and protocols. The goal was to help clinicians and policymakers make decisions that would allow the largest number of patients to achieve the best results. In particular, the foundations of analysis were and remain probabilistic, with analytical techniques borrowed from epidemiology and psychometrics. Evidence-based medicine – a Canadian innovation arising from McMaster University's medical school – remains an important toolkit of ideas for managing a clinical realm

where decisions reflect a struggle to do the right thing in the face of the play of chance. For example, because many drugs have only a small chance of benefiting a given patient, randomized trials must be very large to reliably assess drug effectiveness, or combined through meta-analysis. Interpreting imprecise laboratory tests has likewise required trade-offs between the chances of false-positive and false-negative results.

Precision medicine, in contrast, has the ambition of allowing clinicians to pursue a more deterministic approach. Originating from root biological causes and pathways, new biomarkers can radically enhance the signal to noise ratio in laboratory tests or tumour characterization. And by targeting the right patient with the right drug at the right time, precision medicine may well reduce the collateral injuries – and waste – associated with the shotgun pharmacotherapy that currently prevails.

All that said, the need for a disciplined and critical approach to clinical research evidence is not likely to disappear any time soon. The applicability of precision medicine to many common conditions remains unclear. For reducing one's risk of most common diseases, individualized prevention through precision medicine is a side-show at present; behaviours based on common sense and general knowledge remain the sensible way forward for most Canadians. Thus, the question contemplated by the Panel was not how to suddenly change clinical paradigms, but how to ensure that patients in Canada's healthcare systems will be able to benefit from these fast-breaking changes in the near future and medium-term as they become ever more pervasive.

Panelists received a snapshot of that future at a round-table with leading clinicians and scientists. For example, at the London Health Sciences Centre's Personalized Medicine Clinic in Ontario, patients benefit from clinicians who can provide on-site pharmacogenetic expertise, tailoring drug treatments according to a patient's genetic makeup. In speaking with the Panel, Dr. Richard Kim, director of the clinic, outlined the story of the 35-year-old man with Crohn's disease and mild renal impairment. Under standard treatment approaches, the patient would have received a medication dosage leading in many instances to adverse outcomes, such as severe bone marrow suppression, sepsis and death. However, because the man underwent genotyping, he was given a dramatically lower dosage and experienced no related adverse effects.

This case illustrates the potential consequences of imprecise prescribing. At best, when drugs are not a good fit for the patient they are wasteful and expensive and may require the use of second or third drugs to treat the side-effects from the first drug. At worst, adverse drug reactions can lead to poorer quality of life, heavier healthcare utilization, or even increased risk of death. Seniors in particular are disproportionately affected by adverse drug reactions, and are also more likely to take multiple medications. Estimates suggest that pharmacogenomics testing could be relevant for 15 to 25 percent of all clinical decisions about existing prescription drugs.[192] As new, more targeted drugs become available, genotyping and other biomarker information will become increasingly important for drug selection.

Emerging evidence is also illuminating the linkages between imprecise prescribing, mental health issues, and economic impacts – both direct and indirect. For example, in a study of patients with depression and anxiety, patients who were on antidepressants or antipsychotics but who were later found to be poor metabolizers of these drugs took more sick leave from work, made more disability insurance claims, and used more medical care. On average this cost an additional $5000+ in direct care costs per patient over those whose medication was a better metabolic match.[193]

Dr. James Kennedy, Head of the Psychiatric Neurogenetics Section of the Centre for Addiction and Mental Health in Toronto, shared additional insights with the Panel. Kennedy's team has already found that a substantial minority of patients are either very fast or very slow metabolizers of many powerful drugs used routinely in psychiatry. They estimate that literally thousands of people with depression alone would benefit from having this information to guide their choice of drug and dosing. Kennedy is now moving forward with a randomized trial to test these strategies in practice. Even slight improvements in medication management and adherence could improve the lives of many individuals with severe mental illness,[194,195] while saving very large costs in emergency department visits and hospitalizations.

In the same session, panelists were apprised of new ways of diagnosing and treating cancer, genetically-conditioned differences in responses to a heart drug that caused a completely wrong-headed interpretation of a major randomized trial, and ground-breaking research in the application of genomics to understanding nervous system diseases such as autism and spinal muscular atrophy. These impressive advances, and additional information

gathered by the Panel, affirmed the standing of Canadian research and researchers in this field. The Panel would be remiss, therefore, not to applaud the investments in applied genomics and precision medicine research that have been made by CIHR, Genome Canada, many other national foundations and grant-making bodies, provincial research agencies and ministries, private industry and other supporters.

Despite these advances, the Panel also heard warnings from clinicians, researchers, and healthcare stakeholders that Canada may squander its research investments without a more strategic approach. What is missing, in particular, is a wider-angle strategy to ensure that, from the standpoint of application and innovation, Canada is competitively positioned. In this work, not only is CIHR a potentially valuable partner, but CIHR's SPOR initiative, described earlier, represents a network that would be a useful launching pad for implementation of any strategy.

The appeal of working with CIHR rests on the fact that, in this field more than others in healthcare, the lines between research, development, clinical application, and innovation are blurred. Bio-banks feed databanks and vice versa. Instead of random associations, big data analytics drive out results with a biological rationale that can easily be tested. Translation into clinical studies ensues at a much faster pace than has previously been possible. This rapid cycle creates enormous potential for discoveries that can be commercialized, but in an era of intense competition, other jurisdictions are unlikely to buy Canadian biotechnology if the product cannot achieve domestic market entry.

The Panel accordingly sought out examples of jurisdictions taking steps to turn the healthcare system itself into a living laboratory for precision medicine. Two came quickly into view.

- Genomics England, a subsidiary of England's National Health Service (NHS), recently announced the 100,000 Genomes Project, which aims to sequence the genomes of NHS patients with rare diseases or cancer and their families. This genomic information will be linked to clinical data, providing a wealth of information to enable the provision of genomic medicine at the bedside and to promote new medical and scientific discovery.[196,197]

- The National Health and Medical Health Research Council, Australia's granting council for health research, recently launched an AU$25 million grant competition to fund research on "Preparing Australia for the Genomics Revolution in Health Care." As one of the largest single grants in the Council's history, the funding will support a multi-disciplinary, cross-national research team that will explore how medicine can improve precision for disease prevention, diagnosis, and treatment; analyze the economic and policy impacts genomic data will have on the healthcare delivery system; and develop intelligence on how genomics can be applied in real world healthcare settings.[196,198]

The US, too, has entered the fray. In his 2015 State of the Union address, President Obama announced the Precision Medicine Initiative, starting with US$215 million in the 2016 Budget.[199] In the words of the White House release,

> "The potential for precision medicine to improve care and speed the development of new treatments has only just begun to be tapped. Translating initial successes to a larger scale will require a coordinated and sustained national effort. Through collaborative public and private efforts, the Precision Medicine Initiative will leverage advances in genomics, emerging methods for managing and analyzing large data sets while protecting privacy, and health information technology to accelerate biomedical discoveries. The Initiative will also engage a million or more Americans to volunteer to contribute their health data to improve health outcomes, fuel the development of new treatments, and catalyze a new era of data-based and more precise medical treatment."[200]

Notably, the funding included a special allocation to the Office of the National Coordinator for Health Information Technology, to "support the development of interoperability standards and requirements that address privacy and enable secure exchange of data across systems".[200]

The Panel was struck by the clarity and foresight of these announcements. In the case of the US, the investments are partly enabling, and partly operational around a large volunteer cohort. In Australia, the investment is enabling – albeit much more limited in scope than suggested by the Panel's synthesis of the challenges and opportunities arising from this field.

The one Canadian initiative that partly reflects these models comes from Newfoundland and Labrador. On a visit to St. John's, Panel members heard first-hand about Newfoundland's

Translational and Personalized Medicine Initiative (TPMI). TPMI was designed with the goal of using advanced computer infrastructure, provided by IBM, to integrate electronic health information (e.g., a patient's health history, laboratory results, family genetic history), improvements in clinical practice, and healthcare research.[187] Because a limited number of Founder Families make up a substantial portion of Newfoundland's population, there is an unusual concentration of rare genetic disorders on the island.[201] TPMI's design turns that problem into an opportunity. By targeting patients and families at high risk for certain diseases (e.g., various cancers, sudden heart attacks due to cardiomyopathy, inherited deafness, and inflammatory arthritis), it aims to improve care while reducing healthcare costs and generating novel research findings. The rest of Canada can and should learn from TPMI and its work to make Newfoundland a living laboratory for precision medicine.

The Panel also observed that a project under the auspices of Global Alliance for Genomics and Health (GA4GH) presents a contrast to the 'islands of genetic discovery' model pioneered by Iceland and adapted by Newfoundland. The Matchmaker Exchange is co-led by Dr. Kym Boycott from the Children's Hospital of Eastern Ontario. Using academic pediatric hospitals worldwide as living laboratories, this initiative enables more efficient characterization of rare genetic diseases by multi-national matching of phenotypes and genotypes.

The Panel views these as complementary strategies for understanding rare diseases. However, experts have emphasized to the Panel that the challenges are very different in tackling the most prevalent chronic disorders. Canada's relatively small size means that researchers will instead need to collaborate across provincial, territorial, and even international boundaries to develop study populations of sufficient size that will allow characterization of disorders with extremely complex genetic and environmental causes.

The GA4GH is focused on fostering those collaborations. Both Genome Canada and the CIHR are members of this global alliance, along with member organizations from thirty other countries. GA4GH's aims to create a common framework of harmonized approaches that "enable the responsible, voluntary, and secure sharing of genomic and clinical data".[202] Its secretariat is co-hosted in the US, UK, and Canada; the Executive Director, Peter Goodhand, is based at the Ontario Institute for Cancer Research. By setting common standards, the hope is that large amounts of data can be aggregated and analyzed across international jurisdictions, opening the door for the discovery of patterns and insights about health and disease that would otherwise remain obscure.

What does the Panel conclude from this high-altitude survey?

First, without a cogent strategy, without the right infrastructure – both biobanks and databanks, without mechanisms to translate successful discoveries into both improved clinical care and exciting new businesses, Canada runs a risk of wasting opportunity and money – and falling even further behind our peers.

Second, the data storage and handling demands of precision medicine may well exceed those anticipated in current plans for institutional and jurisdictional information technology. Day to day clinical applications at a given clinical site may require less 'crunching power,' but data-driven innovation and formal research studies will require major analytical capacity. The situation is more complex given Canada's under-developed healthcare info-structure, and the fact that the lines are blurred, as noted above, between data-driven innovation in precision medicine and its clinical applications. Furthermore, neither the Canada Foundation for Innovation nor CIHR have been entirely clear about what they will fund in the realm of Big Data infrastructure and related operational requirements for health research and healthcare delivery. The Panel believes a roadmap must be drawn to determine the respective responsibilities and contributions of the various federal agencies (Canada Foundation for Innovation, CIHR, Genome Canada, Infoway, and CIHI) as well as the provinces and territories that have primary responsibility for healthcare operations.

Third, the Panel believes that, in responding to the emergence of precision medicine, Canada must be guided by several objectives:

1. Developing mechanisms to adopt, scale up, and contribute new clinical insights from across the global field of precision medicine;

2. Securing a global leadership position in selected fields of research relevant to precision medicine – a goal where CIHR is obviously the primary agency;

3. Establishing a global leadership position in the systematic uptake and iterative improvement of these methodologies as applied to clinical care in healthcare systems across Canada;

4. Ensuring that national and international collaboration is maximized, and that data are shared widely with due regard for privacy and security;

5. Fostering the development of the Canadian talent pool not only in the relevant biological and clinical fields, but in data analytics and software development; and

6. Promoting the commercialization of made-in-Canada precision medicine concepts.

In sum, the rapid rise of precision medicine offers both an opportunity and a challenge for Canada. Our response will help define the trajectory of our healthcare systems for the next generation and beyond. The Panel views action on this front as an extremely high priority.

Preventing Genetic Discrimination

Although genetic information has the potential to be a powerful tool for health, this information could also be used to discriminate against individuals. For example, insurers, financial lenders, or employers may be more negatively inclined towards individuals who are known to be genetically at risk of developing a serious illness or chronic condition. The Panel has heard anecdotally that there are patients in Canada who have been counselled by their physicians *not* to undergo voluntary genetic testing, given the lack of legal or policy safeguards to protect them and their families from discrimination by third parties. Related reports have come to the attention of the Canadian media, as well as the Standing Senate Committee on Human Rights.[203,204]

Recognizing these risks, other countries have enacted legislation or other policies to protect their residents from discrimination on the basis of genetic makeup. For example, in France, the law stipulates that genetic tests may only be taken for valid medical or scientific reasons, and there are penalties for misuse.[205] In the UK, insurers and employers are responsible for handling genetic information according to existing laws governing the use of personal information, and British insurers have voluntarily adopted a policy to not ask or pressure individuals to undergo genetic testing in order to obtain insurance, with some exceptions.[205] The US enacted the *Genetic Information Non-discrimination Act* (GINA), legislation that limits the ways that employers and insurers may use genetic information to protect individuals from discrimination.

> "Canada is a little bit too blue sky and open air around genetics and the use of personal genetic testing… quite frankly, no one knows who is protected, what is what."
>
> *Participant at Industry/Government Roundtable*

As of June 2015, Canada has no specific protections in place to prevent genetic discrimination. However, there is growing awareness that Canada needs ethical, legal and social parameters to guide the collection and use of this information. The Panel addresses this issue in a recommendation below.

Open Data

The Open Data movement has gained momentum worldwide even as anxieties about privacy and data security have grown. Institutions, enterprises, and jurisdictions alike are struggling to find the right balance – not an easy matter if health-related data are involved.

Earlier, the Panel emphasized that general privacy concerns must not be invoked to justify denying patients access to their own health records, or to excuse foot-dragging on the development and implementation of EHRs. The question here, however, is different. Assuming that the data have been anonymized – i.e., stripped of identifiers – who should have access to what data sets and on what terms?

The question arises because researchers, software application developers, journalists, and a range of other users are keenly interested in these data sets.

The case for making reliable analyses on health system performance widely available to the public is well-established. Some provinces are well along this road, and CIHI has created online tools that allow website visitors to examine and compare the performance of healthcare providers on multiple levels. The Panel observes, however, that the CIHI analyses could be more accessible, more informative and more widely publicized. In any case, sharing pre-digested data through an interface is not the same as sharing unprocessed data.

"Somehow, the governance of Canada's wealth of data needs to be reformed so that data custodians become 'data stewards' – they are mandated (and provided adequate resources) not only to protect confidentiality, but also to facilitate bona fide research."

Stakeholder Submission

On that latter score, some data custodians, including CIHI, have a good record of making anonymized raw data available to a wide range of interested parties for their own use. Others do not. A comprehensive review of access to health data for research was recently undertaken by the Council of Canadian Academies. A key finding of this review is that inter-provincial barriers to data-sharing may be impeding the work of academic health researchers and the aims of national data platforms with strong relevance to health and healthcare (e.g. the Canadian Longitudinal Study on Aging).[206] In the Panel's view, Canada as a federation cannot have it both ways. We cannot trumpet the virtues of decentralization as a vehicle for 'natural experiments' in public policy, and then refuse to share appropriately anonymized data so as to permit independent assessments of the results of those experiments. A recommendation on data-sharing follows below.

The Panel is reluctant to add a lengthy coda to what is already a long chapter, and will recapitulate only a few points. After what has been written above, it may be superfluous to observe that Canada has not made optimal use of information and communications technology in the nation's healthcare systems. Acceleration of the adoption and meaningful use of EHRs remains a necessary precondition. The rapid development of precision medicine and the related data handling challenges and opportunities add to the urgency of the situation. The goals, obviously, should be improved collection of data, and effective transformation of those data into usable intelligence for patients, providers, administrators and policymakers. Opening up anonymized data sets to a wide variety of stakeholders is consistent with the principle of data-driven innovation that will be essential if Canada's healthcare systems are to thrive in the era of applied genomics and precision medicine.

While there is much to be done, the Panel sees that most of the foundations have been laid and the necessary raw materials are at hand. Enormous progress can now be made in short order with the right strategies, serious investments, political will, and a resolute commitment to inter-jurisdictional collaboration.

Recommendations to the Federal Government

7.1 Through the Healthcare Innovation Fund and new Agency, develop and initiate a national Strategy for Implementation of Precision Medicine, in concert with provinces, territories, healthcare and health research agencies, and a range of relevant stakeholders and experts.

- This field is characterized by a blurring of the lines between applied research, innovation, and implementation at scale. The Strategy should seek to leverage Canada's diverse populations and single-payer healthcare systems as a competitive advantage.
- The Strategy should include development of a roadmap of steps needed to ensure that Canada's health information and communications technology can support data-intensive models of care and the rapid-cycle innovations that characterize this field.
- The Strategy should focus on:
    - Developing and implementing mechanisms to adopt, scale up, and contribute new clinical insights from across the global field of precision medicine;
    - Establishing a global leadership position in the systematic uptake and iterative improvement of Precision Medicine methods as applied to clinical care across Canada;
    - Ensuring that national and international collaboration is maximized, and that data are shared widely with due regard for privacy and security;

- Fostering the development of the Canadian talent pool not only in the relevant biological and clinical fields, but in data analytics and software development; and
- Promoting the commercialization of made-in-Canada precision medicine concepts and tools.

7.2. Through the Healthcare Innovation Fund, and in partnership with federal and provincial research and innovation agencies, accelerate the implementation of the above-noted Strategy by assessing and scaling up models of care in the field of Precision Medicine.

- Potential starting points with wide impact include pharmacogenomics in diverse clinical fields, and precision/personalized cancer care.
  - A major commitment of funds will be needed to launch the broad Strategy across Canada as well as to effect clinical scaling-up in select fields.

7.3 Convene a federal, provincial and territorial dialogue on a pan-Canadian framework that will protect Canadians while putting put Canada at the forefront of applied genomics and precision medicine, including:

- Regulatory and legislative amendments to prohibit genetic discrimination, such as changes to the Canadian Human Rights Act, the Criminal Code, the Personal Information Protection and Electronic Documents Act, and the federal Privacy Act.
- Policies to enable broad sharing of appropriately anonymized data across and within jurisdictions.
  - This is critical not only for rapid innovation in the field of precision medicine, but for enhancing applied health research and data-driven innovation in Canada's healthcare delivery systems.

7.4 With support from the Healthcare Innovation Fund, and building on current efforts by organizations such as CIHI, provide greater transparency about healthcare in Canada, by:

- enabling more accessible and user-friendly information on areas including patient satisfaction, quality, safety, efficiency, effectiveness and health outcomes
- leading "open data" efforts, by making data available to a wide range of stakeholders, including the public, to enable development of new tools and approaches
- developing partnerships to build the capacity of health system stakeholders to use data for health system improvement
- exploring mechanisms to gather and share data about activity in healthcare's private sector – corresponding to the 30 percent of spending that is not supported by public funds.

7.5 Through Infoway initially and then through the Healthcare Innovation Agency of Canada, accelerate the deployment of interoperable electronic health records across points of care, including efforts to assist providers and payers in meaningful use and prioritizing the creation of online portals where patients have mobile access to their own records.

- Ensure future investments in health information technologies are standardized, interoperable, linked across multiple sites, and available to third parties for assessment of performance.

7.6 Through the Canadian Institute for Health Information, and in partnership with the First Nations Quality Council, address the significant data gaps that exist in the area of First Nations health, providing a fuller picture, of First Nations health status, as well as access to care, and quality of services.

Chapter 8

Improving Value in Healthcare

"Many of the business models healthcare has been using for half a century that reward high volume care — how much you do rather than how well you do — will have to be modified. This is one major challenge in adopting healthcare reform. To deliver patient-centered care, to realize that often doing less rather than more may be better for the patient, the infrastructure of healthcare and the practice culture will both need to change. We can do it, but it will be a difficult transition."[207]

Don Berwick

Improving Value in Healthcare

Recently, there has been no shortage of dire prognostications about the future financial sustainability of Canada's healthcare system. David A. Dodge and Richard Dion estimate that between now and 2031, health spending as a share of gross domestic product (GDP) could increase from current levels to anywhere from approximately 15 to 19 percent.[208] The Parliamentary Budget Officer estimates that publicly-funded healthcare costs could increase from 7.4 percent currently to over 13 percent of GDP in 2087.[209] Projections such as these do spark debate about how much society should spend on healthcare relative to other social and economic priorities (i.e., education, social programs, etc.). But the numbers also make assumptions about demographic, social and economic drivers that are unlikely to hold.

For now, instead of spinning further out of control, healthcare spending growth has moderated dramatically. Real per capita spending on healthcare has actually decreased by 1.2 percent from 2011 to 2014,[5] something that has not been seen since the mid-1990s. This phenomenon is not unique to Canada. Almost everywhere in the industrialized world, governments are capping or reducing healthcare spending growth in an unprecedented push to address growing debts and deficits.[5]

On the other hand, Canadian experience during the 1990s provides a cautionary tale. Faced with a deep recession and high indebtedness, governments took measures to reduce the growth in health spending, including cutting medical school enrolments, capping medical fees and imposing utilization controls, closing hospital beds, freezing hospital budgets and delisting services. While this helped to reduce the growth in health spending to about one percent in real per capita terms over a four year period, public concerns about access started to build.[5] When economic growth picked up again, governments were forced to open up the spending tap once more. Hectic spending escalation resumed.

Fortunately, jurisdictional efforts are now underway to tackle spending pressures and change the health spending trajectory in a sustainable way. The strategies and investments outlined thus far in this report are designed to support and accelerate those efforts. This chapter adds to the Panel's recommendations by focusing specifically on value-for-money in Canadian healthcare.

Measuring Value: the Cornerstone of a High-Performing System

It is difficult to imagine running a business without understanding production costs or the value of products to consumers. Yet in Canadian healthcare, this has been the historical reality. In the past, medical fees were – and still are – negotiated by governments and physician organizations with limited consideration of the measurable value of different services to patients.[210] Hospital budgets were based on historical spending.[158] Drugs and medical devices that meet regulatory safety requirements would spill into the market and be diffused with uneven evidence of their cost-effectiveness in different groups of patients who receive them – a situation that has changed only slightly.[211] Expensive technology solutions were routinely adopted without a proper assessment as to their value – again, only somewhat improved today. And little if any information was collected on what patients think about their experience with the healthcare system – somewhat better now, but a far cry from what one encounters dealing with many private businesses.

