Commission of Inquiry on Hormone Receptor Testing

Part II Submissions

List of Authorities

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Tab 1

BUILDING *on* VALUES

THE FUTURE OF HEALTH CARE IN CANADA

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INFORMATION, EVIDENCE AND IDEAS

Directions for Change

- ***Enable the establishment of personal electronic health records for each Canadian, building on the work currently underway in provinces and territories.***
- ***Take clear steps to protect the privacy of Canadians' personal health information, including an amendment to the* Criminal Code of Canada.**
- ***Provide better health information to Canadians, health care providers, researchers and policymakers – information they can use to guide their decisions.***
- ***Expand the scope, effectiveness and co-ordination of health technology assessment across Canada.***
- ***Create four research Centres for Health Innovation to address the gaps in applied research in important areas of Canada's health care system, including rural and remote health, health human resources, health promotion and pharmaceutical policy.***
- ***Forge stronger linkages with researchers in other parts of the world and with policymakers across the country.***

THE CASE FOR CHANGE

We repeatedly hear that the 21st century is the age of information and evidence – a time when the keys to progress and success lie in our ability to innovate, to tap into new information and evidence and transform ideas into exciting new developments, new services, and new solutions. In health, information, evidence and ideas have the potential to unlock the cures to many of today's illnesses, identify the genetic source of chronic illnesses, give health care providers access to the latest and best information on new treatments or drugs, improve the quality and safety of care within the health care system, and most importantly, empower patients to manage and maintain their own health.

Some might wonder why a chapter on information would figure so prominently and be placed at the beginning of a report on the future of Canada's health care system. The answer is

that leading-edge information, technology assessment and research are essential foundations for all of the reforms outlined in subsequent chapters of this report. Furthermore, health research – especially biomedical and scientific research – is an increasingly important component of Canada's knowledge economy and a source of high-skilled, well-paid employment for thousands of Canadians.

To take full advantage of the potential of information, evidence and ideas in the health care system, the necessary information infrastructure must be in place. This requires action on three important fronts: putting essential information management and technology systems in place, improving our ability to assess and manage the potential benefits of health care technologies, and expanding our applied research capacity across the country.

These three aspects are clearly linked. Putting the information management and technology infrastructure in place means that essential information can be collected, compiled and used to make better decisions and improve quality and care within the system. Improving our ability to assess new technology means that only the most effective new treatments, prescription drugs or equipment would be purchased and used in Canada's health care system. With better information management and technology in place, researchers can assess the impact and value of different treatments and approaches to delivering health care services in addition to developing and testing new discoveries and cures. Together, these three "pieces of the puzzle" can create a 21st century information and evidence infrastructure that will guide and inform the future of Canada's health care system, improve its efficiency, and most importantly, improve the health of Canadians.

BUILDING CANADA'S HEALTH INFORMATION TECHNOLOGY INFRASTRUCTURE

RECOMMENDATION 8:

A personal electronic health record for each Canadian that builds upon the work currently underway in provinces and territories.

RECOMMENDATION 9:

Canada Health Infoway should continue to take the lead on this initiative and be responsible for developing a pan-Canadian electronic health record framework built upon provincial systems, including ensuring the interoperability of current electronic health information systems and addressing issues such as security standards and harmonizing privacy policies.

RECOMMENDATION 10:

Individual Canadians should have ownership over their personal health information, ready access to their personal health records, clear protection of the privacy of their health records, and better access to comprehensive and credible information about health, health care and the health system.

RECOMMENDATION 11:

Amendments should be made to the *Criminal Code of Canada* to protect Canadians' privacy and to explicitly prevent the abuse or misuse of personal health information, with violations in this area considered a criminal offense.

RECOMMENDATION 12:

Canada Health Infoway should support health literacy by developing and maintaining an electronic health information base to link Canadians to health information that is properly researched, trustworthy and credible as well as support more widespread efforts to promote good health.

Introducing Personal Electronic Health Records

Information technology has literally revolutionized the way information is collected, stored, shared and used. It is one of the "four strong winds" forcing change in health care today (Decter 2000). Good information systems are essential to a high quality health care system. They allow health care providers, managers and policymakers to share information and use the best available evidence to guide their decisions. They can also forge a strong link between quality on the one hand and accountability on the other.

Increased use of information technology in health care can also have important benefits for patients. It can provide them with better access to their own health information as well as to relevant health knowledge, which in turn allows them to play a more active role in maintaining their health and making decisions about their medical care.

Provinces and territories, health regions, and health care providers understand and support the need to make better, more effective use of information technology in addressing a number of challenges in today's health care system. Yet, despite this consensus, progress has been slow and provincial and federal initiatives are being developed in isolation, despite the fact that the costs of each government going it alone are very high. Initiatives in provinces are motivated by different interests and objectives and it is not always clear if the projects are driven by administrative priorities, commercial interests, or the interests of citizens. In addition, as outlined in Chapter 7, there is much that remains to be done to provide rural and remote parts of the country with the basic electronic infrastructure to facilitate developments such as telehealth.

Much of the focus in information technology applications in health care has been on electronic health records. Why are electronic health records so important?

Electronic health records are one of the keys to modernizing Canada's health system and improving access and outcomes for Canadians. An electronic health record provides a "collection of personal health information of a single individual, entered or accepted by health care providers and stored electronically. The record may be made available at any time to providers, who have been authorized by the individual, as a tool in the provision of health care services" (HC 2001f). Data are entered on individuals' personal health records every time they visit their physician, have a prescription filled, have a lab test, or go to the hospital. The electronic record provides a systematic, historic record of every interaction a person has with the health care system.

Currently, much of the clinical and administrative information in the health system is contained in files of paper records. In most cases, health care providers and their organizations decide what information is relevant for their purposes and what form the information should take. As a result, the current health record system can be described as an assortment of non-standardized patient information stored in isolated patient records.

Paper records are increasingly becoming obsolete and inadequate. They limit the flow of information, insufficiently document patient care, impede the integration of health care delivery,

create barriers to research, and limit the information available for administration and decision making. They also limit Canadians' ability to access their personal health records and use their personal health information for making decisions about their own health and health care.

In contrast, electronic health records provide important advantages.

- Diagnoses, treatments and results can be improved when health care providers have access to complete personal health information and can link that information to clinical support tools. In a recent survey from the Canadian Medical Association, over 76% of physicians agreed that improving how patient information is shared is an important or very important potential benefit of electronic health records. Further, 68% agreed that the use of electronic health records would result in improvements in clinical processes, efficiency of workflow, and continuity of care. Almost 60% said that electronic health records would improve the quality of care (Martin 2002).
- Accuracy of personal health records can be improved. With an electronic health record, information from a variety of health care providers is collected and stored on a single record, providing a more complete and more accurate record of an individual's personal health history.
- Efficiency can be improved. As one health region described it, roughly 30% of nursing time is spent managing paper records. Just a 5% reduction in the time nurses spend doing charts could free up the equivalent of 90 nursing positions and generate $5 million a year in savings. They also point to potential efficiencies in managing chronic diseases by targeting efforts to expand electronic health records at the primary health care level (Calgary Health Region 2002a and 2002b).
- Electronic health records provide aggregate data that can be used in health research and in health surveillance, tracking disease trends and monitoring the health status of Canadians.
- Security can be improved. From the point of guaranteeing necessary access to health records, precautions need to be put in place to ensure that electronic health records do not become an obstacle when accessing health services. Necessary safeguards must be in place to ensure that a network crash never serves as an obstacle to obtaining necessary care. Furthermore, electronic health records bring together a host of health records that were previously physically dispersed into a new comprehensive format. This change will have important implications in terms of the physical security of personal health information.

"A jewel in our crown is our electronic medical record system ... We believe the M-R [Medical Record] is the key tool in improving health outcomes for our patients ... and it saves time and money."

GROUP HEALTH CENTRE SAULT STE. MARIE. PRESENTATION AT SUDBURY PUBLIC HEARING.

With a complete system of electronic health records in place, there are some important benefits for individual Canadians, for health care providers, researchers and the system as a whole.

Individual Canadians would have secure on-line access to their personal electronic health records. One potential scenario could involve the development of a Web site to access personal electronic health records similar to on-line banking, where individuals could log onto the system using a personal identification number. At the click of a mouse, they would have access not only to their personal health information but also to a broader base of general information on health issues. With this information, individuals can play a more direct role in managing their own health.

Health care providers would have access to clinical decision support tools to assist them in making decisions based on the best available evidence. Health care providers would be able to access patient records at the point of a clinical encounter. It would help manage the massive amounts of complex health information and ensure that health care providers have complete and accurate information about patients' health and health care histories. It also would improve physicians' ability to access the latest information, select the best course of action, and use evidence to guide their decisions.

Researchers and policymakers would have access to aggregate data compiled through the electronic health record system. These data could be extracted generically for health research purposes, without being linked to any individual electronic health record. The Commission understands that researchers would, in many cases, prefer to have access to "person-oriented" health information to allow them to track certain illnesses or health-related factors over time. Only when there are sufficient safeguards in place and the system has demonstrated its ability to protect the privacy of individuals, should researchers have access to "person-oriented" data. This information could be used to monitor and measure outcomes and allow increased health surveillance in the management and treatment of particular diseases, especially for patients with chronic illnesses.

> *"There is no national, interprovincial or cross-jurisdictional coordinating body to ensure health practitioners have cost effective and universal access to the best patient care and health research information."*
>
> CANADIAN HEALTH LIBRARIES ASSOCIATION 2001. WRITTEN SUBMISSION.

Finally, the overall quality of the health care system can be improved. The electronic health record system would enhance the ability of health care managers and researchers to identify and respond to medical errors or problems that occur in the health care system, and improve patient safety and quality of care. Currently, problems in the health care system related to patient safety are not well monitored or identified for a host of reasons including the lack of information technology to monitor and track errors and also the fear of blame and litigation.

A Leadership Role for Canada Health Infoway

Clearly, the benefits of electronic health records are substantial for Canadians, for health care providers and managers, and for governments. While a number of electronic health record initiatives are underway across the country, progress on the major provincial initiatives has been slow and costs have been high. Greater collaboration among governments could both speed up development and save costs for all Canadians.

Some intergovernmental co-ordination has occurred under the intergovernmental Advisory Committee on Health Infostructure (ACHI). In December 2000, ACHI released a *Blueprint and Tactical Plan for a pan-Canadian Health Infostructure* identifying the following three priorities (HC 2000):

- developing an electronic health record system;
- developing integrated provider solutions, including clinical decision support tools and ultimately an electronic provider portal; and
- providing relevant, credible and timely health information to the public to empower individuals to manage their own health through a Canadian Health Network and self-care and telecare services.

Following from the First Ministers' Agreement in September 2000, the federal government invested $500 million into Canada Health Infoway. Infoway is an independent, non-profit

corporation with responsibility for accelerating the development and adoption of modern systems of information technology with the aim of providing better health care. Infoway is currently attempting to build on existing initiatives and pursue collaborative relationships with the provinces and with the Advisory Committee on Health Infostructure. The Commission believes that, with continuing diligence, Infoway's funding can go a long way in supporting the necessary ongoing efforts to create a national electronic record system. Further funding, if necessary, should come only after discussion by the federal, provincial and territorial health ministers.

Given its mandate, Infoway is uniquely poised to provide overall leadership and to act as a catalyst in moving forward on essential information management and technology initiatives. This work will require ongoing support from provincial, territorial and federal governments to ensure that decisive and timely action can be taken to put the necessary systems and networks in place. There is wide consensus in the health care system that electronic health care records are essential to future improvements in the system and in the quality of care. Deliberate action is needed on an urgent basis to put the necessary systems in place and begin to see some tangible and concrete progress. The proposed Health Council of Canada should conduct an assessment of Infoway's progress in this area in two years' time and provide its findings and future recommendations in a public report to Canadians and health ministers.

Empowering Canadians and Protecting Their Privacy

Moving to an electronic health records system provides important benefits to Canadians, particularly in terms of giving them ready access not only to their own personal health care information but also to a wealth of trusted, credible information on a variety of health topics.

At the same time, many Canadians worry that their personal health information could be abused or misused. Issues surrounding protection of privacy are serious and complex. On the one hand, Canadians need a strong assurance that their personal health information is used only by those who need it and only under certain circumstances. The Privacy Commissioner of Canada notes that there are privacy risks whenever personally identifiable information is stored electronically. Therefore, rules need to be in place to ensure that personal health information is carefully safeguarded. Most often, those rules focus on requiring individuals' consent before their personal information is accessed and shared. On the other hand, health care providers need access to personal health information in order to provide the best possible care to patients, to guide their decisions, and ensure that they have a complete picture of an individual's health needs. Privacy rules have to strike the right balance between strict privacy protection procedures and the legitimate and important need for health care providers to access personal health information, often on an urgent or emergency basis.

> *"We are still very concerned, obviously, about privacy of information and personal health information; but in order for the system to function as efficiently as possible ... there needs to be access and a flow through of the information."*
>
> CONSUMERS' ASSOCIATION OF CANADA. PRESENTATION AT TORONTO PUBLIC HEARING.

Consistent and clear privacy rules should be in place across the country. With the aim of protecting individual health information to the greatest extent possible, amendments should be made to the *Criminal Code* to make abuse or misuse of personal health information a criminal offense. Specifically, it should be a criminal offense for anyone to acquire, use or share another person's personal health information for purposes

that do not explicitly relate to the management of the health of the person to which the records relate. These amendments should also prohibit authorized users of the information from utilizing it for purposes other than this intent without the consent of the patient.

Expanding Health Literacy

Another important benefit to Canadians lies in the potential for the electronic health record system to go beyond just a record system to provide comprehensive health information. Increasingly, Canadians are turning to the Internet as a source of health information. Roughly half of the people who use the Internet use it to search for health-related information (Statistics Canada 2001d). Despite concerns that specific health information is difficult to access and may not be credible, the majority agreed that the Internet, as a health resource tool, has made them more knowledgeable about their health and health-related issues.

> *"We need to do more than disseminate reliable nutritional information, we must also motivate Canadians to use that information."*
>
> DIETICIANS OF NEWFOUNDLAND AND LABRADOR. PRESENTATION AT ST. JOHN'S PUBLIC HEARING.

To provide Canadians with the necessary tools and information about health and health issues, a multi-layered approach is needed – one that addresses not only how health information is packaged but also how it is accessed, interpreted and used (Jadad 1999). Specifically, Canadians need:

- comprehensive and integrated pools of credible information that are presented in intellectually appealing and user-friendly formats;
- timely access to relevant and credible health information;
- optimal skills to process and understand the relevance of health information; and
- receptive environments where they are able to use information as part of decisions they make about their health and health care.

Looking at the various Web sites of health information available today, it is obvious that the public sector has played a limited role in providing health information to the public (HC 2001f). In contrast, the private sector, in the United States in particular, has flooded the Internet with electronic health information. Unfortunately, the credibility of this information is uncertain since much of it is posted and sponsored by particular commercial enterprises.

To date, a primary source of electronic health information for Canadians has been the Canadian Health Network. The network currently provides 12,000 e-based English and French language health resources on 26 health topics ranging from health promotion and ways of staying healthy to specific illnesses such as cancer. These resources reach beyond Canadian sites and material to include relevant international material. In addition, the network provides links to discussion groups on various topics and offers users a guide for evaluating the quality and reliability of other health information available on the Internet.

> *"Canadians strongly value and endorse individual responsibility and accountability and want information that will help them to make educated life choices. They also believe that governments are responsible for providing them with the information they need."*
>
> FPT MINISTERS RESPONSIBLE FOR PHYSICAL ACTIVITY 2001. WRITTEN SUBMISSION.

Infoway should play a key role in promoting health literacy as it relates to the development of an electronic health record system by opening the door to a vast amount of trusted, credible health information for Canadians. It should build on work already done by the Canadian Health Network and establish linkages to other reliable sources of electronic health information. The Network could serve as the foundation for the development of a comprehensive health information Web site with

links to a number of credible national and international Web sites. Infoway should also work with the Canadian Institutes of Health Research to build up an electronic health information evidence base and link it into current electronic health record developments. Linkages should be made with existing health information sources at the provincial, territorial and regional levels, particularly in the area of prevention and promotion.

The following vignettes provide examples of how access to personal health records, combined with trusted sources of health information, can benefit individual Canadians.

A young woman learns from her doctor that she is pregnant for the first time. Her physician gives her some good information about the things she needs to do to make sure she has a healthy pregnancy, including taking vitamins, watching her diet, exercising regularly, and avoiding alcohol. She has heard about several risk factors and wants to do as much as she can to avoid them. So she goes on the Internet, enters her personal identification number, and has access to important facts from her personal health history. She knows, for example, that a family history of diabetes might have an impact. She connects to the health information side of the system and finds a wealth of reliable information about pregnancy and diabetes, including the signs to watch for. She makes a list of some questions she wants to ask her doctor at her next visit. She also finds links to other information and resources available in her community.

An elderly couple has led an active and independent life, but recently, the husband has been showing persistent signs of forgetfulness and disorientation. The doctor confirms it is the early signs of Alzheimer's disease. Faced with this devastating news, they decide to learn as much as they can so they can be well prepared for what is to come. They contact a local branch of the Alzheimer's Society and learn the latest and most accurate information is available through the electronic health records system. They go to the local library and are able to access the information using the husband's personal identification number. Although the computer is in the library, they can use it in confidence because the system protects their privacy. They find a lot of helpful information. They also get information on personal directives and living wills that allows them to discuss the options and make decisions along with their children.

A 12-year-old boy has been diagnosed with juvenile diabetes. He needs to track his insulin levels and other information about how he is feeling through the day and provide that information to the health management team that is monitoring his care. With that information, they can regulate his dosage of insulin, his diet, his activity levels, and help manage his care. The boy uses a mobile device like a Palm pilot. He feeds information into the Palm pilot during the day, and at night, he hooks it up to his home computer, types in his personal identification number, and sends it to the health management team. During regular meetings, he and his parents go over the information with the health management team. He and his parents can also use his personal identification number to access information about juvenile diabetes, especially research that is underway to find a cure.

STREAMLINING AND IMPROVING HEALTH TECHNOLOGY ASSESSMENT IN CANADA

RECOMMENDATION 13:

The Health Council of Canada should take action to streamline technology assessment in Canada, increase the effectiveness, efficiency and scope of technology assessment, and enhance the use of this assessment in guiding decisions.

The Growing Importance of Health Technology Assessment

Advances in health technology have tremendous potential for changing the organization and delivery of health care services and improving health outcomes for Canadians, but they come at a price. More varied and sophisticated equipment and products come onto the market on an almost daily basis. In making decisions about whether to purchase and use these new technologies, health care managers and decision makers must rely on the best available assessment of the impact, benefits and effectiveness of new technologies on health care and health outcomes.

Health technology assessment is a comprehensive and systematic assessment of the conditions for and the consequences of using health care technology. It provides relevant information to managers, decision makers, and health care providers on the safety, economic efficiency, clinical effectiveness, as well as the social, legal and ethical implications of using new and existing technologies. Indeed, health technology assessment should be about what is best for the patient – medically and economically – and not about technology for technology's sake. The assessment is intended to help health policymakers, providers, and especially, health organization managers make decisions about whether to purchase and use new technologies, whether to replace old technologies with new ones, and what benefits they can expect to see.

With continuing innovations in technology and mounting cost pressures, the need for careful technology assessment will become even more acute. Suggestions have been made that, with rapidly expanding and changing knowledge and new technologies and treatments, health care providers have trouble keeping up with the knowledge being generated (Davenport and Glaser 2002). The best way to enhance their use of information is to "make the knowledge so readily accessible that it can't be avoided" (Davenport and Glaser 2002, 108).

In a similar vein, Morgan and Hurley (2002a) suggest that the inflationary pressures associated with health care technologies could be better controlled through policies that influence decisions made by health care providers in their clinical encounters with patients. In other words, for health care providers to use technology effectively, they need accurate and relevant information and the right incentives for its use when they are dealing directly with patients.

New health care technologies also have the potential to raise serious social and ethical considerations, particularly in areas such as biotechnology where issues such as cloning, eugenics or new genetic and reproductive technologies pose troubling and complex questions that go well beyond science or medicine. Accordingly, suggestions have been made that processes for technology assessment need to be transparent, accountable and allow for meaningful input from Canadian citizens (Lehoux 2002).

Provinces, territories and the federal government understand the importance of carefully assessing health care technology before it is implemented or used in the health care system. This assessment is critical to ensure the safety and effectiveness of the technology and also to get the best value and clear improvements in health outcomes for a substantial investment in new technology.

At the provincial level, several provinces have established health technology assessment agencies to provide policy advice and to guide decisions on health technology. These provincial bodies have built a strong reputation for effective work, but they face two challenges: first, they have limited assessment capacity (in both financial and human resources) and second, their efforts to disseminate their assessments along with clinical practice guidelines and care protocols are insufficient (Lehoux 2002). Consequently, there is a significant gap between the work of these assessment agencies and the decision makers and planners making decisions on the uptake of new and existing technology.

The provinces, territories and the federal government have also worked together to establish and fund the Canadian Coordinating Office for Health Technology Assessment (CCOHTA). CCOHTA's role is to co-ordinate health technology assessment across the country, to facilitate information exchange, pool resources, co-ordinate priorities for health technology assessments, minimize duplication as well as conduct its own technology assessments in areas where gaps exist. Despite its extensive mandate, several reports and studies have pointed to the need to strengthen CCOHTA's co-ordinating role (McDaid 2000; HC 1999a; Battista et al. 1995). As set out in Chapter 2, this can be achieved by having the Health Council of Canada assume the current responsibilities of CCOHTA.

Overall, there are a number of obstacles that prevent maximum utilization of health technologies and their assessments in Canada.

- Not enough attention is paid to identifying and setting priorities for assessing emerging health technologies. In particular, there is a need for a cross-country early warning system to support future development and diffusion of new health technologies.
- The overall level and scope of health technology assessment has been limited compared with other OECD countries. For example, there currently is no formal process for evaluating all telehealth applications and there has been only minimal technology assessment of PET (positron emission tomography) scanners, in spite of the fact the equipment has been in use in Canada for over 20 years.
- Health technology assessments are often not sufficiently comprehensive, either because they fail to fully consider the social, legal and ethical implications of the use of health technologies, or because they fail to provide sufficiently detailed economic evaluations. This may explain, in part, why health technology assessments have, so far, had a marginal impact on resource allocation decisions. Assessment agencies have also had limited contact with decision makers, planners and health care providers, and decision makers and planners have not made effective use of the assessment materials provided to them.
- There is a lack of relevant research on the relationship between health technologies and overall improvements in health outcomes. Decisions about purchasing new technology are too frequently made without knowing the impact of that technology on addressing population health needs.

- Decisions regarding the uptake and diffusion of technologies are primarily taken at the provincial, territorial, regional health authority or individual hospital or health program level with only limited co-ordination across or within jurisdictions.

Expanding Health Technology Assessment in Canada

The proposed Health Council of Canada should have a two-fold mandate in the area of health technology assessment. First, it should increase the overall technology assessment capacity in Canada. Second, with CCOHTA being folded into the Council, it will be able to continue to share assessment information among jurisdictions. Clear linkages should be developed between the Health Council of Canada and the current work being conducted at the intergovernmental level in setting up shared sites of excellence for low volume surgeries such as pediatric cardiac surgery and gamma knife neurosurgery (FMM 2002).

Given finite resources in the health care system, the Council should facilitate intergovernmental collaboration in the development, co-ordination and implementation of a health technology strategy to guide more efficient financing, management and utilization of technologies within the Canadian health system, with a long-term goal of assessing all health technologies in use across the country. This strategy would:

- Establish a framework for the overall management of technologies within the health system, with priority on assessing health technologies that impact rural and remote health delivery (e.g., telehealth applications) and primary health care change;
- Explore the possibility of harmonizing financing for the acquisition, upgrading and maintenance of high-cost technologies such as diagnostic imaging technology, including MRI (magnetic resonance imaging) and CT (computed tomography) scanners;
- Develop a targeted plan for the adoption of specialized technologies that takes into account specific population needs, the availability of health human resources and the necessary infrastructure to support these given technologies;
- Address current gaps in our knowledge about the clinical benefits and cost-effectiveness of health technologies as well as the added value of improving health outcomes for Canadians in general and for people with certain diseases;
- Support the development of clinical practice guidelines based on evidence derived from health technology assessments either at the national or interprovincial level; and
- Strengthen training programs and ensure a stable health human resources supply to manage and appropriately use health technology. (This links with the Council's overall work on health human resources as set out in the following chapter.)

Increased health technology assessment should serve as a driving force to encourage the adoption and implementation of appropriate health technologies. It should ensure that provinces and territories are keeping pace in adopting new technologies and that health professionals and decision makers use technology assessments to guide their decisions. In future, the Health Council may want to consider ways of seeking input from Canadians on issues where new health technologies have significant ethical, moral or social implications.

BUILDING CANADA'S HEALTH RESEARCH KNOWLEDGE BASE

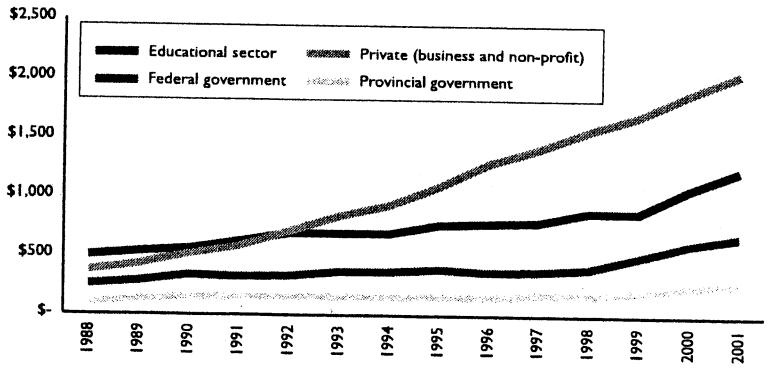
RECOMMENDATION 14:

Steps should be taken to bridge current knowledge gaps in applied policy areas, including rural and remote health, health human resources, health promotion, and pharmaceutical policy.

Canada's health research infrastructure consists of a rich and diverse network of individual scientists, academics and organizations. This research is conducted by individual university-based scientists and researchers whether working alone, in groups or networks, in research and scientific institutes, and perhaps most importantly, in teaching hospitals across the country. Funding for this research comes from federal and provincial arm's length granting bodies, from private sector companies such as the pharmaceutical industry, and from non-governmental agencies such as the Canadian Cancer Foundation and the Heart and Stroke Foundation that fund research on specific diseases. The vast majority of this research, and the funding for it, are dedicated to biomedical and scientific research aimed at disease prevention, treatment and analysis. Canada has a long tradition in excellence in clinical research. From the historical achievements of Banting and Best in discovering insulin to modern research on genetics, Canada has an impressive community of dedicated clinical researchers. In 1997, the $36 billion life sciences industry in Canada accounted for 86,000 jobs and is expected to grow to 130,000 jobs by 2003.

On the whole, Canada has seen an increase in health-related research and development expenditures since the early 1990s (see Figure 3.1). Federal funding for health research and development has risen from $255 million in 1988 to $674 million in 2001 (Statistics Canada 2001a).

Figure 3.1 Distribution of Health-related R & D Expenditures in Canada ($Millions), by Source of Funds, 1988 to 2001



Source: Statistics Canada 2001a.

In 2000, the federal government established the Canadian Institutes of Health Research (CIHR) with the primary objective of strengthening and integrating the health research infrastructure in Canada. CIHR is comprised of 13 organizations that support and link over 6,000 researchers across disciplines, sectors and regions. These organizations and researchers address issues ranging from biomedical and scientific research into cancer, genetics and diabetes to Aboriginal health, gender and health policy.

Taking the Next Steps to Expand Our Knowledge Base

Health research has played an essential role in the history of the public health system and will continue to do so in the future. With the variety of different funding agencies and bodies in place across the country, there are sufficient resources for institutes and their partners to conduct necessary research and evaluations, and disseminate results. In spite of this, there are a number of important problems and challenges within the health care system that currently receive insufficient attention within the scientific community, among governments and health researchers. On several occasions, the Commission was struck by the minimal amount of information available on issues as vital as rural and remote health and health care delivery, or interprofessional collaboration in primary health care settings. Health research challenges in these and other applied research areas require immediate attention and an associated investment of resources, both human and financial.

To this end, the Commission recommends that four Centres for Health Innovation for applied policy research should be created as soon as possible by the Canadian Institutes of Health Research. The federal government has increased CIHR funding substantially in recent years and appears sympathetic to CIHR's desire to see that funding rise to $1 billion per year in the next few years. The Commission supports this direction. If this occurs, the CIHR should consider setting aside $20 million to fund the proposed Centres for Health Innovation, at a modest cost of $5 million for each centre per year. This cost is based upon the existing costs of the current policy-related institutes of the CIHR. The following four centres should be established:

> *"The biggest risk to public medicare in Canada is, in fact, the risk of failing to innovate."*
>
> DAVID MCKINNON, ONTARIO HOSPITAL ASSOCIATION. SUSTAINABILITY POLICY DIALOGUE.

- **Rural and remote health issues** – The CIHR has already committed $5.2 million and the federal government has committed $1 million to research related to challenges faced by rural and remote communities. However, research to date has been conducted on a piecemeal basis. Rural health researchers have tended to work in relative isolation, just like the people and communities they study. A rural health agenda should be developed to address issues like health conditions and determinants, healthy behaviours, delivery and organization of services, and health status of people living in rural, remote and northern communities.
- **Interprofessional collaboration and learning** – Despite increasing calls for interprofessional collaboration, particularly in relation to primary health care, there is limited research on effective ways of implementing new mixes of skills and providers in health care delivery settings. New work environments and new divisions of labour call for new approaches to collaboration among health care providers in order to maximize the use of the health workforce. There also is limited information about the health care workplace in terms of its organization, planning, the nature of group practice, payment

mechanisms and incentives, and professional responsibility. A Centre for Health Innovation on interprofessional collaboration could go a long way in developing and disseminating best practices in the area of interprofessional collaboration to support primary health care.

- **Health promotion** – Despite numerous studies highlighting the merits of wellness and prevention in improving the health of individuals, organizations have yet to devote sufficient resources to make health promotion a priority. A centre for health innovation focusing on health promotion would support the development of programs aimed at improving individuals' physical and mental health as well as targeting prevention efforts and services in the Canadian population.
- **Pharmaceutical policy** – Greater emphasis needs to be placed on pharmaceutical policy research in order to support integration of prescription drugs into the health care system. Independent pharmaceutical policy research would help ensure that Canadians are getting the best value for their investment in drugs. A new Centre for Innovation on Pharmaceutical Policy would serve as a vehicle for evaluating pharmaceutical policy, disseminating best practices, and providing objective and reliable knowledge to the Canadian public. While pharmaceutical companies would continue to do their own research and development activities, the Centre for Health Innovation on pharmaceutical policy would ensure that policy-oriented research is as free from commercial influence as possible. The Centre could also play an important role in issues related to ethics, particularly in the relationship between the pharmaceutical industry and ongoing pharmaceutical research.

"Research is essential to a cost-effective, innovative and sustainable health care system."

CANADIAN INSTITUTES OF HEALTH RESEARCH 2002. WRITTEN SUBMISSION.

As suggested by the CIHR, these Centres for Health Innovation should be established with a mandate to "engage government, industry, community groups, health charities and others to foster and disseminate a culture of innovation and evidence-based decision-making across the health care system" (CIHR 2002, 20). CIHR would be responsible for the establishment, oversight and evaluation of the performance of these new centres. The Centres for Health Innovation should also be closely linked to the ongoing work of the Health Council of Canada, particularly in relation to its role in providing regular reports to Canadians on the performance of the public health care system.

Once these initial Centres for Health Innovation have been established and have demonstrated their effectiveness in encouraging and supporting both research and innovation in key areas, consideration should be given to establishing future centres in the following areas:

- patient safety
- mental health
- telehealth
- genomics and proteomics
- chronic disease management

Forging Better Linkages

The primary value of these centres would be to inform and guide policy decisions. Unfortunately, current structures and mechanisms within the health care system do not promote this kind of linkage (Lomas 2000). The proposed Centres for Health Innovation will help to bridge that gap in certain areas. In addition, there is a need for a more global approach to establishing and maintaining linkages between researchers and policymakers. One way of doing this is to encourage secondments of individuals to "work in each other's world." In this way, researchers would gain experience in the policy environment and policymakers would gain a better understanding of the research domain. Over the longer term, these secondments will help to ensure more effective dissemination of research and analysis and its use in guiding health policy decisions. The Canadian Health Services Research Foundation should be tasked with this initiative.

Another important linkage is with research initiatives around the world. While much of our focus is and should be on health and health care issues here in Canada, many of the issues we face today are also faced by countries around the world. Much of what we hear on the research front comes from studies in the United States. But the fact is, Canada's health care system has more in common with health care systems in European Union countries, Australia or New Zealand. This sets us apart from other countries in North and South America and highlights the need for us to look more carefully at work being done abroad. CIHR should be responsible for establishing deeper linkages between Canadian research efforts and research efforts and results in other countries around the world. In particular, linkages should be formed with the World Health Organization, the European Observatory, and research organizations in the European Union, Australia and New Zealand.

WHAT DOES THIS MEAN FOR CANADIANS?

Canadians understand the importance of knowledge and ideas in developing new solutions. They understand the need to harness the combined potential of knowledge, information and technology to improve health and health care for patients, permit better evidence-based decision making to support citizens, health care providers, policymakers and managers, and find new treatments and cures.

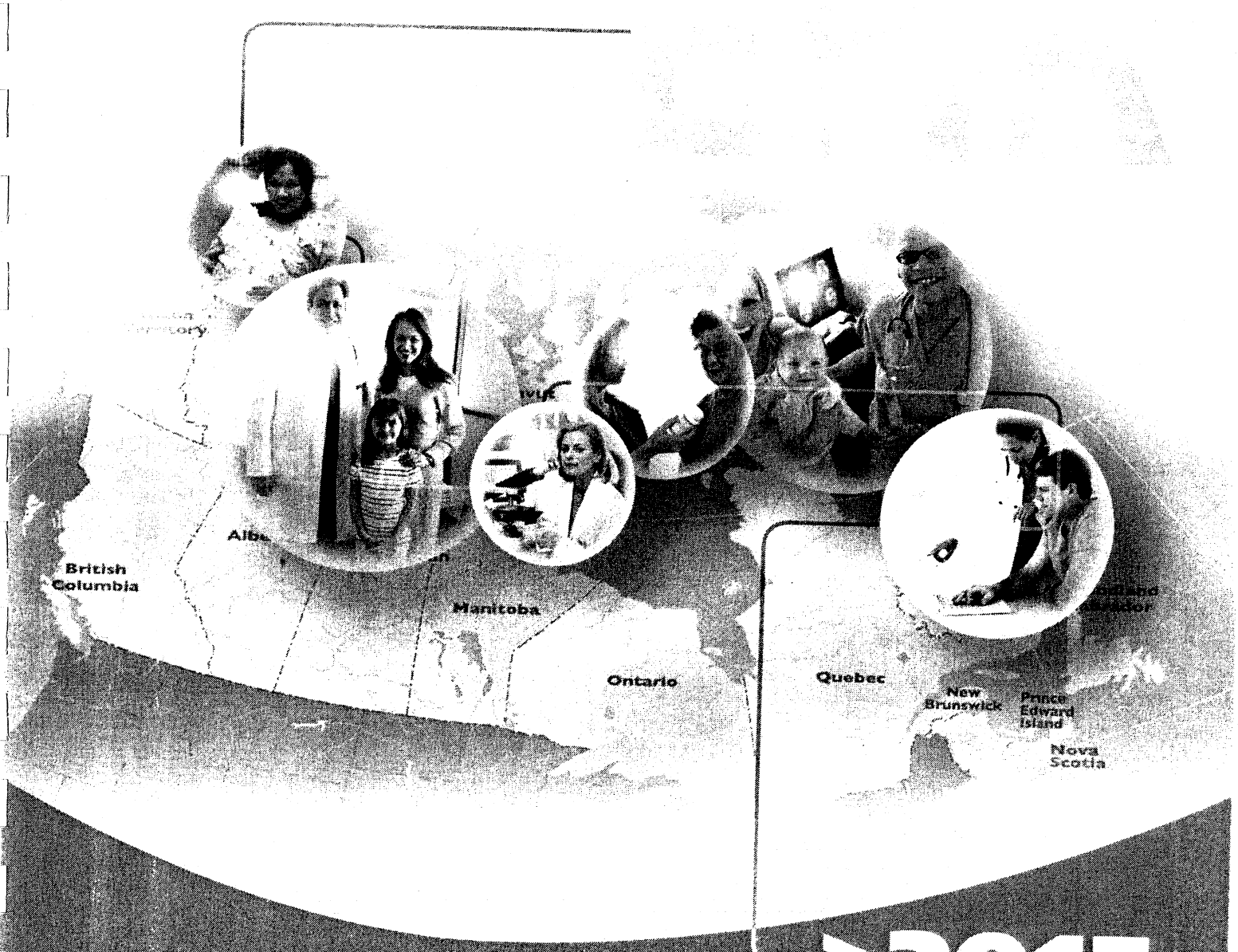
With the recommendations in this report, Canadians can expect:

- A 21st century information and evidence infrastructure that is responsive, adaptable, and sustainable over the long term and meets the changing needs and objectives of Canada's health care system;
- More accessible access to information and analysis on the performance of the health care system and the health of Canadians;
- Better access to personal health information as well as access to a wealth of trusted and reliable health information to make informed choices about their own health;
- Clear rules for protecting the privacy and security of their health information;
- Assurance that their health care providers have access to complete information about their health as well as the latest information on health treatments, protocols and guidelines; and

- Access to the best and most appropriate health care technology combined with assurance that new technology has been carefully assessed.

With the necessary investment and infrastructure, Canada can tap the full potential of research, knowledge and technology. This comprehensive strategy will put Canada at the forefront and ensure that we continue to develop, explore, and implement new ideas and new technology to improve Canadians' health and the health care system.

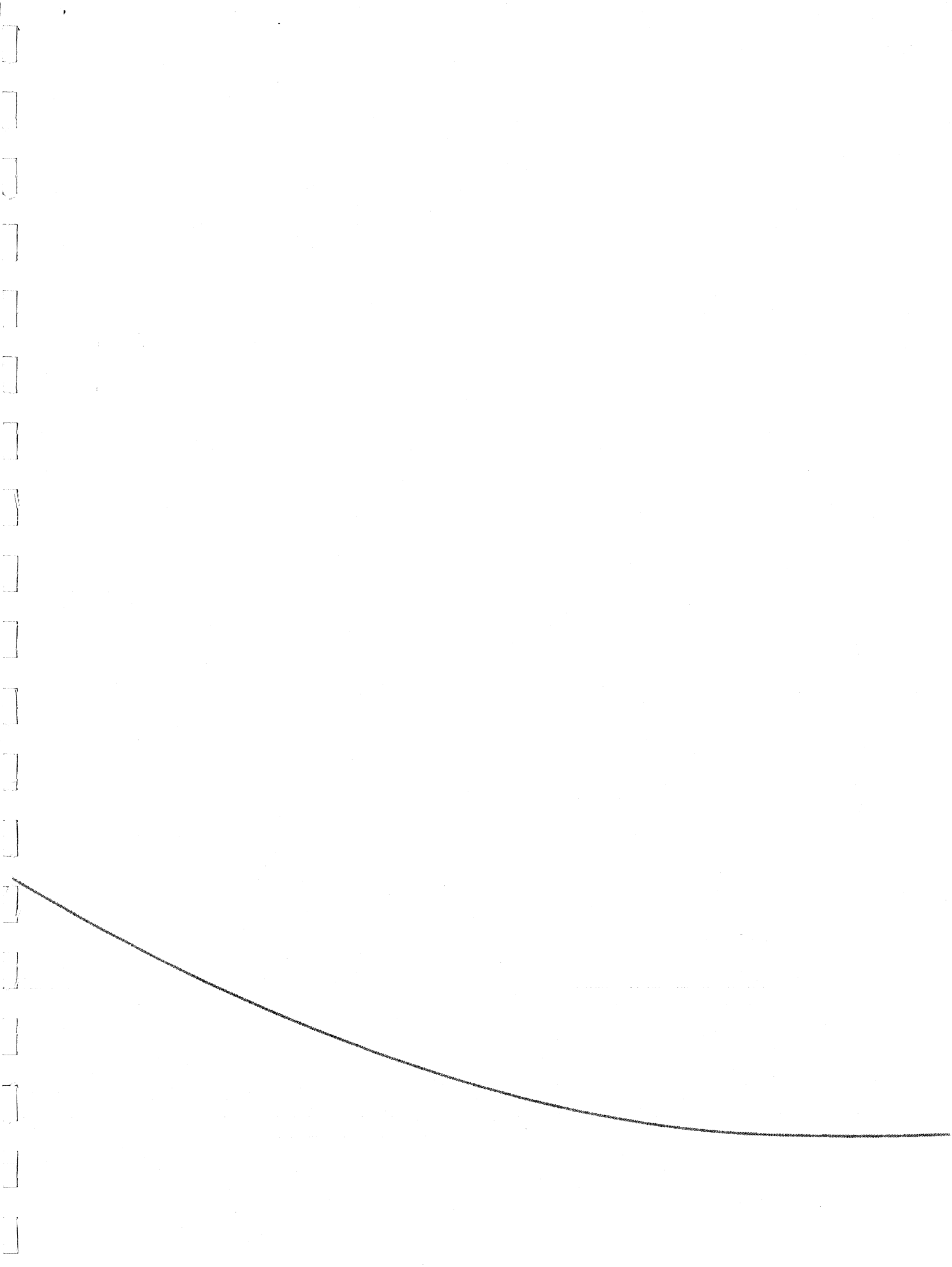
Tab 2



>2015

advancing Canada's next generation of healthcare

Canada Health Infoway | Inforoute Santé du Canada



Contents

Foreword

Reduced wait times. Increased patient participation in health care. Efficient chronic disease management. Improved access to care in remote and rural communities. Few adverse drug interactions. Better prescribing practices.

This is the future of health care in Canada. Since 2001, Canada Health Infoway, along with its partners, has been working to deliver a safer and more efficient healthcare system through electronic health records (EHR). Considerable progress has been achieved since *Infoway's* inception and promising advances are on the horizon. But *Infoway's* funding is limited. Clearly, more needs to be done to provide a healthcare infostructure across all points of care.

Recognizing this, *Infoway's* Board asked the organization to develop a comprehensive health IT strategy for Canada to guide further investment over the next 10 years. As part of this process, McKinsey & Company was commissioned to provide an independent fact-based analysis as an input to the development of the plan. More than 100 stakeholders from across Canada and from all areas of the healthcare sector were consulted. McKinsey heard from deputy ministers and health region executives, hospital CEOs and CIOs, clinicians, patients, health associations and government agencies.

What emerged as a result of this process was a comprehensive strategy – a vision – to guide the next 10 years of investment in healthcare information systems and identify areas benefiting from a pan-Canadian approach.

2015: Advancing the Next Generation of Health Care in Canada summarizes the key findings and conclusions from the strategic planning effort. More importantly, it serves as a roadmap for advancing Canada's healthcare infostructure and forms the strategic framework to guide *Infoway's* investments and priorities in the years ahead.

Introduction

Healthcare delivery in Canada is a large and diffuse operation. It involves numerous people and points of care – almost 400,000 general practitioners, local pharmacists, and nurses; more than 700 hospitals; and numerous community care centres.

These stakeholders increasingly recognize that successfully delivering care across all these settings requires managing not only the patient and expenditure flows but also the critical health information flow. And like all other $100-billion-plus enterprises, Canada's healthcare system needs to operate with a strong information infostructure to help ensure the delivery of quality care and to effectively manage the system's performance through adequate oversight.

Looking at only one aspect of the system – the more than one billion appointments and tests requisitioned and tracked primarily through manual processes today – it is readily apparent that our healthcare system needs a new approach to help lower costs, speed up access, and lessen the incidence of inappropriate decisions stemming from a lack of "available" information.

In addition to the system's "operators" and "managers," patients and the public are increasingly demanding more information and support to help them navigate the system and, in many cases, to more proactively manage their own care. They expect more personalized care, better access to specialists and GPs, and more transparency on the status of their health and treatment plans – all of which would be facilitated by an information infostructure.

"There are so many people involved in care that communication is a large challenge. We need information that is more easily shared among providers. It saves time and helps us deliver quality care to our patients."
– Clinician

In the future, the need to coordinate and manage information will become more crucial as:

- **Patient consumerism continues** to raise demand for transparency and timely delivery of health care, more self-care options, and alternative service delivery options (e.g., tailored solutions 24/7 at convenient locations, such as in the home).