Adding Value to Value: Porter's Contribution

The term "value" has been popularized by competition guru Michael Porter as "the health outcomes achieved per dollar spent". Health economists have long used such constructs in different forms of cost-effectiveness analysis. Likewise, long before Porter, countless academic papers rigorously explored the place of process and outcome assessments in healthcare quality assurance. While some academics may take a dim view of Porter's failure to acknowledge his debts to pioneers in these fields, there is a lesson here: Academic papers are like pilot projects - and Porter's accessible elaboration and scaling-up of these ideas has greatly amplified their impact.

Porter, M. What is Value in Health Care. The New England Journal of Medicine. 2010 Dec; 363:2477-2481. Available from: http://www.nejm.org/doi/full/10.1056/NEJMp1011024

In contrast, during its visit to Washington DC the Panel was impressed by the intensity of data collection and reporting activity in the US healthcare system. This is partly attributable to a multi-payer system that requires detailed costing information to support billing for the full continuum of health services, and a competitive environment where performance on quality and patient satisfaction both have an impact on the bottom line. From the development of Diagnostic Related Groups used for hospital reimbursement, to the resource-based relative value scale used to adjust physician fees, to pioneering health technology assessment, the US has been at the leading edge of innovation in the evaluation of healthcare services and products. As outlined in earlier chapters, this expertise has led to the development of a new array of funding and delivery models – medical homes, bundled payments, and accountable care organizations – that could very well revolutionize US healthcare.

For its part Canada has also been a leader in methodologies and frameworks for measuring value in healthcare. Starting in the early 1970s, Canadian researchers at McMaster University played a key role in the conceptualization of quality-adjusted life years, as well as in the development and application of methods to measure health outcomes, and the cost-effectiveness of health interventions (i.e., drugs, treatments, etc.).[212] However, until recently, given Canada's reliance on fee-for-service payment for medical care and global budgets for hospital services, there has been little incentive to further develop methodologies that would support value-based payment strategies.[158]

Governments in Canada are now beginning to move away from global funding for hospital budgets and towards activity-based and patient-based funding models.[158] Unlike global funding, activity-based funding approaches strive to encourage greater efficiency by providing funding to hospitals based on the number and type of activities performed, and classifying activities using diagnosis-related groups to develop reimbursement levels and prices. Ontario, Alberta, and BC have all had some success in implementing activity-based and performance-based funding models in an effort to improve hospital funding transparency and create better incentives for high-quality, efficient care.[158]

Ontario, for example, is shifting from global budgets to funding based on the number of patients treated, services delivered, quality of services and specific needs of population.[213] The Health Based Allocation Model estimates funding at the organizational level for expected healthcare expenses based on a number of factors including: demographics, age, gender, growth projections, socio-economic status/ geography, clinical data and complexity of care. Quality Based Procedures (QBP) allocate funding to specific procedures based on a "price X volume" approach. To date, QPB has been rolled out for 10 different procedures including hip replacement, cataract surgery and stroke. By 2015-16, 70 percent of the provincial funding envelope provided to hospitals is expected to be allocated via these two measures.[213]

"To ensure innovations are ultimately incorporated into practice, healthcare providers need to be reimbursed based on performance rather than volume. The current pay system hinders efficiency, and therefore innovation: if new programs decrease patient volumes, and therefore funding, healthcare professionals and organizations are disinclined to adopt them."

Stakeholder Submission

Investments in case-mix costing methodologies by the Canadian Institute for Health Information (CIHI) are supporting these payment reforms.[214] Per recommendation 6.2, the Panel encourages CIHI to extend these efforts and pave the way for bundled payment models by developing methods to measure multi-sectoral costs of episodes of care.[158]

While hospital funding is becoming more sophisticated, the same cannot be said of the valuation of medical services. Physician fee schedules contain hundreds of figures on the unit price of individual services. The absolute and relative value of these services is rooted in the social history of medicine, changes in healthcare technology, and inter-specialty politics. So-called "relativity adjustments" do get made. For example, there have been adjustments recently to fees for services such as cataract surgery where technological change has dramatically reduced the time required for an operation.[215] But while most medical associations have tried to manage the fairness challenges implicit in relativity, the logic model for fees and total compensation remains opaque. In particular, there are substantial differences in compensation across family

practice, and cognitive and procedural specialties that defy explanation.[216] As well, some types of services, such as consultations by phone, email, or web-enabled video are simply not considered as billable services despite evidence in other jurisdictions that virtual visits lead to reduced costs and improved patient experience.[113] This acts as a huge disincentive for the development and uptake of new approaches to care.

With support from the proposed Healthcare Innovation Fund and new Agency, jurisdictions could collaborate with medical associations in developing a set of evidence-based benchmarks for a set of key medical services, and, in the interests of transparency, make this information public along with comparative analyses of medical fee schedules. Such work would obviously complement the broader review of scopes of practice in relation to professional compensation, recommended in Chapter 6.

Moving Away from Fee-for-Service: a Long Goodbye

From the initial exploration of health insurance proposals in the 1920s, to the adoption of universal hospital and medical insurance in the 1950s and 1960s, to the adoption of the *Canada Health Act* in 1984[217], national and provincial physician associations have been at the centre of debates about how to fund and deliver healthcare. Core principles of professionalism – the primacy of the patient-physician relationship and importance of preserving clinical autonomy – were routinely turned into political positions, and used to justify the maintenance of fee-for-service payment models and protection of independent private practice.[218] These arrangements remain largely intact 50 years later.

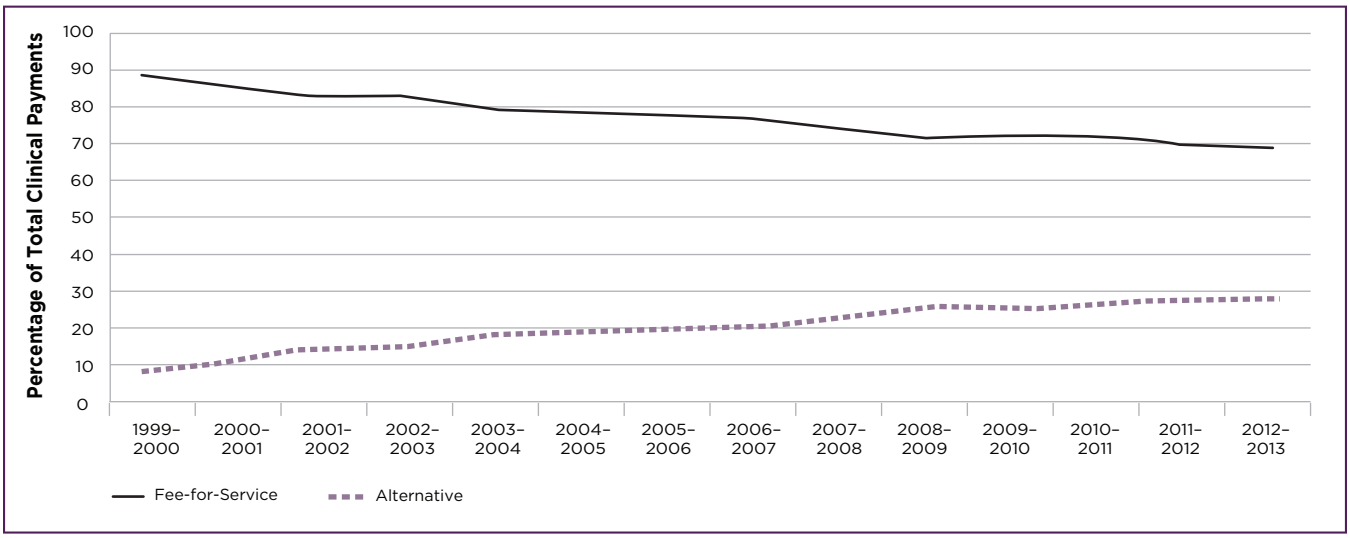
The adoption of fee-for-service as a primary method of payment for physician services under Medicare was the least disruptive way for governments to transition physicians from private health insurance plans to universal, publicly-funded medical plans. Physicians gradually warmed to the advantages of working in a system that provided them with a guaranteed income while preserving their clinical autonomy and small business ethos. As medical services insurance was established province by province, and then continued in operation nationally, organized medicine shifted its energy to collective bargaining. The new battle fronts were levels of fees, obtaining coverage for costs of practice such as malpractice insurance, and preservation of "extra-billing" – i.e. doctors' latitude to charge more than the negotiated insurance rate.

As explained in Chapters 2 and 6, most high-performing health systems have moved away from stand-alone fee-for-service as a dominant payment model for physician services. Even in the US, the global bastion of fee-for-service private medicine, the Obama administration has set goals and a timeline to shift physician payment under Medicare from traditional fee-for-service to alternative payment models that are tied to quality or value.[219] The goal is to tie 30 percent of fee-for-service Medicare payments to quality or value through alternative payment models such as accountable care organizations and bundled payment by the end of 2016, and 50 percent of payments to these models by the end of 2018.[219]

Canadian jurisdictions have also been moving in this direction. As shown in figure 8.1, close to 30 percent of physician clinical payments in 2012-13 were made through alternate payment plans, up from 10 percent in 1999-2000. This includes a range of models such as block funding for specialty groups in academic health sciences centres, blended fee-for-service and salary funding for specialists, on-call stipends, capitation in primary care settings, contracts, sessional remuneration, and salary.

The Panel welcomes this trend, but observes that movement is slow. Some of these payments, moreover, are simply add-ons to core fee-for-service compensation, while others are capitation payments to family physicians with uneven yields as discussed earlier. The Panel reiterates the position taken in Chapter 6. In an ideal world, provinces and territories would set timelines and targets to greatly reduce the prevalence of physician payment models solely based on fee-for-service, and align incentives around measurable quality parameters with risk-sharing. For now, the federal agency and Fund introduced in Chapter 4 should foster the development of integrated funding models that are cost-effective and promote quality and continuity of care.

Figure 8.1 Fee-for-Service vs. Alternative Payment



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Source: Adapted from: Canadian Institute for Health Information (CIHI). Approaches for Calculating Average Clinical Payments per Physician Using Detailed Alternative Payment Data. Ottawa: CIHI; 2015 March 12. Available from: https://secure.cihi.ca/free_products/PhysicianMetrics-mar2014_EN.pdf. P.12

Pressing "Reset" on Labour Relations and Health Human Resources (HHR) Regulation

The collective bargaining process employed in Canada to determine physician fees and practice conditions has been described as a significant barrier to system change.[220] High-stakes discussions take place behind closed doors with little or no public transparency. Governments and medical associations both claim to speak for the public good and to have the best interests of patients at heart. A deal is struck that sets in motion a range of incremental changes to fee schedules and practice models. If fiscal conditions are tight as they have recently been, governments may be able to extract concessions or even impose a deal that is unpopular with the profession.[210] But chances are that nothing fundamental will change in the way the system is organized. Regional health authorities and institutions are then left with the unenviable task of integrating the physician workforce into the daily operations of a health system with minimal ability to realign incentives to the advantage of patients, physicians, and the institution or region.

The Panel is convinced that a new model is urgently needed. Governments will need a steady hand to set out the overall funding envelope for medical services and articulate goals and expectations for patient care. What the Panel envisages is an open process, not a closed-door negotiation with organized medicine. The goal should be the creation of an environment of trust whereby senior public officials, healthcare administrators, and physicians function as partners, not adversaries, in the management of local health services, to the benefit of the patient an taxpayer. The Panel emphasizes here that it is not referring to jurisdiction-wide co-management by physicians – a model that has been tried, without much success, in Canada. Rather, as discussed in Chapter 6, the concept is to create local partnerships. As already outlined, the Kaiser Permanente model in the US is a superb example of successful physician leadership at the local level, resulting in a world-renowned non-profit healthcare system.[221]

More generally, there is significant inefficiency and duplication in the regulation of the healthcare workforce in Canada. Entry-to-practice credentials and licensure requirements differ across jurisdictions, impeding labour mobility and the efficient deployment of health human resources. Professional guilds often seek to increase study requirements for their profession, creating a domino effect in disciplines and jurisdictions.[220] Negotiations with unions create competition across jurisdictions to attract scarce health human resources and create additional financial pressure on a system that is already under fiscal duress. Chapter 6 has already made the case for more enlightened regulations that will support shared care.

"The same budget source would encourage the right provider, providing the right care for Canadians at the right time. In the current system where physicians are paid from a different budget source (medical service branch or equivalent) and all other providers paid from the region health authority (or equivalent) only encourages offloading of care. The cash strapped health authority would rather contract the services of a physician that they do not have to pay for out of their own budget rather than develop Nurse Practitioners or Clinical Nurse Specialists who could do the same role for fewer tax payer dollars."

Stakeholder Submission

Fortunately, there has been increased collaboration across jurisdictions on health human resources strategies in recent years. The Council of the Federation has identified the need to share evidence and leading practices across jurisdictions, recognize the inter-dependence of policies from one jurisdiction to another, and integrate planning activities.[222] Complementary federal investments have been made to support the development of provincial and territorial health human resources strategies and facilitate the integration of internationally educated healthcare professionals.[223] The new Agency and Fund would unquestionably facilitate and accelerate progress in these positive directions.

A Digression on "Pharmacare"

Prescription drugs are an essential part of modern healthcare systems. Without them, many diseases and conditions would be untreatable or would require more invasive interventions, and the quality of life of patients suffering from debilitating chronic diseases would be significantly worse. In the vast majority of industrialized countries, universal coverage for prescription drugs is the norm.[224] In Canada, however, universal drug coverage is limited to prescription drugs provided in hospitals. Drug coverage is otherwise provided through a patchwork of public and private drug plans.

There is a long history of proposals and failed attempts to introduce universal drug coverage in Canada dating back 50 years, when the 1964 Hall Commission recommended 50/50 cost sharing between the federal and provincial governments to create a national prescription drug program with a co-payment of $1 per prescription.[225] Three decades later, the National Forum on Health recommended first dollar coverage for prescription drugs in 1997, and in 2002, the Romanow Commission and the Kirby Senate Committee called on the federal government to jointly fund improved coverage for catastrophic drug costs with provinces and territories.[226]

What happened as a result of all these recommendations?

Very little nationally, as it turns out: federal commitments were made in the 1997 Speech from the Throne to develop a national plan to improve access to medically necessary drugs. In the health accords of 2000, 2003 and 2004, governments acknowledged the need to improve coverage for prescription drugs, including a nine-point National Pharmaceuticals Strategy under the 2004 Accord that costed but did not implement, a national approach to catastrophic drug coverage.[227]

Fortunately, provinces and territories did not wait for a national consensus before moving forward with initiatives to broaden coverage for prescription drugs. Starting in the 1970s, most jurisdictions created public drug programs to provide free or subsidized prescription drug coverage for seniors and low-income Canadians.[227]

In 1997, Quebec mandated universal prescription coverage for its residents through a combination of private health insurance plans and a public program for those ineligible for private coverage. The Quebec Public Prescription Drug Insurance Plan, administered by the *Régie de l'assurance maladie du Québec (RAMQ)* covers all Quebecers who are not eligible for a private plan. All provincial residents must have some type of drug insurance coverage, regardless of age or income. Those who are not covered through group insurance or an employee benefit plan are automatically covered by the RAMQ's public drug insurance plan.[228] Recently, New Brunswick introduced a mandate for universal prescription drug coverage similar to the Quebec model, albeit with very modest publicly funded coverage.[229] At present, no other Canadian province has universal coverage. Canada also has the lowest proportion of its population covered by a public drug plan of all comparator countries, except the US.[230]

Cost is a key reason why Canadian jurisdictions have balked at the idea of expanding public coverage for prescription drugs. Spending on drugs has grown sharply over the past 40 years, almost doubling as a share of total health expenditures from 8.8 to 15.8 percent.[5] Drugs are now the second largest area of healthcare spending after hospitals, closely followed by physician services. In 2014, spending on prescription drugs in Canada is estimated to have reached more than $33.9 billion.[231] Public drug plans accounted for approximately 42 percent or $12 billion, private drug plans accounted for 35 percent or $10 billion, and out-of-pocket spending by Canadian households represented 23 percent or $7 billion.[5] Expanding public coverage would require governments to absorb a significant portion of current private spending on drugs, and to increase taxes or levy premiums to make up the difference. And until very recently, drug costs have been the fastest growing category of health expenditures, increasing by an average of approximately 10 percent annually from 1997 to 2008.[5]

Some experts have recently called for yet another push for national pharmacare, arguing that moving to a national program of universal coverage with a national formulary and collective purchasing would result in lower overall spending on drugs and only a marginal increase in spending by government.[232] In their view, true cost control in this area can only be achieved through consolidation of buying power under a national drug plan.

The Panel certainly sees merit in a more robust approach to collective procurement and pricing, but is concerned that the current structures and incentives may not be aligned appropriately.[xxvii] Expanding public coverage of drugs risks creating yet another silo of spending, and runs counter to the basic principle of trying to integrate budgets and align incentives. Indeed, one expert argued provocatively in a recent speech about the US and Canadian healthcare systems that "pharmacare without managed care is nothing else but an open bar for big pharma."[233] The Panel observes in fairness that "big pharma" does not write prescriptions and that leaders of pharmaceutical and medical device companies have been advocating risk-sharing arrangements for their products over the last few years. Be that as it may, concerns about cost escalation and lack of budgetary integration strike the Panel as valid.

In sum, the Panel strongly supports the principle that all Canadians should have access to medically necessary drugs without financial barriers. The Panel takes no position on whether this should be a single-payer or multi-payer plan involving both private and public health insurers. However, while such strategies are debated and designed, the Panel believes that it is vital to improve Canada's management of drug costs, including purchasing and negotiating strategies as set out below. In the short-term, recognizing that financial barriers are currently impeding access by many Canadians to needed drugs, the Panel is recommending in Chapter 10 measures to assist individual Canadians without drug coverage, specifically changes to the *Income Tax Act* to help Canadians cover out-of-pocket costs.

Making Pharmaceuticals More Affordable

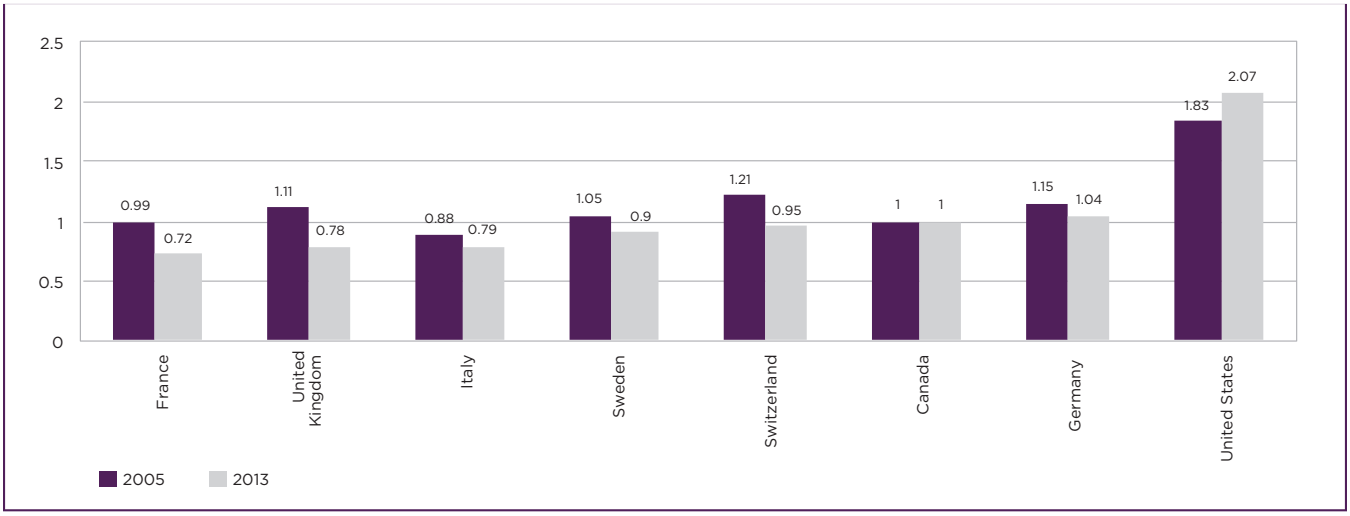
Canada's performance in managing the cost of drugs has been poor by international standards. Among OECD countries, Canada has the second highest level of per capita spending on drugs next to the US.[234] From 2000 to 2011, drug spending in Canada increased by 160 percent, compared to 126 percent in the US, 81 percent in France and 44 percent in the UK.[235] Drug prices in Canada are relatively high when compared to other OECD countries. The Patented Medicine Prices Review Board (PMPRB) reports that of the seven countries included in its reference basket, only Germany and the US have higher patented drug prices than Canada.[235]

As shown in figure 8.2, Canada's performance relative to these seven countries deteriorated from 2005 to 2013. This is hard to understand given the regulatory mandate of the PMPRB and its seven-country reference basket. Canada has also been lagging other countries with respect to generic drug prices. Canadian generic drug prices are approximately 185 percent higher than the Netherlands, and significantly higher than most countries except for Switzerland and Austraia.[236]

The provinces and territories have recognized this problem and have taken collective action to bring drug prices more in line with the experience of other countries. The aforementioned Pan-Canadian Pharmaceutical Alliance (pCPA) has been formed to address outdated policies of provinces and territories making individual decisions on the prices of brand and generic drugs. Through pCPA, provinces and territories may participate in joint

xxvii Other aspects of any single-payer plan will need attention. For example, the plan proposed by Morgan et al includes user fees or co-payments. If the level of these charges is too high, then coverage may become less comprehensive for some portion of the population with private plans. It is also unclear whether the presumed windfall for employers would simply fall to the bottom lines of enterprises co-funding existing private coverage or be taxed away.

Figure 8.2: Average Foreign to Canadian Price Ratios: 2005, 2013



Source: Adapted from: Patented Medicine Prices Review Board. Annual Report 2013. Ottawa: Patented Medicine Prices Review Board; 2014 May 30. Available from: http://www.pmprb-cepmb.gc.ca/CMFiles/Publications/Annual%20Reports/2013/2013-Annual-Report_2013-09-15_EN.pdf. P.24

negotiations with drug companies to leverage their combined purchasing power with the aim of achieving lower prices, improving access to drugs, and realizing greater consistency in coverage. As of December 31, 2014, these collaborative efforts have realized 49 completed joint negotiations on brand name drugs and price reductions on 14 generic drugs, resulting in over $315 million in savings annually.[237] The Panel applauds the significant progress made by jurisdictions on this front. But it believes there is potential for further innovation in this area supported by federal actions.