- Canada's aging population and Canadians' health status drive an **increased incidence of chronic diseases** (e.g., diabetes) and an **increased need for ongoing cancer care.** By their nature, these types of conditions require managing a patient through many different care settings for extended periods of time, rather than just through "traditional" acute care interventions.

- **The shortage of general practitioners** creates a more sporadic pattern of care across multiple channels (e.g., walk-in clinics, acute care emergency settings, specialists) in which the system can no longer rely on the GP as a single point of integration to generate and manage a holistic view of the patient over time.

- Care settings continue to **shift from acute to home care and other alternatives**, particularly for more complex and information-dependent treatment decisions such as chronic disease management. This will require further coordination across centres that traditionally lack information technology capabilities and the ability to request support as well as review the quality of care delivered.

- **The rising costs of health care** and **continued funding and human resources constraints** demand significantly higher levels of performance management by the system to drive improvement and to ensure its sustainability.

> "We're not in the healthcare business; we're in the information management business. We should start thinking as information managers dealing with healthcare information, and think about the tools we need to do it properly."
> **– Health Region CEO**

In light of these pressures, the stakeholders – deputy ministers, regional CEOs and CIOs, key hospital CEOs and CIOs, as well as physicians and nurses – strongly expressed their belief in building a **standardized electronic health record (EHR)** for patients. The electronic health record, containing **critical health information** and **linked across sources of care delivery within a jurisdiction**, is paramount to delivering healthcare today and in the future. They also believe that, while not sufficient, the electronic health record represents an important enabler for achieving the longer-term goals of:

- Delivering superior quality care across the system through timely access to accurate information and improved decision-making support

- Enhancing ongoing disease management for chronic and longer-term care by facilitating systematic follow-up, a higher level of patient involvement and education, and more guideline-compliant treatment

- Providing critical elements of the information required to manage wait times and improve patient access by triaging patients and scheduling according to urgency across the entire domain of qualified providers

- Ensuring the system's long-term sustainability through enhanced performance management of cost, quality and access, as well as management of critical resources

- Enabling patient self-care and remote care

- Controlling system risks to the population from pandemics or other health issues.

These managers and providers also consistently believe that Canada, for the most part, is on the right path; that significant value has accrued from developing elements of the electronic health record solution at a pan-Canadian level; and that progress has been made in key areas (e.g., standards setting).

However, they have expressed concerns about a number of barriers that need to be overcome to achieve the vision and realize the full value of the health infostructure. These barriers are:

- Inconsistent and sometimes insufficient commitments over time by federal and some provincial jurisdictions to fund the completion of the health infostructure
- The lack of a truly compelling "story" (for politicians, physicians, and the public) about the urgent and crucial need to build the health infostructure
- The inability to fully illustrate the impact (although all believe the benefits are there) and provide proven case studies
- The challenges of driving implementation and user uptake, including redesigning basic processes to unlock the full value of the system investment and providing the resources to ensure successful implementation and change management.

Within this context, the *Infoway* effort has sought to develop a vision for a longer-term health infostructure for Canada that puts the creation of an electronic health record infostructure within the context of the broader health system demands and to identify the critical areas within that strategy where the continued development of a pan-Canadian approach may make sense.

Accordingly, the remainder of this document:

1 **Presents** a summary of the progress Canada has made in achieving its original objectives in developing a common health infostructure

2 **Sets a vision** for the integrated health infostructure required in Canada, based on the current and emerging health business needs

3 **Outlines five priorities** within this broader vision to focus on for 2015.

1. Current State Assessment

"We need this information. We can't realize our goals without it."
– Hospital CEO

In 2000, as part of the *First Ministers' Agreement*, Canada's political leaders identified as one of their top healthcare priorities the development of appropriate health information and communications technologies, including an interoperable electronic health record for use within and accross jurisdictions. This commitment was subsequently reinforced in the 2003 *Accord on Healthcare Renewal* and the 2004 *10-Year Plan to Strengthen Healthcare.*

To address the health infostructure priority, the Government of Canada announced in September 2000 that it would "invest $500 million immediately in an independent not-for-profit corporation [Canada Health Infoway] mandated to accelerate the development and adoption of modern systems of information technology, such as electronic patient records, so as to provide better healthcare." In 2003, an additional $600 million was allocated to *Infoway* followed by an additional $100 million in 2004 – for a total of $1.2 billion.

The remainder of this chapter describes *Infoway*'s mandate, approach, progress to date and benefits already accrued, and discusses the need for a next stage of development.

Canada Health Infoway's Mandate

In 2000, *Infoway* was given a mandate to build the foundational elements of an interoperable electronic health record infostructure, with the direction to "accelerate the development and adoption of modern systems of health information and to define and promote standards governing the health infostructure to ensure interoperability" *(Figure 1).* This mandate was reinforced in 2003 with the addition of the $600 million toward the EHR core mission and telehealth. *Infoway*'s ability to work collaboratively with the jurisdictions was further recognized in 2004 through the $100 million provided for the development of a pan-Canadian public health surveillance system. Over time and with the support of its members, *Infoway* translated its initial mandate into the core objective of providing electronic health records to 50 per cent of the Canadian population by 2010.

The goal of the pan-Canadian approach is to:

- Ensure the electronic health record elements are built with consistent standards, thereby enabling future interoperability within and across jurisdictions and simplifying the movement of knowledge and people across jurisdictions
- Serve as a catalyst for new infostructure developments and ensure common platform quality across all jurisdictions
- Where possible, encourage cooperation, thereby eliminating redundancy and duplicative efforts in systems design, vendor negotiations, etc.
- Reduce long-term costs and implementation time by leveraging scale and cross-jurisdictional knowledge.

When complete, the electronic health record will facilitate the sharing of key clinical data across the continuum of care while protecting the privacy and confidentiality of the information. It will include patient and provider registries that allow for unique identification of and information on diagnostic images, laboratory test results, medication profiles, hospital clinical reports, immunization history, and infectious disease reports. The electronic health record will be accessible from various points within a jurisdiction – acute care hospitals, ambulatory clinics, community health centres, and physician offices – so that an individual care giver, at a minimum, will be able to view a patient's record.

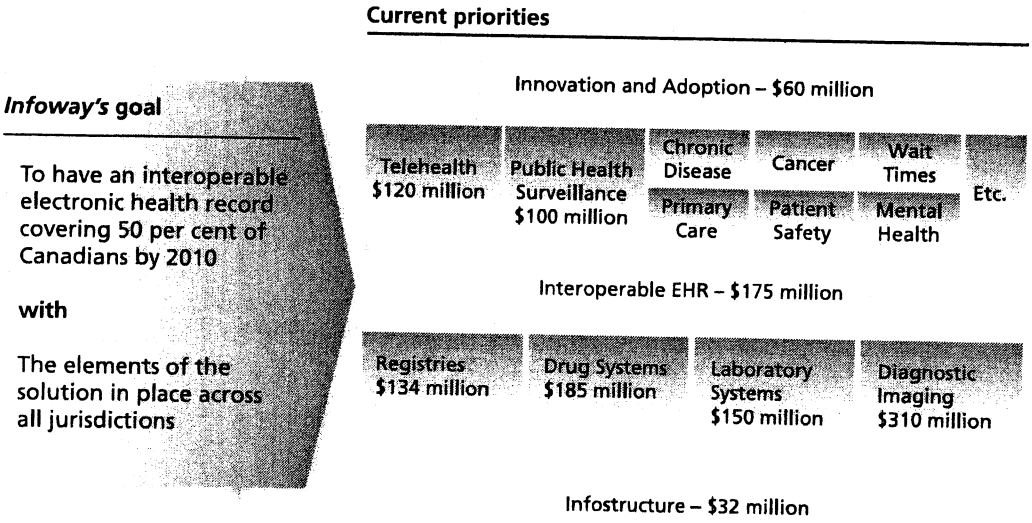
This represents a significant step forward. GPs, enabled with a computer, will be able to follow their patients' care and alert hospital physicians of idiosyncratic patient characteristics. Care givers will be able to access crucial information at any time so that, for example, an emergency room physician will not have to rely on a severely sick patient's recall of his or her drug regimen. Hospital throughput will be improved as several physicians in a hospital will be able to access a patient's file and test results (e.g., a diagnostic image) simultaneously, eliminating an important bottleneck. And patients will be able to avoid duplicative tests and will no longer have to provide the details of their medical histories over and over again.

Distinct Approach

While *Infoway* was being formed and funded, many other countries were also recognizing the value in creating a shared electronic health record to exchange information across care settings. Accordingly, two basic architectures emerged: hub-and-spoke repository and point-to-point information exchange.

Figure 1

INFOWAY'S GOAL AND INVESTMENT PRIORITIES



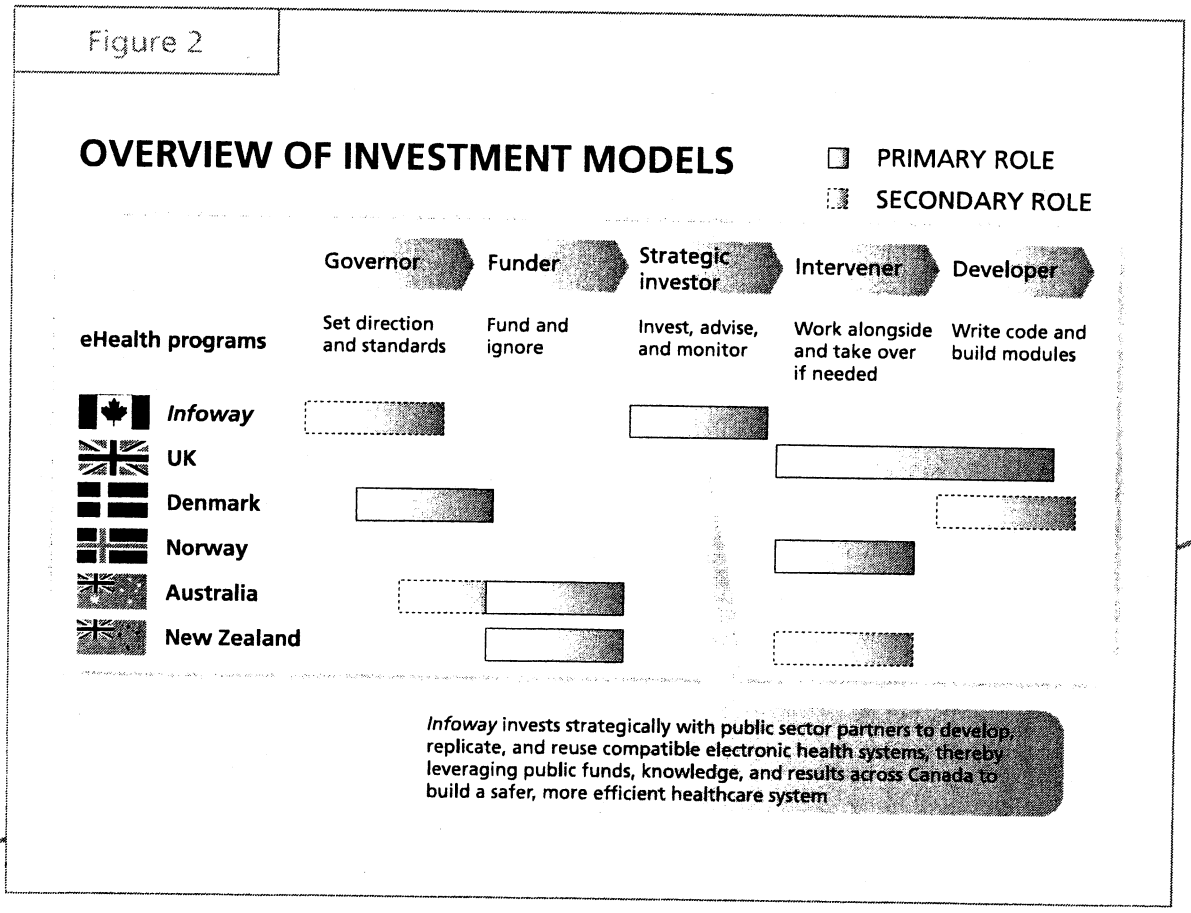
Canada chose to create a series of ***hub-and-spoke repository systems.*** They collect and store copies of critical health information in jurisdictionally coordinated repositories. This enables a care giver (if enabled with a computer) to view and access consolidated, timely information easily. The United Kingdom, Norway and the U.S. Department of Veterans Affairs and Kaiser Permanente, a large American healthcare organization, have taken similar approaches.

Australia, Denmark and New Zealand chose a different approach to their architecture — ***a point-to-point information exchange system.*** Each provider maintains its own database and shares elements of information as requested. As a result, if a doctor wants to see a patient's complete drug history, he or she makes a request to view the information to all the relevant care givers (e.g., GPs, specialists, acute care settings).

Both approaches have a common objective: to streamline the flow of health information to deliver higher quality care, improve services, and reduce costly errors and redundancies. Typically, the choice of architecture depended on the nature of the existing health infostructure. For example, countries with a high penetration of electronic medical record (EMR) systems within their general practitioner and specialist populations – such as Denmark – had a natural starting point for developing a decentralized, point-to-point system. Other governments or systems with greater financial control over hospitals and acute care settings, and without a strong existing EMR infostructure, tended to choose coordinated repositories for key health information.

These two system architectures will likely converge over time. The information exchange system is often much faster to roll out, faces

Figure 2



significantly less resistance from general practitioners and care givers, and provides savings on administrative costs by eliminating paper transfers. However, it does not have the facility for longer term disease management and quality of care offered by a repository system, nor does it allow for on-demand accessing of integrated patient records.

Consequently, Australia and New Zealand, after starting with an information exchange system, are now investigating moving toward a repository model. Furthermore, Denmark, although celebrating its successes, is beginning a process to add in elements of the repository model for systematic disease management (e.g., a chronic disease registry). However, it is experiencing difficulties because it lacks a common approach and standards within the existing data.

Perhaps the most unique element of Canada's approach to developing an EHR is the **strategic investor role** adopted to administer the allocation of the federal investment funds *(Figure 2)*. *Infoway*'s "gated" approach ties funding to achieving specific implementation milestones. The case for investment is made upfront, and funding is allocated based on the potential for success and conformity with agreed-to standards.

Furthermore, *Infoway* uses a collaborative, jointly funded, and shared governance model with members including the deputy ministers of health from across the country.

This model offers a number of advantages over traditional funding approaches. It:

- Allows pan-Canadian priority setting in a "depoliticized" environment
- Creates a sense of urgency and competition for funds which can spur planning and investment in the jurisdictions and focuses on delivering value for money
- Facilitates jurisdictional participation in setting a pan-Canadian direction and helps ensure that jurisdictional strategies are aligned with wider priorities
- Helps facilitate coordination around procurement, knowledge sharing, and benefits assessment
- Ensures funding decisions are based on a rigorous assessment of project proposals, risk management approaches, jurisdictional readiness, and connection to overall pan-Canadian objectives, thereby reducing project risks and increasing overall public confidence in the success of these investments
- Sets and enforces clear jurisdictional accountability for delivery and adoption (i.e.,release of funds depends on success potential).

Solid Progress to Date

"People who have never talked about an EHR in the past are talking about it now...the dialogue is active."
– Regional CIO

In line with its mandate, *Infoway* and Canada have made solid progress toward building the core infostructure of an interoperable electronic health record.

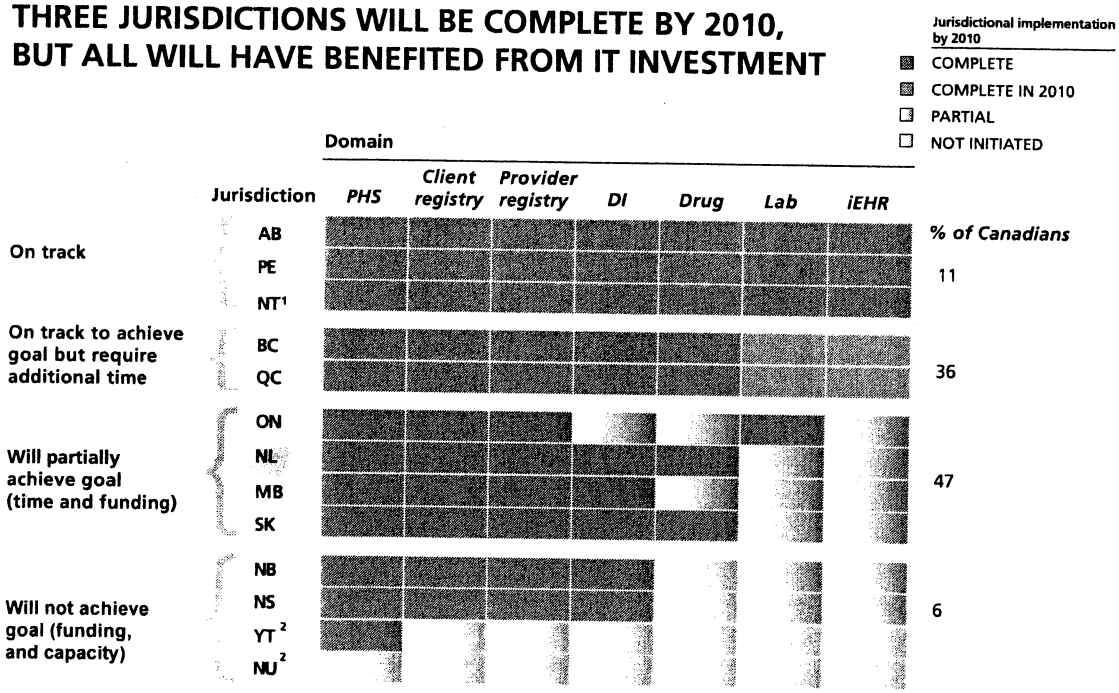
- By March 31, 2007, *Infoway* will have **approved more than $1 billion, or 85 per cent of its total funding**, across all its program areas, even though actual projected expenditures will come later because of the gated funding approach.
- **Implementation** will be **well underway across the country**, and while all jurisdictions will have benefited from having at least one element of the infostructure in place, Canada will be **stretched to achieve its goal of providing 50 per cent of Canadians with an interoperable electronic health record infostructure by 2010**. Only three of 13 jurisdictions will have the full interoperable EHR infostructure in place by the end of 2010 *(Figure 3)* and managing implementation risks will remain critical.

- By 2010, Alberta, Prince Edward Island, and the Northwest Territories (assuming progress continues at its current pace), should be on track to have all elements of the EHR basic infostructure in place. Implementation in British Columbia and Quebec will likely extend further into 2010. This means that in these jurisdictions, a provider should have the ability to retrieve a unique health record for a patient within his or her region. That record would contain historical drug, lab, diagnostic imaging, some hospital clinical reports, and immunization data – no matter where the information originated. And the patients in these regions would no longer have to remember their drug histories or repeat lost or unavailable tests. Together, these five jurisdictions represent 47 per cent of Canada's population.

- The remaining jurisdictions fall into two groups. Ontario, Newfoundland, Manitoba, and Saskatchewan will require more time and more funding to complete implementation. However, they will be well on track with a number of the core systems, including registries and diagnostic imaging in place by 2010, and will begin to see benefits from these systems. New Brunswick, Nova Scotia, the Yukon, and Nunavut will require significantly more time and resources to complete the electronic health records infostructure.

Figure 3

THREE JURISDICTIONS WILL BE COMPLETE BY 2010, BUT ALL WILL HAVE BENEFITED FROM IT INVESTMENT



1 Assumes shared service agreements – NT with Capital Health
2 Is discussing a shared services arrangement with BC and/or AB
3 Assumes 50 per cent of BC's and QC's populations will have iEHRs in place by 2010
Note: Full iEHR assumed to include PHS, Client and Provider Registries, DI, Lab, Drug, and iEHR; telehealth goals not tracked as part of iEHR goals
Source: *Infoway* staff interviews; *Infoway Jurisdictional Update*, March 15, 2006; team analysis

The U.S. Department of Veterans Affairs

The Department of Veterans Affairs (VA) initiated a system-wide re-engineering, during which it developed its Veterans Affairs and Technology Architecture (VistA), with an EHR at its core. The EHR operates across all inpatient and outpatient locations. Laboratory, radiology, medication information, as well as physicians' notes are simultaneously available. VA's EHR is also the mechanism for optimizing and standardizing clinical practice, providing real-time error checking and clinical decision support, and supporting their preventive medicine programs for chronic disease patients.

VistA has led to significant benefits, notably patient compliance to pre-screening and treatment protocols, which is among the best in the United States. For instance, cholesterol screening following a heart attack is now at 94 per cent, a 10 per cent improvement and the leading rate in the US. These benefits, combined with fewer medical errors, have led to little increase in treatment cost per patient between 1995 and 2004, while the average cost of health care in the rest of the U.S. has risen by 40 per cent.

The EHR has also allowed VA to explore previously unforeseen avenues for care improvements and cost containment.

> The EHR implementation has opened the door for second generation applications and benefits we had not thought of before. For instance, we have started to reduce our no-shows at the eye clinic by eight per cent through proactive tracking of patients, or even screening patients at remote locations.
>
> **– Clinician at the Roudebush Veteran Affairs Medical Center**

- Across all jurisdictions, stakeholders have identified a number of risks that will need to be carefully managed to ensure successful implementation. The availability of funds is often the most obvious, but additional funds alone will not be sufficient to meet the current mandate. Other bottlenecks are critical and potentially pose greater risk. They include the capacity of the system to implement the change given a perceived shortage of skilled healthcare IT workers and change leaders. There is also the need to balance the pace of change impacting the front-line clinicians.

- While comparing progress across countries is difficult because systems vary, **Canada appears to be on track to achieve its goals at a similar or faster pace than other countries profiled** – from launch to full implementation of both diagnostic imaging and laboratory systems. Furthermore, from a cost per capita perspective, Canada will have invested significantly less than Kaiser, Veterans Affairs, and the United Kingdom. However, building out our current infostructure to a system of comparable functionality – including additional decision support systems, order entry systems, scheduling, and patient portals – will bring the funding more in line with that of these other jurisdictions.

Case Remains Strong with Benefits Beginning to be Visible

As discussed, most stakeholders articulated the case for an interoperable electronic health record as a "cost of doing business" in today's increasingly information-based, multi-site health delivery environment. This is consistent with the views of the leadership of various other countries and Canadian academic institutions that have demonstrated that the current generation of technology is viable and can be accepted by physicians once an initial learning curve has been mastered.

While *Infoway* and the stakeholders have developed a benefits measurement framework, actual implementation and concrete measures are at least 12 to 24 months away. Still, there is a strong and shared belief that the case for implementing an interoperable electronic health record remains strong. For example:

- **Stakeholders perceive real value in building the baseline electronic health record.** The most significant value will come from improved patient care by enabling self-care, improving safety, and reducing drug interactions. They also believe that the EHR infostructure will improve workflow, speed up patient services, and free up doctors to see more patients. And they expect increased administrative efficiencies through eliminating paper-based systems, lost results, and duplicative testing.

- **Real tangible benefits are emerging.** Other healthcare systems are also beginning to realize benefits. The Veterans Affairs' VistA system *(see sidebar on page 10)*, arguably the world's most advanced large-scale EHR implementation, has shown significant improvement in all its prevention and treatment process metrics. And other organizations, such as the Cleveland Clinic, Partners Health, and Johns Hopkins, have conducted studies that consistently confirm the qualitative benefits for patient care.

- Fraser Valley in British Columbia *(see sidebar at right)*, where the diagnostic imaging system is in place across 11 hospitals, at least $4.5 million in cost reductions are being realized annually through lower film costs, productivity gains, and freed-up storage space (on an investment of $11.8 million). In Edmonton's Capital Health Region *(see sidebar on page 12)*, where the netCare integrated EHR system is in place across acute care facilities and viewer functionality is available in other care settings, lab tests requests by fax, paper, or phone have been reduced by 50 per cent. This system is being actively used by over 6,000 physicians and front-line care workers.

fraserhealth
Better health. Best in health care.

Fraser Health

Fraser Health has spearheaded physician enablement through the deployment of an integrated digital diagnostic imaging system in 11 hospitals across the health region. The system, using PACS technology, provides physicians with instant on-site and remote access to patient images, including x-rays, MRIs, CTs, etc., and currently processes more than 800,000 images annually.

> This technology enables a physician to access patient images even before the patient has a chance to walk out of the exam room. The benefits to a patient's health management are incalculable.
> **– Radiation technologist**

Thus far, the system has led to significant cost savings and cost avoidance valued at more than $4.5 million, resulting from reduced film costs, increased productivity, and freed-up storage space.

netCARE
Capital Health Electronic Health Record

netCare Capital Health

Capital Health has become a leader in healthcare with the deployment of its integrated EHR system across all acute care facilities. This EHR system, with more than 6,000 users, provides physicians with the ability to track their patients' test results and medication histories within the health region, regardless of the location/facility where a given treatment has taken place (i.e., physicians can view patient test results and medication history). In addition, the EHR tracks case information to help improve chronic disease treatment, as well as provide decision support (both synchronous and asynchronous), such as drug-drug interactions and dosage alerts.

The EHR system has led to significant benefits including a 50 per cent reduction in lab requests within 18 months of implementation.

> There's no doubt in my mind, none whatsoever, that today, the medicine I do, the care that I deliver to my patients, is far superior than five years ago...
>
> **- Physician**

The netCare system was first initiated five years ago as a stand-alone project and eventually developed into a full-fledged EHR system. Looking forward, Capital Health hopes to implement an enterprise-wide EMR.

- **Economic case remains sound.** While no complete economic cases have been fully documented and studied in Canada, preliminary estimates based on successes in similar healthcare environments suggest the business case remains sound. If the current mandate of implementing the basic elements of an electronic health record is achieved, Canada is estimated to be on track to realize $1 billion to $1.9 billion in annual benefits to the system through eliminating duplicative tests and, more importantly, reducing adverse drug events.[1] At this rate, the investment will generate positive cumulative returns of nine to 10 years[2]. These annual returns are in line with other jurisdictions' achievements.

That said, the case should not be made on business assumptions alone. The benefits from this upfront investment in the baseline infostructure have the potential to increase significantly, once the primary care providers are fully enabled (e.g., the integration of the GPs' electronic medical records). In many instances, this investment will realize much greater benefits in patient self-care, proactive disease management, reduction in wait times and overall performance management. Furthermore, the health infostructure will likely have much more impact when the front-line business processes are redesigned to capitalize on the investment.

1. Benefits were estimated by identifying economic drivers and triangulating estimates from a number of sources, including *Infoway*, Booz Allen Hamilton, international case studies, vendors, and the Canadian Medical Association. More information and detailed estimates are available upon request.
2. Payback includes all dollars spent since *Infoway's* inception and projected annual maintenance costs and assumes full adoption by practitioners. Payback on the interoperable EHR will vary depending on whether it is deployed to 50 or 100 per cent of Canadians. Summaries of the analysis are available upon request.

Yet the Journey is Far from Complete

Despite this strong progress in building the baseline infostructure, the shared understanding is that the healthcare IT journey is far from over. In particular, the country will need to pursue four initiatives.

1 **Complete the baseline electronic health record and extend its functionality and reach.** As discussed, although progress will have been made on providing 50 per cent of Canadians with an interoperable electronic health record by 2010, achieving the full goal will be unlikely within this time frame. In addition, the state of the infostructure by jurisdiction will vary significantly.

Completing the baseline infostructure will require extending the systems to cover 100 per cent of Canadians and extending and integrating (from view-only functionality) the EHR into the community care settings (e.g., general practitioner and specialist offices). This is where the majority of patient care is delivered today and where the patient expectations for change are greatest.

Completion will further entail extending the functionality to include order entry capabilities and other decision support elements. All stakeholders view these extensions as critical to achieving the desired results of improved quality and access and lower administrative costs.

2 **Build a case for ongoing support and secure funding.** While an electronic health record is viewed as a critical cost of doing business and a key managerial priority, politicians have not consistently articulated it as a specific policy priority.

3 **Bring key stakeholders – the public and front-line practitioners in particular – on board.** Long-term success requires building a strong demand for an electronic health record within both the public and the front-line practitioners. To date, the case for change has not been explicitly made or understood by these groups. Furthermore, thoughts on how to provide the information back to patients in an empowering way have been limited.

4 **Selectively invest in IT to enable the next level of "business needs."** In addition to the investments required to complete the electronic health record infostructure, other demands are being made – for example, for more extensive disease management and cancer care systems, enhanced pandemic and public health services, more extensive remote care, and shorter wait times.

The role an electronic health record plays in enabling or enhancing these additional business needs should be stressed and an approach developed to prioritize IT investments.

2. Integrated vision for health infostructure in Canada

"We have a history of under-investing in healthcare IT in this country. We need to increase our investments so we can deliver the quality and service we aspire to. It's what it takes to do business properly."
– Regional CEO

Managing a complex, interdependent $100-billion-plus health business requires managing information flows, as well as patient and resource flows. Without an integrated IT infostructure, Canada will struggle to meet the increasing demands of all its stakeholders to deliver superior care at a sustainable cost.

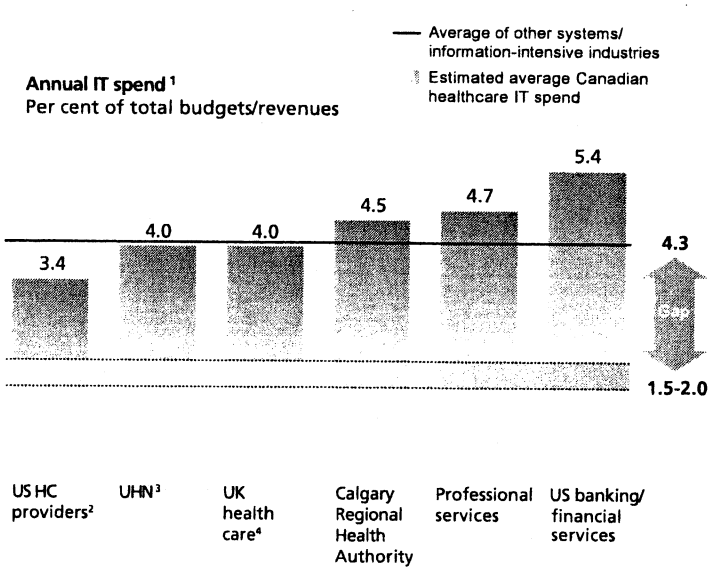
While it is difficult to estimate the actual spending on health IT in Canada, given its diffuse nature, estimates suggest that annual spending on building and maintaining the health infostructure lags that of other countries and other information-intensive sectors. It also varies considerably across Canada – from an estimated low of one to 1.5 per cent of total hospital budget in some parts of Atlantic Canada, to 1.5 to 2.5 per cent of total budget in Ontario hospitals, to a high of four to five per cent in the Calgary Health Region, which has developed and maintains an electronic health record for 6,000 users *(Figure 4)*.

Furthermore, concerns have surfaced that much of the total spending may not be optimal. For example, in jurisdictions without a strong regional infostructure, the **costs of development**

Figure 4

IT INVESTMENT LEVELS

- The EHR is not **consistently viewed as a political priority**
- Canada is **underinvesting in IT** relative to other healthcare providers and information management industries
  - Canada's healthcare system would rank No. 10 in the *Fortune 500*, is 3 times the size of the Royal Bank, and yet has limited ability to manage its information
- Additionally, **IT investments have often been fragmented** and one-off leading to **duplicated efforts** and the need for reinvestments



1 Operating and capital
2 Gartner estimate as percent of revenues; assume providers working on a non-profit basis
3 The University Health Network in Toronto, ON; spend is between 3.75 and 4.2%; on average; UHN operates slightly below 4%
4 Predicted to rise to 4% from 1.5% in 2004
Source: Information Technology Association of Canada, 2004; Gartner; interviews

and maintenance may be duplicated in many subscale operations across hospitals, doctors offices, and other care settings. As well, **non-standardized legacy environments**, such as the incompatible electronic medical record systems in many physicians' offices and incompatible hospital clinical systems, require costly custom integration to work with the electronic health record infostructure. This additional cost could have been avoided with upfront planning, coordination, and investment, which are less challenging than attempting a later integration.

Consequently, stakeholders voiced a strong need to create an integrated plan to guide investments in the future. This plan would need to strike a balance between creating the "ultimate solution," which runs a high risk of failure, and pursuing a decentralized, incremental approach, which would fall short in delivering the required technical standards and visible progress against goals. At the same time, the integrated plan would require flexibility to manage jurisdictional priorities.

"It's important to have an integrated vision. We haven't had one in the past, and we're suffering for it now. We're spending a lot of money to get our systems talking to each other – we could have avoided this."
– Regional CIO

Emerging Health Infostructure Vision

With the goal of simplifying the discussion yet creating a comprehensive view, the stakeholders developed an integrated plan to achieve Canada's health IT vision *(Figure 5)*. The infostructure can be categorized under three headings:

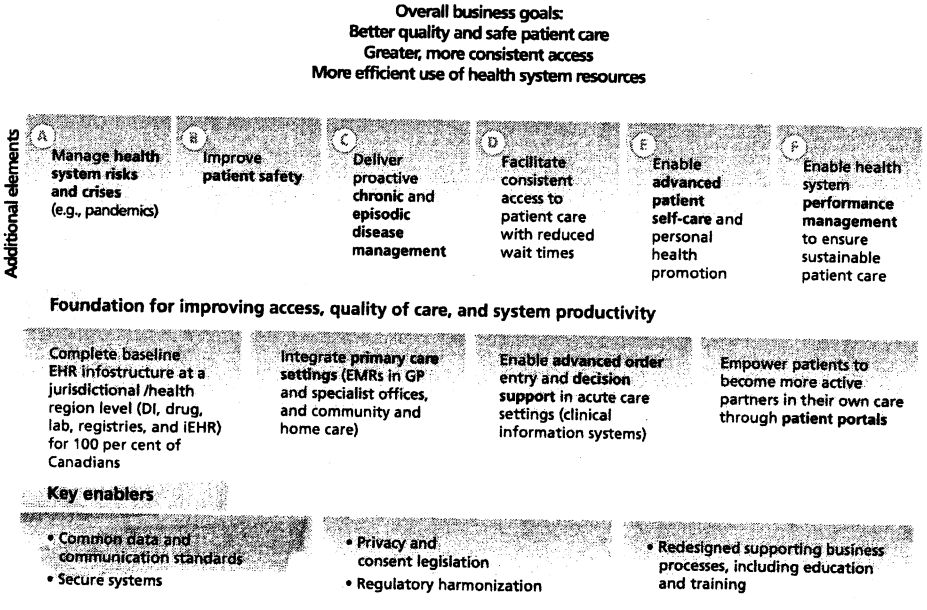
1 Foundational elements

2 Additional elements

3 System enablers.

Figure 5

VISION FOR HEALTH IT IN CANADA



This integrated IT vision is critical to enabling the system to make significant progress against its three main business goals: 1) continued enhancement of patient safety by eliminating errors caused by misinformation or delayed information and by encouraging greater communication across the continuum of care; 2) greater and more consistent access to health services by streamlining processes and freeing up capacity to reinvest in patient care; and 3) improved overall system sustainability by driving performance management and lowering cost of care.

1. Foundational Elements

While strong progress will have been made on building elements of the baseline EHR infostructure throughout the country and on providing 50 per cent of Canadians with an interoperable EHR by the end of 2010, achieving the full goal is unlikely. In addition, the state of the EHR infostructure in the jurisdictions will vary significantly.

Furthermore, completing the foundational infostructure will require extending and integrating (from view-only functionality) the EHR into regional community care settings (e.g., general practitioners), extending the functionality to include order entry capabilities and other decision-support elements in the acute care settings, and beginning to enable patient self-care.

The foundational next steps include:

- **Completing the baseline electronic health record infostructure at a jurisdictional level for 100 per cent of Canadians.** This would entail establishing the base systems across the remaining jurisdictions (beyond the five jurisdictions on track for completion by 2010); capturing the key patient information to enable providers to understand care history; and extending the systems to cover Aboriginal Canadians and other federally provided healthcare settings (e.g., the military).

- **Enabling seamless communication across the continuum of care and into community-based settings.** This would include integrating primary care physicians, specialists, and community care facilities (i.e., through EMRs).

- **Extending functionality to include order entry and other decision support elements in acute care settings to support the delivery of high-quality care.** This would help physicians stay on top of an ever-growing flow of medical knowledge by providing patient-specific information, including diagnostic and prognostic details, and particularly therapeutic suggestions and alerts with high sensitivity and specificity (e.g., drug interactions or special efficacy in ethnic groups). In addition, it would include pharmacy systems to improve the execution of drug prescribing and reduce medical errors and adverse drug events.

- **Empowering patients to manage their own care.** Even though this is not necessarily a significant driver of near-term returns to the system, stakeholders believe it is critical to begin now to engage the public and create demand for change. This would start with creating patient portals with self-care tools and basic EHR information where available.

All stakeholders consider these four elements "foundational" and the highest priority as they will:

- **Drive significant benefits to the system** by improving access and service through more coordinated communication and workflows across care settings, enhancing quality through reducing errors and adverse drug events, and making it easier for providers to practice proactive medicine. The foundational elements will also enable managers to control system resources and performance by lowering unit costs (e.g., through reducing films and repeated lab tests), freeing capacity, and making information available that can facilitate greater human resources flexibility and improved overall management.

- **Create the foundation that enhances the system's ability to pursue the business needs.** While the foundation on its own is not sufficient to address the entire slate of business needs (or always a pre-requisite for making more immediate progress against them), its elements are critical to capturing the full value associated with them. For example, while simple on-line case management tools can help chronically ill patients develop individual care plans, these tools are much more powerful when properly integrated with various systems. This includes integration with drug systems that notify specialists of any potential co-morbidities with drugs prescribed by other physicians, with lab systems that enable all providers to view patients' latest results, and with GP scheduling systems that alert an office to follow up with patients to support them and ensure compliance.

2. Additional Elements

The six additional elements address **key public and provider demands** and build on, or are strengthened by, the foundational elements.

They are:

- **Ensure health system preparedness to manage public risk.** This would involve data warehouses, immunization, vaccine, outbreak and disease surveillance, and alerts as well as workload management tools that help carry out faster, more coordinated responses to potential epidemics.

- **Continuously enhance patient safety.** This would include the advanced decision support elements in the clinical information systems and the electronic medical record e-prescribing tools described in the foundational elements, the data collection and research analysis tools enabled by the foundational elements, and the monitoring and reporting tools included in the performance management module. Together, these systems would enhance the quality of care and patient safety by reducing errors and adverse drug events through advanced decision support, more standardized treatment protocols, and more active performance management.

- **Provide chronic disease management.** This would extend the functionality resident within the electronic health record to ensure more proactive treatment and compliance with chronic diseases guidelines; faster, more efficient diagnoses through enhanced decision support systems; optimized treatment outcomes from using more standardized approaches, better screening, and remote care tools; and improved execution of therapeutic plans.

- **Facilitate access to patient care with reduced wait times.** This would create regional and provincial scheduling systems for online management and booking of care, registries to enable prioritization, increased 24/7 care through telehealth and online channels, logistical systems in acute care settings, and access to GPs and specialists to streamline referral processes.

- **Enable patient self-care and personal health promotion.** This would address the increasing need for patients to proactively manage their own health. Patients would move from passive care recipients to drivers of care provision. They would have access to advanced self-monitoring and self-treatments, including advanced telehealth applications, and would be able to track their own progress and educate themselves.

- **Ensure sustainability of the healthcare system through superior performance management.** This would include the key infostructure to track process and outcome metrics (cost, quality, and access) as well as resource management and purchasing management tools.

3. System Enablers

The final components of the vision are the system enablers:

- Establishing common data and communication standards
- Applying an appropriate privacy and consent legislative framework
- And, most importantly, redesigning the key business processes to realize the value from the IT investment, along with the supporting education and training.

While progress has been strong in some areas (e.g., standards), it has been inconsistent in others (e.g., privacy legislation). However, the biggest gaps are in business redesign and change management – both of which are critical to avoid "automating problems" and not resolving underlying process issues in parallel with systems implementation. The stakeholders are enthusiastic about developing a more systematic and coordinated approach for these enablers.

Figure 6

INCREMENTAL INVESTMENT TO COMPLETE THE VISION

		Incremental capital costs $ Billions
Foundational elements	Complete baseline EHR	2.2-2.6
	EMR to GPs/specialists	1.6-2.0
	Patient portal	0.1
	CIS	2.5-3.1
	Total foundational elements	**6.4-7.8**
Additional elements	Public health	~0.1
	Patient safety*	0.0
	Chronic disease	0.2-0.4
	Access/wait times	2.0-2.5
	Self-care	0.9-1.1
	Performance management	2.0-2.5
	Overlap**	-(1.6-2.4)
	Total business needs	**3.6-4.2**

Note: Costs are incremental, therefore, foundational costs already incurred by *Infoway* and the jurisdictions are not included. Costs are inclusive of change management but do not include: annual operating costs ($1.5 billion-$1.7 billion); community care enablement (~$3.7 billion), and business process redesign.

* Costs are incurred as part of foundational elements (EMR and CIS), public health (research), and performance management (monitoring and reporting)

** Costs overlap as some systems deliver multiple business needs but are only counted once in total costs

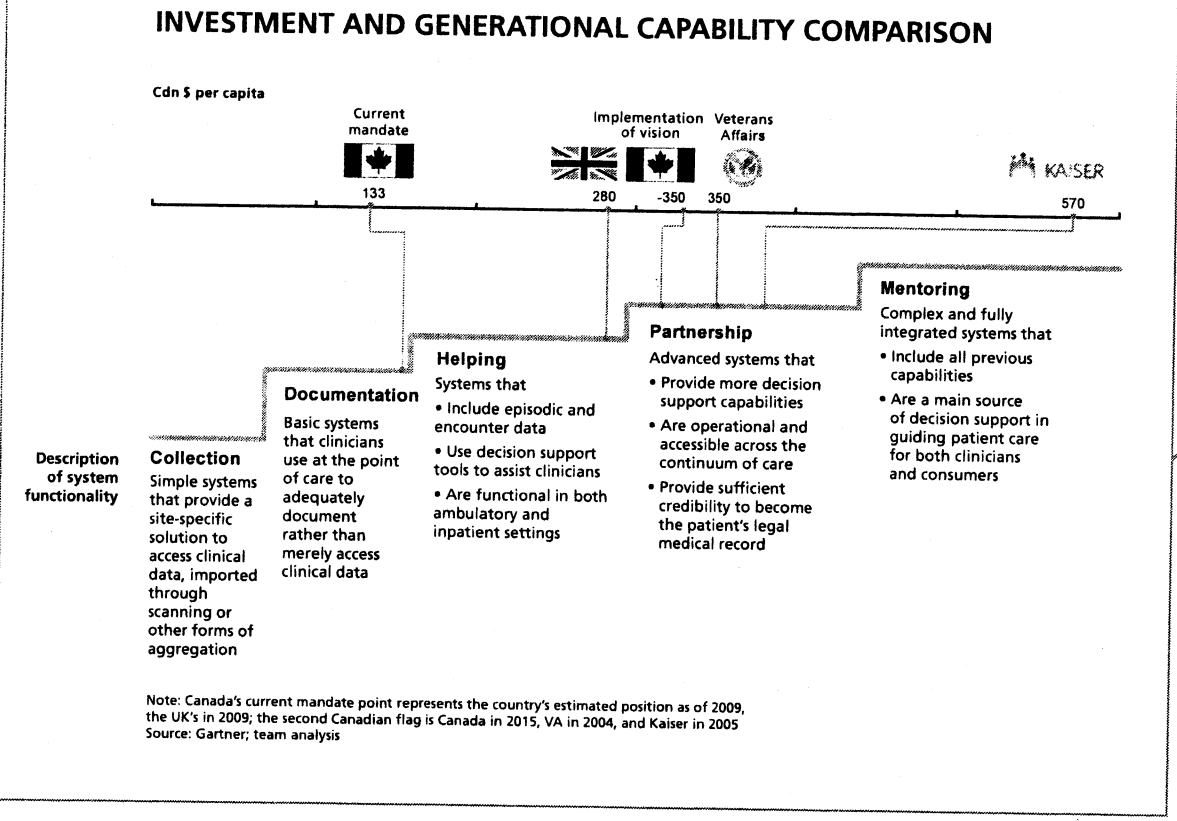
Case for the Full, Integrated Vision

The **total incremental cost** of this integrated vision over the next 10 years is estimated to be between $10 billion and $12 billion in additional capital, and between $1.5 billion and $1.7 billion in annual operating costs *(Figure 6)*.[3] This does not include the additional ~$3.5 billion to $4 billion cost to provide integrated systems to allied health professionals and the broader community care environment (e.g., all long-term care facilities, home care, public health, and mental health).