Pharmaceutical policy is an area where the federal government has comparatively significant levers and responsibilities, both as a payer and regulator of pharmaceuticals. The Government of Canada as a payer provides drug benefits through separate plans that serve First Nations and Inuit, Royal Canadian Mounted Police (RCMP) members, the Canadian Forces, veterans and federal inmates, for a total of $630 million in drug-related spending in 2014.[5] Ontario, Quebec, BC and Alberta spend more, but this is a larger annual outlay than is made by several provinces and all three territories. Given the significant scope to achieve price reductions through collective purchasing, the Panel urges the federal government to coordinate efforts across federal plans and reaffirm its desire to join the pCPA as soon as possible.

> "We need to find efficiencies. We need to purchase pharmaceuticals, supplies and equipment on a national basis, not each jurisdiction buying these things on their own. This squanders the leverage we have as a nation."
>
> *Public Submission*

As noted earlier, the federal government regulates the prices of patented drugs through the Patented Medicine Prices Review Board (PMPRB). This unique regulatory mechanism was created in 1987 under the *Patent Act* to protect consumers by regulating the price of patented drugs to ensure they are not excessive. At that time, price regulation of patented pharmaceuticals was accepted by the brand name pharmaceutical industry in exchange for enhanced patent protection stemming from trade agreements. Pharmaceutical manufacturers also publicly committed to increase their investment in research and development activities in Canada to 10 percent of the value of drug sales, a benchmark they have latterly failed to reach.[238]

The PMPRB regulates the price of patented drugs by comparing the price proposed by the manufacturer to the price of existing drugs on the Canadian market and in up to seven other countries specified in regulations. To stay within the definition of "non-excessive," the price of new breakthrough drugs cannot exceed the median of a seven country basket.[xxviii] New formulations of existing drugs or new drugs that do not represent a significant additional therapeutic benefit over existing drugs are benchmarked against the price of comparable drugs already on the market. Year-over-year increases in prices are limited to the consumer price index. When prices are found to be excessive, the manufacturer can voluntarily lower its prices and provide compensation to the PMPRB for the excess revenues it earned. As a quasi-judicial body, the PMPRB also has the power to levy financial penalties.[238]

The Panel has mixed views about the PMPRB. The data presented above clearly show that even with the PMPRB, Canada's performance in managing drug prices has been weak. To make matters worse, commitments by industry to increase investment in research and development have not been met.[235] As collective purchasing of drugs expands across public plans, and eventually to private plans, the PMPRB's role may be further diminished.

However, as long as Canada does not have universal coverage of prescription drugs through a network of public and/or private plans, the PMPRB should continue to serve as a backstop against high drug prices for consumers who are not covered by group purchasing arrangements. This will become increasingly important as new, expensive "niche" drugs and biologics arrive on the market with the promise of curing or treating rare diseases. The Panel therefore recommends that the federal government review and strengthen the PMPRB, paying particular attention to the choice of reference countries, and how PMPRB arrives at a benchmark price, so as to ensure that the Board will provide more effective consumer protection against high patented drug prices.

More generally, the Panel observes a disconcerting lack of transparency in drug pricing. Confidential price listing agreements between public payers and pharmaceutical companies are now the norm around the world.[239] Collective purchasing arrangements will consolidate purchasing power and may lead to lower effective drug prices that benefit taxpayers. However, even under the pCPA, negotiated rebates off the official list price of drugs will continue to be confidential. Pharmaceutical companies will continue to price discriminate between countries, and between payers within the same country. While it may not be possible to have full transparency in drug pricing in the current international regulatory and trade environment, the Panel is strongly of view that drug prices should be more transparent. The Panel therefore recommends that the federal government, through the Healthcare Innovation Agency of Canada, work with public and private payers, as well as the pharmaceutical industry and pharmacists, to improve transparency of drug prices and ensure that prescribers and patients have enough information to make informed choices, and explore options for bringing private insurers into the pCPA.

"Canada and the provinces have been continually under pressures to approve and fund a myriad of new drugs, diagnostic imaging, medical devices and surgical interventions – and these pressures have been growing inexorably. Many of these demands for new funding are highly valuable and worth the investment. But there are also many innovations which are simply not worthwhile. In the private sector, there is a constant weeding that separates really beneficial from poor quality innovations – whether in mobile phones or new cars."

Stakeholder Submission

Towards more Efficient Regulation of Healthcare Products

Throughout the Panel's consultations, participants expressed concerns about the inefficiency and duplication of regulatory processes governing healthcare products and services. Innovators are frustrated by a multi-tiered system for regulatory approval and fragmented purchasing, forcing them to seek adoption by individual healthcare institutions and providers. Payers are in a fiscal straightjacket and can barely keep up with the flow of products in the industry pipeline, only some of which represent significant value-

xxviii France, Italy, Germany, Sweden, Switzerland, UK, and the US.

added benefits for the healthcare system. (i.e., breakthrough therapies, new diagnostics). Patients do not really have a voice in the process, but they are the ones with the most at stake when health-enhancing therapies are not available to them or when scarce public resources are squandered on products with no health benefit.

Measures to integrate services and create shared budgets, recommended in Chapter 6, may address some of the frustrations of innovators industry stakeholders seeking greater clarity about purchasing decisions. However, to address the regulatory concerns, the Panel recommends that federal, provincial and territorial governments embrace the following directions:

1. Adopt a life-cycle approach to product regulation that builds on pre-market evaluations and uses information from real-world use

2. Where possible, harmonize requirements with, and leverage the capacity of foreign regulators such as the US Food and Drug Administration and the European Medicines Agency

3. Develop and use common metrics for evaluation and avoid duplication of product assessments across Canadian jurisdictions

4. Streamline regulatory processes to expedite adoption of value-added innovations

5. Strengthen communication among all players to enable more effective procurement by the healthcare system

Stakeholders also expressed concerns that Canada is lagging in its adoption of international regulatory approaches that facilitate the adoption of incremental innovations for medical devices, including the "substantial equivalence" (SE) provision under the US Food and Drug Administration 510(k).[240] This SE process differs from a pre-market approval process as regulators are only partially assessing the safety and efficacy of a device based on its SE to a product already on the market. Consideration is needed as to a similar approach in Canada, particularly in light of the fast life-cycle of medical devices.

"Medical device technologies are a long term investment, and investors are often hesitant to fund small and medium-sized medical device companies because of lengthy regulatory hurdles and uncertainty of the affordability of development in Canada. It is for this reason that leadership is sorely needed from government."

Stakeholder Submission

The federal government has a well-established role in regulating the safety and efficacy of drugs. This is a necessary role, but it is no longer sufficient. The emerging reality of pharmaceuticals is that decisions about their use need to be made on a continuing basis, throughout the product's lifecycle, and by many different actors. Information needs to be collected and shared to support this process.

As part of new federal initiatives to strengthen drug safety, Health Canada is updating its user fees to better allocate its resources to reflect the growing importance of post-market work.[241] Through regulatory cooperation initiatives with Australia and initiatives focused on generic drugs, Health Canada is expanding the use of approvals of other trusted regulatory authorities to meet the market access requirements in Canada, particularly for more straightforward reviews (i.e., generic drug review, low risk small molecule drugs).[242] This should allow Health Canada to focus scarce resources on more post-market work, complex reviews, and reviews of more benefit to the healthcare system.

Building on these initiatives, Health Canada should actively seek to improve dialogue and communication with other parts of the healthcare system, while making adjustments to its current policies and processes. Departmental officials should establish regular bilateral meetings with provincial and territorial officials responsible for drug plans. Health Canada should adjust its fee schedule and/or prioritization of product reviews to privilege drugs that are a priority for the healthcare system. It should share information with others, such as informing the Canadian Agency for Drugs and Technologies in Health (CADTH) and provincial/territorial officials when a drug is under review. It should also develop guidance on the interchangeability or similarity of biologics and subsequent-entry biologics, to advance Canadian adoption of this class of drugs, and provide drug plans with greater leverage to negotiate better prices.

Furthermore, the federal government should use its role in approving clinical trials to encourage the pharmaceutical industry to conduct studies for the benefit of payers, not just for Health Canada's market approval. The objective would be to support organizations like CADTH, the pCPA, and provincial and territorial drug plans in getting the studies and information they need, as has been proposed for the implementation of the orphan drug framework. This could be done by providing advice to pharmaceutical manufacturers on trials they ought to perform, or it could be turned into a regulatory requirement.

Finally, recognizing that there are a variety of organizations and players in this area, and that an increasing proportion of drug-related information will be obtained post-market, the federal government should improve and align the work of federal or federally-funded agencies, including Health Canada, CADTH, the PMPRB, CIHI and the Drug Safety and Effectiveness Network (DSEN).

Fostering Culture Change to Reduce Waste and Inefficiency

The Panel would be remiss not to highlight two promising areas of work that seek to change system culture to improve value in healthcare.

First, several provinces, including Saskatchewan, Manitoba, BC, Ontario and Quebec, have integrated Lean techniques in their reform efforts. In its simplest form, Lean is a system that organizations can use to eliminate waste and meet the demands of customers through continuous improvements to processes. Originally popularized in North America through the Toyota Production System in the manufacturing sector, Lean is now applied to healthcare, where it has the potential to reduce wait times and length-of-stay, create system efficiencies, and improve quality of care.[243]

Saskatchewan has identified Lean as the foundation for the province's quality improvement efforts, and hundreds of projects are currently underway. For example, clinical practice redesign is a key component of the Saskatchewan Surgical Initiative and includes a set of tools and methodologies designed to improve access to care, improve office efficiencies and improve communication between office settings and healthcare providers.[187] Within hospitals, Lean activities have helped to reduce waste in front-line staff. Lastly, major capital projects have also incorporated Lean principles in facility design to improve processes.[243]

As one example of the type of work that might be supported by an Innovation Fund and the new Agency, Lean techniques could be scaled up to other regions and jurisdictions in collaboration with leaders and practitioners who have already applied them successfully in some parts of Canada.

Choosing Wisely Canada is a new campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to support smart and effective choices to ensure high-quality care. The movement, spear-headed by Dr. Wendy Levinson from the University of Toronto, began in the US and has now been introduced in Canada with support from the Ontario Ministry of Health and Long-Term Care.[244] Canadian national specialty societies participating in the campaign, representing a broad spectrum of physicians, have been asked to develop lists of "Things Physicians and Patients Should Question". These lists identify tests, treatments or procedures commonly used in each specialty, but that are not supported by evidence and/or could expose patients to unnecessary harm. For example, in the area of primary care, family physicians have proposed the following:

- Avoid imaging for lower-back pain unless red flags are present;
- Do not use antibiotics for upper respiratory infections that are likely viral in origin, such as influenza-like illness, or self-limiting, such as sinus infections of less than seven days of duration;
- Do not order screening chest X-rays and electrocardiograms for asymptomatic or low risk outpatients;
- Do not screen women with Pap smears if under 21 years of age or over 69 years of age;
- Do not do annual screening blood tests unless directly indicated by the risk profile of the patient.[245]

The Panel salutes this initiative as an innovative physician-led and patient-centred approach that has the potential to shift healthcare away from a culture of consumption to a focus on appropriateness and quality of care. The Panel encourages governments to support the implementation of this initiative in all jurisdictions and to carefully evaluate its impact.

Recommendations to the Federal Government

8.1 Coordinate and integrate existing federal drug plans and reaffirm federal desire to join the Council of the Federation's pan-Canadian Pharmaceutical Alliance.

8.2 Through Health Canada, expand the Government of Canada's approach to regulating drugs beyond drug safety to better support system decision-making on the cost- effectiveness of drugs.

- Consider therapeutic benefits in addition to safety benefits in its approval process;
- Require drug manufacturers to conduct comparative effectiveness studies;
- Adjust cost recovery for drug approvals to privilege high impact and value drugs over "me too" drugs; and,
- Provide advice to system decision-makers on the interchangeability or similarity of biologics and subsequent entry biologics.

8.3 Through Health Canada, accelerate work on transparency in its regulatory processes. This should include providing advance notice as to which products it has under review to permit decision-makers to plan their budgets accordingly. It also must include making public all data on the safety and effectiveness of drugs and devices.

8.4 Review the Patented Medicines Pricing Review Board to assess its relevance and strengthen its role in protecting consumers against high drug prices in an era of enhanced collective procurement and coordinated national pricing.

8.5 Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund:

- Offer to serve as the secretariat for a pan-Canadian Drug Purchasing Alliance.
- Pursue support for the implementation of the Choosing Wisely Canada initiative in all jurisdictions and carefully evaluate its impact.
- Work with public and private payers, as well as the pharmaceutical industry and pharmacists, to explore options to that would improve transparency about drug prices, and ensure that prescribers and patients have enough information to make informed choices.
- Collaborate with provincial, territorial, and private drug plans on strategies to extend the reach of collective purchasing strategies to all Canadians including the potential for bringing private insurers into the pCPA.

8.6 Re-orient the Canadian Agency for Drugs and Technologies in Health (CADTH) to better support innovation by providing real-time advice to decision-makers on drugs and medical devices, and support CADTH to:

- Build up its expertise and increase its turnover related to its decisions on technologies to reflect their rapid life-cycle, including partnering with provincial initiatives that seek to align the pre-market and post-market assessment processes.

- Benchmark its turnaround against similar health technology assessment agencies internationally, which play a central role in providing rapid-cycle guidance on the cost-effectiveness of drugs and technologies.

- Assume the responsibilities of the Drug Safety and Effectiveness Network (DSEN; currently located in CIHR), which supports research into the post-market safety and effectiveness of drugs, given the natural affinity of this work with CADTH's mandate.

- Examine and make recommendations related to practices that are becoming obsolescent, such as those that no longer provide optimal patient outcomes.

Chapter 9

Healthcare and Economic Prosperity

"Entrepreneurs challenge the status quo, whereas incumbent institutions in health are designed to largely maintain the status quo. A vibrant community of young health start-ups that are problem solving at the front lines is critical to support healthcare institutions."

Public Submission

"In order to succeed, innovators need access to national and international markets. Doing so allows innovators to scale their solutions, provide a reasonable return on investment, and generate profits that can be reinvested in new research and development. The Canadian marketplace, with 14 government jurisdictions each setting their own requirements, makes it difficult for innovators to succeed."

Stakeholder Submission

Healthcare and Economic Prosperity

The costs of healthcare in Canada understandably receive considerable attention. On occasion, however, we overlook the economic benefits that this sector provides to our society. According to the Conference Board of Canada, in 2011 the healthcare sector supported "2.1 million jobs – directly throughout the sector and indirectly through the supply chain."[246] The Conference Board of Canada estimated in 2013 that, "for every dollar spent on healthcare, the various levels of government collect 21.7 cents in taxes."[246] Other benefits were cited by the Board in 2013: "because healthcare services touch the life of every Canadian, the sector plays a key role in decreasing employee absence due to illness, stress, and disability which bring significant economic burden to Canada. Put simply, healthier workers are more productive workers."[247] In this regard, major corporations in Canada are increasingly recognizing that the health and wellness of employees is a key contributor to employee productivity, and are developing wellness programs to both keep their employees healthy and reduce the cost of their health insurance plans.[xxix]

This chapter extends the analysis in Chapter 8 by taking a wider view of how segments of the investor-owned healthcare sector can contribute to Canada's prosperity. Drawing on selected international comparisons, it pays particular attention to the environment for healthcare business that has been created through fragmented purchasing in Canadian healthcare systems, and revisits the issues of duplication and delay in approvals elucidated in the preceding chapter.

Canada's Healthcare Products and Services Industry

The healthcare products and services industry has the potential to create prosperity while helping Canada's healthcare systems to deliver higher quality or more cost-effective care, and Canadian patients to enjoy longer and better lives.

> "Based on stock market values at the end of 2014, the collective value of a mere four US [biotech] biggies – Gilead, Amgen, Celgene and Biogen Idec – was larger than all of Canada's Big Six banks plus the insurers Sun Life and Manulife put together."
>
> *Eric Reguly*

Reguly E. Why is Canada's life sciences sector flatlining? Globe and Mail. 2014Apr23. Available from: http://www.theglobeandmail.com/report-on-business/rob-magazine/why-is-canadas-life-sciences-sector-flatlining/article24030375/)

For example, in 2012, Canada's medical devices market was estimated at $6.4 billion and accounted for about two percent of the global market, valued at about $327 billion.[248] The medical device industry – not taking into account medical imaging and assistive devices - employed over 35,000 people in close to 1,500 corporate facilities, with a large portion of the industry being small and mid-sized companies.[249] In 2014, the manufacturing portion of pharmaceutical sector employed over 26,000 people and had an estimated value of $7.5 billion.[250]

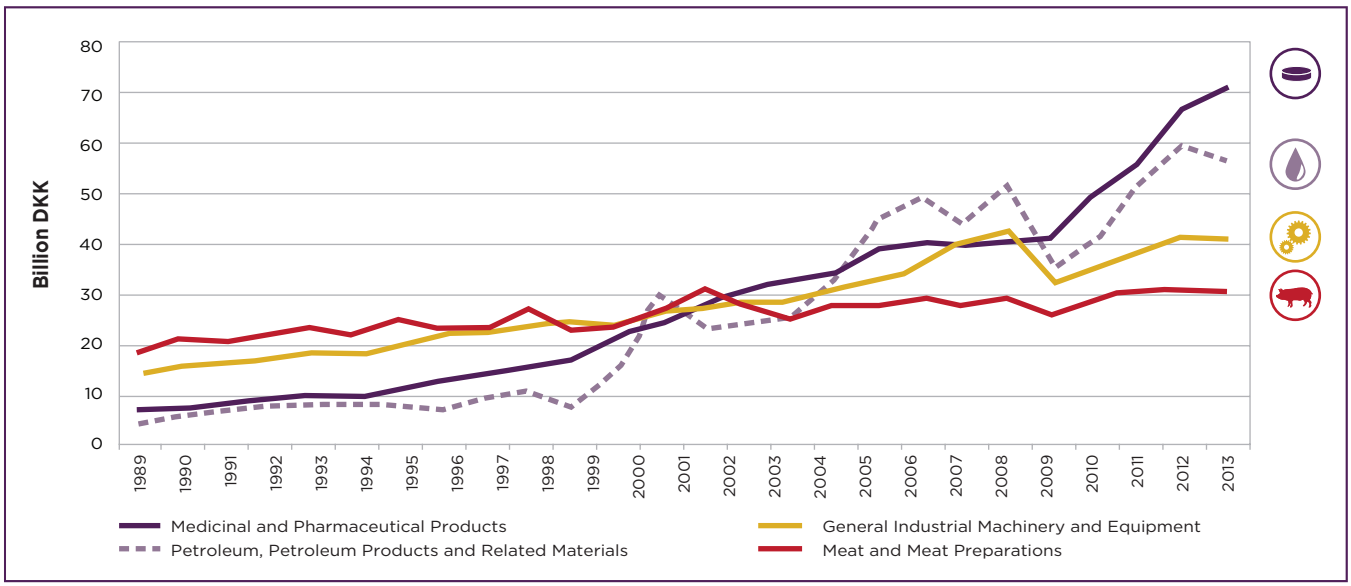
Countries such as Denmark and the UK[xxx] have recognized the dual potential of this industry. For example, approximately 40 percent of the world's hearing aids are being developed and manufactured in Denmark.[251] Its Medicon Valley hub, which spans Eastern Denmark and South-Western Sweden, is one of Europe's largest life science clusters, employing more than 40,000 in the life science sector,[251]and accounting for 20 percent of the total GDP of Denmark and Sweden combined.[252] Denmark is also home to a highly competitive pharmaceutical industry, with pharmaceuticals being one of Denmark's largest export items at close to 11 percent of total Danish exports.[251]

Canada stands in stark contrast. In the light of commissioned research and discussions over the last year with a range of stakeholders, the Panel has concluded that Canada is

xxix While outside the scope of this report, the Panel heard comments from industry representatives about the need for Canada's largest employer – the Government of Canada – to adopt similar approaches and to become a role model for other employers in Canada. The Panel is encouraged by the federal government's recent decision to create a Joint Task Force to examine ways to improve the psychological health and safety in the federal workplace, including "reviewing practices from other jurisdictions, and reviewing the National Standard of Canada for Psychological Health and Safety in the Workplace and identifying how its objectives shall best be achieved within the Public Service." Treasury Board of Canada Secretariat [Internet]. Ottawa: Government of Canada; 2015. Available from: http://news.gc.ca/web/article-en.do?nid=956409

xxx Germany is another example of a country that is deriving significant benefit from its medical devices industry. According to a study in 2011 conducted by the Federal Ministry of Economics, "innovations in the healthcare sector and progress in medical technology resulted in savings in the amount of 22 billion euros for the German economy in the last few years." MedInsight. New study on innovation impulses by the Ministry of Economics. German Healthcare Market & Advanced Medical Technology. 2011.

Figure 9.1 Health (Drugs and Devices); Denmark's Largest Export, 2013



Hentze J. Presentation to the Advisory Panel on Healthcare Innovation: Leveraging Healthcare For Economic Growth: Denmark's Story. Toronto: Royal Danish Consulate General; 2015.

failing to leverage this industry as a driver of economic growth. As one indicator, Canada has an active market for medical devices but imports account for about 80 percent of purchases.[248] Likewise, notwithstanding strong sales, pharmaceutical manufacturing has been declining over the years. In 2013, pharmaceutical exports amounted to $5.6 billion, while imports were valued at $13.7 billion.[250] Today, Novo Nordisk, a Danish company, is the world leader in the production of insulin – a Canadian invention.[253]

"Technology-enabled community-based care solutions can be the breakthrough our system urgently needs to reduce the growth rate of healthcare costs, while also raising productivity and improving health outcomes."

Stakeholder Submission

On the positive side, Canada has unrealized potential to punch above its weight in the development, commercialization, adoption and export of innovative healthcare products and services. The global nature of demand also means that Canadian products and services of high value can jump into larger healthcare markets. Canada has many of the fundamentals in place. These include a favourable tax environment, competitive levels of support for research and development, world class healthcare and post-secondary institutions, leading academic researchers and healthcare professionals, and the presence of many prominent healthcare companies. From its consultations, the Panel was also left in no doubt that Canada is not short of good ideas and new inventions that could be turned into market-ready innovations. The question, then, is whether we will continue to let others develop and market new products and services to us or whether we can create the winning conditions for home-grown industries and innovations to succeed here and around the world.