Spread over 10 years, these investments represent a total incremental IT spending of approximately two per cent per year on Canada's roughly $100 billion of public spending on healthcare. When combined with existing annual investment levels (estimated at 1.5 to 2.5 per cent), Canada will only be slightly below the average IT spending by other information-intensive industries (e.g., banks, which typically spend more than five per cent of revenue on IT). Furthermore, on a per capita basis, this represents approximately $350 for the full vision, in line with investments in comparable systems in the UK ($280) and at VA ($350) and Kaiser Permanente ($570) *(Figure 7)*.

3. Costs were estimated by identifying the systems required to enable each element of the vision and include initial systems acquisition and change management costs. They were derived and triangulated from a number of sources, including *Infoway*, Booz Allen Hamilton, Canadian Healthcare Technology, CIHI, international research, vendor RFP responses, and management consultancy benchmarks. Detailed estimates are available upon request.

Figure 7



The following sections highlight the infostructure's financial and other benefits, as well as the risks of non-investment.

1. Financial Benefits

This IT-enabled healthcare environment of the future promises a **number of tangible benefits.** These include real savings from eliminating duplicative or unnecessary tests and "paper" costs (e.g., radiology films and storage). They also include recouping future investment costs by freeing up capacity through improved process efficiency (e.g., reducing no-show rates for physician visits through scheduling systems).

The integrated benefits to the entire system are estimated to be $6 billion to $7.6 billion annually (in 2006 dollars), when all elements are in place. Roughly $5.2 billion to $6.2 billion will accrue from better resource utilization and $0.8 billion to $1.4 billion from a reduced unit cost[4]. This level of savings should provide a payback of between eight and 10 years, based on estimated rollout schedules and in line with the experiences at Veterans Affairs and Kaiser.

If fully captured and reinvested in the system, the benefits would also help slow the growth of overall systems costs and ensure the system's sustainability. For example, if the system were fully implemented today, the total annual benefits of $6 billion to $7.6 billion would have offset the average annual rate of growth in dollars over the same period.

2. Additional Benefits

In addition to having a solid business case, these investments will facilitate a number of additional benefits, including:

- Improving the patient care experience through a new sense of empowerment (e.g., full insight into one's own medical data through a patient portal) and service (e.g., reducing the need for duplicated information)

- Helping enable greater human resources flexibility and satisfaction by freeing up clinical and administrative time to devote to patient care and by making it easier, through standardized IT and business systems, for clinicians to work across different provider settings

- Speeding the development of evidence-based medicine through analyzing drug treatments and therapies, which can help contain the growth in pharmaceutical expenditures and improve patient outcomes.

Furthermore, the benefits for Canadians in pursuing this path will reach beyond healthcare. Leadership in the still-emerging healthcare IT industry will bring intellectual capital and associated high-skilled jobs. In addition, a rich combination of large-scale, standardized health data and the right research-oriented privacy guidelines could position Canada to shape medical thinking and clinical guidelines and, subsequently, attract the best medical and research talent worldwide.

4 Two types of quantifiable benefits were estimated: cost reduction, where real dollar savings can be captured (e.g., fewer laboratory tests, reduced film costs), and capacity creation, where productivity improvements can lead to treating more patients with the same resources (e.g., fewer hospitalizations because of adverse events). More information and detailed estimates are available upon request.

3. Risks Associated with Not Investing

As well as severely constraining the health system's ability to address the critical business goals identified, there are also additional risks associated with failing to make the needed investments or continuing to delay them. Specifically:

- Government will ultimately need to spend more money on IT if jurisdictions and providers make uncoordinated investments in building and upgrading or replacing non-compatible systems. It will also incur higher investments in front-line staff to maintain manual processes.

- Exposure to legal or ethical risks associated with medical errors resulting from a lack of accurate and timely information will increase. This could seriously undermine the public's confidence in the health system. Today, this breakdown in health information (e.g., drug interactions) is believed to contribute to up to 24,000 deaths in Canada each year – and this will be exacerbated as the number and nature of care hand-offs increases and the population requires more ongoing chronic care.

- Human resource challenges in rural areas and less IT-enabled jurisdictions will be further heightened, particularly as younger clinicians increasingly expect to work in computerized environments and will demand change or gravitate to centres that can provide these advantages.

- Providing health services, particularly complex medical treatments, to rural regions will become increasingly difficult if they are isolated from centres of specialization and do not have access to telehealth functionality.

- A continued lack of critical information to drive true performance management within a $100 billion business will further constrain the managers of the system in making the right tradeoffs and assessments.

- Canada risks stranding investments made in critical infostructure to date (e.g., in registries) as well as losing valuable knowledge and lessons learned from existing experience.

3. Emerging priorities for 2015

"We can't stay static. We need to ensure that the dialogue and momentum continue... and that we have a repository of expertise so we can share best practices across the country."
– Deputy Minister

While considerable progress has been made to implement the electronic health record infostructure, much remains to be done. In this chapter, we describe the continuing support for the pan-Canadian approach, explain how the priorities for 2015 were determined and outline each priority. We then summarize each one's anticipated progress by 2015.

Strong Support for Pan-Canadian Approach

Across this integrated vision, all stakeholders in the system consistently articulated a strong desire for a continued pan-Canadian leadership role, citing particular advantages in continuing the cross-jurisdictional dialogue and maintaining an integrated view of the desired end state and priorities. These advantages include:

- Accelerating the health infostructure dialogue
- Ensuring and following consistent standards in building the infostructure's foundational elements, enabling future interoperability within and across jurisdictions, and simplifying the movement of knowledge and people across jurisdictions
- Serving as a catalyst for new infostructure developments and ensuring consistent platform quality across all jurisdictions
- Where possible, encouraging cooperation, thereby eliminating redundancy and duplicative efforts in systems design, vendor negotiations, etc.
- Reducing long-term costs and implementation time by leveraging scale and cross-jurisdictional knowledge.

Need for Priority Setting

While the integrated health infostructure vision is compelling and the benefits are likely substantial, it is unrealistic to believe Canada can achieve full implementation by 2015 given:

- **Cost constraints.** The required investment may be perceived as prohibitively high compared to Canada's historical average IT spending of 1.5 to two per cent of total hospital budget. In addition, many other healthcare priorities are competing for funds – such as investments in more front-line staff and medical devices – and other resources. Political tradeoffs may tend to favour these more visible items.
- **Different starting points and priorities by jurisdiction.** While some jurisdictions like Alberta are well advanced and can be expected to make significant progress against many of the business needs by 2015, others have only just started to implement the systems covered by the *Infoway* mandate. And some territories like the Yukon and Nunavut may not have made significant progress by 2010. Even if these jurisdictions were able to accelerate implementation by leveraging best practices from other jurisdictions, it is still extremely unlikely that the full vision could be implemented and funded across Canada by 2015. In addition, the lack of a common strategy beyond the electronic health record will result in jurisdictions pursuing other priorities, both IT- and non-IT related, that may not contribute to reaching the vision by 2015.

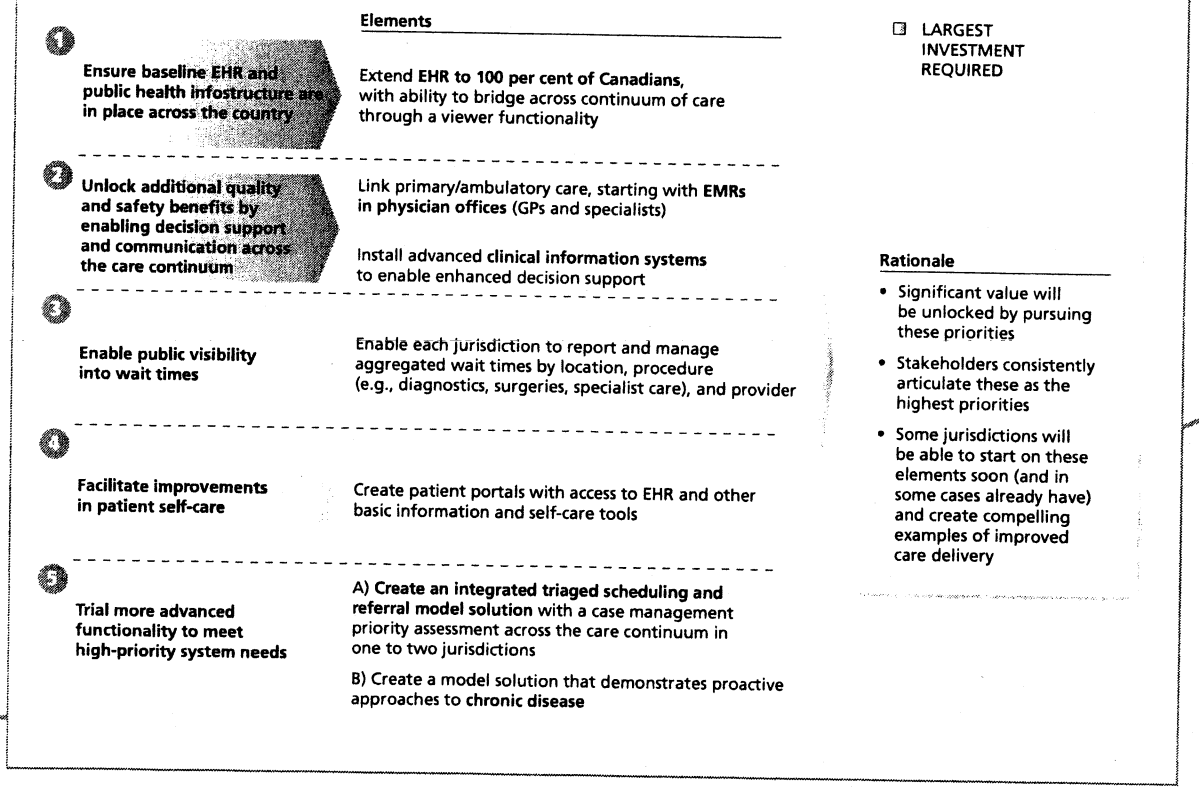
- **Natural project sequencing.** Implementing the systems that enable the vision can only partially be done in parallel (e.g., physician and clinical systems can be implemented at the same time). Most will need to follow a natural sequence. For example, building extensive performance management systems in the absence of a solid clinical information system or integrated remote monitoring tools without an electronic medical record makes only limited sense and will expose investments to potentially costly retrofits and integrations. Even with sufficient funding, the ability to accelerate the implementation will be limited by the duration of existing projects.

- **Resource limitations.** Progress in some jurisdictions is already limited by the inability to find sufficient skilled and experienced healthcare IT specialists. These jurisdictions will need to focus their resources on completing the current mandate before taking on additional projects.

- **Change management requires time.** The front-line capacity to absorb change is limited, and adopting new practices takes time. For instance, when netCare was introduced in Alberta, physicians were reluctant to share data beyond a narrowly defined circle of trust, particularly because of their concerns about interference with their patterns of practice (e.g., evaluation of guideline compliance). Several years later, the physicians' resistance dropped significantly and the next step in implementation could be taken.

Figure 8

FIVE PRIORITIES EMERGED FOR 2015



Given these constraints, it was essential to determine which of the vision's critical elements should be implemented by 2015 and where the pan-Canadian approach will create the greatest value. The elements were analyzed and prioritized based on specific criteria to determine which ones:

- Offer the greatest return through a pan-Canadian level (e.g., the systems' effectiveness depends on having a highly interoperable system across the country)
- Offer the highest economic returns for the health system (e.g., creating real savings in cost, increased quality, or improved access)
- Support a recognized political priority (e.g., wait times and access)
- Are critical to enabling other benefits (e.g., there are technology interdependences where future priorities require investment in foundational systems, such as enabling GPs to allow for chronic disease management).

Five Key Priorities

From this analysis and through dialogue with the system stakeholders, five priorities were identified to enable Canada to make significant progress over the next 10 years. These priorities do not preclude individual jurisdictions and/or providers from pursuing additional initiatives. However, they are considered essential elements of an e-health strategy to 2015 and need to be commonly committed to across the jurisdictions *(Figure 8)*.

Priority 1: **Ensure baseline electronic health record and public health infostructure are in place across the country**

Stakeholders view these elements as the most critical for two reasons. First, they are the foundation for achieving many of the other business needs; they are required either to enable the business needs or to strengthen the benefits from the business systems. And, second, they are key to achieving pan-Canadian interoperable solutions.

- As stated earlier, ***a baseline electronic health record for 100 per cent of Canadians***, containing registries, diagnostic imaging, laboratory, medication, hospital clinical reports, and immunization data, is a foundational element for unlocking most of the benefits articulated in the overall vision. However, by 2010 less than 50 per cent of Canadians will be included. Increasing the coverage to 100 per cent by completing work in the remaining jurisdictions and extending the mandate to include Aboriginal populations and federally managed healthcare recipients makes sense. This will enable capturing all the benefits, require a relatively small incremental investment (many electronic health records component systems – e.g., registries – are already or will be in place for 100 per cent of Canadians), and provide a strong payback for "finishing what we started."

The total incremental capital costs for extending the baseline electronic health record to cover 100 per cent of our population is estimated at $2.2 billion to $2.6 billion. This figure includes the jurisdictional and hospital integration costs. When complete, the system will begin to reap benefits by improving patient safety through greater access to patient drug histories; increasing service by streamlining activities and speeding the return of test results; and reducing costs through elimination of DI film and paper storage expenses.

More importantly, a baseline electronic health record for 100 per cent of Canadians will create the critical elements required to support patient self-care and chronic disease management, as well as further patient safety actions, and speed progress in improving access.

- ***Completing the public health surveillance system*** entails a relatively minor cost (and is included in the electronic health record estimate). While this is not a high public priority, prudent planning suggests that this moderate "insurance premium" to help identify outbreaks, communicate protocols, and manage critical drug flows will be key to avoiding the challenges the system experienced during the SARS outbreak. Furthermore, as noted by all stakeholders, it is the most critical system to be designed and implemented at a pan-Canadian level.

Priority 2: Unlock additional quality and safety benefits by enabling decision support and communication across the care continuum

Stakeholders view these elements as critical to unlocking the value of electronic health records (estimated at an additional $2.7 billion to $3.3 billion in annual benefits, in addition to those accruing from putting the baseline electronic health record in place). In addition, the stakeholders consider these elements the most important next steps to manage the system and drive improvements in patient safety, quality care, and access.

- ***Enabling the physician and specialist offices with electronic medical records*** was universally seen as the next highest priority for three reasons. First, an estimated 80 per cent of all patient encounters happen in this care setting. Second, Canada has a disproportionately low prevalence of technology applications within this setting relative to other countries. And, third, this element is key to pursuing broader goals such as enabling patient care, scheduling full wait times and access, and managing chronic diseases.

Enabling all GPs and specialists in Canada with an electronic medical record solution will cost an estimated $1.6 billion to $2 billion but will generate an additional $1.6 billion to $2 billion in annual benefits. The benefits are most likely to come from reducing adverse drug events and the number of lab tests, and increasing generic drug substitutions. However, given the challenges in instituting change management, 100 per cent adoption among physicians will be unlikely within the next 10 years.

SSCN

As part of an overall effort to reduce wait times, the Saskatchewan Surgical Care Network (SSCN) developed and implemented a province-wide computerized registry to track and monitor patients needing surgeries within the province. The registry itself, which is being used by 99 per cent of surgeons, includes three components:

1. Patient assessment process – an electronic questionnaire that records patient symptoms
2. Urgency profiles – a prioritization tool based on the assessment process, that places patients within a wait time band to determine their approximate wait time for surgery
3. Wait times monitoring and reporting – an aggregated on-line report of wait times by region and specialization.

The SSCN project cost $1 million over 3 years and was part of the overall wait times effort. As a result of the overall effort, the number of surgeries has increased by 650 since 2004-2005, and the number of people waiting more than 18 months for surgery has decreased by 30 per cent. The netCare system was first initiated five years ago as a stand-alone project and eventually developed into a full-fledged electronic health record system. Looking forward, Capital Health hopes to implement an enterprise-wide electronic medical record.

Completing the IT infostructure for ***hospitals*** will require implementing clinical information systems to provide advanced ***decision support*** and integrate the information stored in the EHR and the interactive workflow support (e.g., order entry) into the clinical systems. This step is essential for driving adoption and usage. It will also require implementing pharmacy systems, which will help reduce errors in the delivery of drug prescriptions, improving quality and reducing costs (e.g., through shorter hospital stays).

Full implementation of this element is estimated to require $2.5 billion to $3.1 billion in incremental cost, and it will generate $1.1 billion to $1.3 billion in additional annual benefits. As with electronic medical records, these benefits are driven primarily by reductions in adverse drug events and lab tests and increases in generic drug prescriptions.

Together, Priorities 1 and 2 represent the bulk of expenditures and activities, as well as the change management challenges, required to make significant progress in realizing the integrated vision. However, in addition to these priorities, stakeholders strongly believe that progress needs to be seeded in other areas to address core business and public needs and to unlock the additional value from investments in existing IT infostructure. Priorities 3, 4, and 5 are described in the next sections.

Priority 3: Enable public visibility into wait times

While completing the full vision of improving access and wait times requires a number of systems – including patient logistics systems, advanced scheduling solutions, and in-hospital tools – many of which hinge on enabling the GP community with at least basic computer functionality, beginning to address the current priority of wait times and enabling care guarantees must begin long before electronic medical records are in place. A short-term win can be achieved by creating a common approach to transparency into wait times through simple monitoring, prioritizing, and reporting tools that enable jurisdictions to

report aggregated wait times by location, procedure, and provider. Providers can then take steps that do not depend on technology, such as process redesign and capacity reallocation, to increase access to care.

Again, while individual efforts are underway in many jurisdictions today, stakeholders believe a pan-Canadian approach can add value in several ways. First, by ensuring consistent processes are in place to measure wait times, this approach can help guarantee fairness and equity in access to care, and enable patients to move to other regions or jurisdictions if they choose. Second are the scale benefits to developing a common IT system. Third, this approach can help facilitate the transfer of "lessons learned" from those jurisdictions leading in developing wait times reporting today (e.g., Saskatchewan, Ontario) to other parts of the country.

Total costs for these types of systems are estimated to be $60 million to $80 million (excluding the cost of placing computer technology within the GP and specialist offices included in electronic medical record costs). The benefits generated in the short term may be difficult to ascribe directly to IT investments alone (as they are often tied to funding increases and process improvements). However, as Saskatchewan's experience has demonstrated, when coupled with a number of other changes (e.g., front-line investments, performance management), IT has contributed to an increase in surgeries and a 30 per cent decrease in the number of people waiting more than 18 months for surgery.

Priority 4: Begin to facilitate patient self-care and empowerment

Achieving the full vision of patient self-care and empowerment requires having a number of other systems in place, as well as developing remote monitoring technology. Even so, we can begin now by creating portals that provide patients with access to their own health information stored in the electronic health record, as well as to other basic information and self-care tools that will enable them to see the potential benefits of e-health.

My CARE Source

Grand River Hospital is at the forefront of patient self-care and empowerment with the creation of a patient portal for cancer patients. The portal, with more than 500 users, allows patients to schedule their appointments, view test results, follow up on treatments and potential side effects, and participate in discussion groups and maintain a personal journal. The portal itself is centred on the patient, i.e., it is the patient who grants access to external viewers, ensuring patient privacy and confidentiality.

The portal is generating significant benefits, including enhanced patient confidence through self-monitoring of treatment/side effects, greater patient compliance with treatments through increased transparency, and increased operational efficiency from online scheduling. Aside from these benefits, the patient portal also allows clinicians who join an existing care team to quickly get up to speed on local practices and patients.

"All patients say:
'This is easy to use and
navigate. I would use it again.
I would recommend it
to somebody else..."

– Director of
My CARE Source Project

The portal was developed in partnership with a vendor, at a total estimated cost of $1 million. However, the content was developed by Grand River itself. This has allowed it to sell the content to third parties interested in developing their own portals, and will help fund initiatives to expand the portal's functionality.

While this will encourage patients to be more involved in their care and drive some quality benefits, a patient portal will also have secondary benefits. For example, a consumer educated on the benefits of electronic health records will help drive adoption with community and acute care providers and continue to provide political backing for further investment. However, the patient portal must be created cautiously to ensure that the content is viewed as beneficial to the public and not simply linking the elements already available in the electronic health infostructure.

Because a number of efforts are underway to create patient portals, including the My CARE Source Project at the Grand River Hospital in Ontario *(see sidebar on page 27)*, Canada risks incurring significant costs to build and maintain these many separate sites. Therefore, the stakeholders believe that building a national patient portal infostructure that could be tailored to local needs would be an effective and efficient way to make progress in this area.

The total cost to build the patient portal infostructure is estimated at $100 million, although creating and maintaining the content will require additional funds.

Priority 5: Trial and perfect more advanced functionalities in wait times and chronic disease management

These are high priorities for meeting system needs. However, they will be difficult to implement in the short term at a pan-Canadian level because of financial, technical, and capacity constraints – particularly managing change within the GP offices and redesigning the business systems required to achieve success.

The pan-Canadian goal, therefore, should be to demonstrate in one or two health regions or jurisdictions the elements of the reference solution to be built; to develop a sound business case, and to test the appropriate implementation and change management techniques. Once the baseline electronic health record infostructure and enablement of GPs are in place across Canada, the other jurisdictions can opt to adopt the reference solution, thereby speeding the rollout timing. (Note: If the reference solution is highly successful, there may be ways to speed rollout even more by coupling these solution elements to the electronic medical record implementation and/or leading with these solutions and basic computer technology.)

These reference solutions will entail:

- Trialling a reference solution for integrated **triaged scheduling and electronic referrals to further improve wait times management and access** in one or two regions or jurisdictions. This includes case management and common referral and priority assessment tools across the care continuum – from GPs to specialists through to hospital operating rooms and community and home care environments. This would need to be coupled with significant process re-engineering to ensure the full value is captured. The estimated cost for the case management and priority assessment tools in one large jurisdiction is $40 million to $60 million and $140 million to $160 million for all jurisdictions.