Key Barriers to Harnessing our Economic Potential

Consider an inventor turned entrepreneur who has just developed a new healthcare product. While she is convinced that once adopted, the system will be grateful for the lives and money her product will save, she has no idea how to get it into the hands of the end-user. Unfortunately, there is no map to point her in the right direction. What she instead encounters on her uncharted journey is a tangle of decision-makers and conflicting

criteria to get her product approved for safety, evaluated for cost-effectiveness, assessed for potential purchase and re-assessed for reimbursement. None of those processes are connected or aligned. In the absence of an integrated pathway to procurement and adoption, she must go hospital to hospital or even physician to physician to pitch her product, with her success being linked more to who she knows than the value of the product. Her money is running out, as is her passion for the product she feels will save the lives of many patients.

While the troubles of our fictitious entrepreneur are meant to be illustrative, they represent an authentic roll-up of what the Panel heard from many different business leaders and innovators.

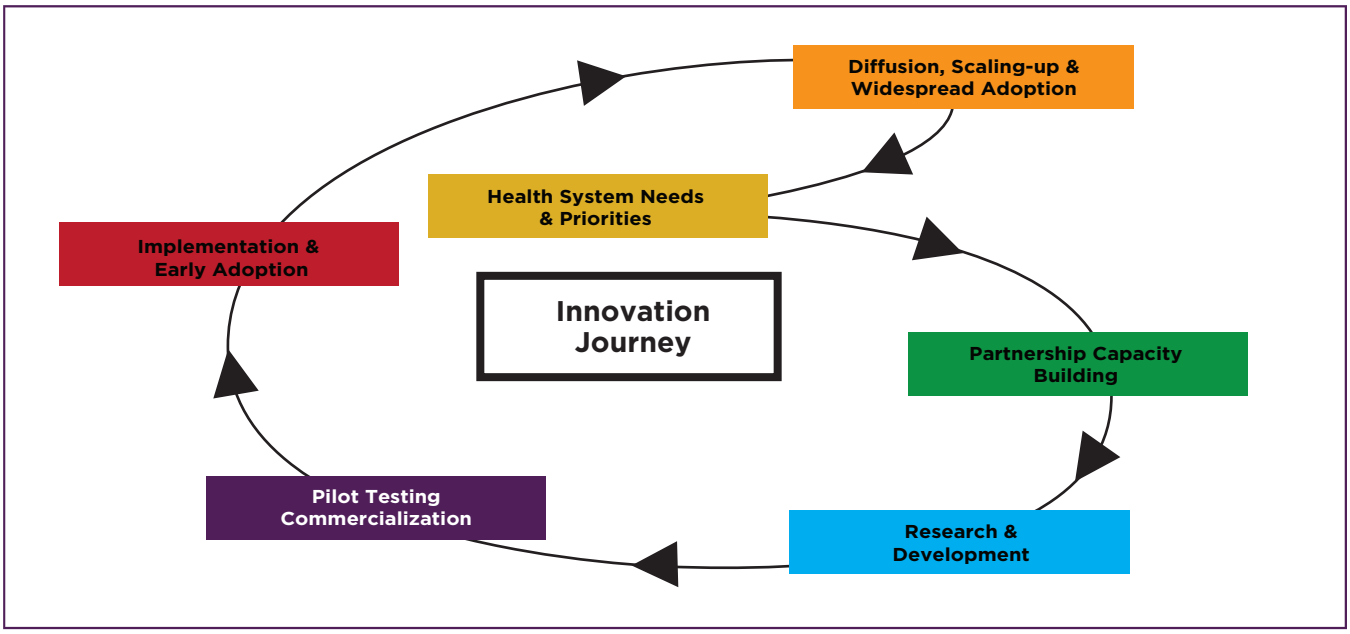
Research commissioned by the Panel confirmed these concerns (see figure 9.2): While governments of all jurisdictions were enthusiastic in principle about innovation in the healthcare system, their support was focused upstream. Funding flowed primarily for research, secondarily for development, and much less so to support the adoption of new products, processes and services, partnership development and diffusion or scaling-up. The Ivey International Centre for Health Innovation concluded that Canada performs poorly in these latter areas.[254]

Specific factors cited by stakeholders were: a lack of government-industry partnership, a highly fragmented market, and duplication and lack of harmonization in the regulatory environment – both domestically and internationally. These will be reviewed in turn.

Need for Government-Industry Partnership

During its consultations, the Panel heard that elsewhere in the world, countries have a partnership ethos: they are looking to proactively engage with industry for development of context-appropriate healthcare solutions. Canadian representatives from small and medium-sized enterprises, as well as larger companies, painted a different picture in Canada. They voiced concerns that industry was seldom seen as a partner in solving persistent healthcare problems. In other industries, governments have found a way to work with industry that supports the life cycle and broader economic benefits of publicly-funded procurement while leveraging the ability of industry to create new solutions. In the healthcare sector, collaboration between the public and private sector to develop solutions and needed products remains underdeveloped – despite the fact that the federal, provincial and territorial governments all invest in health-related research and development.

Figure 9.2: Innovation Adoption Journey



Adapted from Ivey International Centre for Health Innovation. Advisory Panel on Healthcare Innovation Commissioned Research: An Overview of Canada's Health Innovation Architecture. London; c.2015.

"Governments are big players in Canada, very big players in the healthcare system and with a few exceptions there are not many leaders interested in government-industry collaboration. We do not have a lot of people bridging that gap."

"The problem for the provinces is that they all have budget pressures. So it is all heads down trying to balance your budget."

Participants at Industry/Government Roundtable

Many stakeholders also pointed to the rigidity of adoption and reimbursement policies across Canada's healthcare systems. For example, virtual medicine is having a tangible and positive impact on the quality and cost-effectiveness of ambulatory care. However, uptake in Canada has been piecemeal and we have failed to successfully leverage this innovation to the extent other countries have done. In part, inflexible processes for adjusting physician remuneration for new ways of delivering care have discouraged use of these products and approaches. Furthermore, as outlined in Chapter 6, misaligned incentives and weak integration are larger problems that continue to constrain the adoption of this and other innovations.

The overall result is that dialogue between the health sector and industry on system needs and priorities is simply not taking place. In a better world, early and open discussions to identify the critical problems of Canadian healthcare could be used by the private sector to create products and services that meet domestic needs – and that might well be saleable globally after being adopted here.[xxxi]

Industry commentators signalled strongly to the Panel that their sector is prepared to meet the high standards of safety and efficacy that Canadians expect from health-related interventions, to conduct research in Canada that meets ethical and scientific standards, and to compete for business on the basis of value for money. In return, they expect that Canadian governments will recognize that industry can play a valuable role in developing tools to improve the quality and cost-effectiveness of care. The Panel believes that collaboration on these terms among industry, government, providers and other stakeholders should be encouraged.

"We do not have the economic or the business case conversation. These one-offs of virtual care and fee schedules that are all new, small, changes, are not enough. It really warrants, I think, a workforce conversation."

Participant at Industry/ Government Roundtable

"Despite a rapidly growing list of mHealth solutions in existence today, payment models do not adequately recognize mobile health solutions as a reimbursable service. Reimbursement models for healthcare professionals must be aligned to account for new outcomes-based models of care delivery that leverage the use of mobile technology."

Stakeholder Submission

Fragmentation Within the Canadian Market

Canada is a small market on the international stage, made smaller still by a systemic lack of collaboration and coordination of procurement. Multiple jurisdictions, with numerous purchasing processes at the regional and institutional level, create multiple hurdles for any company seeking uptake of its innovative goods or services. The situation at times seems Kafkaesque: for example, the Panel heard about Canadian technologies being sold to sophisticated international markets which were ignored by purchasers in the cities and provinces where the products were developed.

xxxi An important theme that emerged from the Advisory Panel's Industry/ Government Roundtable.

"There is no home market…it seems to me that we are shooting ourselves in the foot."

"It is ridiculous that we cannot get our act together. We call ourselves a single payer agent country. We are not a single payer. We have more payers than anywhere else I go to. And it's about time we got moving on it."

"You have to have a bit of a screw loose to innovate health in Canada. There are not many of us, I do not think. I have got an all Canadian team. We are all motivated by Canada. But I am looking straight at the US because I know exactly how to get it done there. And I have no idea how to get it done here. And so I just do not even look here anymore. This is an awful shame to take all this Canadian trained talent, all this investment into our start-up but I'm not even looking at this country because I have no clue who the buyer is."

Participants at Industry/ Government Roundtable

Fragmentation Meets Duplication and Lack of Harmonization: The Domestic Environment

The process for getting a new drug into the Canadian market is long and complicated.[255]

- It first must get approved for the market by the federal government. Health Canada is responsible for assessing drug safety, efficacy and quality and for post market monitoring of drug safety. Many stakeholders commented on the length and lack of transparency of Health Canada's review processes.

- Once Health Canada grants market approval, the product can be prescribed but may or may not be reimbursed by drug plans. For the federal, provincial and territorial drug plans (except Quebec) the product must undergo a clinical and cost-effectiveness assessment by the Canadian Agency for Drugs and Technologies (CADTH).[xxxii] Each of these publicly funded drug plans and cancer agencies (again except Quebec) considers the recommendations of the CADTH review along with local factors and budgets, before making a decision on coverage. In 2012-13, these plans followed the CADTH recommendations in over 90 percent of cases.

- Each private payer (e.g. private insurance companies, employer-sponsored drug plans etc.) follows its own process. Some may cover any drugs approved for sale by Health Canada, while others follow decisions made by public plans or create their own formularies. Private drug plans do not collaborate with each other or the public sector in terms of sharing data and information or on common issues, such as joint purchasing of drugs.

- For the drugs provided in hospital, each hospital or hospital region has traditionally developed its own formulary. This has been justified over time by the fact that not all hospitals treat the same types of patients.

- In terms of procurement, Group Purchasing Organizations negotiate contracts with drug manufacturers in order to realize cost savings for regional health authorities and hospitals. As discussed in Chapter 8, provinces and territories created the pan-Canadian Pharmaceutical Alliance (pCPA) to jointly negotiate the price of publicly funded generic and brand name drugs. At this time, the pCPA does not negotiate preferred drug pricing for drug expenditures covered by public hospitals or by private employee drug plans. The Panel has already referred to the wisdom of aligning private plans with pCPA; it sees no reason why similar group procurement cannot be done routinely with and by publicly-funded hospitals.

xxxii This is done through the Common Drug Review and for cancer drugs, through the Pan-Canadian Oncology Drug Review.

"There is no accountability for innovation adoption and spread; nor are there consequences for not embracing, rapidly adopting, and rapidly diffusing proven innovations. This is actually highly irresponsible given the volume of inventions and pilots that are financed by the public purse in Canada that never see the light of day in terms of full value capture."

Stakeholder Submission

While the picture for drugs in Canada may seem complicated, the situation for medical devices is even more so:[256]

- Like drugs, medical devices are first approved for market by Health Canada, which reviews the product for safety, quality and effectiveness. This can be a lengthy process, depending on the class of the medical device.[xxxiii] Like the process for drug approval, stakeholders complain about a lack of transparency.

- Once approved for market, however, there is no central process for health technology assessments.[xxxiv] BC, Alberta, Ontario, Quebec, and Newfoundland have developed their own provincial processes.

- CADTH undertakes health technology assessments deemed to be of national interest at the request of governments. This service is particularly helpful for those provinces which do not have their own capacity. However, CADTH can only review a fraction of new medical devices coming on the market. It has been criticized for slow reviews – an issue given the short life-cycle for these products relative to drugs.

- The final decision on whether to fund a given product is made in most cases by individual hospitals or regional health authorities. These decision-makers may or may not be required to follow the recommendations of health technology assessment bodies.

- After the reimbursement decisions are made, group purchasing arrangements often kick in[xxxv] for negotiations with medical device suppliers. Different group purchasing organizations operate across the country with varying approaches, posing another hurdle for suppliers, particularly smaller-scale companies.

- Because of these fragmented processes, decision-making does not consistently take into account the results of formal health technology assessments or the potential savings a new technology could bring to the healthcare system.

- Furthermore, despite some alignment of procurement principles (such as the Agreement on Internal Trade[257] and New West Partnership Trade Agreement[258]), the fact remains that companies must go province by province (if not hospital by hospital) to seek uptake of their products.

On this last point, the Panel heard that our disjointed system is leading multinational enterprises, especially in the device sector, to see Canada as an unfavourable place for investment or for field-testing promising innovations. As one representative of a multinational company said to the Panel: "As an international company, we are just fighting to get Canada on the map in terms of getting innovation dollars to bring into Canada…Once I make the argument on a global scale that Canada is important for my company to invest in, then I have to go to, well, what province? …. It does not make sense."

xxxiii Medical devices are regulated under the *Food and Drugs Act* as a Class I, II, III or IV, with Class I representing devices that present the lowest risk and Class IV the highest. Class I devices are exempt from licensing and do not need to obtain Health Canada approval to market. Class II devices require that applicants assert the safety and efficacy of their device without having to submit evidence to support this conclusion. Class III and IV devices require more documentation and provision of evidence proving the safety and effectiveness of their device.

xxxiv CADTH defines health technology assessments as "evaluations of clinical effectiveness, cost-effectiveness, and the ethical, legal, and social implications of health technologies on patient health and the healthcare system." (CADTH [Internet]. About Health Technology Assessments. Ottawa, Canadian Agency for Drugs and Technologies in Health; 2015. Available from: https://www.cadth.ca/hta)

xxxv This is a common practice in most provinces.

"Generally, all drugs that are approved by the FDA will eventually have applications submitted for review in Canada. Canada has one tenth the population of the US and our regulatory budget is less than one tenth that of the FDA, but Health Canada still needs to review the same number of applications. There needs to be some collaboration."

Stakeholder Submission

The lack of a national review process has also led to allegations of regulatory capture by stakeholders who may not be making objective decisions.[xxxvi] In this respect, the Panel is aware that physicians and administrators may have relationships with particular companies, and that physicians on occasion are involved with the invention of local technologies. It cannot judge whether these factors have unfairly skewed purchasing at the local level.

"In terms of entry to market…when you run a company that has over 80,000 products, you are looking at a rather complex process in terms of getting licences in Canada. …We just launched a brand new total knee system… which has thousands of pieces. But if one of the instruments is not licensed, then we are looking at months in delays of actually bringing that product to market in Canada….We could certainly drive towards a quicker model."

Participant at Industry/ Government Roundtable

Stakeholders were particularly concerned that group purchasing organizations place too much emphasis on purchase price alone, and not enough on overall value to patients and the healthcare system. Industry representatives also spoke forcefully for the need for a roadmap that will help steer product developers in the right direction, and streamlining of current processes. A study by the Ivey International Centre for Health Innovation echoes these concerns. It concluded that in order for "Canada's health system to reap the benefits of new innovative technologies, procurement processes must consider quality of patient care and long-term system-level efficiency as key indicators for the procurement of innovative medical devices."[259]

In those respects, an international best practice may be the Capital Region of Denmark's (Copenhagen) procurement office, which "structures tenders to include 'mandatory' features, while allowing competition on 'voluntary' (value-added features). Approximately equal weight is given to price and non-price factors."[260]

More broadly, the European Union has introduced competitive dialogue as an innovative procurement practice. While procurement rules have generally discouraged close collaboration between healthcare buyers and suppliers, competitive dialogue allows bidders to develop alternative proposes in response to a client's outline requirements. The goal is to increase value in terms of quality and responsiveness to health system needs while maintaining competition in the bidding process.[261]

Looking domestically, Ontario's MaRS Excellence in Clinical Innovation Technology Evaluation (EXCITE) program exemplifies the same approach. EXCITE facilitates a dialogue among innovators and payers or end-users. The goal is to identify upfront whether innovations are of potential value to a given healthcare system and relevant to the payer's and end-users' priorities.[262]

The result is sharing of data to support regulatory and procurement/ reimbursement decision-making through a streamlined, single, harmonized pre-market process.[262]

In sum, clearing this regulatory and purchasing thicket depends meaningfully on better collaboration among the federal, provincial and territorial governments. One stakeholder remarked tartly to the Panel: "The trouble that the feds have is to establish positive enough relationships with the provinces so that federal levers can be used." In the foregoing case, the Panel would observe the levers are best constructed and used on a multi-jurisdictional rather than federal basis. But the point about collaboration holds. The Panel believes that new models for these relationships -- coalitions of the willing that collaborate to innovate – may change dysfunctional aspects of the current federal/provincial/territorial dynamics.

xxxvi This theme surfaced strongly in the Advisory Panel's Industry/Government Collaboration Roundtable.

Duplication and Lack of Harmonization Internationally

Similar to the fragmentation of Canada's internal market, the Panel also learned about the misalignment of its regulatory functions with its international counterparts. While the safety of products should always be paramount and sober second thoughts from domestic regulators have a place, the Panel is persuaded of the need for Canada to ensure that there is regulatory harmonization with other global regulatory bodies like the US Food and Drug Administration (FDA), or the European Union.

The Panel applauds steps that the federal government is already taking in this regard. To elaborate: in 2011, Canada and the US established the Canada-US Regulatory Cooperation Council to improve alignment between the two countries' regulatory approaches, including in health. Regulators benefit from sharing expertise, more efficient decision-making and the development of joint approaches to common risks. The private sector benefits from not having to meet duplicative regulatory requirements. Consumers benefit from improved safety, timely access to innovations and possibly lower prices.[263]

In 2014, under the Joint Forward Plan, Health Canada and the US Food and Drug Administration agreed to work together to resolve pre- and post-market regulatory issues in a range of areas including pharmaceutical and biologic products, as well as medical devices.[263] Given the significant risk that Canada will be left behind as industry steers clear of what is widely perceived to be a fragmented and duplicative regulatory and reimbursement environment, the Panel encourages acceleration of these collaborative efforts.

"Denmark should be among the most attractive countries in the world for developing, testing and manufacturing health and care solutions based on strong research, fast implementation of innovative new technology, good conditions for public-private collaboration and a well-functioning, development-oriented home market."

Joan Hentze, quoting from Denmark at Work: Plan for Growth in Health and Care Solutions

Hentze J [Presentation]. Leveraging Healthcare For Economic Growth: Denmark's Story. Toronto: Royal Danish Consulate General; 2015.

"The federal government can say: hey, look, not only do we need consistency from province to province on certain things that just intuitively make sense... but that even within a province, we have got to get better at integrating where we are going to spend money and where we are going to see the benefits."

Participant at Industry/ Government Roundtable

Key Directions for the Future

Looking beyond Canada for a moment, it is clear that there are excellent examples of countries that support the healthcare needs of their population through strong publicly insured services while also ensuring that they have access to the latest safe and effective drugs and devices.

At the outset of this chapter, Denmark was identified as a leader. Denmark actively shapes policies to support the development of a healthcare products industry that can compete globally, supports domestic small and medium sized enterprises in the healthcare field, and actively facilitates the commercialization of key healthcare innovations.[264] Denmark has also launched a "single point of entry" in each Danish region for companies conducting clinical trials with the aim of making patient recruitment faster and facilitating better communication between hospitals and industry.[251] Finally, in its network of Innovation Centres and Trade Councils around the world, Denmark places a priority on ensuring that Danish companies can break into and navigate foreign healthcare markets.

The UK has also recognized the potential of the private sector to develop new tools and processes that will improve the quality and cost-effectiveness of care. It is actively taking steps to remove barriers and accelerate the adoption of innovations by the National Health Service (NHS). It recently created the Innovative Medicines and Medical Technology Review to examine regulatory and reimbursement systems and other factors that impact the speed of the adoption of innovations to patients. The aim "is to ensure that the UK is the fastest place in the world for the design, development and widespread adoption of medical innovations. This will help stimulate new

investment, jobs and economic growth to support a stronger NHS."[265]

In addition, the NHS has developed several programs to address issues around adoption and to further strengthen the role of healthcare as an economic driver:

- The 2014 *NHS Five Year Forward View* proposed the creation of "test beds," which will offer a site to test new technologies' real-world impact in the healthcare system (i.e., in terms of improved care and value-for-money). There are currently five test beds to which interested domestic and international innovators are being invited to apply. Only the most promising innovations will be selected based on their ability to provide the greatest potential value to patients as well as taxpayers.[266]

- Innovation Connect is another NHS program which is designed to help fast-track emerging healthcare innovations, with a team that will support innovators and help them to navigate and overcome barriers on their route.[267]

- The NHS Innovation Accelerator (NIA) programme, mentioned in Chapter 2, "aims to give patients more equitable access to cutting edge, high impact products, processes and technologies, by focusing on the conditions and cultural change needed to enable the NHS to adopt innovations that matter to patients, at scale and pace."[268]

In sum, we have an opportunity in Canada to follow in the footsteps of Denmark, the UK and other nations in creating an environment that leverages the economic potential of the healthcare sector. The Panel recognizes that there will be points of friction. The ethos of our universal healthcare systems and those working in them will sometimes be at odds with the bottom-line goals of industry partners. Inter-jurisdictional collaboration and harmonization may be challenging. However, the Panel believes that the current situation is not only damaging to Canada's long-term economic standing, but also undercuts sustainability and excellence in our healthcare systems. Federal leadership through a single organization that is mandated to drive opportunities for partnership of mutual benefit to industry and Canadians is critical to catalyzing needed change in this area.

Recommendations to the Federal Government

9.1 Create a Healthcare Innovation Accelerator Office, housed in the Healthcare Innovation Agency of Canada, to:

- Work with federal, provincial and territorial ministries of health and other stakeholders to accelerate the adoption of potentially disruptive technologies that show early promise of value for money to the system and benefit for patients.
    - This would include interacting with companies in pre-market processes to reduce post-market redundancy (viz. European Union practices, or the MaRS EXCITE model)

9.2 Through Health Canada, accelerate regulatory harmonization and convergence, while ensuring that safety remains paramount, to streamline domestic processes with international standards in recognition of the global nature of the pharmaceutical and medical devices industry. Priorities should include:

- Providing advice to small and medium-sized enterprises on how to navigate the healthcare system, including developing a roadmap of processes and supports.

- Partnering with the US Food and Drug Administration in order to reduce redundancy without compromising Canada's high standards around the safety of products, further to the discussion in chapter 8.

9.3 Through Health Canada, in collaboration with Industry Canada, develop a whole-of-government federal strategy to support the growth of Canadian commercial enterprises in the healthcare field.

- The strategy should consider the needs of Canadian companies in the generation, domestic commercialization, and export of products and services, as well as in attracting foreign investment to the health field.

- Elements of the strategy should track recommendations from the 2010 report of the Independent Review of Federal Support for Research and Development, including approaches to encourage greater availability of capital for innovative start-ups; value-based procurement practices to encourage adoption of high impact innovations; and support for commercialization and export of successful products.

- The strategy should be adapted to the unique features of healthcare (e.g., regulatory requirements, primacy of patient safety, large-scale public purchasers, influence of providers on procurement processes, etc.), including addressing fragmentation through a simplified process that is easy to navigate for industry.

9.4 Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund, support the spread and scale-up of measures to improve procurement, including consideration of value-based approaches and best practices internationally such as the competitive dialogue process in the EU.

Chapter 10

Tax Policy in Support of Healthcare System Change

"The hardest thing in the world to understand is the income tax."

Albert Einstein

Tax Policy in Support of Healthcare System Change

Earlier chapters in this report discuss the historical evolution of publicly funded healthcare in Canada, and identify growing gaps in performance on accessibility and quality of care that require urgent attention. The Panel has made the case that a Healthcare Innovation Fund, in tandem with a new agency, the Healthcare Innovation Agency of Canada, could provide catalytic support for new partnerships and meaningfully enhance the performance of Canada's healthcare systems. In the last few chapters, the Panel has set out its analysis and offered advice on five key areas for innovation where inter-jurisdictional and wider collaboration could have the largest impact. These chapters also highlight where the Fund and the Agency could most usefully focus resources to promote collaboration and bring about high-impact changes in Canadian healthcare.

In each of the priority areas for innovation, the Panel has also made recommendations on actions that the federal government could take in its own sphere of responsibility and using the levers at its disposal. One of these levers – tax policy – is left to this chapter to explore, not because it is more or less important than the others, but because it is relatively under-appreciated as a federal healthcare lever and can potentially address issues that cut across all five priority areas for innovation.

Beyond the obvious role of general taxation as the main source of funding for Canada's healthcare system, tax policy is not typically thought of as an instrument of healthcare policy. However, it is part of the landscape of financial incentives affecting all healthcare stakeholders: patients, healthcare providers and institutions, innovators, and public and private payers. It therefore has an impact on the choices made by all of these actors, and on the broader goals of economic efficiency and equity in the tax system. Furthermore, although health-related tax expenditures are small relative to federal health transfers to provinces and territories, they represent significant foregone revenue by federal government, exceeding what the government spends directly on healthcare through its internal programming.

In deciding to frame recommendations on tax policy, the Panel took other points into consideration.

As noted earlier, 30 percent of Canada's total spending on healthcare is privately financed as compared to 70 percent public spending.[5] Arguments that this split accounts for our underperformance were addressed in Chapter 2. In fact, a 70 percent proportion of public spending was first tallied in 1970, as universal medical services coverage took hold across Canada. That proportion peaked at 75 percent in 1980, fell minimally to 74 percent in 1990, and then declined slowly to its current level of 70 percent in the late 1990s.[5] The proportions of publicly- and privately-financed spending have been more or less stable since then.

That stability, however, masks a problem – growth in out-of-pocket spending (as contrasted with spending through private insurance plans or another third party). That growth in turn bears more heavily on low-income Canadians – a burden that could be mitigated by tax policy.

Considerations of equity also arise when one considers Canada's aging population. This demographic trend will see a relative increase in management of chronic health problems as opposed to the utilization of acute, episodic care that characterizes younger individuals and families.[269] Older Canadians will increasingly need healthcare services and supports in the community or at home. Community-based care is a better option than institutional care in many cases – better for patient experience, for health outcomes, and more economical for the healthcare system. However, this shift is likely to increase the financial burden on patients and their families. Here, too, tax policy has the potential to both encourage this transition and cushion its financial impact on Canadians.

The Panel does not view these recommendations as the definitive solution to long-standing health insurance gaps in Canada, but as an innovative way forward to address unfairness in paying for healthcare while reducing the differential in public support for healthcare services so as to improve efficiency. This approach does not vitiate the need to achieve universal coverage for prescription drugs, to consider how new delivery models and bundled payment mechanisms might allow cost-effective expansion of public coverage for a variety of services, and many other policy changes that might strengthen Canadian healthcare and restore its international lustre. Nonetheless, it is relatively straightforward for the federal government to make changes in this area, and the Panel believes that these measures would bring some much needed financial relief to patients with high out-of-pocket healthcare expenses.

Current Health-Related Tax Expenditures

Health-Specific Tax Expenditures

Figure 10.1 sets out the principal federal health-related tax expenditures as reported annually by Finance Canada,[270] which is the lead department at the federal level on all matters pertaining to tax policy. In total, these tax measures provided support in the order of $7 billion in 2014.[270] The overall goal of these measures is to ensure that where possible, the tax system reduces or at least does not add to the burden of financing needed healthcare services, as well as ensuring equitable tax treatment for households as between those with members who have chronic medical conditions and those without. This is accomplished in four ways.

First, some of these measures are designed to recognize the cost of privately funded healthcare goods and services that are paid by individuals and/or to recognize the additional burden placed on disabled individuals or families caring for infirm dependents. Under the Medical Expense Tax Credit (METC)[271], individuals can claim a portion of eligible medical expenses as a tax credit to reduce income tax that would otherwise be payable. A refundable version of this credit ensures that low income working individuals can benefit from support regardless of whether they pay income tax. The Family Caregiver Tax Credit[272] and Disability Tax Credit[273] provide tax relief to those who care for an infirm dependent relative, or to individuals who have a severe and prolonged impairment in physical or mental functions.

The second policy approach is to exempt healthcare goods and services purchased by individual from being taxed, again with the goal of reducing the burden placed on individuals to finance needed healthcare services. The non-taxation of health and dental benefits falls into this category. In practice, this means that employer-paid premiums from employer-sponsored private insurance plans are not taxed in the hands of the employees who receive the benefits. In contrast, other employer-paid premiums for employee benefits, such as employer-sponsored life insurance, are a taxable benefit to employees. GST/HST health measures ensure that patients are not charged GST/HST on privately-paid prescription drugs, certain medical devices, or healthcare services such as physiotherapy or psychologist services.

The third policy approach is to offset the burden on publicly-funded healthcare institutions that pay taxes on services and products used in the production of healthcare. For example, hospitals, regional health authorities, and government-funded eligible charities and non-profit organizations that provide healthcare services similar to those traditionally performed in hospitals are eligible for a GST/HST rebate that reimburses them for 83 percent of the GST or federal portion of the HST[xxxvii] paid on a broad range of goods and services used by these entities in the delivery of health services. Charities and qualifying non-profit organizations, including those that provide health services but are not eligible for the 83% rebate, claim a 50 percent rebate of the GST/HST (federal portion) on their purchased inputs.[274] HST participating provinces provide rebates of the provincial portion of the HST at varying rates determined by the province.[274]

Fourth, a relatively new thrust of tax incentives aims to encourage healthy behaviours. Through the Fitness Tax Credit[275], parents can claim eligible expenses for children under 16 years of age participating in a prescribed program of physical activity. The 2015 federal budget proposed the creation of a Panel to study the potential scope of a similar credit for adults. Given the epidemic of childhood obesity and broader concerns about the dietary habits of Canadian families, the Panel sees merit in extending this credit to out-of-pocket costs incurred for nutritional counselling for children under 16 years of age. However, a full costing of this concept was not feasible, and some relief from the cost of these services is provided under the general recommendations that follow.

A summary of these health-related tax measures are outlined in figure 10.1.

While all of these tax measures are worthy of examination, the Panel focused its attention on the three measures which account for over half of the value of health-related tax expenditures. Two of these help to recognize out-of-pocket healthcare costs faced by Canadians, but they may impose a sizeable administrative burden on tax filers, particularly for complex cases.

- The main provision is a non-refundable tax credit for eligible medical expenses that can be claimed if they exceed three percent of an individual's net income or $2,171, whichever is less (for the 2014 tax year). [xxxviii]

xxxvii Some provinces receive a 100% rebate (i.e., Alberta, New Brunswick).

xxxviii Provinces and territories offer similar credits against provincial/territorial income taxes payable for medical expenses, although the threshold amounts vary by jurisdiction.

Figure 10.1: Health-Related Tax Measures (with Projected Federal Revenues Foregone for 2014)

Non-taxation of employer-paid health and dental benefits	$2.065 billion
Medical Expense Tax Credit (METC)	$1.425 billion
Refundable Medical Expense Supplement for low-income working Canadians	$150 million
Disability Tax Credit	$750 million
GST/HST zero-rating for medical devices and prescription drugs	$1.12 billion
GST/HST exemption for healthcare services	$670 million
GST/HST rebate for hospitals	$620 million
Children's Fitness Tax Credit	$130 million
Total	$6.93 billion

Source: Adapted from: Department of Finance Canada. Tax Expenditures and Evaluations 2014. Ottawa: Department of Finance Canada; 2015. Available from: http://www.fin.gc.ca/taxexp-depfisc/2014/taxexp14-eng.asp

- An additional refundable medical expense supplement is available for working individuals with low incomes and high medical expenses. To be eligible for the supplement, taxpayers must claim medical expenses and/or disability supports, and have combined family net income of less than $48,546.[xxxix] The maximum refundable supplement is $1,152 (for the 2014 tax year) or 25 percent of the claimed disability supports and medical expenses above the three percent/$2,171 threshold for the METC, whichever is less.[xl] The supplement is reduced by five cents for each dollar of combined net income above $25,506, completely disappearing at $48,546.

The third measure – the non-taxation of health and dental benefits – is significant, though it is not administratively complex. Approximately 24 million Canadians have some form of health coverage through private insurance.[276] Under the federal *Income Tax Act*, premiums paid for coverage under group private health insurance plans are non-taxable to the employee. The same is true at the provincial level, except for Quebec, which introduced taxation of these benefits under the provincial income tax system in 1997. Those individuals who purchase health insurance may claim the premiums as medical expenses under the METC.

Other Tax Measures Linked to Health

The federal government also provides vehicles for Canadians to save for the future, which potentially could be used to pre-fund health expenditures. These include incentives for Canadians to save in general (e.g., the Tax Free Savings Account), for retirement savings (Registered Pension Plans and Registered Retirement Savings Plans) or savings for the long-term financial security of individuals with disabilities (Registered Disability Savings Plans).

Beyond these savings vehicles, the tax system provides support for a range of other activities that support health and healthcare objectives. These include tax credits to support charitable giving, a good portion of which benefits health sector charities that invest in research on a range of diseases. Support for health-related research and development activities performed by the private sector is also provided through the Scientific Research and Experimental Development Tax Credit, which was the subject of a separate federal review in 2011.[277] Finally, the so-called "sin" taxes on tobacco products and alcohol are,

xxxix In contrast to the METC which is based on an individual's net income, the supplement is calculated based on both the individual's and spouse's net income. Combined net income refers to the net income of the tax filer and spouse, if applicable.

xl Disability supports are expenses paid for personal attendant care and other supports allowing an individual to go to school or earn income.

at least in part, intended to deter unhealthy behaviour. The Panel did not explore these areas in any depth as its mandate was focused on system innovations in support of healthcare delivery.

Are Existing Tax Measures Adequate?

During the Panel's consultations, several participants raised concerns about the adequacy of existing measures to help Canadians bear the cost of services not covered by the existing Medicare system (i.e., home care, prescriptions, etc.).

As outlined in Chapter 2, Canada's healthcare system relies extensively on private payment to finance services beyond the core hospital and physician services. As noted above, of the $215 billion in estimated total health expenditures for 2014, 30 percent was privately-funded, of which it is projected that 12 percent will be through private insurance and fully 15 percent will be paid out-of-pocket.[5] Out-of-pocket expenditures include deductibles and copayments for publicly[xli] or privately insured services, and direct out-of-pocket expenditures for non-insured health services. The largest categories of private out-of-pocket spending in 2012 were: prescription drugs ($6.4 billion); long-term care and other institutions ($6.0 billion); dental care ($4.7 billion); over-the-counter drugs ($2.9 billion); vision care ($2.6 billion); and personal health supplies ($2.1 billion).[5]

xli As explained in Chapter 1, these co-payments or deductibles can apply to publicly-insured services that are outside the requirements for first-dollar coverage defined by the *Canada Health Act*.

While the growth of out-of-pocket payments is slightly lower than the rate of expenditure growth for hospitals, doctors, and drugs, it remains a key healthcare pressure, increasing 4.7 percent annually between 1988 and 2012.[278]

A growing body of evidence indicates decreasing equity in access to core healthcare services in Canada as a result of increasing out-of-pocket health costs. As shown in figure 10.2, growth in out-of-pocket expenditures has been particularly acute for the lowest income quintile, resulting in a 40 percent increase in the proportion of households spending more than five percent of after-tax income on healthcare.[279] The second-lowest income quintile represents an additional risk group due to lack of eligibility for various public insurance programs.[279]

Canadians most affected by high out-of-pocket costs include certain lower-income Canadians (particularly the working poor) without access to publicly funded prescription drug plans, and those without employer-provided private health insurance (including some self-employed) and their families.

The burden of high out-of-pocket costs is sub-optimal from both equity and efficiency points of view:

- From an equity point of view, access to important and large segments of the healthcare system is hindered for some individuals based on characteristics such as the province in which an individual resides, income, age, and employment status. For example, the Panel heard from stakeholders in the northern communities that it is not uncommon for persons to travel 200

Figure 10.2: Percentage of Households with Out-of-Pocket Expenditures on Healthcare More Than 5 Percent of Total Household Income, by Household Income Quintile, Canada Excluding Territories, 1997 to 2009

Household income quintile	1997	1999	2001	2003	2005	2007	2009	1997 to 2009 Percent change
Q1 (lowest)	26	29	30	33	34	37	37	40
Q2	30	33	35	37	38	39	36	23
Q3	23	25	26	30	30	29	31	33
Q4	16	19	19	21	22	22	19	16
Q5 (highest)	10	9	10	13	13	13	14	42

(Source: Statistics Canada, Survey of Household Spending)

kilometres or more to receive a specialized health services or diagnostic testing with a corresponding cost that they pay for out-of-pocket.

- This situation is also inefficient because there is a bias towards publicly funded services, which are sometimes the most expensive services. For example, lack of access to prescription drugs and home care could lead to avoidable hospitalizations.

"We strongly encourage the government to incent Canadians to take a proactive approach to their personal healthcare through a full tax deduction on extended health benefits for those who do not have them sponsored by their employers."

Stakeholder Submission

Tax policy could be used to address high private costs by providing tax relief for current expenses or incentives for Canadians to save in advance for future healthcare costs. More broadly, tax policy could be adapted to support change in the healthcare system, such as the movement of healthcare services from facility-based services to community-based services, as well as support public health initiatives to improve the health of Canadians.

The Panel recognizes that the efficiency and equity issues related to tax support for health services have to be considered within the context of tax policy in general. The credit provided for medical, caregiver and disability costs under the *Income Tax Act* recognizes the additional costs borne by individuals to achieve a minimal standard of living. If such costs were not recognized under the *Income Tax Act,* individuals and families requiring health services would be treated less fairly than those who do not require such services. Similarly, provisions that provide tax support for health services should not distort economic decisions in other contexts. Hefty tax relief directed at healthcare services could distort household spending decisions towards healthcare.

The Panel particularly notes two examples by which suggestions for certain tax measures causes distortions and unfairness in the tax system.

The current non-taxability of employer-provided health and dental benefits creates unfairness as well as distorting the choice of compensation paid by public and private employers. Those individuals who are not able to participate in employer-provided plans receive on average less tax relief for premiums under the Medical Expense Tax Credit. Further, as several studies have documented, the non-taxation of health and dental benefits have led to higher growth in this form of compensation compared to salaries.[280]

Under the GST/HST, there are different levels of rebates provided to offset GST/HST paid on goods and services by public service bodies such as municipalities, hospitals, charities and not-for-profit organizations. This can result in distortions in the allocation of resources. The Panel heard in its consultations that municipal bodies providing home care are eligible for a 100% rebate for the GST or federal portion of the HST paid on their inputs while a charity only receives a 50% rebate. This reflects the existing system in which MUSH sectors (municipalities, universities and public colleges, schools and hospitals) and charities generally do not charge GST/HST for their services and receive varying degrees of rebates on their inputs. The original reason in 1991 for a partial rebate given to these bodies was to maintain the same level of tax as under the manufacturers' sales tax that was replaced by the GST (municipalities were fully refunded GST on inputs at a later time). The Panel recommends, therefore, that the Department of Finance examine the current partial rebate system to reduce distortions.

"…we are asking the Government to increase the HST rebate on all eligible purchases made by publicly-funded, not-for-profit institutions in the health sector to 100 percent putting hospitals on par with municipalities."

Stakeholder Submission

The Panel believes, obviously, that any tax support for healthcare services should not undermine the overall integrity of the tax system. However, in this case, more tax support is needed, especially for lower-income Canadians, and such measures would be consistent with the overall objectives of both tax and health policy.

A Refundable Health Tax Credit

The Panel notes that the current Medical Expense Tax Credit (METC) and Refundable Medical Expense Supplement provide limited tax relief for out-of-pocket healthcare services. Claims can be made in excess of specific thresholds as mentioned above. Further the METC can only be used if the taxpayer has sufficient tax to be paid. Although the Refundable Medical Expense Supplement helps provide some support for families with modest income, it is limited to medical costs in excess of same limits applied to METC.

The Panel believes that additional tax support for health-related costs paid by Canadians would provide more support for community-based services, complementing the provision of hospital and physician services. It is especially important to support lower-income Canadians who bear a significant cost relative to their means. Further, expanded tax support would improve the income tax system by recognizing better costs incurred by households to fund their needs.

Designing the New Tax Credit

Considerable complexity arises from the limits imposed by the METC that reduces the provision of healthcare services. As many taxpayers often do not qualify for the METC due to limits, they are less likely to maintain proper documentation for tax filing when they are eligible to claim the METC.

The limits under the METC are a particular problem in achieving a more efficient, fair and simpler tax treatment of health costs. When expenses are claimed under the METC, federal support is only 15 cents on the dollar for expenses that are either above the threshold of 3 percent of a tax filer's net income or $2,171, whichever is lower. In addition, it is a non-refundable credit. The system should focus on the major expenditures that are eligible for tax support from the first dollar[281] and at a higher value than 15 percent given the burden faced by many families. It can also encourage pooling by enabling more individuals to purchase private insurance.

The Panel therefore proposes a Refundable Health Tax Credit (RHTC) that would be focused on those families with modest incomes. The federal tax credit would be 25 percent of qualified health expenses up to $3,000 per year (additional expenses would be claimable under the METC for a single individual and up to $6,000 per year for a family with two or more members.) Therefore the maximum tax credit would be $750 for a single person or $1500 for a family. Any health expenses covered by the RHTC would not eligible for other tax credits. Provinces would have the option of adopting the new credit in their tax systems, thereby potentially increasing the value of the credit significantly.

Under this program, the full value of the tax credit would be available to families (two or more members) with incomes below $89,000 and individuals below $44,000. The credit would be income-tested for each individual taxpayer such that the eligible expenses would be reduced by five cents for each dollar of income above $44,000.

The Panel's proposal focuses on costs in relation to community-based care rather than supplemental charges incurred during hospitalization in an acute care institution. Eligible categories include prescription drugs, certain pharmaceutical supplies, dental services, premiums on qualifying health and dental plans, long-term care insurance, attendant care and vision care. These categories total approximately 80 percent of existing privately-funded expenses. Consideration could be given to including the cost of certain health-promoting and disease-preventing interventions as eligible expenditures, especially if research evidence supports the effectiveness of those interventions.

Administering the New Tax Credit

To enable greater ease in claiming both the refundable health tax credit and medical expense credit, the Panel recommends that a new T6 slip be introduced whereby providers of insurance, drugs, dental services and other qualifying services provide a taxpayer the amounts of medical expenses that can be claimed for the RHTC and METC or just the METC alone. This would significantly simplify the system for taxpayers who currently must keep individuals slips provided by suppliers.

The Panel also recommends that the government enable low income individuals to receive their credits on a quarterly basis based on a previous year's information of expenditure patterns and income. This could only apply to recurring health expenditures such as drug expenditures and premiums, as currently done with the GST low-income tax credit. Non-recurring expenditures cannot be predicted and therefore claims for the credit can only be done when filing income taxes.

Costing the New Credit

The existing Refundable Medical Expense Supplement would be cancelled since it applies on a very limited basis.

The Panel also recommends that employer- paid premiums for health and dental benefits be made a taxable benefit to the employee. This would be consistent with the tax treatment of other employer-paid premiums for benefits such as life insurance, which are a taxable benefit to employees. Removing the tax-free status of employer-paid health insurance premiums eliminates a labour market distortion. Employees in receipt of that benefit are still better off than employees without workplace health and dental insurance, while employers retain an advantage in recruitment that is fair rather than being privileged through tax policy. The premiums for employer-paid health insurance should be deemed an eligible expense under the new RHTC and existing METC, similar to the current policy related to self-paid premiums. Thus, premiums should be eligible for a tax credit whether paid by the employee or employer.[282]

Overall, this proposal is revenue-neutral and consistent with the Panel's Terms of Reference. The gain to families associated with the Refundable Health Tax Credit is $5.9 billion as shown in figure 10.3. The net change in the Medical Expense Tax Credit reduced by expenses allocated to the refundable tax credit but increased by employer-paid health and dental premiums is -$542 million. The taxation of employer-provided premiums yields $5.2 billion in revenue and the cancellation of the existing medical expenses supplement yields another $157 million.[283]

Those households with incomes below $100,000 will pay less tax. Higher income households will pay more tax primarily as a result of the taxation of employer-provided health and dental benefits. The Panel has considered other combinations of income thresholds and maxima for the refundable credit. Both the cost of the Refundable Health Tax Credit and the related redistributive effects vary predictably as one changes those parameters. The Panel fully understands that the Government of Canada may choose to modify the model, but recommends the combination of thresholds shown in figure 10.3 as a fair way forward.

Taken together, the Panel believes these measures would make a significant contribution to offset growing out-of-pocket healthcare costs borne by Canadians, and increase equity among Canadians in terms of the tax treatment of these expenses.