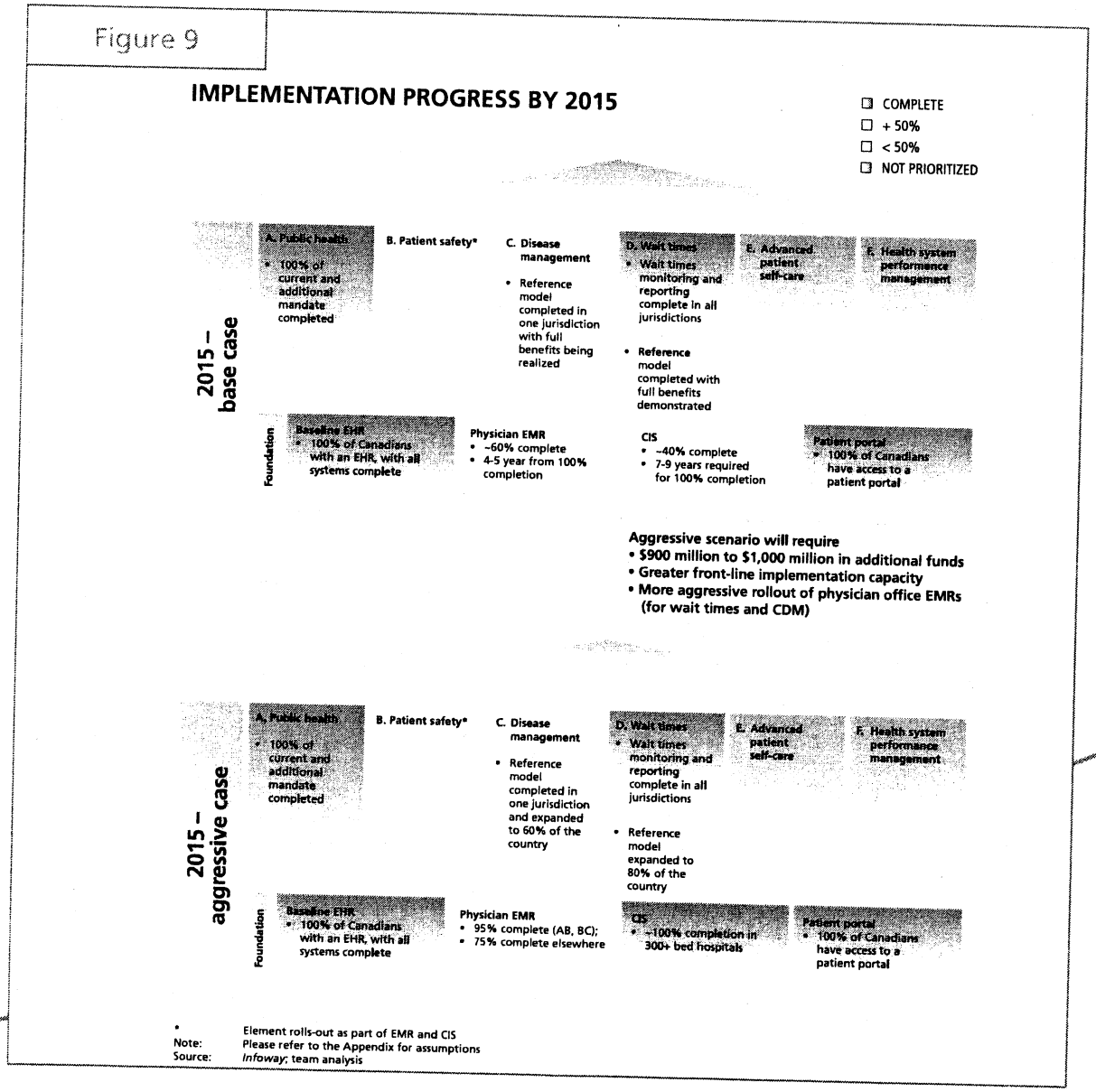
- Trialling a reference solution for **proactive chronic disease management** in one or two regions or jurisdictions. Disease management is a high priority and would accrue economic and quality benefits. However, its dependency on a full rollout of the electronic health record and electronic medical records means complete implementation across the country will extend beyond the 2015 horizon. The estimated cost for the screening and case management systems to enable this for one jurisdiction is $15 million to $25 million and $180 million to $220 million for all jurisdictions.

Remaining Elements

Setting priorities within the integrated vision means that certain elements will likely not be pursued at a pan-Canadian level over the next five to 10 years.

- **Advanced patient self-care functionality.** The most critical elements of self-care that can be pursued now (e.g., patient portal) have already been included in the foundational elements. The more complex patient self-care tools will require completion of the electronic health record, electronic medical record, and disease management elements before they can be put in place. Nor will they offer the same benefit return as some of the other elements. Furthermore, many of the advanced patient self-care functionalities (e.g., in-home monitoring devices for diabetes) can be pursued by private providers (e.g., telecom, insurance or drug companies) in a patient or employer/insurance fee-for-service model.

Figure 9



* Element rolls-out as part of EMR and CIS
Note: Please refer to the Appendix for assumptions
Source: *Infoway*; team analysis

- **Health system performance management.** While these systems are likely to be extremely valuable to enable health managers (e.g., deputy ministers, health region and hospital CEOs) to drive quality, access, and productivity in the system, it was felt that the most critical elements to be addressed at a pan-Canadian level were already covered in the five priorities – namely, the collection of standardized health information through the electronic health record and electronic medical record and the need for a pan-Canadian coordinating mechanism for wait times. Furthermore, the Canadian Institute for Health Information (CIHI) was seen as a more natural owner to determine pan-Canadian performance standard, and, given the politically sensitive nature of the remaining elements, performance standards were more likely to be developed at a jurisdictional level.

- **Electronic medical records in broader community and long-term care settings.** Managing long-term healthcare costs will require extending the electronic health record and EMR decision support systems beyond the acute care and GP and specialist offices over time. Extending the continuum of care to the long-term care settings was not included as a medium-term priority for several reasons: the high cost of including the broader community and long-term care settings ($3.7 billion); the less robust business case; the priority placed on completing the GP and specialist settings, and the ability of the system to absorb change. However, it is critical to note that even without the full functionality, these settings would be able to access the electronic health record through the viewer if enabled with computer technology.

- **Hospital-level logistics, scheduling, and bed-tracking systems.** Hospital-level logistic systems are also costly and are more appropriately implemented at a health region or hospital level to ensure compatibility with existing systems and processes.

Figure 10

SUMMARY OF COSTS AND BENEFITS BY SCENARIO

$ Millions

☐ AGGREGATE SCENARIO HAS CHANGED FROM 2015 BASE ESTIMATE

		2015 base	2015 aggressive
1 Baseline EHR and public health	• EHR and public health	2,200-2,600	2,200-2,600
2 Additional quality and safety benefits	• EMR	900-1,000	1,300-1,400
	• CIS	1,200-1,300	2,500-3,100
3 Wait times	• Jurisdictional reporting	60-80	60-80
4 Patient self-care	• Patient portal	80-120	80-120
5 High-priority system needs	• Wait time reference solution	40-60	110-130
	• Chronic disease management reference solution	15-25	110-130
TOTAL INCREMENTAL COSTS		4,495-5,185	6,360-7,560
ANNUAL BENEFITS		2,800-3,400	3,700-4,500

- An additional $0.4 billion to $0.7 billion in costs will be required to complete the 5 priorities
- This will generate an additional $2.2 billion to $2.8 billion in annual benefits once systems are fully implemented

Note: EHR costs are incremental only, analysis includes all benefits from installing EHR.

Progress Level Achieved by 2010 and End State by 2015

The progress against these five priorities will vary by jurisdiction, given different starting points and momentum for implementation. However, a first-cut rollout plan has been developed in two phases:

- **Phase 1: Completing the foundation (to 2010)** will focus on completing the electronic health record beyond 50 per cent of Canadians and the health preparedness system (i.e., containing communicable disease outbreaks and mitigating the incidence of illness and death); beginning the electronic medical record and clinical information system infostructure in advanced jurisdictions; and ensuring quick-win patient elements are in place (e.g., portals, wait time registries) or underway (e.g., reference solutions for disease management and wait time solutions).

- **Phase 2: Extending the benefits (to 2015)** will focus on continuing deployment and enablement of primary care settings; rolling out the advanced decision support systems in the acute settings across Canada; and beginning broader rollout of reference solutions for disease management and advanced scheduling and wait times solutions.

Rollout in the second phase could advance more quickly if Phase 1 implementation proceeded at or slightly ahead of plan; if the appropriate financing was in place, and if adequate jurisdiction-level and front-line implementation capacity existed. Therefore, two scenario rollout plans – **base case** and **aggressive** – were developed. The scenarios impact the deployment speed for Priority 2 and Priority 5.

For each priority, progress should be made as described below *(Figures 9 and 10)*:

- **Priority 1. The baseline electronic health record for 100 per cent of Canadians and public health surveillance infostructure** will be completed across the country by 2012, with almost 50 per cent of Canadians included by 2010.

- **Priority 2. Unlocking additional quality and safety benefits.** The **base case** assumes the system will likely only be implemented in half the hospitals (~45 per cent of large hospitals) and physicians' offices by 2015, with significant differences in jurisdictions. While some jurisdictions like Alberta, which already has initiated electronic medical record implementation, can be expected to reach close to 100 per cent penetration by 2015, others will lag significantly.

While these base case timelines may appear lengthy, the delay in achieving the goal will be driven by the time and capacity required to complete existing projects and the complexity of front-line change management associated with implementing electronic medical records in small physicians' offices.

Given these constraints, the more **aggressive rollout** scenario would see Canada achieve ~75 per cent of physicians' offices and 100 per cent of large hospital settings by 2015. However, it is critical not to underestimate the change management challenge.

- **Priority 3. A simple registry and reporting system for wait times** can be implemented quickly. The bottleneck is likely to be political alignment rather than technical rollout. Again, a full implementation should be possible within the next three to five years.

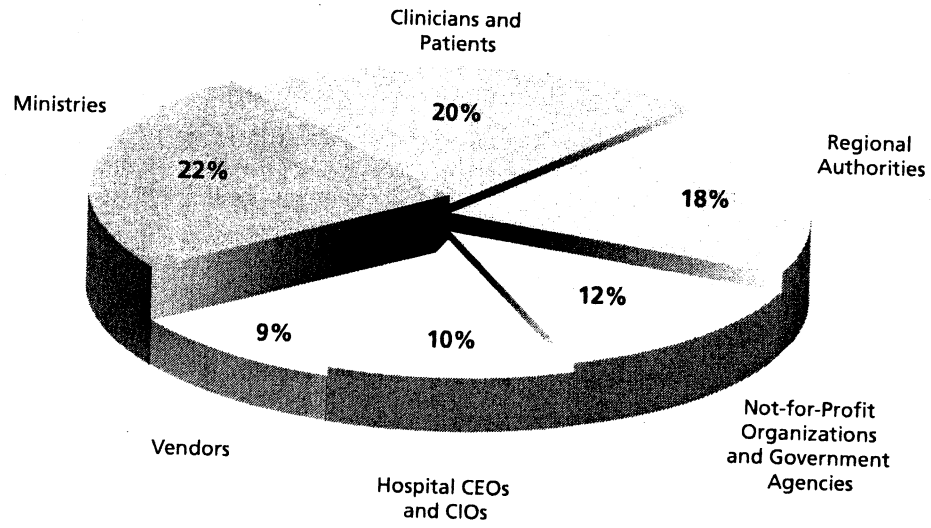
- **Priority 4. Patient self-care** can be a quick win with implementation limited mainly by the progress on the electronic health record, because electronic health record data is a key content component for patient portals and is needed to tailor the information to the visiting patient. The first edition of the portal (ongoing development) should be available upon completion of the baseline electronic health record in 2010 (or earlier in some jurisdictions) but will become more valuable with the rollout of electronic medical records.

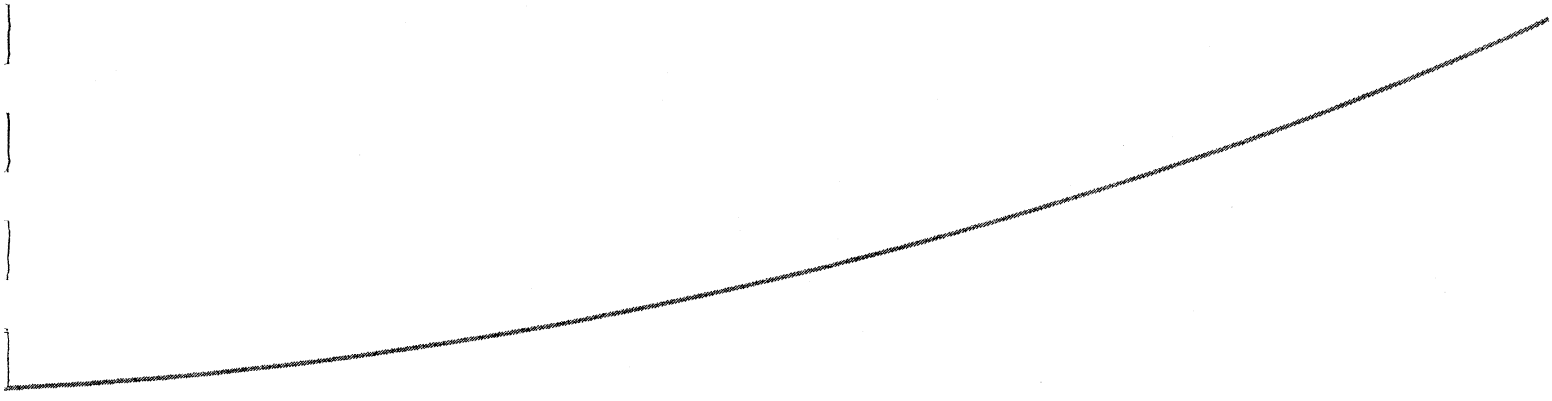
- **Priority 5. Reference solutions** can be accelerated based on the state of the chosen pilot region or jurisdiction.

The **base case model** assumes 35 per cent of Canadians will have access to an advanced wait times system by 2015, costing $40 million to $60 million and creating ~$25 million to $35 million in yearly benefits. A chronic disease management would be available for 10 per cent of Canadians, costing $15 million to $25 million with annual benefits of $5 million to $10 million.

There is potential, however, to pursue **more aggressive rollout** timelines based on the reference solution test results. This could be done by coupling the rollout with the EMR or by looking at short-term enablement of GP offices (e.g., enabling web access only). By 2015, this would provide 80 per cent of Canadians with an advanced wait times system, costing ~$110 million to $130 million and creating ~$60 million to $80 million in yearly benefits. A chronic disease management would be available for 60 per cent of Canadians, costing $110 million to $130 million and creating annual benefits of $30 million to $40 million.

Canadians from across the healthcare sector were involved in the development of the 2015 vision.





Tell us what you think of the healthcare vision for Canada:
www.infoway-inforoute.ca

Ce document est également disponible en français

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Tab 3

March 31, 2004

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Canada Health Infoway

Electronic Health Record (EHR) Standards Needs Analysis

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Canada Health Infoway (*Infoway*) would like to acknowledge the following individuals for their contribution to the EHR Data Definitions and Standards Project:

- The many team members who researched and contributed to our focus group sessions;
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- Our Project Coordinator, Sari Schapira, for expertly handling the complex logistics needed across the country.

This group of people is representative of the many capable, knowledgeable and motivated health sector professionals who contributed time and energy toward helping us understand the imperatives and constraints for health information standards in Canada.

Canadian Institute for Health Information
Institut canadien d'information sur la santé

This project was a collaborative effort between the Canadian Institute for Health Information (CIHI) and Canada Health Infoway (Infoway), leveraging CIHI's expertise in the standards domain and Infoway's mandate for EHR interoperability and investment in its enablers.

Table of Contents

Executive **Summary**

Canada Health Infoway (*Infoway*) initiated the Electronic Health Records (EHR) Data Definitions and Standards Project (Arch 2) in December 2002. The goal of the EHR Data Definitions and Standards Project was to define a clear strategy for key health information standards initiatives that will advance the development and implementation of the interoperable EHR.

This project was a collaborative effort between the Canadian Institute for Health Information (CIHI) and *Infoway*, leveraging CIHI's expertise in the standards domain and *Infoway*'s mandate for EHR interoperability and investment in its enablers. The project included valuable input from standards experts as well as extensive consultation with our stakeholder community through structured focus group workshops across Canada. Interviews with key users and implementers of standards also were conducted, along with working sessions at the Partnership for Health Information Standards Symposium.

Using this comprehensive approach, the project team was able to collect and prioritise information about subject areas for inclusion in the interoperable EHR. The team identified key issues, priorities and gaps in the establishment of EHR health information standards in Canada, while setting out basic principles to promote effective collaboration with stakeholders in selecting and implementing standards on a pan-Canadian basis.

Not all of the gaps and issues identified by our stakeholders can be addressed within the context of *Infoway*'s current business plan and imperatives. *Infoway* is committed to achieving its mandate through the execution of its program strategies, and will incorporate into those strategies the work needed to advance interoperability standards.

1 Introduction

1.1 KEY DEFINITIONS

Before covering the findings and recommendations of the project, it is important that we clearly define the core concepts under discussion and the terms used.

- The term "standards" applies broadly to the standardization forms of technology, information or business processes.
- For the purpose of this document, the focus is on standards as they relate to the structure, content and communication of health information.
- Technology and business process standards, while necessary for the use of interoperable EHR solutions, were not objectives of this project.

When we speak about standards development, we presume an order of precedence for how we establish necessary standards. This follows the order of:

- Adoption of existing standards (the preferred method for standards implementation).
- Adaptation of existing standards, preferably where the standard provides for localization to meet varied business requirements, or where the standard has a solid foundation but must be modified to suit Canadian requirements.
- Development of standards, preferably through active participation in established Canadian and international standards development organizations and processes.

1.2 THE CASE FOR STANDARDS

In its role as a strategic investor in the establishment of interoperable EHR solutions, *Infoway* is acting as the catalyst for the adoption and development of health information standards across Canada. The need for standards is rooted in the fact that interoperability between diverse care settings, information systems and jurisdictions cannot possibly occur without a clearly defined set of common standards.

In the course of preparing this report, it has become very clear that establishing consistent health informatics standards across Canada will require considerable dedication and effort on the part of all affected stakeholders. There is a strong consensus that this effort is more than justified given the benefits of having interoperable systems that deliver accurate, timely health information to the broadest possible spectrum of providers and administrators of health services.

It is clear, however, that this type of collaboration will not occur spontaneously without some vision and motivation for participation. Those of us who provide information systems to support health services delivery are aware that any implementation of information technology requires some form of standardization, even if this is only specific to a department, facility or organization. The challenge is for IT implementers to be willing to contribute to, and adhere to, use of informatics standards that apply beyond their local needs, and that across jurisdictional, care setting, and care discipline boundaries. Fortunately, there are many compelling reasons for our stakeholders to participate in the adoption of standards on a comprehensive pan-Canadian basis.

The following table outlines the stakeholder groups and the corresponding benefits to be gained from achieving standards-base interoperable Electronic Health Records:

Stakeholder Group	Benefit of Standards and Interoperable Systems
Providers	• Improved quality and consistency of care through timely access to comparable data from multiple sources; • Increased use of structured and measurable information rather than free-text only, allowing faster and more reliable review of health information and increased user confidence; • Reduced reliance on verbal and anecdotal exchange of health information; • More accurate and effective communication among providers; • Reduced duplication of effort; • Better ability to consolidate clinical findings; • Shorter elapsed time between steps in the care process; • Higher probability of positive patient outcomes.
Patients	• Dramatically reduced need to repeatedly provide personal and family health history each time a patient encounters a different health care provider; • A personal health history that accumulates data with each encounter and that is easily understandable across a range of providers; • Better coordination of services across providers; • Reduced duplication of diagnostic procedures; • Better health outcomes.
Service Delivery Organizations	• Ability to reuse solutions implemented elsewhere in Canada, leveraging: - Lessons-learned - Change management and implementation strategies • A broader base of comparable data for monitoring and measuring performance; • Improved ability to work effectively in regionalized or collaborative capacity with other organizations, across different geographies and care settings; • Ability to interface to the interoperable EHR for access to compatible data from a vast array of sources beyond an organization's boundaries; • Higher confidence in vendor software products through improved ability to predict suitability for use, effectiveness and return on investment.

Stakeholder Group	Benefit of Standards and Interoperable Systems
Provinces / Territories	• Increased reliability and flexibility in allocating limited system, human and financial resources in the delivery of health services, through improved interoperability and comparability of information and business processes among organizations and across a wide range of settings; • More accurate, reliable and comparable data as the foundation for responsive policy decisions, capacity planning and program monitoring; • More accurate and timely comparability with other jurisdictions on the effectiveness of health service delivery programs. This leads to improved program planning and can provide a better foundation for resource allocation; • Ability to participate in, and have access to, the coordinated work effort of many F/P/T jurisdictions in the development of standards. This collaboration and sharing of health business requirements and the subsequent solutions offers a rich set of capabilities that could not reasonably be developed by just one jurisdiction; • Better access to potential *Infoway* investment funding through participation in the standards development process, together with a willingness and readiness to actively use the standards.
Educators	• Standards help educators offer curricula that are tightly integrated with the accreditation process; • Data that is captured for care is often used for education and research – use of standards increases data's relevance and usefulness; • One measure of the effectiveness of standards is their impact on practice improvement and practice outcomes, for example patient safety; • Exposure to standards-based curricula allows educators and healthcare professionals to understand the health informatics environment at a very early stage; • Standards enhance task-specific extraction of information from published sources, such as matching cases to clinical studies or clinical practice guidelines.
Researchers	• Higher quality comparable data across a broader range of sources; • Enhanced "linking" across disparate data sets (linking people, providers, locations, disease entities, treatment modalities, etc.); • Reduced time and effort to prepare data for use; • Larger, comprehensive datasets; • Ability to merge / correlate datasets across a broader range of studies; • Better ability to measure and assess outcomes and to identify health determinants.