Figure 10.3: Tax Impact on Families (Single and Multiple Members) by Income Group[xlii]

Family Total Income ($)	Change in METC credit Cost ($000s)	Total value of new grant with clawback ($000s)	Revenue from new tax on employer health and dental benefits ($000s)	Change in medical supplement cost ($000s)	Net Change Per household income ($)
Min-25,000	-162,075	1,608,859	-775,950	-76,941	92
25,001-50,000	-277,675	1,757,335	-796,357	-76,549	136
50,001-100,000	-279,899	2,281,219	-1,680,251	-3,443	61
100,001-150,000	68,377	261,530	-1,060,090	0	-322
150,001-200,000	63,071	2,151	-483,992	-3	-491
200,001-Max	45,852	1,378	-426,200	-12	-551
All	-542,348	5,912,472	-5,222,840	-156,948	0

xlii Based on calculations provided by Philip Bazel, researcher from the University of Calgary.

Recommendations to the Federal Government

10.1 Through the Department of Finance, and in collaboration with Health Canada, pursue the following initiatives:

- Examine the current partial GST/HST rebate system for public sector bodies to reduce distortions arising from differential tax treatment of hospitals, municipalities, non-for-profit organizations and charities that deliver healthcare services.

- Create a new Refundable Health Tax Credit (RHTC) to provide tax relief of 25 percent on eligible out-of-pocket healthcare expenditures up to $3,000 per year, replacing the Refundable Medical Expense Supplement.

    - The RHTC would apply to the first-dollar spent on eligible expenses, and would be income-tested, with the full value of the credit made available to lower-income Canadians who bear a significant cost relative to their means. It would be administratively simple for tax filers, with tax slips issued by insurers and providers of health services. Payments to individuals with recurring expenses could be made on a quarterly basis.

- Make employer-paid premiums for employer-sponsored health and dental benefits a taxable benefit to the employee, while permitting employees to claim this expense as a qualifying medical expense under the new RHTC or METC.

Chapter 11

Concluding Summary

Concluding Summary

The Advisory Panel on Healthcare Innovation received its mandate from the Honourable Rona Ambrose and began work in late June 2014. The Panel was charged with identifying five priority areas where action by the federal government could promote innovation in Canadian healthcare systems. It was also asked to advise the Minister on important enabling actions that could be taken by the Government of Canada, acting within its legitimate jurisdiction.

Background

In the course of its deliberations, the Panel received scores of submissions from organizations and individuals, conducted on-line consultations, crisscrossed the country for in-person discussions with a wide range of stakeholders, reviewed literature and commissioned research studies, and spoke with experts in both domestic and international healthcare policy. These interactions consistently brought home two points.

First, consistent with polls showing that Canadians are concerned about the state of their healthcare systems, the Panel heard from many stakeholders who see the need for fundamental changes in how healthcare is organized, financed, and delivered.

The Panel's review suggested that these concerns were well-founded. Canada's healthcare systems remain a source of national pride and provide important services to millions of Canadians every week, the scope of public coverage is narrow, and their overall performance by international standards is middling, while spending is high relative to many OECD countries. Canada also appears to be losing ground in performance measures relative to peers.

Second, pockets of extraordinary creativity and innovation dot the Canadian healthcare landscape. Local, regional and even provincial programs worthy of emulation have simply not been scaled up across the nation.

Many barriers to effective scaling-up were identified by stakeholders. One key challenge was the lack of any dedicated funding or mechanism to drive systemic innovation. As well, the fragmented nature of the system – with separate budgets and accountabilities for different provider groups and sectors – emerged as the most important structural barrier to both new reform initiatives and effective scaling-up of well-tested ideas and programs. This shortcoming appeared to be operating in a vicious cycle with slow deployment and incomplete utilization of modern information technology.

The Panel observed further that Canada's healthcare systems appeared to be ill-prepared to respond to various shifts in their context. Patients are demanding more participation in their own care and engagement with the design of healthcare programs. As the population ages, there will be a greater premium on seamless delivery of multi-disciplinary care across diverse settings, not least the patient's place of residence. The digital revolution continues to disrupt many enterprises, and sooner or later will transform healthcare. Moreover, accelerating advances in biotechnology are now ushering in an exciting but challenging new era of precision medicine. Canada has pockets of research leadership in this field, but only one small province has taken steps towards implementation of the required learning systems to make precision medicine a clinical reality.

Meanwhile, polling data show that the majority of Canadians no longer believe that an increase in operating funds is the primary solution to the perceived shortcomings of their healthcare systems.

Critical Areas for Healthcare Innovation

Weighing all these inputs, and consistent with its mandate, the Panel identified five broad areas where federal action was important to promote innovation and enhance both the quality and sustainability of Canadian healthcare. These were:

- patient engagement and empowerment
- health systems integration with workforce modernization
- technological transformation via digital health and precision medicine

- better value from procurement, reimbursement and regulation
- industry as an economic driver and innovation catalyst.

To make recommendations for action on these fronts, the Panel first examined the federal government's role in the evolution of Canada's universal healthcare systems.

The Evolving Federal Role

In the 1950s and 1960s, federal investments built capacity for healthcare across Canada, and, through conditional cost-sharing, induced provinces and territories to adopt universal coverage for hospital costs and physician services on more or less uniform terms. Those conditions were weakened by new cost-sharing arrangements in the 1970s, but reaffirmed in 1984 with the *Canada Health Act*.

Starting in the 1980s and intensifying through to the mid-1990s, successive federal governments unilaterally reduced transfers to the provinces and territories. Fiscal circumstances eased, and from the late 1990s to 2004 Ottawa steadily augmented funding for healthcare. By agreement, these new funds were earmarked to achieve specific objectives, albeit distributed on a formulaic basis. The largest of these initiatives moved an additional $3.2 billion per year to the provinces and territories. Some laudable progress was made – for example, waiting times for specific services were reduced. However, the Panel's view is that, overall, this period and these investments led neither to modernization of the architecture of Canadian healthcare, nor to serious broadening of the scope of public coverage.

The last 'Health Accord' of this nature committed the federal government to make six percent annual increases in the Canada Health Transfer. In 2011 the federal government unilaterally determined that, after expiry of the 2004 agreement and starting in 2017-18, it would reduce the annual rate of growth to the rate of GDP growth or three percent per annum, whichever was larger.

Already facing fiscal pressures, the provinces and territories have intensified their cost containment measures and responded with collaborative initiatives such as group purchasing of prescription pharmaceuticals. However, in the Panel's view, these and other commendable front-line efforts to improve healthcare and augment its value are limited in part by a serious shortfall in working capital, and the absence of a cadre of dedicated and expert personnel who can support efforts to initiate and scale up improvements in healthcare across Canada.

Collaboration for Healthcare Innovation: New Model, New Agency, New Money

The Panel understands that sustaining six percent compounded growth in the federal transfer is difficult in the present fiscal circumstances. It has not recommended any changes to the current plans for transfers. It has also rejected a return to earlier approaches that depended on unanimously agreed priorities and formulaic allocations of funds. Instead, having examined the scope and scale of the problem, and having examined international and domestic precedents, the Panel is recommending two key enabling actions.

The first is a consolidation of the mandates of three existing agencies and expansion of capacity to create a new vehicle for accelerated change. As a placeholder, this agency has been termed the Healthcare Innovation Agency of Canada (HIAC). HIAC would draw on staff from the Canadian Foundation for Healthcare Improvement, the Canadian Patient Safety Institute, and, after a transition period for completion of its existing projects, Canada Health Infoway.

The second is the provision of fuel for both that vehicle and to support provinces and territories as they strengthen their healthcare systems with fundamental reforms and work with stakeholders to scale up well-tested innovations. These funds would flow to 'coalitions of the willing' – jurisdictions, institutions, providers, patients, industry, and committed innovators of all backgrounds. Again as a placeholder, this has been termed the Healthcare Innovation Fund (hereafter, the Fund, for short).

About the new Agency: As exemplified by seven pan-Canadian health organizations and the Canadian Institutes of Health Research (CIHR), this approach to supporting national collaboration in specific areas has been used for more than two decades. CIHR is the largest of these entities with an annual outlay of approximately $1 billion per annum. However, its primary mandate has been – and should remain - the funding of academic research. Each of the other entities has a specific focus on elements of innovation, and each can claim unique strengths. However, none has had a broad innovation mandate, and none has

anything like the scale to take on such a role. In contrast, HIAC as a new Agency would be dedicated to catalyzing change in real-time, evaluating the impacts of those changes, and accordingly rejecting, revising and re-evaluating, or scaling up the resulting innovations.

HIAC should be an arm's length organization, supported through the Healthcare Innovation Fund, governed by a group of eminent Canadians appointed on merit alone, and linked to one or more advisory committees composed of representatives of a range of stakeholders, not least provincial and territorial governments. Its corporate structure should enable it to provide robust, independent oversight and direction for a range of projects, including those fielded across Canada with support from the Innovation Fund.[xliii]

About the new Fund: The Healthcare Innovation Fund's broad objectives would be to effect sustainable and systemic changes in the delivery of health services to Canadians. Its general goals would be to: support high-impact initiatives proposed by governments and stakeholders; break down structural barriers to change; and accelerate the spread and scale-up of promising innovations. It would not be allocated on the basis of any existing transfer formulae, nor would its resources be used to fund provision of healthcare services that are currently insured under federal, provincial and territorial plans. Allocations would instead be made on the basis of rigorous adjudication against transparent specifications, having particular regard for measurable impacts on health outcomes, creation of economic and social value, sustainability, scalability, and a commitment by partners to sustain those innovations that are demonstrably successful.

The Panel recommends that these two initiatives should begin as early as possible in the mandate of the Government that will take office after the election of October 2015. The outlay from the Fund should rise as needed, with the expectation that a steady-state target of $1 billion per annum might in ideal circumstances be reached as early as 2020. The Agency and the Fund would be important enablers for many of the specific recommendations made by the Panel in each of the five identified areas that are priorities for innovation. Unless otherwise specified, the Fund and HIAC should be assumed to be the leads from the federal side in what follows.

xliii As noted earlier, the combined enterprise represented by the Agency and Fund might be reflected by a collective moniker, such as Healthcare Innovation Canada.

Theme 1: Patient Engagement and Empowerment

The Panel reviewed evidence showing a large gap between the rhetoric of patient-centred care and the experience of many patients and families in modern healthcare systems. It was also encouraged by many teams, institutions and systems in Canada that have been taking positive steps to bridge rhetoric and reality. At a system or subsystem level, the Panel recommends implementation of various models of payment and accountability organized around patients' needs, rather than the existing revenue streams of providers and institutions. At the institutional or regional level, priority must be given to implementation and scaling-up of the many programs that have yielded positive results as regards patient-centred care and patient and family engagement in the design and evaluation of healthcare programming and systems.

The Panel has also identified an acute need for developing and implementing information tools for patients in two distinct areas. The first is the promotion of health and healthcare literacy. The second is the scaling-up of best practices in the use of patient portals, ensuring that patients effectively co-own their health records. Patient engagement and co-ownership of health records would be further facilitated through mobile and digital health solutions that enable virtual care and empower patients, while meeting common standards and interoperability requirements. The role of government in this milieu will be very different than was the case when Infoway began building information infrastructure in 2001. As outlined under Theme 3, a transition in structures and roles is warranted.

Theme 2: Health Systems Integration with Workforce Modernization

The Panel observed substantial symbiosis between an integrated healthcare system and an innovative one. US group health plans illustrate how, even within a very challenging context, integrated healthcare systems offer patients enhanced access, along with high quality care from multi-professional and multi-specialty teams, at costs lower than current Canadian per capita spending. Supporting the implementation and iterative improvement of integrated healthcare demonstrations and 'bundled payment' models must accordingly be a high priority for the Agency and Fund. Where possible, demonstrations

should be implemented that integrate healthcare and social services or that otherwise provide specific incentives to addressing social needs, protecting and promoting health, or preventing disease.

These shifts in payment and accountabilities operate synergistically with changes in professional roles and responsibilities. Best practices in inter-professional care should be scaled up, with particular attention paid to implementing the recommendations of the Canadian Academy of Health Sciences report on *Optimizing Scopes of Practice* (2014). In a similar vein, the Panel recommends a collaborative national initiative to examine roles, responsibilities, and payment of health professionals in relation to generation of value.

These general priorities for more integrated care carry additional weight in the realm of Aboriginal healthcare. A number of recommendations are accordingly directed to Health Canada and its First Nations and Inuit Health Branch on this topic. Among these are co-creation of a First Nations Health Quality Council and a parallel liaison committee for Inuit representatives, drawing together Aboriginal representatives and patients, and representatives of provincial and territorial governments. Experimentation is already underway with new models of co-governance of health services for First Nations; the Panel urges continued exploration of these models along with careful evaluation, ensuring always that service transfers are commensurate with resources. A range of other concerns have also been surfaced for action. *Inter alia,* these include: improved health infrastructure and health human resources for reserves, the administration of the Non-Insured Health Benefits program and its integration with provincial and territorial systems, and the need for new models of care that will mitigate costs and burden of travel.

Theme 3: Technological Transformation via Digital Health and Precision Medicine

A third priority for innovation is to capitalize on the exciting developments underway in the generation and application of health data and knowledge.

About Health Data and Electronic Health Records: Development of info-structure has accelerated in Canada, with wider uptake of electronic health records. However, Canada lags on many fronts, including meaningful use of those digital resources, secure access to patient records by authorized users to enable safe and seamless care, assurance of digital access to their own records for patients, development of virtual care applications, and achievement of sufficient inter-operability and standardization of data to permit more effective use of all these data for performance measurement and advanced analytics. The Panel has recommended action on all those fronts.

As noted earlier, the Panel envisages the short-term continuation of Canada Health Infoway, with bridge funding that will enable it to complete current projects. Thereafter, as the agenda shifts from info-structure to uptake and applications, Infoway would merge into HIAC and all further funding for its partnerships should flow through the Fund.

CIHI would be supported to provide greater transparency about healthcare in Canada and to lead 'open data' efforts. CIHI would also be expected to pursue more intensive data-gathering on three fronts: the 30% of healthcare spending that flows from private sources; health services for, and health of First Nations, working in partnership with the First Nations Quality Council; and patient-oriented outcome measures. CIHI and the new Agency would partner with provinces and territories to develop information appropriate to support integrated delivery models, including different forms of bundled payments. Lastly, CIHI would need to ensure greater information dissemination to a range of audiences – particularly the general public -- of the information it gathers.

About Precision Medicine: The rapid development of sophisticated biomarkers is disrupting the prevention, diagnosis, and treatment of illness – indeed, redefining existing diseases and their prognoses. Canada has pockets of strength in precision medicine, and a nascent research strategy has been led by CIHR. However, what is notably absent is a national strategy for innovation, i.e., implementing these concepts into front-line care. For example, the Panel saw meaningful scope to improve the use of prescription drugs by applying these techniques – but limited uptake. The Panel's recommendations are designed to ensure that Canada's diverse populations and single-payer healthcare systems can be leveraged to our national advantage. It is particularly important to develop and begin following a roadmap to ensure that Canada's healthcare information and communications technology will support these data-intensive models of care and the rapid-cycle innovations that characterize precision medicine as a field. The Panel also urged the scaling-up of models of care in subfields of

precision medicine that are relatively more mature, such as pharmacogenomics and cancer diagnosis and treatment. It perceives that there is substantial potential for the commercialization of made-in-Canada concepts and tools in the precision medicine field, provided that a nimble implementation strategy can be launched as recommended.

Theme 4: Better Value from Procurement, Reimbursement and Regulation

As noted, on a value-for-money basis in healthcare, Canada is lagging many peer nations. The Panel concluded that changes to healthcare finance, purchasing and regulation could improve the value received by Canadians in areas such as prescription drugs, physician services, and medical technologies. Most of the related recommendations are directed to Health Canada or existing federal agencies.

Pharmaceutical products stood out as a concern, given Canada's extremely high per-capita outlays, our outlier status as a country with universal healthcare programs but inequitable and uneven coverage of prescription drugs, and the cost pressures looming from new biological compounds. The Panel strongly supports the principle that every Canadian should be able to afford necessary drugs, but sees demonstration of wide improvements in pricing as a prudent precursor to extending coverage, and is concerned that, absent integration and alignment of incentives, a new stovepipe of spending on pharmaceuticals may not have the anticipated cost-control effects. To this end, it has recommended that existing federal drug plans reaffirm their desire to join the Council of the Federation's pan-Canadian Pharmaceutical Alliance (pCPA) and that HIAC offer to serve as the secretariat, in conjunction with exploring strategies to extend the reach of this alliance to private insurance plans.

In contrast to current industry practice of confidential rebates, the Panel supports a national push for full transparency of net prices paid, so that all stakeholders have enough information to make informed choices. As well, the high price of pharmaceuticals and move to collective procurement both suggest the need for a review of the policies and practices of the Patented Medicines Pricing Review Board.

Last, the Panel observed that some effective technologies and practices are slow to diffuse, while obsolete technologies and practices persist. To this end it recommended funding for, and careful evaluation of the impact of, Choosing Wisely Canada.

Theme 5: Industry as an Economic Driver and Innovation Catalyst

Other nations are adopting policies designed both to nurture a domestic healthcare industry and to reshape interactions with multinational companies that provide healthcare goods and services. The underlying motivation is clear: publicly-funded healthcare is invariably a valued social program, but can also contribute to economic development. The Panel's review found that Canada lags other jurisdictions such as Denmark and the UK in policies and processes of this nature. In particular, for both drugs and devices, Canada's regulatory environments and markets are characterized by fragmentation, duplication, and inconsistencies.

The Panel has accordingly recommended a number of changes, including creation of a Healthcare Innovation Accelerator Office, to be housed in HIAC, focused on accelerating the adoption of potentially disruptive technologies that show early promise of value for money to the system and benefit for patients. HIAC should also support the spread and scale-up of improved procurement processes, e.g. value-based approaches and best practices such as the competitive dialogue process used by the European Union and MaRS Excite.

Some of the recommendations in the recent *Review of Federal Support to R&D (2010)* will require customization for the unique features of healthcare enterprises, but are highly relevant to health-related Canadian companies, particularly small and medium-sized enterprises. In this regard, drawing on insights from the 2010 Review, Health Canada should work in tandem with a range of stakeholders inside and outside the federal government to develop a whole-of-government strategy that would support the growth of Canadian commercial enterprises in the healthcare field.

In the chapters covering Themes 4 and 5, the Panel is recommending a number of improvements to the mechanisms for assessing and regulating drugs and devices, targeting variously Health Canada and its Health Products and Food Branch, and the Canadian Agency for Drugs and Technologies in Health (CADTH). Under theme 5, the

Panel urges attention to regulatory enhancements that might reduce duplication and enable higher quality and faster reviews without compromising Canada's current standards for drug and device safety.

Consensus and Fairness as Healthcare Evolves

A Federal Role in Consensus-Building: Many of the Panel's recommendations have cross-cutting implications. For example, a more integrated healthcare system has a much higher probability of yielding a patient-centred experience than one in which patients and families navigate a poorly coordinated care with uneven coverage and incomplete sharing of health records. In the same vein, interwoven through the report are a number of recommendations that broadly enable innovation through consensus-building with or without related legislative or regulatory action. They are gathered and summarized here.

Technological and social innovation in healthcare have already generated a variety of ethical and legal issues. The Panel recommends that Health Canada in partnership with the new Agency should take the lead in consultation and consensus building across provinces and territories to anticipate such issues, and resolve legislative ambiguities as needed. Obvious pressure points are physician-assisted dying and genetic discrimination. However, a national consensus is also needed on protection of patient privacy while enabling innovation (e.g. in precision medicine and genomics, mobile health, and various forms of digitized health records). The Panel has been similarly struck by continued confusion – and the potential of inter-jurisdictional inconsistencies – on the matter of patients' access to and co-ownership of their personal health records. Last, but not least, in an era when Open Data and Big Data are seen as twinned enablers of data-driven innovation, Canadian governments and research agencies have failed to forge a consensus on how broad sharing of appropriately anonymized health-related data can safely occur across and within jurisdictions. As noted, this is critical not only for rapid innovation in the field of precision medicine, but for enhancing applied health research and data-driven innovation in Canada's healthcare delivery systems.

Financial Fairness in a Period of Transition: Canada's total proportion of private spending on healthcare has been more or less stable at 30% since the late 1990s, but out-of-pocket spending is rising in relative terms. This is associated with an inequitable burden on lower-income Canadians. The inequitable distribution of this burden will also be exacerbated by population aging given that about $6 billion was spent out-of-pocket on long-term care and billions more in other supplies and services that are used at a much higher rate by senior citizens.

In recommending changes to tax policy that will enhance fairness, the Panel emphasizes that these are transitional measures: they do not vitiate the need to achieve universal coverage for prescription drugs nor the adoption of new delivery models that might allow cost-effective expansion of public coverage.

The Panel's core recommendation in this regard is an income-scaled Refundable Health Tax Credit (RHTC). The RHTC would replace the existing supplement and, like that supplement, , be applied in conjunction with the existing Medical Expense Tax Credit. The RHTC would provide tax relief of 25 percent on eligible out-of-pocket healthcare expenditures up to $3,000 per year, starting with the first dollar spent on eligible expenses. Additional expenses would be claimable under the existing Medical Expense Tax Credit. Provinces would have the option of adopting the new credit in their tax systems, thereby potentially increasing its value.

Related recommendations address how the administration of the RHTC could be structured to help ease the cash-flow burden of out-of-pocket health costs on individuals and families with modest incomes. Furthermore, the cost of this credit would be fully offset both by cancelling the existing supplement and, more importantly, by taxing the employer-paid premiums for employer-sponsored private health and dental plans. This expense, however, would be considered as a qualifying medical expense under the new RHTC and/or METC, meaning that employees could claim it on their income tax return. The Panel believes that these measures, in their totality, enhance fairness among taxpayers, as well as helping to mitigate an unfair and growing burden of out-of-pocket healthcare costs on Canadians with modest incomes.

Concluding Reflections

The collection of universal healthcare insurance programs colloquially known as 'Medicare' continues to offer essential services to millions of Canadians, and remains the nation's most iconic social program. However, Medicare is aging badly. The Panel has been left in no doubt that a major

renovation of the system is overdue, and is chagrined and puzzled by the inability of Canadian governments – federal, provincial, and territorial – to join forces and take concerted action on recommendations that have been made by many previous commissions, reviews, panels, and experts.

At the outset of the current review, Panel members sensed that some stakeholders expected a quasi-commercial 'Dragon's Den' exercise – the tidy delineation of five quick fixes or big trends, a spotlight on a few made-in-Canada solutions offered by enterprising teams in the private or public sectors, and some policy palliatives that would justify placing healthcare on the federal backburner. Panel members, including the late Dr. Cy Frank, believed in contrast that their mandate could only be fulfilled by taking a wide-angle view of healthcare innovation.

To that end senior officials in Health Canada have consistently supported the Panel members in their work, and taken in stride the fact that some of the Panel's findings might shine a critical light on the Department itself. For her part, Minister Rona Ambrose has been meticulous in respecting the Panel's independence. The Panel would add that by excellent example, the Minister has illustrated the positive role that facilitative federal leadership can play in Canadian healthcare. It bears repeating, however, that no elected or appointed officials of any government, not least the Government of Canada, should be assumed to endorse any of the interpretations, opinions, or recommendations advanced in this report.

In conclusion, the Panel reiterates that, with bold federal action and prudent investment, and with a renewed spirit of collaboration and shared political resolve on the part of all jurisdictions, Canadian healthcare systems can change course. What has been proposed above is specifically designed to move Canada toward a different model for federal engagement in healthcare – one that depends on an ethos of partnership, and on a shared commitment to scale up existing innovations and make fundamental changes in incentives, culture, accountabilities, and information systems. As stated in the Foreword to this report, we do not pretend that this model offers an immediate remedy for the ills of Canadian healthcare. However, we have a high degree of confidence that concerted action on our major recommendations can make a meaningful difference that will be seen and felt across Canada by 2025.

Appendix 1: List of Recommendations

A. Collaboration for Healthcare Innovation: New Model, New Agency, New Money

New Model, New Money

Starting in 2015-16, create a ten-year Healthcare Innovation Fund with a gradual ramp-up, ideally reaching steady-state by 2020 (4.1).*

- The Fund's broad objectives would be to effect sustainable and systemic changes in the delivery of health services to Canadians. Its general goals would be: to support high-impact initiatives proposed by governments and stakeholders, to break down structural barriers to change, and to accelerate the spread and scale-up of promising innovations.

- The Fund will not be allocated on the basis of any existing transfer formulae, nor will its resources be used to fund provision of health services that are currently insured under federal, provincial and territorial plans. Funds will be allocated on the basis of rigorous adjudication against transparent specifications, having particular regard for measurable impacts on health outcomes, creation of economic and social value, sustainability, scalability, and commitment of relevant stakeholders to sustaining successful initiatives.

- The annual outlay from the Fund should rise over time towards a target of $1 billion per annum, derived primarily from new federal commitments.

- The Fund's initiatives will be grouped under five priority themes:

    - patient engagement and empowerment

    - health systems integration with workforce modernization

    - technological transformation via digital health and precision medicine

    - better value from procurement, reimbursement and regulation

    - industry as an economic driver and innovation catalyst

New Agency

Create the Healthcare Innovation Agency of Canada to work with a range of stakeholders as well as governments to set the long-term vision for the healthcare system and healthcare innovation goals across the Panel's proposed five areas of focus (4.2).

- The Agency should provide oversight and expertise for the Fund, in keeping with the twin goals of removing structural barriers and supporting spread and scale-up, with the long-term aim of improving Canada's standing internationally on key metrics of health system performance.

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* Numbers in brackets refer to the location of the recommendation as set out in the body of the report.

- The Agency should be an arm's length organization, funded by the federal government. It should be governed by a group of eminent Canadians, who would be supported by one or more advisory committees composed of representatives of a range of stakeholders (provincial and territorial governments, patients, providers, industry and others). Its corporate structure should enable it to provide robust, independent oversight and direction for the Fund.

- The Agency should catalyze and coordinate collaboration with the pan-Canadian health agencies and the Canadian Institutes for Health Research to ensure alignment of activities.

- Shift funding and staff for both the Canadian Foundation for Healthcare Improvement and the Canadian Patient Safety Institute to the new Healthcare Innovation Agency of Canada (4.3).

    - This recommendation reflects the relevance of the mandates of both organizations to the promotion of healthcare innovation. It will also reduce duplication, provide some economies of scale for the federal government, and streamline a crowded pan-Canadian health organization field.

- Continue Canada Health Infoway *pro tem* as a separate organization with staffing to complete projects currently underway. Once the new Agency is established, fold relevant functions from Infoway into the Agency, and flow future federal funding for digital health through the Innovation Fund (4.4).

B. Specific Recommendations by Theme

Theme 1: Patient Engagement and Empowerment

Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund, pursue the following priorities (5.1):

- Support provinces, territories, and regional health authorities in undertaking large-scale projects that implement highly integrated delivery systems that test new forms of payment, where care is organized and financed around the needs of the patient.

- Develop and implement a strategy to promote patient and family-centred care in partnership with governments, patients, providers and others. Elements of this strategy would include:

    - Developing and implementing information tools that patients need.

    - Creating incentives for greater patient engagement at the organizational and system level, with the goal of improving models of care and system design.

    - Sourcing and supporting mobile and digital health solutions that meet needed common standards and interoperability requirements.

Adopting and deploying best practices in the development and use of patient portals, including best practices internationally.

Theme 2: Health Systems Integration with Workforce Modernization

Through the new Healthcare Innovation Agency of Canada, alongside federal investments from the Healthcare Innovation Fund, promote integrated delivery systems across Canada.

Relevant themes follow (6.1):

- Develop, implement, and evaluate strategies for ensuring that integrated delivery arrangements in Canada address social needs and determinants of health, protect and promote health, and prevent disease.

- Support provinces, territories, and regional health authorities in adapting, scaling up and spreading partial integration models, e.g. primary care commissioning, portfolio funding for disease management, and assorted bundled payment strategies. Where possible, introduce elements of competition through tendering or bidding for care contracts.

- Support pan-Canadian multi-sectoral collaboration to implement the recommendations of the Canadian Academy of Health Sciences 2014 report *Optimizing Scopes of Practice.*

- Review and identify the best practices in inter-professional shared care, with specific reference to leading integrated delivery models. Promote adaptation, scaling-up and spreading of similar practices in Canadian jurisdictions.

- Collaborate with provinces and territories, professional associations and others on a pan-Canadian pay commission to examine the relative value of healthcare services in terms of cost, provider activity and patient outcomes, thereby helping decision-makers evaluate professional roles, payments and prices.

Through Health Canada, and its First Nations and Inuit Health Branch, pursue the following priorities (6.3).

- Co-create a First Nations Health Quality Council, in partnership with First Nations representatives and patients, and with provincial and territorial governments. This Council would report on the quality and safety of care for First Nations across all sectors and regions. A priority for the First Nations Health Quality Council should be collaboration with CIHI for data development and collection relevant to First Nations (see Recommendation 7.6).

- Co-create a tripartite liaison committee with Inuit representatives and patients, and with the relevant provincial and territorial governments. The mission of this committee would parallel that of the First Nations Health Quality Council.

- Support First Nations leaders, together with willing provinces or territories and other partners, not least the Federal Government to initiate, evaluate and scale up new models of co-governed integrated care in varied locations across Canada. Managed by First Nations, these holistic entities should be modelled on international best practices, such as the Alaska Native Tribal Health Consortium or the Nuka System of Care.

- Facilitate the transfer of federal healthcare delivery programs to interested First Nations communities, working in partnership with First Nations leadership in those communities and the relevant province or territory, while ensuring that service transfers are accompanied by commensurate resources.

- Continuously monitor existing initiatives that transfer responsibility for services, such as the BC First Nations Health Authority, to ensure that devolution strategies are effective, efficient, and equitable.

- Improve the health infrastructure and health human resource capacity on reserve to meet patients' needs.

- Work with First Nations, Inuit, and other stakeholders to improve the management and responsiveness of the Non-Insured Health Benefits (NIHB) program to enhance access to care through digital technologies and ensure that it provides coverage comparable to other public and private plans.

    - To this end, the federal government should provide quasi-statutory authorities to Health Canada to adjust or expand health benefits offered through NIHB within an overall financial framework set by Parliament.

    - Through the combined resources of the Healthcare Innovation Fund, the Healthcare Innovation Agency of Canada, Health Canada, relevant provincial and territorial partners, First Nations and Inuit communities and others, develop new models of virtual and physical care to mitigate the hardships incurred by patients and families when First Nations and Inuit peoples travel to receive healthcare.

Theme 3: Technological Transformation via Digital Health and Precision Medicine

Through Infoway initially and then through the Healthcare Innovation Agency of Canada, accelerate the deployment of interoperable electronic health records across points of care, including efforts to assist providers and payers in meaningful use and prioritizing the creation of online portals where patients have mobile access to their own records (7.5).

- Ensure future investments in health information technologies are standardized, interoperable, linked across multiple sites, and available to third parties for assessment of performance.

With support from the Healthcare Innovation Fund, and building on current efforts by organizations such as CIHI, provide greater transparency about healthcare in Canada, by (7.4):

- Enabling more accessible and user-friendly information on areas including patient satisfaction, quality, safety, efficiency, effectiveness and health outcomes.

- Leading "open data" efforts, by making data available to a wide range of stakeholders, including the public, to enable development of new tools and approaches.

- Developing partnerships to build the capacity of health system stakeholders to use data for health system improvement.

- Exploring mechanisms to gather and share data about activity in healthcare's private sector – corresponding to the 30 percent of spending that is not supported by public funds.

Through the Canadian Institute for Health Information, and in partnership with the First Nations Quality Council, address the significant data gaps that exist in the area of First Nations health, providing a fuller picture, of First Nations health status, as well as access to care, and quality of services (7.6).

Through the Canadian Institute for Health Information, in collaboration with interested provinces and territories, and with supplemental support from the Healthcare Innovation Fund as needed, pursue the following priorities (6.2):

- Expedite work to develop methodologies adaptable for use in physician capitation payment and in designing integrative or bundled payments based around common episodes of care.

- Accelerate work in the area of patient reported outcome measures (PROMs) and patient costing data, including case costing data, to create national risk-adjusted patient grouping methodologies and other tools.

Through the Healthcare Innovation Fund and new Agency, develop and initiate a national Strategy for Implementation of Precision Medicine, in concert with provinces, territories, healthcare and health research agencies, and a range of relevant stakeholders and experts (7.1).

- This field is characterized by a blurring of the lines between applied research, innovation, and implementation at scale. The Strategy should seek to leverage Canada's diverse populations and single-payer healthcare systems as a competitive advantage.

- The Strategy should include development of a roadmap of steps needed to ensure that Canada's health information and communications technology can support data-intensive models of care and the rapid-cycle innovations that characterize this field.

- The Strategy should focus on:

    - Developing and implementing mechanisms to adopt, scale up, and contribute new clinical insights from across the global field of precision medicine.

    - Establishing a global leadership position in the systematic uptake and iterative improvement of Precision Medicine methods as applied to clinical care across Canada.

    - Ensuring that national and international collaboration is maximized, and that data are shared widely with due regard for privacy and security.

    - Fostering the development of the Canadian talent pool not only in the relevant biological and clinical fields, but in data analytics and software development.

    - Promoting the commercialization of made-in-Canada precision medicine concepts and tools.

Through the Healthcare Innovation Fund, and in partnership with federal and provincial research and innovation agencies, accelerate the implementation of the above-noted Strategy by assessing and scaling up models of care in the field of Precision Medicine (7.2).

- Potential starting points with wide impact include pharmacogenomics in diverse clinical fields, and precision/personalized cancer care.

    - A major commitment of funds will be needed to launch the broad Strategy across Canada as well as to effect clinical scaling-up in select fields.

Theme 4: Better Value from Procurement, Reimbursement and Regulation

Through Health Canada, expand the Government of Canada's approach to regulating drugs beyond drug safety to better support system decision-making on the cost- effectiveness of drugs (8.2).

- Consider therapeutic benefits in addition to safety benefits in its approval process.

- Require drug manufacturers to conduct comparative effectiveness studies.

- Adjust cost recovery for drug approvals to privilege high impact and value drugs over "me too" drugs.

- Provide advice to system decision-makers on the interchangeability or similarity of biologics and subsequent entry biologics.

Through Health Canada, accelerate work on transparency in its regulatory processes. This should include providing advance notice as to which products it has under review to permit decision-makers to plan their budgets accordingly. It also must include making public all data on the safety and effectiveness of drugs and devices (8.3).

Re-orient the Canadian Agency for Drugs and Technologies in Health (CADTH) to better support innovation by providing real-time advice to decision-makers on drugs and medical devices, and support CADTH to (8.6):

- Build up its expertise and increase its turnover related to its decisions on technologies to reflect their rapid life-cycle, including partnering with provincial initiatives that seek to align the pre-market and post-market assessment processes.

- Benchmark its turnaround against similar health technology assessment agencies internationally, which play a central role in providing rapid-cycle guidance on the cost-effectiveness of drugs and technologies.

- Assume the responsibilities of the Drug Safety and Effectiveness Network (DSEN; currently located in CIHR), which supports research into the post-market safety and effectiveness of drugs, given the natural affinity of this work with CADTH's mandate.

- Examine and make recommendations related to practices that are becoming obsolescent, such as those that no longer provide optimal patient outcomes.

Coordinate and integrate existing federal drug plans and reaffirm federal desire to join the Council of the Federation's pan-Canadian Pharmaceutical Alliance (8.1).

Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund (8.5):

- Offer to serve as the secretariat for a pan-Canadian Drug Purchasing Alliance.

- Work with public and private payers, as well as the pharmaceutical industry and pharmacists, to explore options to that would improve transparency about drug prices, and ensure that prescribers and patients have enough information to make informed choices.

- Collaborate with provincial, territorial, and private drug plans on strategies to extend the reach of collective purchasing strategies to all Canadians including the potential for bringing private insurers into the pCPA.

Review the Patented Medicines Pricing Review Board to assess its relevance and strengthen its role in protecting consumers against high drug prices in an era of enhanced collective procurement and coordinated national pricing (8.4).

Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund (8.5):

- Pursue support for the implementation of the Choosing Wisely Canada initiative in all jurisdictions and carefully evaluate its impact.

Theme 5: Industry as an Economic Driver and Innovation Catalyst

Create a Healthcare Innovation Accelerator Office, housed in the Healthcare Innovation Agency of Canada, to (9.1):

- Work with federal, provincial and territorial ministries of health and other stakeholders to accelerate the adoption of potentially disruptive technologies that show early promise of value for money to the system and benefit for patients.
    - This would include interacting with companies in pre-market processes to reduce post-market redundancy (viz. European Union practices, or the MaRS EXCITE model) .

Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund, support the spread and scale-up of measures to improve procurement, including consideration of value-based approaches and best practices internationally such as the competitive dialogue process in the EU (9.4).

Through Health Canada, in collaboration with Industry Canada, develop a whole-of-government federal strategy to support the growth of Canadian commercial enterprises in the healthcare field (9.3).

- The strategy should consider the needs of Canadian companies in the generation, domestic commercialization, and export of products and services, as well as in attracting foreign investment to the health field.
- Elements of the strategy should track recommendations from the 2010 report of the Independent Review of Federal Support for Research and Development, including approaches to encourage greater availability of capital for innovative start-ups; value-based procurement practices to encourage adoption of high impact innovations; and support for commercialization and export of successful products.
- The strategy should be adapted to the unique features of healthcare (e.g., regulatory requirements, primacy of patient safety, large-scale public purchasers, influence of providers on procurement processes, etc.), including addressing fragmentation through a simplified process that is easy to navigate for industry.

Through Health Canada, accelerate regulatory harmonization and convergence, while ensuring that safety remains paramount, to streamline domestic processes with international standards in recognition of the global nature of the pharmaceutical and medical devices industry. Priorities should include (9.2):

- Providing advice to small and medium-sized enterprises on how to navigate the healthcare system, including developing a roadmap of processes and supports.
- Partnering with the US Food and Drug Administration in order to reduce redundancy without compromising Canada's high standards around the safety of products.

Consensus and Fairness as Healthcare Evolves

A Federal Role in Consensus Building

Through Health Canada, take the lead in consultation and consensus building across provinces and territories on emerging ethical and legal issues arising from technological and social innovation in healthcare, and bring forward needed legislative changes in a timely fashion (5.2).

Through Health Canada, request the federal Privacy Commissioner to work with provincial and territorial privacy commissioners to develop a common understanding on how to protect privacy while enabling innovation (e.g. in precision medicine and genomics, mHealth, and various forms of digitized health records) across Canada (5.3).

- Privacy commissioners should be asked to consider how their respective legislative frameworks could be better harmonized across Canada to reduce any unnecessary duplication or confusion that could impede innovation.

Through the new Healthcare Innovation Agency of Canada, with federal investments from the Healthcare Innovation Fund (5.1):

- Support the development of policy and legislative tools to enable patient access to, and co-ownership of, their own personal health records.

Convene a federal, provincial and territorial dialogue on a pan-Canadian framework that will protect Canadians while putting put Canada at the forefront of applied genomics and precision medicine, including (7.3):

- Regulatory and legislative amendments to prohibit genetic discrimination, such as changes to the *Canadian Human Rights Act,* the *Criminal Code*, the *Personal Information Protection and Electronic Documents Act,* and the federal *Privacy Act.*

- Policies to enable broad sharing of appropriately anonymized data across and within jurisdictions.

    - This is critical not only for rapid innovation in the field of precision medicine, but for enhancing applied health research and data-driven innovation in Canada's healthcare delivery systems.

Financial Fairness in a Period of Transition

Through the Department of Finance, and in collaboration with Health Canada, pursue the following initiatives (10.1):

- Examine the current partial GST/HST rebate system for public sector bodies to reduce distortions arising from differential tax treatment of hospitals, municipalities, non-for-profit organizations and charities that deliver healthcare services.

- Create a new Refundable Health Tax Credit (RHTC) to provide tax relief of 25 percent on eligible out-of-pocket healthcare expenditures up to $3,000 per year, replacing the Refundable Medical Expense Supplement.

    - The RHTC would apply to the first-dollar spent on eligible expenses, and would be income-tested, with the full value of the credit made available to lower-income Canadians who bear a significant cost relative to their means. It would be administratively simple for tax filers, with tax slips issued by insurers and providers of health services. Payments to individuals with recurring expenses could be made on a quarterly basis.

- Make employer-paid premiums for employer-sponsored health and dental benefits a taxable benefit to the employee, while permitting employees to claim this expense as a qualifying medical expense under the new RHTC or METC.

Appendix 2: Full List of Acknowledgments

The Panel would like to recognize the great many individuals and organizations, listed below, whose contributions helped to shape the Panel's deliberations and final report.

Invited Presentations

The Panel wishes to thank the following individuals for their presentations to the Panel: Michael Green, Trevor Hodge, and Graham Scott (Canada Health Infoway); Terrence Sullivan, Brian O'Rourke, and Bernadette Preun (Canadian Agency for Drugs and Technologies in Health); Leslee Thompson, Maureen O'Neil, Stephen Samis (Canadian Foundation for Healthcare Improvement); David O'Toole, Brent Diverty, and Jeremy Veillard (Canadian Institute for Health Information); Alain Beaudet, Christian Sylvain, Michel Perron (Canadian Institutes of Health Research); Shelly Jamieson and Nicole Beben (Canadian Partnership Against Cancer); Hugh MacLeod, Catherine Gaulton, and Kim Stelmacovich (Canadian Patient Safety Institute); Simon Kennedy and Paul Glover (Health Canada); Abby Hoffman (Strategic Policy Branch, Health Canada); Mary-Luisa Kapelus (First Nations and Inuit Health Branch, Health Canada); Don Husereau (Institute of Health Economics); David Goldbloom and Jennifer Vornbrock (Mental Health Commission of Canada); David Williams and Jovan Matic (Ontario Health Innovation Council); and G. Ross Baker (University of Toronto) and Maria Judd (Canadian Foundation for Healthcare Improvement).

Senior Health Officials

The Panel wishes to thank the following senior health officials for contributing their time and counsel via meetings, roundtable discussions, correspondence, site visits, and other activities: Hon. Fred Horne and Janet Davidson (Government of Alberta), Hon. Glen Abernethy and Debbie DeLancey (Government of the Northwest Territories), Colleen Stockley (Government of Nunavut), Hon. Mike Nixon, and Paddy Meade (Government of Yukon), Stephen Brown (Government of British Columbia), Karen Herd (Government of Manitoba), Tom Maston (Government of New Brunswick), Hon. Steve Kent and Bruce Cooper (Government of Newfoundland and Labrador), Peter Vaughan (Government of Nova Scotia), Hon. Eric Hoskins and Bob Bell (Government of Ontario), Michael Mayne (Government of Prince Edward Island), Hon. Gaétan Barrette (Government of Quebec), Hon. Dustin Duncan and Max Hendricks (Government of Saskatchewan), and George Da Pont and Simon Kennedy (Government of Canada).

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National Stakeholder Association Meeting (Ottawa, Ontario), attended by Wendy Nicklin (Accreditation Canada), David Moorman (Canada Foundation for Innovation), Vinita Haroun (Canadian Alliance for Long Term Care), Jeremy Veillard (Canadian Institute for Health Information), Emmanuelle Hébert (Canadian Association of Midwives), Janet Craik (Canadian Association of Occupational Therapists), Paul Geneau (Canadian Association of Optometrists), Elaine Orrbine (Canadian Association of Paediatric Health Centres), Graham D. Sher (Canadian Blood Services), Gabriel Miller (Canadian Cancer Society), Gary MacDonald (Canadian Dental Association), Jim Keon (Canadian Generic Pharmaceutical Association), Ivy Bourgeault (Canadian Health Human Resources Network), Gail Crook (Canadian Health Information Management Association), Nadine Henningsen (Canadian Home Care Association), Sharon Baxter (Canadian Hospice Palliative Care Association), Cindy Forbes (Canadian Medical Association), Mark Ferdinand (Canadian Mental Health Association), Karima Velji (Canadian Nursing Advisory Committee), Jane Farnham (Canadian Pharmacists Association), Kate Rexe (Canadian Physiotherapy Association), Glenn Brimacombe (Canadian Psychiatric

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Edmonton, Alberta, attended by Peter Silverston (Addiction and Mental Health Strategic Clinical Network), Deborah Marshall (Alberta Bone and Joint Institute), Donna Durand (Alberta Council on Aging), L. Miin Alikhan (Alberta Health), Andrew Neuner (Alberta Health Quality Council), Deb Gordon, Troy Stooke, and Kathryn Todd (Alberta Health Services), Tim Murphy and Pamela Valentine (Alberta Innovates Health Solutions), Donald Back (Alberta Innovates Technology Futures), Don Dick and Linda Woodhouse (Bone and Joint Strategic Clinical Network), Colleen Norris and Blair O'Neill (Cardiovascular Health and Stroke Strategic Clinical Network), Mehadi Sayed (Clinisys), Colleen Enns (Edmonton Oliver Primary Care Network), Brian Rowe (Emergency Strategic Clinical Network), Isabel Henderson (Glenrose Rehabilitation Hospital), Chad Saunders (Haskayne School of Business), Duncan Robinson (Seniors Health Strategic Clinical Network), Tyler White (Siksika Health Services), Chris Lumb and Randy Yatscoff (Tech Edmonton), Christopher McCabe and Doug Miller (University of Alberta), Herbert Emery (University of Calgary), and Jann Beeston (Volunteer Alberta).