Stakeholder Group	Benefit of Standards and Interoperable Systems
Vendors	• Create a market advantage for those vendors who participate, in terms of (1) understanding early directions of health information standardization and product development and (2) the opportunity to actually "set" the national/regional or international standard in a particular domain or service. • Reduced customization by existing and prospective clients, resulting in better margins, reduced time-to-market and increased responsiveness to clients; • Improved access to prospective customers nationally (and potentially internationally); • Compliance with standards increases value of the product and service to clients.
Systems Integrators	• Easier integration of information systems; • Reduced costs and risk during integration of systems; • Easier transfer of skills between projects.
Standards Development Organizations	• Increased participation by stakeholders in the development and ownership of standards; • Improved ability to define localization needs for standards regionally and nationally; • Better applicability and suitability of open consensus standards in meeting current and emerging business requirements of the health sector.
Canada Health Infoway	• Provides objective criteria for better assessment of initiatives for *Infoway* strategic investment; • Increased probability for project success and transportability of solutions; • Increased willingness by other organizations and regions to adopt successful investments; • Maximized return on investment of public funds; • Improved effectiveness of solutions in meeting pan-Canadian business needs in the health sector; • Improved ability to implement benefits of *Infoway*'s Electronic Health Record Solution (EHRS) Blueprint, which requires pan-Canadian collaboration on the selection and implementation of health information standards.
Canadian Institute for Health Information	Many of the standards requirements inherent in achieving interoperability at a pan-Canadian level are directly applicable to CIHI in its role as a consolidated source of analysis on the health of Canadians and the health of the healthcare delivery system at large. Achieving interoperability through standards offers the potential for CIHI to benefit from EHR data through: • Large potential longitudinal source of semantically consistent data from multiple sources and contexts; • Source of data for primary use, such as in the Canadian Joint Replacement Register (CJRR), Canadian Organ Replacement Register (CORR), etc; • Source of data for secondary use in other analytical databases, such as Health Services, Adverse Events, Health System Expenditures, and Population Health.

Underlying these comprehensive benefits is an explicit understanding that by broadly implementing health information standards, we can reduce the cost of delivering health services in Canada.

This report does not attempt to quantify the cost associated with the establishment of pan-Canadian Standards. But it is generally accepted that an interoperable EHR is a crucial step in improving efficiency and eliminating the wide duplication of effort that is inherent in today's health system.

The adoption and implementation of standards alone will not ensure interoperable systems or the consistent recognition and usefulness of information across diverse care settings and organizations. Standards must be chosen in the context of their ability to meet compelling business needs, and implemented within a framework of clearly defined interface specifications adopted consistently, both locally and nationally.

In one sense, the specification of these common interface components and capabilities represents another form of standard-setting activity that will inherently occur as part of *Infoway*'s mandate.

Additionally, implementing health information standards in Canada will not occur in isolation of existing systems and business processes. When selecting any standard, it will be crucial to consider the impact of that standard on all stakeholders with a vested interest in its use. Also key will be identifying the change management processes required for an organization to establish or replace interoperability standards.

In cases where new standards are used to enable system-to-system interoperability, those most affected will be developers and maintainers of information technology systems. In other cases, when standards are used in recording, communicating or analyzing health concepts or outcomes, the affected stakeholders will be health care practitioners, administrators, teachers and researchers.

In each case, the implementation of new standards carries profound implications for the business of planning, managing and delivering health services in Canada. It is important to define and implement strategy that effectively engages stakeholders in choosing and adopting standards that will affect them for years to come.

Given both the need for effective health information standards and the complexities of creating them on a pan-Canadian basis, the EHR Data Definitions and Standards Project was established to gain a sense of which steps we need to take to develop those standards.

2 Project context

The project's objective was to "define the approach and strategy for the key standards initiatives to advance the development and implementation of the interoperable EHR." The project used the ACHI definition of standards:

- Standards define the rules that enable organizations and people to communicate, tasks to be carried out, information to be shared, and technology needed to inter-operate.
- Standards enable people to speak a common language and to work together on common matters. In the health domain this is done through secure information systems.

Given that definition, the scope of this initiative included:

- Exploring what data needs to be exchanged in an interoperable EHR;
- Exploring standards issues and criteria to allow these subject areas to exchange information;
- Defining a standards-alignment process for existing programs and new initiatives;
- Identifying standards investment projects.

In addition, it was considered necessary to develop a stakeholder engagement strategy for *Infoway* standards work in order to provide a framework and model for establishing pan-Canadian EHR standards.

2.2 Project approach

2.2.1 Project team

An expert project team consisting of leading Canadian and international vocabulary and messaging experts as well as consultants from across Canada was assembled to inform the development of an EHR standards strategy for *Infoway*. Please refer to Appendix 1 (page 40) for a list of team members.

2.2.2 Stakeholder consultations

The project approach was consultative in an effort to leverage the expertise and efforts of existing standards groups, as well as EHR initiatives in Canada and internationally. Between April and June, 2003, the project team hosted five focus groups with key stakeholders across the country -- in Halifax, Toronto, Regina, Montreal and Vancouver. Approximately 180 participants were involved and they represented a wide variety of stakeholders. Please refer to Appendix 2 (page 41) for a list of focus group participants.

The scope for discussion at the focus groups was to identify strategies and issues in achieving standards for an interoperable EHR. Participants were asked:

- To identify the primary subject areas that should make up the interoperable EHR;
- To identify the top five and bottom five priority subject areas on the list just identified, to include in the EHR;
- To identify five standards initiatives for the interoperable EHR that should be done first. The standards initiatives that should be addressed first may not be the same as the priorities above. (For example: drugs may be a priority but standards may exist; clinical histories may also be a priority but no standards exist.);
- What principles must underlie all work toward standards for EHR interoperability?
- What are the issues and barriers to achieving standards for EHR interoperability?
- What criteria should be used in choosing, approving and endorsing standards?
- What are the three most important criteria?
- When selecting standards, what has worked and what hasn't worked based on your experiences?
- What is the most effective way to engage you in standards activities?
- What do you need so that you can be engaged?

In addition to the focus groups, input into the project was received during breakout sessions at the Partnership for Health Information Standards Spring 2003 Symposium. Approximately 100 participants were involved in this forum and addressed the following discussion points:

- Project-based verses pan-Canadian standards development;
- Criteria for choosing standards;
- Key principles for engaging stakeholders.

To identify a stakeholder engagement strategy, the project team also conducted 28 interviews with more than 75 stakeholders across Canada. Please refer to Appendix 3 (page 46) for a list of interviewees.

2.2.3 Research

In addition to stakeholder consultations, the project included research/literature reviews within the following paths of activity:

- Data definitions and use cases;
- Vocabulary and messaging standards;
- Project alignment;
- Stakeholder engagement.

The scope of this work was not meant to be exhaustive. It is intended to create a good basic understanding of best practices and lessons learned, so as to better inform recommendations for next steps. The results of this research, combined with results of the focus groups, has resulted in a significant body of work that will provide a framework for *Infoway* investment projects and other initiatives that should be undertaken to address standards issues and needs identified here.

2.2.4 Stakeholder validation

In October, 2003, the project hosted three Webcasts and an expert working group session to help validate the preliminary findings and proposed recommendations. Approximately 75 people participated in the Webcasts and 24 in the expert working group session. Please refer to Appendix 4 (page 48) for a list of participants at the expert working group session.

2.0 STANDARDS IN THE CONTEXT OF INFOWAY'S BUSINESS PLAN

During the EHR Data Definitions and Standards Project, *Infoway* announced its updated business plan for 2003/04. To make the project's recommendations more timely and relevant, the new plan's updated context and language were adopted in addressing the project's deliverables. It is therefore important to understand the main principles of the business plan.

Canada Health Infoway is an independent, not-for-profit corporation created in response to a commitment by Canada's First Ministers in September, 2000, "to work together to strengthen Canada-wide health infostructure, to improve quality, access and timeliness of healthcare for Canadians." *Infoway*'s mission is to foster and accelerate the development and adoption of compatible electronic health information systems. The approach is to invest strategically, building upon existing and planned health sector infostructure investments in each jurisdiction, working in partnership with stakeholders, including the private sector.

Federal, provincial and territorial Deputy Ministers of Health, who are the members of Canada Health Infoway, unanimously endorsed *Infoway*'s 2003/04 business plan for continued strategic investment in the development and implementation of compatible electronic health records systems across Canada. The business plan is a roadmap for putting in place the basic elements of secure, compatible Electronic Health Record systems designed to improve patient care.

Figure 1: *Infoway* investment program benefits

Telehealth	■ Support remote and rural care delivery/access ■ Incent Telehealth-EHRS linkages
Laboratory Information Systems	■ Information portability and timeliness for patient care ■ Physician office efficiency
Diagnostic Imaging Systems	■ Increased availability of diagnostic imaging for physicians ■ Improved productivity (e.g. less duplication, faster turnaround)
Drug Information Systems	■ Reduced dispensing costs; fewer dispensing clarification call-backs ■ Reduced drug interactions and adverse events
Registries	■ Core patient, provider and location registries; foundation piece for EHRS ■ Secure and trusted identification of individual patients, providers and locations
Infostructure	■ Common blueprint: standards and services ■ Fundamental to interoperability and reduced implementation costs

As outlined in the business plan *Building Momentum*, there is a strategic focus on six investment programs. These include five key building blocks for EHR solutions (infostructure, registries, drug information systems, diagnostic imaging systems and laboratory information systems) along with the addition of telehealth as an investment program.

A clear set of benefits have been identified for each program. Highlights of these benefits are outlined in figure 1.

It is important to note that the latest business plan represents a shift in direction to a program-based approach, compared to the 2002/03 plan's project-based approach. The shift from a tactical to a more comprehensive and strategic approach integrates replication and deployment strategies in all program investments.

The proposed recommendations from the EHR Standards Needs Analysis will inform the development and refinement of *Infoway*'s investment program strategies.

Infoway works in collaboration with its partners to seek out and develop best-of-breed systems that can be used in multiple jurisdictions, creating the most cost-effective deployment. As a strategic investor, *Infoway* helps jurisdictions to reduce the costs, timelines and risks associated with healthcare technology development.

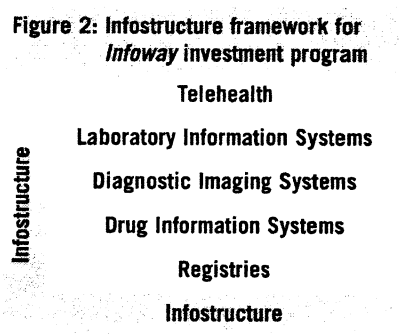
As part of its strategic investor role, *Infoway* is engaging with its members in collaborative planning toward adoption of solutions resulting from funded programs.

To facilitate an interoperable EHR, jurisdictions are expected to replicate a solution's functional specification, interface specifications and standards for data and messaging. This will allow for interoperability with other EHRS implementations. In this capacity, we will ensure that each investment program addresses the need for shared standards by providing a consultative and collaborative approach with stakeholders. *Infoway* will also coordinate standards activity across investment programs to ensure coherence.

In addition to promoting interoperability through its core investment programs, *Infoway* will define certain standards initiatives that are required as prerequisites or considered essential for all programs. This will include actively monitoring, influencing and contributing to international standards development.

In these cases, *Infoway* will define and invest in projects within the infostructure program, and ensure that solutions meet existing needs, by soliciting public sector partner participation. The following diagram (figure 2) illustrates how the infostructure program will provide a framework for use by other programs, and how the infostructure will function as a discrete program with its own goals, objectives and projects:

Figure 2: Infostructure framework for *Infoway* investment program



To support the principles governing the 2003/04 business plan, the proposed recommendations derived from the EHR Data Definitions and Standards Project will inform and guide all of *Infoway*'s program investment strategies. Alignment with pan-Canadian standards and EHRS specifications will be a prerequisite for investment and replication funding, and will be key measures applied to projects in meeting gated funding requirements.

2.4 CIHI and *Infoway* as Strategic Partners in EHR Standards

On May 23, 2003, *Infoway* and CIHI announced the signing of a Memorandum of Understanding (MOU), which formalizes a relationship for the development and maintenance of standards required in support of EHR data definitions and standards. As part of the agreement, *Infoway* acts as the catalyst for the development of EHR solution standards and acts as the overall program manager for EHR standards-related work. CIHI acts in the capacity of Preferred Partner to *Infoway* in the development of these standards. CIHI will continue to be responsible for data definitions, content standards and classification systems which are core to CIHI's business.

This partnership allows both organizations to take advantage of their collective expertise, ensuring a cost-effective and consistent approach to standards development. The organizational objectives of *Infoway* and CIHI are mutually beneficial, and this collaborative relationship to develop and maintain EHR standards furthers the goal of interoperable EHR solutions for Canada.

CIHI continues to provide coordination for the various standards stakeholder organizations both within Canada and internationally through activities such as the Partnership, HL7 Canada, the North American Collaborating Center for the World Health Organization, and the Canadian Advisory Committee of ISO/TC 215. As part of the agreement, *Infoway* assumes a seat on the Canadian Advisory Committee (CAC) of ISO/TC 215 Canada as well as a seat on the executive committee for HL7 Canada.

3 Summary of findings and gaps

The objectives of our consultations were to identify:

- Data required for exchange in an interoperable EHR;
- Standards gaps and priorities for advancing standards;
- Criteria for standards selection;
- Strategies, risks and issues in advancing standards for an interoperable EHR;
- The best approach to achieving interoperability and moving towards the emerging pan-Canadian vision;
- Stakeholder roles in adoption, adaptation or development standards to support an interoperable EHR.

The questions that were posed to stakeholders, and their responses, are provided in this section.

The purpose of identifying EHR subject area priorities was to define the data to be exchanged in an interoperable EHR, not the technologies used to transmit it. We asked stakeholders to identify the EHR subject areas without regard to physical implementations or deployment strategies, and to think beyond a minimum data set. In particular, we asked stakeholders:

- To identify the primary subject areas that should make up the interoperable EHR;
- Who has an operational model or picture of an interoperable EHR;
- What subject areas does this account for?

An extensive list of more than 100 potential subject areas to be included in the EHR was generated through focus groups. These ranged from patient demographic information to health outcomes. The top priority subject areas that were consistently identified across the country included:

- Client demographic and identification information;
- Health history and clinical summary information;
- Problem lists and diagnoses;
- Diagnostic information (values and interpretation);
- Medication information (past and present);

- Care plan and decision support information;
- Treatment information;
- Consent information;
- Vital signs and alerts;
- Provider identification information;
- Clinical documentation for chronic disease;
- Existence/encounter information;
- Immunization information;
- Primary care and community care information;
- Quality and safety information.

In order to use and interpret the above information in a clinically relevant context, the following collateral data were identified as additional priority requirements:

- Contextual information related to encounters and clinical decisions;
- Privacy and confidentiality information;
- Disclosure law and logs;
- Service and agency directories;
- Information on current legislation.

3.2 STANDARDS GAPS AND PRIORITIES

It was recognized that the standards initiatives that may need to be addressed at the outset may not necessarily be the same as (or related to) the subject area priorities identified above.

For example, the inclusion of medication information in the EHR may be a priority but standards related to medications may already exist. Or health history and clinical summary information may also be a priority but no standards may currently exist. We asked stakeholders to identify five standards initiatives for the interoperable EHR that should be completed first.

An exhaustive list of existing standards gaps was again identified and the message was consistent across the country. The priority gaps identified included standards to support:

- Common clinical vocabulary including diagnostics and intervention nomenclature;
- Unique identifier for client / provider / location of care;
- Encounters and the definition of an encounter;
- Standardized documentation;
- Pharmacy / medications;
- Laboratory;
- Messaging standards, including:
  - operational systems;
  - registries;
  - those specific to the EHRS/EHR;
- Core data set / EHR data set;
- Client / provider / location registries;
- Privacy harmonization / authentication;
- Trust relationships.

In addition, our stakeholders identified not just gaps in data and messaging standards but the need for ongoing sustainable infostructure to support these standards. The following priorities related to standards were identified:

- Mapping methodologies;
- Standardized data presentation / provider views;

In the areas of processes and governance, the following priorities were identified:

- Standards development and implementation;
- Conformance and compliance of standards;
- On-going support and maintenance of standards.

3.3 CRITERIA FOR SELECTING STANDARDS

A key message we consistently heard concerned the need to leverage the use of existing standards work wherever possible, including local, national and international standards efforts.

The message was clear: "adopt" first, "adapt" second and "develop" when no other options exist.

To determine the criteria to use in assessing which standards to adopt, adapt or develop for meaningful exchange of EHR data, we asked the stakeholders:

- What criteria should be used in choosing, approving and endorsing standards?
- What are the three most important criteria?
- What has worked and what hasn't worked based on your experiences?

The criteria utilized by the various provincial standards councils and other international organizations were also identified and prioritized as being important in the selection of standards and standards investments. The top criteria for standards selection identified included:

- Ease of implementation / practicality / feasibility / time to adopt;
- Cost / availability of incentives / funding;
- Appropriateness;
- Benefits / risks of using the standard;
- Maintenance and post-implementation support requirements;
- Balance of standardization and innovation;
- Existing base for the standard;
- Ease of use of the standard;
- Stability of the standard;
- Flexibility of the standard.

It was clearly evident that a methodology or measurement system for applying the standards criteria was required to determine if an existing standard was appropriate for adoption; if an existing standard required adaptation; or whether a new standard should be developed.

3.4 POTENTIAL RISKS AND ISSUES IN ACHIEVING STANDARDS

A key message consistently articulated was: "The business case for pan-Canadian EHR standards has been well justified, so let's get on with the work of achieving interoperable EHR standards."

We also asked stakeholders to identify any issues and barriers related to achieving standards for EHR interoperability. In response, the following points were raised:

- Use cases and business processes must be well understood;
- The understanding of provider workflow and the impact on providers is critical;
- There is a need to recognize the trust relationships inherent in healthcare;
- There are financial barriers and lack of incentives to ensure the uptake of standards, including:
  - the high cost and time to develop standards;
  - funding for collaboration is inadequate;
  - the need for paid (not voluntary) resource work;
  - the costs associated both with changing to new standards and not changing to new standards;
- A strong commitment is needed on building capacity and capability for standards development, implementation, compliance and maintenance;

- There may be political barriers to overcome, including:
  - jurisdictional and cross-jurisdictional political barriers;
  - finding an appropriate body to mandate standards and a monitoring process;
  - competing standards – international, national and local;

- A neutral forum must be created for consensus-building and collaboration;

- Vendor engagement is required to support buy-in and compliance;

- A need for technology and tools for standards, including:
  - technology to support standards development and related processes;
  - tools to support standards implementation;
  - tools to support transition to a standards environment;
  - tools to support maintenance of standards;

- Legislative challenges may exist;

- Communication and education related to standards initiatives are critical:
  - for communication and education of standards within jurisdictions and between jurisdictions and national groups;
  - to educate on the process of standards in our health-related education programs;
  - to address public concerns on use of standards;
  - to use key learnings from other experiences and initiatives.

The extensive consultation undertaken during the EHR Data Definitions and Standards Project highlighted some significant findings related to stakeholder engagement. The following are highlights identified as particularly relevant:

- There is a broad consensus among stakeholders concerning:
  - principles for stakeholder engagement;
  - standards activities;
  - stakeholders to be engaged in standards activities;
  - potential roles for stakeholders;
  - effective strategies and methods for engaging stakeholders.

- There is overwhelming support among all stakeholders for a fair, open and transparent engagement process.

- There is broad agreement on the need to clearly identify who ultimately is responsible for specific activities of EHR standards at the national level, including development, implementation, maintenance and conformance and compliance of standards.

- There is a need to clearly define the standards approval process interface at the federal-provincial level.

- Stakeholders view some of the standards processes as complex, cumbersome and slow. Provinces are uncertain as to how to proceed with the standards process and coordinate efforts with other jurisdictions, especially at the national level. While most stakeholders acknowledged the complexities of the standards process, many believe a more effective process can be established.

- Many stakeholders support the establishment of a national advisory group to identify and discuss strategic areas and issues, as needed and appropriate. The group would include experts and representatives of the key stakeholder groups.

- There was overwhelming agreement on the need for a forum for pan-Canadian collaboration and consensus around standards. Standards must be developed in an environment that considers broad requirements. Incentives will be needed to promote participation in standards work at the national level.

- Stakeholders recognized the need for a formal governance structure to support pan-Canadian standards work during development and implementation. Standards will need to be formally endorsed and, more importantly, mechanisms will be required to support implementation and transition and to monitor conformance and compliance.

- Dedicated leadership and resources will be needed to support the establishment and implementation of EHR standards. Standards work will need to be elevated within the industry and be supported by formal roles and structures.

- Many stakeholder groups have cited the need for active vendor involvement in establishing standards. By engaging vendors, we can leverage their experience and knowledge, while working toward a commitment to complying with standards as they are endorsed.

- While the Canadian healthcare system recognizes the need to move toward interoperable EHR standards, there is broad consensus that it currently lacks the capabilities and the capacity to support the volume of standards activities that will be required. Any stakeholder engagement model must highlight a commitment to building the capabilities and capacity required for success.

- Similarly, there was a desire to develop a model that supports the development of standardized methodologies and tools. Again, this will provide an efficient mechanism to support ongoing standards work.

- It is generally recognized that there is a need to identify and further develop mechanisms and infrastructure that will reliably support implementation, conformance and compliance, and maintenance of standards nationally.

- Stakeholders need an opportunity to provide meaningful input and to feel confident that their input will have an impact.

- Stakeholders highlighted the importance of interdisciplinary representation in developing and implementing standards. In this way, the unique needs of each stakeholder group can be evaluated. The involvement of front-line (or grassroots) stakeholders was cited as critical to the task of facilitating the adoption of standards.

- The stakeholder engagement process, like all initiatives, is time sensitive and should be coordinated with other activities, events and cycles, so as to maximize impact and results.

- For some stakeholder groups, financial incentives will be required to stimulate participation. For example, providers that forfeit income to participate may need to be compensated for their time.

- An effective standards process will require a thoughtful communication strategy that is targeted to the specific needs of each stakeholder segment.

4 Recommendations and proposed initiatives

4.1 PRINCIPLES FOR MOVING FORWARD

The vision for a pan-Canadian solution for the interoperable electronic health record is emerging amid a convergence of will, and a commitment to building the necessary capacity and capability. In meeting the challenge, it is clear that uniform adoption of sustainable standards to support the EHR will be a key to success.

While few definitive standards exist today, most agree that there is clearly an opportunity now to establish an EHR based on robust, sustainable standards.

The process of researching and developing standards that meet the diverse needs of the EHR should be guided by a set of principles that ensure relevance, accuracy, completeness and timeliness. These principles ensure that as agents of change, we continue to maintain a clear focus on our ultimate objectives.