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Vancouver, British Columbia, attended by Richard Lester (British Columbia Centre for Disease Control), Shirley Vickers (British Columbia Innovation Council), Nancy Paris (British Columbia Institute of Technology), Warner Adam and Travis Holyk (Carrier Sekani Family Services), Nathalie Dakers (CDRC Ventures Inc.), Bruce McManus (Centre of Excellence for the Prevention of Organ Failure (PROOF)), Karimah Es Sabar (Centre for Drug Research and Development), Christine Penney (College of Registered Nurses of British Columbia), David Ostrow (Fraser Health), Paul Drohan (LifeSciences British Columbia), Alexandra Greenhill (Medeo), Diane Finegood (Michael Smith Foundation for Health

Research), Heather Davidson, Doug Hughes, and Lynn Stevenson (Ministry of Health, Government of British Columbia), Olive Godwin (Prince George Division of Family Practice), Leanne Heppell and Margot Wilson (Providence Health Care), Stefan Fletcher (RebalanceMD), Ryan D'Arcy and Paul Terry (Simon Fraser University), Allen Eaves (Stemcell Technologies Inc.), Catherine Helliwell (THINKPHC), Jim Christenson, Martin Dawes, Kendall Ho, Nancy Meagher, Steve Morgan, Geoff Payne, and Roanne Preston (University of British Columbia), and Wendy Hansson (Vancouver Coastal Health).

Winnipeg, Manitoba, attended by Andrea Kwasnicki (Canadian Diabetes Association), Marion Cooper (Canadian Mental Health Association of Winnipeg), Daniel Lussier (Catholic Health Corporation of Manitoba), Elaine Csupak (Eveline Street Clinic), Naranjan Dhalla (International Academy of Cardiovascular Sciences), Preetha Krishnan (Lions Personal Care Centre), Bob Thompson (Manitoba Caregiver Advisory Committee), Diana Clarke (Manitoba Centre for Nursing and Health Research), Dave Schellenberg (Manitoba Council on Aging), Brie Demone, Geof Langen, and Marcia Thomson (Manitoba Health), Doug McCartney (Manitoba Innovation, Energy and Mines), Sheila Carter (Manitoba Métis Foundation), Brenda Dawyduk (Northern Regional Health Authority (Manitoba)), Denise Widmeyer (Patient Safety Initiatives), Christina Weise (Research Manitoba), Michel Tétreault (St. Boniface Hospital), Charles Burchill, Kevin Coombs, Neal Davies, Terry Klassen, Sara Kreindler, Alan Menkis, Beverly O'Connell, Caroline Snider, and Roberta Woodgate (University of Manitoba), Martha Ainslie and Ken Rannard (Winnipeg Regional Health Authority), and Roxanne Myslicki (Youville Community Health Centre).

Regional and Site Visits

The Panel wishes to thank the following individuals and organizations for their hospitality and for sharing their time and expertise over the course of the Panel's regional and site visits.

Baltimore, Maryland and Washington D.C., United States, organized with support from Pierre-Gerlier Forest, Angelina Filipova, and Becky Newcomer of the Bloomberg School of Public Health, Johns Hopkins University; staff from the Office of Global Affairs, United States Department of Health and Human Services; Greg Alcock of the Brookings Institution; Jason Sutherland of the University of British Columbia; Marcy Opstal of the Agency for Healthcare Research and Quality; and Stefanie Mosier and Andrew Phillips of the Office of International Affairs, Health Canada; attended by Pierre-Gerlier Forest, Greg Alcock, Jason Sutherland and Marcy Opstal (above), Jeffrey Brady, Steven Cohen, Steven Hill, Ernst Moy, and Quyen Ngo-Metzger, (Agency for Healthcare Research and Quality), Gerard Anderson, Karen Davis, James Gilman, Hadi Kharrazi, Michael Klag, David Peters, Joshua Sharfstein, and Albert Wu (Bloomberg School of Public Health, Johns Hopkins University), Keith Fontenot, Elaine Kamarck, Alice Rivlin, and Louise Sheiner (Brookings Institution), Gilles Gauthier (Embassy of Canada in Washington), Cynthia Anderson, Amy Bassano, Patrick Conway, Ashley Corbin, Darren DeWalt, Ryan Galloway, Sheila Hanley, Ed Hutton, Karen Jackson, Frances Jensen, James Johnston, Mary Kapp, Pauline Lapin, Linda Magno, Renee Mentnech, Doug Nock, Mai Pham, Rahul Rajkumar, Noemi Rudolph, Darshak Sanghavi, and Naomi Tomoyasu (Center for Medicare and Medicaid Innovation), Stuart Guterman and Robin Osborn (Commonwealth Fund), and Cristina Rabadan-Diehl and Alyson Rose-Wood (US Department of Health and Human Services).

New Brunswick, organized with support/participation of Trish Fanjoy and Lyne St-Pierre-Ellis (Department of Health, Government of New Brunswick); attended by Matthew Crossman (Ambulance NB), Gérin Girouard, Renée Laforest, Bruce MacFarlane, Nancy Roberts, Jennifer Russell, Joanne Stone, and Mark Wies (Department of Health, Government of New Brunswick), Marlien McKay (Department of Healthy and Inclusive Communities, Government of New Brunswick), Anne Macies (Department of Intergovernmental Affairs, Government of New Brunswick), Derrick Jardine (FacilicorpNB), John McGarry (Horizon Health Network), Stephane Robichaud (New Brunswick Health Council), Anthony Knight (New Brunswick Medical Society), Jennifer Dickison and Marilyn Quinn (New Brunswick Nurses Union), Paul Blanchard (New Brunswick Pharmacists Association), Roxanne Tarjan (Nurses Association of New Brunswick), and Jean Castonguay (Vitalité Health Network).

Newfoundland and Labrador, organized with support/participation of Chad Blundon and Tara Power (Department of Health and Community Services, Government of Newfoundland and Labrador), James Rourke (Memorial University of Newfoundland); attended by Rosemarie Goodyear (Central Health), Karen Stone (Department of Health and Community Services, Government of Newfoundland and Labrador), Mark Ploughman (Department of Innovation, Business and Rural Development, Government of Newfoundland and Labrador), Tony Wakeham (Labrador-Grenfell Health), Deborah Kelly, Pat Parfrey and Proton Rahman (Memorial University of Newfoundland), and Mike Barron (Newfoundland and Labrador Centre for Health Information).

Northwest Territories, organized with support/participation from Kyla Kakfwi-Scott (Department of Health and Social Services, Government of Northwest Territories); attended by Ewan Affleck, Karen Blondin Hall, Sabrina Broadhead, Jim Corkal, André Corriveau, Sue Cullen, Derek Elkin, and Alicia Tumchewics, (Department of Health and Social Services, Government of the Northwest Territories), with a special thanks to Debbie DeLancey.

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Yukon, attended by Lori Duncan (Council of Yukon First Nations), Cecilia Fraser, Sabrina Kinesella, Shannon Ryan, Sharon Specht, Emily Wale, and Sherri Wright (Department of Health and Social Services, Government of Yukon), Gaye Hanson (Hanson and Associates), Jeanie Dendys and Carmen Gibbons (Kwanlin Dün First Nation), with a special thinks to Paddy Meade.

TAPESTRY Site Visit (Teams Advancing Patient Experience: Strengthening Quality), McMaster University (Hamilton, Ontario), organized with support/participation from David Price and Melissa Watson (McMaster University); attended by Ernie Avilla, Tracy Carr, Lisa Dolovich, Dale Guenter, Doug Oliver, Cathy Risdon, and Alix Stosic (McMaster University).

Roundtable Discussions

The Panel would also like to thank the experts who contributed to the Panel's many special roundtable discussions:

Meeting with the National First Nations Health Technicians Network, Assembly of First Nations (Winnipeg), organized with support/participation of Sonia Isaac-Mann and Erin Tomkins of the Assembly of First Nations; attended by Ardell Cochrane (Assembly of Manitoba Chiefs), Michelle Degroot (BC First Nations Health Authority), Tracy Antone (Chiefs of Ontario), Nadine McRee (Confederacy of Treaty 6 First Nations), Lori Duncan (Council of Yukon First Nations), Roxanne Woodward (Dene First Nations), Kyle Prettyshield (Federation of Saskatchewan Indian Nations), Rosanne Sark (Mi'kmaq Confederacy of PEI), Sophie Picard (Quebec and Labrador Health and Social Services Commission), Carolynn Small Legs (Treaty 7 Management Corporation), Kristopher Janvier (Treaty 8 First Nations), Peter Birney (Union of New Brunswick Indians), and Sally Johnson (Union of Nova Scotia Indians).

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Meeting with La Table des Soins Infirmiers du Réseau Universitaire Intégré de Santé, University of Montreal (Montreal, Quebec) organized with support from the Faculty of Nursing Sciences at the the Université de Montréal; attended by Karine Bouchard, Chantal Cara, Manouche Casimir, René DesCôteaux, Steve Desjardins, Sylvie Dubois,

Marcela Ferrada-Videla, Annie-Claude Forget, Lucie Gagnon, Julie Gagnon, Raynald Gareau, Claudel Guillemette, Karine Houle, Jocelyne Lacroix, Carole Paquin, Mme Roberge, Marielle Roy, Johanne Salvail, Marie-Josée Simard, Sylvie St-Pierre, Jean-Sébastien Turcotte.

Best Brains Exchange on Precision and Personalized Medicine (Ottawa), organized with support/participation from Alan Bernstein of the Canadian Institute for Advanced Research (meeting moderator) and Meghan Baker and Alison Bourgon of the Canadian Institutes of Health Research; attended by Sohrab Shah (British Columbia Cancer Agency), Jane Aubin, Helen Loughrey, Michel Perron, Etienne Richer, Rachel Syme, and Robyn Tamblyn (Canadian Institutes for Health Research), James Kennedy (Centre for Addiction and Mental Health), Kym Boycott and Alex Mackenzie (CHEO Research Institute), David Levine (D.L. Strategic Consulting), Ruslan Dorfman (GeneYouIn), Cindy Bell (Genome Canada), Guy Rouleau (McGill University), Tom Hudson (Ontario Institute for Cancer Research, University of Toronto), Duncan Stewart (Ottawa Hospital Research Institute), Timothy Caulfield (University of Alberta), Peter Liu (University of Ottawa Heart Institute), Mansoor Husain and Sachdev Sidhu (University of Toronto), Jean-Claude Tardif (the Université de Montréal), and Richard Kim (London Health Sciences Centre, Western University).

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International Summit on Healthcare Innovation and High-Performing Health Systems (Toronto), organized with support/participation of Terrence Sullivan (meeting moderator) and Marcella Sholdice (note-taker) (Terrence Sullivan and Associates); Zayna Khayat of MaRS; Erik Landriault of the Royal Danish Consulate General (Toronto); and Jeremy Veillard of the Canadian Institute for Health Information; attended by Janet Davidson (Alberta Health, Government of Alberta), Anthony Sherbon (Australian Independent Hospital Pricing Authority), Andrew Wiesenthal (formerly of the Permanente Federation), Bruce Cooper (Department of Health and Community Services, Government of Newfoundland & Labrador), Paddy Meade (Department of Health and Social Services, Government of Yukon), Eleanor J. Hubbard (Department of Health and Wellness, Government of Nova Scotia), Michael Mayne (Department of Health and Wellness, Government of Prince Edward Island), Tom Maston (Department of Health, Government of New Brunswick), Colleen Stockley (Department of Health, Government of Nunavut), Paul Glover (Health Canada), Molly Porter (Kaiser Permanente International), Karen Herd (Manitoba Health, Government of Manitoba), Joan Hentze (Ministry of Foreign Affairs of Denmark), Bob Bell (Ministry of Health & Long Term Care, Government of Ontario), Stephen Brown (Ministry of Health, Government of British Columbia), Niek Klazinga (Organization for Economic Cooperation and Development), and Martin Marshall (University College of London).

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Youth Engagement Sessions (Ottawa and virtual), organized with support from Sharif Mahdy of the Students Commission of Canada and Michel Blanchard and Roberta Acason of the Healthy Environments and Consumer Safety Branch, Health Canada; attended by members of Health Canada's National Youth Leadership Team on Tobacco Control and the Centre for Addiction and Mental Health's National Youth Advisory Committee.

Interviews

The Panel would like to thank the following individuals for taking the time to participate in key informant interviews with members of the Panel and the Healthcare Innovation Secretariat: David Bates (Brigham and Women's Hospital), Jennifer Zelmer (Canada Health Infoway), Andrew Wiesenthal (Deloitte), Christine Couture (Government of Alberta), Vijay Bashyakarla (Government of Nova Scotia), David Brook and Peter Singer (Grand Challenges), Carrine McIsaac (Health Outcomes Worldwide), Dianne Caldbick and Shannon Glenn (Industry Canada), Kenneth Kizer (Institute for Population Health Improvement, UC Davis Health System), Eddy Nason (Institute on Governance), Chris Ham (King's Fund), Alison Blair and Karen Moore (Ministry of Health & Long Term Care, Government of Ontario), Renata Osika (National Health of Provincial Health Research Organizations), Jeremy Theal (North York General Hospital), Joe Selby (Patient-Centered Outcomes Research Institute), Michael Decter, Sholom Glouberman and Francesca Grosso (Patients Canada), Deborah Gordon-El-Bihbety (Research Canada), Poul Erik Hansen (Rosklide University), Daniel Forslund (Stockholm County Council), Morten Elbaek Petersen (Sundhed), David Blumenthal, Donald Moulds, and Robin Osborn (The Commonwealth Fund), Phillip Bazel (University of Calgary), Charles Friedman (University of Michigan), Lori Turik (University of Western Ontario, Ivey Business School), Sameh El-Saharty (World Bank), and the late Brenda Zimmerman (York University).

Stakeholder Submissions

The Panel would like to thank the 200+ individuals and organizations who submitted formal input via the Panel's online stakeholder consultation process: Accreditation Canada, Albert Friesen, Alberta Health Services, Alzheimer Society of Canada, Arthritis Alliance of Canada, Assembly of First Nations, Association of Faculties of Medicine Canada, BC Alliance on TeleHealth Policy and Research, BC Mental Health & Substance Use Services, BIOTECanada, [BIOTECanada, Canada's Research-Based Pharmaceutical Companies Colleges and Institutes of Canada, HealthCareCAN, Health Charities Coalition of Canada, MEDEC and Research Canada], Bone & Joint Canada, BRYTECH Inc., Canada's Research-Based Pharmaceutical Companies, Canadian Advanced Technology Alliance, Canadian Agency for Drugs and Technologies in Health, Canadian AIDS Society, Canadian Association of Advanced Practice Nurses, Canadian Association of Medical Radiation Technologists, Canadian Association of Occupational Therapists, Canadian Association of Optometrists, Canadian Association of Paediatric Health Centres, Canadian Association of Retired Persons, Canadian Association of Schools of Nursing, Canadian Association of the Deaf, Canadian Blood Services, Canadian Breast Cancer Foundation, Canadian Cancer Research Alliance, Canadian Cancer Society, Canadian Chiropractic Association, Canadian Counselling and Psychotherapy Association, Canadian Dental Association, Canadian Dental Hygienists Association, Canadian Doctors for Medicare, Canadian Federation of Nurses Unions, Canadian Foundation for Healthcare Improvement, Canadian Generic Pharmaceutical Association, Canadian Health Coalition, Canadian Health Food Association, Canadian Home Care Association, Canadian Hospice Palliative Care Association, Canadian Institute for Health Information, Canadian Institute of Actuaries, Canadian Malnutrition Task Force, Canadian Massage Therapist Alliance, Canadian Medical Association, Canadian Men's Health Foundation, Canadian Mental Health Association, Canadian Nurses Association, Canadian Nurses Foundation, [Canadian Pain Society, Canadian Pain Coalition, Chronic Pain Association

of Canada, Pain BC and ILC Foundation], Canadian Partnership Against Cancer, Canadian Patient Safety Institute, Canadian Pharmacists Association, Canadian Physiotherapy Association, Canadian Psychiatric Association, Canadian Psychological Association, Canadian Society for Medical Laboratory Science, Canadian Union of Public Employees, Canadian Virtual Hospice, Canadian Working Group on HIV and Rehabilitation, Carolyn McGregor, Choosing Wisely Canada, CNIB, Cochrane Canada, Collaborative Mental Health Care Network, Colleges and Institutes Canada, Community Health Nurses of Canada, Community Palliative Care Network, Concordia University, Congress of Union Retirees of Canada, CONNECT Communities Ltd., Consortium national de formation en santé, Council of Canadians, Craig Louie, David Tilson, Dieticians of Canada, [John Campbell, Sanjay Rao, John Moore and Dana Pulsifer], Dan Smyth, David Gotlib and Jose Silveira, David Ostrow, Gregor Reid, Ivy Lynn Bourgeault, James Lunney, Janusz Kaczorowski, Joachim Sehrbrock and Theo DeGagne, Murray Enns, Olubankole Obikoya, Patrick Gullane, Richard Riopelle, Stuart MacLeod, Tom Marrie and Brian Postl, Veronica Asgary-Eden, Vivian Rambihar, Francesca Grosso and Michael Decter, Genome Canada, GS1 Canada, Health Care Co-operatives Federation of Canada, Health Charities Coalition of Canada, Health Innovates Ottawa, HealthCareCAN, Heart & Stroke Foundation, Heather Hadjistavropoulos, Hospice Muskoka, Information Technology Association of Canada, Canada Health Infoway, Injury Prevention Centre, Institute for Clinical Evaluative Sciences, Institute of Health Economics, International Eating Disorders Action, Invicta Health Inc., Itarget, IVEY International Centre for Health Innovation, Janssen Inc., [Jim Whitlock, Patrick Sullivan and Antonia Palmer], John Have, KIDSCAN, Kingston Family Health Team, Lumira Capital, MaRS Health, MEDEC, Medical Devices Commercialization Centre, Michael Wolfson, Ministère de la Santé et des Services sociaux (Quebec), Montfort Hospital, National Alliance of Provincial Health Organizations, National Initiative for the Care of the Elderly, Neurological Health Charities Canada, NEXJ Systems Inc., Nuvitik, OCAD University, Patients Canada, Patients for Patients Safety Canada, Réjean Hébert, Prognostic and Therapeutic Harmonization, Providence Health, Registered Nurses Association of Ontario, Research Canada, Rick Hansen Institute, Roche Diagnostics, Royal College of Physicians and Surgeons of Canada, Schizophrenia Society of Ontario, South Medic, Southlake Regional Health Centre, Speech-Language & Audiology Canada, Stem Cell Network, Stemcell Technologies, Stretch It Physiotherapy Services, Strongest Families Institute, TAPESTRY, Tele-Link Mental Health Program, TELUS Health Solutions, Terry Fox Research Institute, The Bear Clinic, The Centre for Drug Research and Development (CDRD) and CDRD Ventures Inc., The Change Foundation, The College of Family Physicians of Canada, [The Community Against Preventable Injuries, The Injury Prevention Centre, The BC Injury Research and Prevention Unit and Parachute], The ILC Foundation, The Kidney Foundation of Canada, the Canadian Society of Nephrology and the Canadian Society of Transplantation, Therapeutic Touch Networks of Canada, TransForm Shared Service Organization, Vancouver Coastal Health, Victoria Health Cooperative, and XAHIVE.

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Note: Given the breadth and diversity of the Panel's activities and the large number of contributing individuals and organizations, the above list may contain errors of omission or attribution. The Panel regrets any such errors and apologizes to anyone who may have been inadvertently missed or otherwise incorrectly acknowledged.

Appendix 3: List of Commissioned Research and Analysis

The Panel wishes to recognize the following individuals and organizations for their contributions to the Panel's research and analysis activities.

Regional and National Stakeholder Consultations – Synthesis Report
Ascentum Inc.

Summary Report of the Advisory Panel on Healthcare Innovation's Patient Roundtable
Ascentum Inc.

Patient Engagement: *Catalyzing Improvement and Innovation in Canadian Healthcare*
G. Ross Baker and Carol Fancott of the University of Toronto and Maria Judd, Elina Farmanova, and Christine Maika of the Canadian Foundation for Healthcare Improvement

Tax-Assisted Approaches for Helping Canadians Meet Out of Pocket Healthcare Costs
J.C. Herbert Emery, University of Calgary

Real vs. Alleged Privacy Barriers to Healthcare Innovation in Canada
David Flaherty, David H. Flaherty Inc.

Review of Leading Provincial and Territorial Healthcare Innovations in Canada
Diane Gagnon, University of Ottawa

Montreal Roundtable on Healthcare Innovation – Summary Report
Karine Guertin, University of Montreal

Impact of Innovation on expenditure growth and options for implementation for Canada
Don Husereau, Institute of Health Economics

Industry/Government Collaboration in Health Innovation Roundtable – Summary Report and Recommendations
Institute of Health Economics

An Overview of Canada's Health Innovation Architecture
Ivey Centre on Health Innovation, Western University

Youth Perspectives on Healthcare Innovation in Canada – Summary Report
The Students Commission of Canada

International Summit on Healthcare Innovation and High-Performing Health Systems: Lessons for Canada – Final Summary Report
Terrence Sullivan and Marcella Sholdice, Terrence Sullivan and Associates

Bundled payments: Can they help Canadian Health Systems?
Jason Sutherland and Erik Hellsten, University of British Columbia

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