The following principles will form the basis for the proposed strategy for EHR health information standards:

1. Development of standards is driven primarily by the business of healthcare and must meet a clearly defined business need.
2. Standards development will be project-based, with standards tested, refined and evaluated as integral components of projects. This ensures a vital connection between the business need and the imperative to standardize, and facilitates re-use in successive projects.
3. The development, implementation and maintenance of standards must be coordinated at a pan-Canadian level, and success will demand strong leadership coupled with broad support from all stakeholders.
4. Adoption and use of standards will succeed only if promoted by compelling incentives.
5. Efforts to develop and implement standards must focus on those standards that can be best sustained over the long term.
6. Two key components for successful standards implementation are management of change and the transition from "current state" to "desired state." Tools and processes must accompany implementation, so as to minimize any negative impact while maximizing every opportunity for success.
7. Existing work will be leveraged wherever possible and practical. The process must always first encourage adoption, or adaptation, of existing standards, before development of new standards is considered. Additionally, development of new standards will be done through participation with and sponsorship of existing standards development organizations.

8. Standardized methodologies and tools will be a key consideration for any standards development model or process.

9. Vendors will be actively involved throughout the establishment of standards.

10. Provincial standards councils must play an integral coordination and communication role between various jurisdictions and pan-Canadian standards processes.

11. A commitment to building capability and capacity for standards work must be a key consideration in any standards development model or process. Stakeholders will need constant and ongoing education about standards initiatives and how they should be engaged.

12. Jurisdictions must be prepared to provide the leadership and resources needed to establish and implement standards.

13. Canada should increase its commitment to playing a leadership role in international standards. While developing pan-Canadian EHR standards represents an ambitious goal, it is also necessary to ensure that standards are harmonized with similar initiatives internationally. Canada's participation in international development activities will directly enhance our efforts to adopt national standards. At a minimum we will be aware of international standards initiatives and participate and influence those that are relevant to our mandate and work.

14. EHR standards development must be coordinated on a pan-Canadian basis. A clear stakeholder engagement strategy will be needed to foster appropriate representation in every aspect of development.

15. Alignment with standards, and with standards-development initiatives, will be key considerations in guiding *Infoway*'s investment decisions for new projects. Project development lifecycles and standards lifecycles should be specifically coordinated.

16. Incentives will be available to existing projects to encourage alignment with standards or standards-development initiatives. In some instances, current projects will be mandated (and funded) to comply with the emerging standards vision.

17. Where applicable, *Infoway* projects will incorporate a standards component and will contribute to the evolution of a robust set of pan-Canadian standards for the EHR.

18. A mechanism must be established to encourage and engage non-*Infoway* projects to contribute to and align with the emerging standards vision.

Stakeholder engagement was cited by most as a critical component in developing and implementing standards effectively.

In particular, the standards process required to support an interoperable pan-Canadian EHR will have significant implications for stakeholder engagement. Future standards work will challenge current stakeholder engagement strategies and processes and will require innovative approaches designed to foster broad support.

Increasing levels of national collaboration and consensus will be crucial to success. This will require a commitment to expanding the current stakeholder base and including stakeholder segments that traditionally have not been actively engaged in standards activities.

Any approach to increasing stakeholder engagement must reflect the extremely complex healthcare environment and the unique relationships and interplay among diverse stakeholder segments.

It is also clear that proposed approaches must align and integrate with existing standards structures and processes, both nationally and internationally.

Material used in developing this stakeholder engagement framework was derived from several sources, including:

- As part of defining the stakeholder engagement framework, an international environmental scan of related literature was done to identify leading or best practices on stakeholder engagement in standards activities across diverse industries;
- Interviews with health informatics standards stakeholders across Canada (see Appendix 2 (page 41) for a list and grouping of stakeholders and Appendix 5 (page 48) for the Stakeholder Interview Guide);
- Focus groups across Canada (Halifax, Montreal, Toronto, Regina and Vancouver) involving selected standards stakeholders;
- Breakout sessions at CIHI's Partnership for Health Information Standards Spring 2003 Symposium.

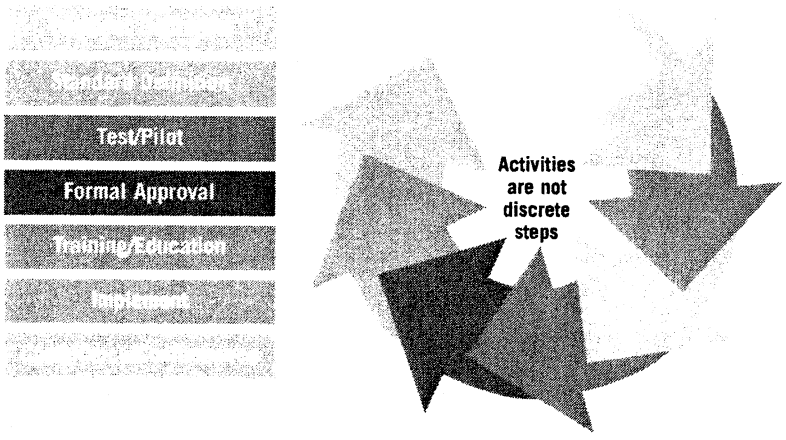
The stakeholder engagement framework that follows includes the following components:

- High level **principles** that should be used for engaging stakeholders in EHR standards activities;
- A synopsis of the **standards activities** that require stakeholder engagement;
- A list of **stakeholders** who should be considered for engagement in EHR standards activities;
- A description of various **roles** that stakeholders can play in standards activities.

The stakeholder engagement framework is designed to set out a generic strategy for stakeholder participation that is consistent with *Infoway*'s vision, mission and objectives.

1. There should be a commitment to engaging with stakeholder segments that have a stake in any activity relating to standards. The commitment to engage must be reciprocal.
2. There should be an open and transparent process for standards activities.
3. Communication with stakeholders on standards activities should be timely and provide information that is relevant and up to date.
4. Stakeholder groups should have meaningful participation in standards activities. Stakeholders should not be asked to "rubber stamp" a standard after the fact.
5. Consideration should be given to ensuring balance in the participation and influence of stakeholder groups.
6. Consideration should be given to ensuring that there is continuity among stakeholder members participating in standards activities. While the goal of engagement is to maximize involvement, it will be important to maintain consistent individual representation in order to ensure that momentum is not lost.
7. The standards process should be flexible and responsive to the unique needs of stakeholders and the interactions between them while engaging in standards activities.
8. Stakeholder engagement should be facilitated as cost-effectively as possible, balancing the goals of participation and efficiency.

Figure 3: The standards lifecycle



The diagram to the right (Figure 3) highlights specific activities within the standards lifecycle. While activities and timeframes will be driven by the specific standard, the activities generally will not be linear. Activities will often occur simultaneously and may be iterative.

Stakeholder engagement is important at all stages. Stakeholder segments to be engaged will vary over the course of the lifecycle.

For example, the early stages are heavily reliant on the input of business experts. These same business experts may have a very limited role during standard definition and testing. Technical experts, on the other hand, will be critical for the middle stages within the lifecycle.

Our consultations identified a comprehensive list of stakeholder segments that should be considered for engagement in EHR standards activities:

- Federal, provincial and territorial jurisdictions;
- Health IT operational agencies (eg. Ontario's Smart Systems for Health SSH);
- Health collaboratives (eg.Western Health Information Collaborative - WHIC, Health Infostructure Atlantic -HIA);
- Health service delivery organizations;
- *Infoway*;
- Canadian Institute for Health Information;
- Health Level 7 (HL7) Canada;
- Canadian Advisory Committee to International Standards Organization (ISO) Technical Committee 215;
- Federal, provincial and territorial standards councils;
- International standards groups;
- Standards Council of Canada (SCC);
- Vendors and vendor associations (eg. Industry Trade Association of Canada, Canadian Health Information Technology Trade Association - CHITTA);
- Statistics Canada;
- Other government departments, ministries, agencies;
- Privacy branches of provincial and territorial governments;
- Professional colleges;
- Providers and professional associations (eg. Canadian Medical Association - CMA, Canadian Nursing Association, Canadian Public Health Association - CPHA, etc.);
- Private payors, third party administrators;
- Researchers and academics;
- Healthcare consumers (patients, residents, clients).

There are a number of important roles that stakeholders will need to fill during standards activity. The diagram (Figure 4) highlights various roles that were identified as particularly important.

At the bottom of the pyramid are stakeholder groups who may be engaged primarily to communicate or distribute information.

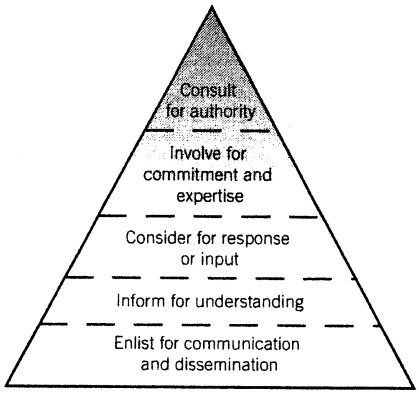
The next layer highlights stakeholders who may be needed to provide information that ensures an understanding of standards work being undertaken, although they could be affected by the final results in a limited way.

Moving up the pyramid, the next layer shows stakeholder segments that may be required to ensure that their perspective and input is considered as standards activities unfold and decisions are made. Typically, this would include stakeholders who are affected by the standards work in a more significant way or who have a strong interest in the work being undertaken.

Next are stakeholders who may need to be actively involved in standards work. Typically, this would include stakeholder segments whose expertise is unique and necessary. This could include participants with technical expertise or a unique understanding of the business context. In addition, stakeholders whose commitment is critical for the success of the work may also be engaged.

Finally, certain stakeholders will need to be consulted to ensure that the results of the standards activities are accepted and endorsed. Stakeholders in this level typically have some formal accountability for the implementation of standards and an understanding of the implications of the standards in the context of Canada's health system.

Figure 4: Roles in engagement

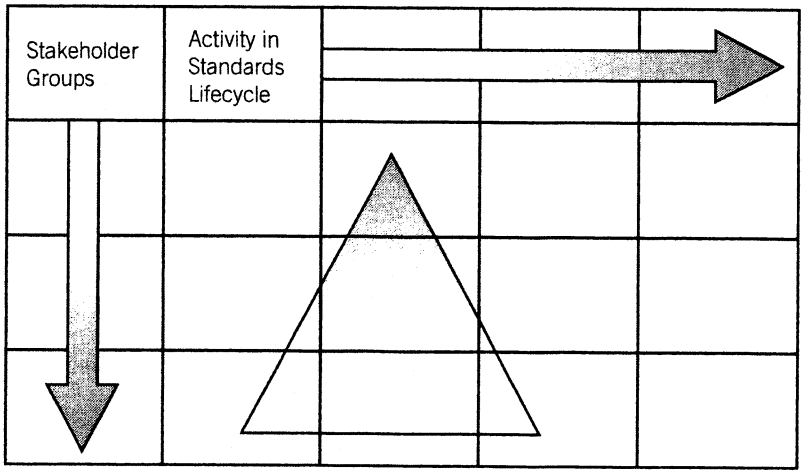


The above components alone do not provide a complete framework for stakeholder engagement in standards activities. When the components are weaved together, however, they provide a concrete framework that can be applied to EHR standards activities.

The diagram below (Figure 5) depicts how the various pieces fit together to create a practical stakeholder engagement framework.

Essentially, the framework provides guidelines for stakeholder groups that should be considered for engagement during the standards process. In addition, it highlights roles that would be most appropriate for each stakeholder segment at each stage.

Figure 5: Weaving the pieces together



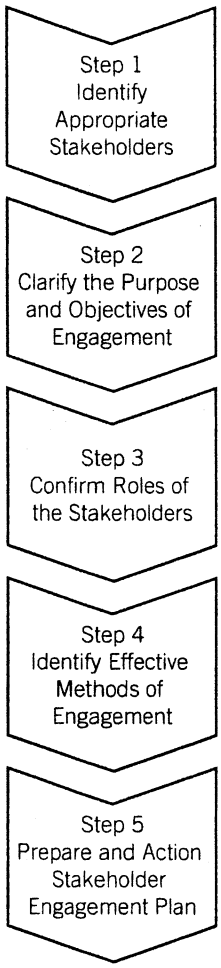
Stakeholder segments could fill more than one role at any given stage. Similarly, the roles played by a particular stakeholder group could change as the process progresses.

It should be noted that there was consensus that *Infoway* has a unique opportunity to stimulate the development of standards related to the EHR.

The framework highlighted above is generic and is meant as a guide. The specifics of each project or activity will need to be considered to determine the best stakeholder engagement strategy.

The final component of the stakeholder engagement framework outlines a process that can be used to overlay project specifics to the generic framework. This process, as outlined in Figure 6, can be applied to standards activities at the pan-Canadian or project level.

Figure 6: Stakeholder engagement process



4.2 Stakeholder engagement model

Consensus is growing on the need for a pan-Canadian approach to establishing health information standards. The concept is not new, having been identified by various groups and initiatives in the past.

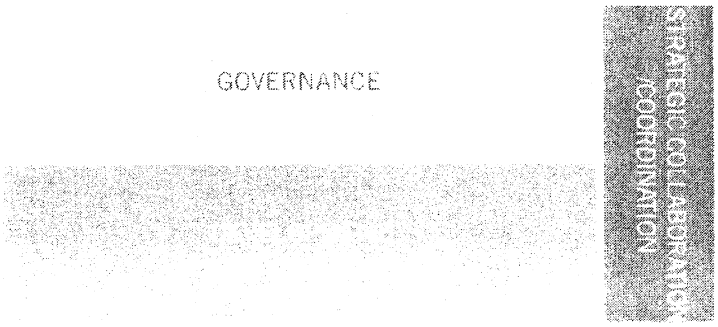
Pan-Canadian data and messaging standards are critical to an interoperable EHR solution and thus a high priority for *Infoway*. Our consultations across the country once again confirmed support for standards activities on a pan-Canadian basis.

Based on this, the EHR Data Definitions and Standards Project team has extended the stakeholder engagement framework and built upon existing engagement models to propose a model to engage stakeholders in establishing EHR standards at the pan-Canadian level.

The following section will provide an overview of the model and outline, some preliminary thinking about the governance and development aspects of the model, and how these fit within the broader health informatics context in Canada.

The objective of the proposed model is to create a forum and the required processes to support establishment of EHR standards at a pan-Canadian level. It will provide a methodology for developing EHR standards in collaboration with stakeholders, while providing for the required collaboration and coordination with a wider stakeholder group.

Figure 7: The three components of the model



At this point, the model is meant to outline a structure and process that would facilitate collaboration and consensus-building around standards work. It is not intended to be prescriptive or limiting in any way. The model will be developed in the short term through consultation and, in the longer term, through experience gained within each program area.

The diagram in Figure 7 highlights the three components of the model.

At the top is a governance layer. It is within this layer that the acceptance, recommendation to endorse and formal approval of standards will occur.

At the bottom is a development layer. Development, in this context, is loosely defined and could mean adoption, adaptation or development of a standard, depending on the needs of the project and based on sound standards criteria.

Also illustrated are mechanisms that support collaboration and coordination across programs, ensuring that standards work is strategically driven both from the top down and from the bottom up.

The following diagram (Figure 8) provides a more detailed description of the proposed model, within the context of the *Infoway* business plan.

The following sections outline the model in more detail and highlight preliminary thinking related to the roles and relationships inherent in the model.

4.2 Governance

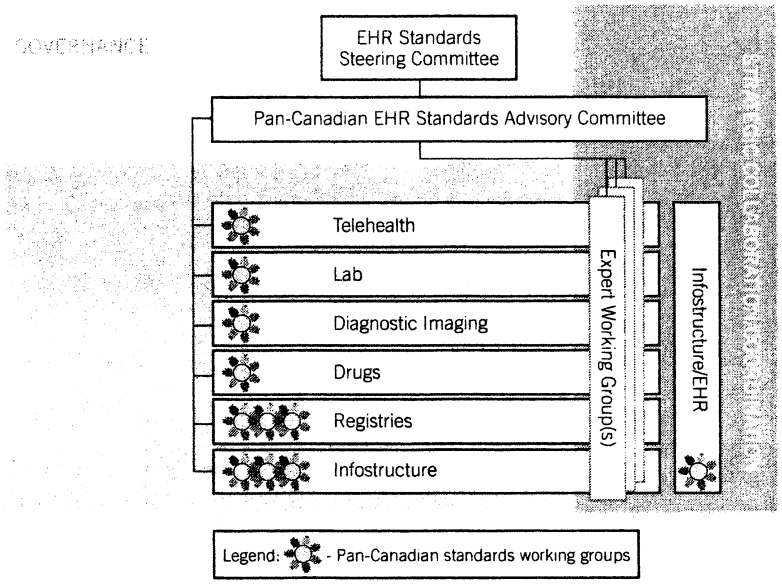
At the governance level, two distinct bodies are being proposed: an EHR Standards Steering Committee and a Pan-Canadian EHR Standards Advisory Committee.

EHR Standards Steering Committee

The EHR Standards Steering Committee holds the ultimate responsibility for endorsing and approving EHR standards for pan-Canadian implementation.

Committee members would have recognized accountability in the national health informatics arena and the ability to understand the implications of standards in that context. They hold positions that would allow them to formally accept a standard for pan-Canadian implementation.

Figure 8: Proposed stakeholder engagement model



In addition, the EHR Standards Steering Committee will provide direction on implementing and maintaining standards, while ensuring that Canada is aligned with proposed or approved international standards.

The following stakeholders are recommended for membership on the EHR Standards Steering Committee:

- CIHI
- Health Canada
- Federal, provincial and territorial jurisdictions;
- *Infoway*
- Professional colleges;
- The Standards Council of Canada (SCC).

It is anticipated that the Steering Committee will be chaired by *Infoway*.

It is proposed that steering committee members are appointed for two-year terms and that the terms are staggered. This will allow maximum participation and ensure continuity.

While the mandate of this model is to support establishment of EHR standards, it is anticipated that the governance model could evolve over time to serve a larger need. It is also conceivable over time that the steering committee may blend into the broader standards context and fulfill some of the requirements of the CAC/NC.

The pan-Canadian EHR Standards Advisory Committee's primary role is to recommend standards for formal approval to the EHR Standards Steering Committee.

The advisory committee will consist of stakeholders with the expertise to make effective recommendations to the steering committee. Members will clearly understand the implications of various standards at a strategic and tactical level and provide counsel and advice to the steering committee on potential risks.

In addition, the advisory committee will identify the need for and facilitate the development of standards that cut across *Infoway* programs.

The advisory committee will ensure coordination between programs where appropriate and will facilitate resolution of any issues arising between working groups.

The advisory committee will also support and facilitate, where required, international balloting of nationally endorsed standards. As a result, it is recommended that the advisory committee act as the primary working liaison with other domestic affiliates of international bodies and standards development organizations.

The following stakeholders are recommended for membership on the pan-Canadian EHR Standards Advisory Committee:

- Vendor associations;
- Regional collaborative; e.g. Health Collaboratives (WHIC, HIA)
- Industry experts;
- Provincial / territorial standards councils;
- Academics and researchers;
- Business leaders from *Infoway* standards working groups (SWG);
- Chair of expert working groups;
- CIHI;
- HL7 Canada;
- *Infoway*;
- Standards Council of Canada (SCC).

It is proposed that the advisory committee report to the steering committee and be co-chaired by *Infoway* and CIHI. It is also recommended that members be appointed by the steering committee for two-year terms and that the terms be staggered to maximize involvement, while at the same time providing continuity and momentum.

4.2.3 Strategic collaboration / coordination

Within the strategic collaboration/ coordination layer are two distinct mechanisms for ensuring that the "white spaces" between programs and aspects of cross-program coordination are effectively addressed.

Expert working groups

It is anticipated that an expert working group (EWG), or groups, will be needed to provide technical coordination and harmonization across programs.

This will ensure that all programs and projects are moving consistently toward an emerging pan-Canadian vision. It will also ensure that similar solutions and strategies are being utilized to address issues in a standardized manner.

Initially, it is proposed that one EWG be established and that all necessary technical experts will participate. Over time, as distinct program needs unfold, it may be effective to establish various EWGs.

EWGs will include experts in health information standards, with members assuming a dual role within the overall model. First, they will participate directly in the development of standards through membership at the pan-Canadian tables.

Second, they will provide expertise in specific areas to support standards development, for example HL7 tooling or establishing clinical vocabulary. Given the expertise of the working group, it would likely be called upon by the pan-Canadian EHR Standards Advisory Committee to conduct preliminary analysis on proposed standards and to provide recommendations for development.

Expert working groups will also play a key liaison role between *Infoway* projects and other national and international standards initiatives. In this way, it will be possible to leverage existing work in some areas and provide leadership in others. This will be done in collaboration with other organizations such as CIHI and other standards development organizations.

It is anticipated that expert working groups will report to the pan-Canadian EHR Standards Advisory Committee. Each group will be co-chaired by the *Infoway* standards director and a working group lead appointed by *Infoway*. The *Infoway* standards director will be responsible for reporting to the pan-Canadian EHR Standards Advisory Committee.

Infostructure program

Another strategic enabler for collaboration and coordination of standards work will be the efforts undertaken in the *Infoway* Infostructure investment program.

Development of the foundational EHRS infostructure components will require key standards that enable interoperability. It is critical for the infostructure program to ensure that components shared across programs are developed in a coherent, timely, coordinated manner, with attention being paid to the requirements of the programs and the need to replicate those solutions on a pan-Canadian basis.

This requires that an *Infoway* standards coordinator/director participate on the pan-Canadian standards working group in each program. This participation will also ensure that opportunities to integrate EHRS Blueprint services components into program solutions are identified early. This will help ensure the practical, consistent translation of EHRS Blueprint concepts into working models.

In this manner, specifications and standards needed to implement the interoperable EHR can be implemented cyclically by leveraging work from previous projects during new projects.

In addition, much of the foundational work that needs to be done to support standards development will be funded out of the Infostructure investment program.

4.2.4 Standards development

Infoway's initial focus on standards development (adopt / adapt / develop) will be through the projects undertaken within our various Investment programs. One of the challenges these projects face is that the interoperable EHR is not yet defined from a functional information model or interoperability standpoint. Because of this, existing projects will need to proceed while EHR specifications emerge.

Each project will contribute to the evolving specification of standards for the interoperable EHR by combining this "bottom up" standards work being done through projects with "top down" initiatives of pan-Canadian standards working groups. Work at the project level provides the pan-Canadian standards working groups with a baseline specification or "starting point." This specification is then reviewed by a larger stakeholder group.

In order to ensure coherence across projects in a program, and between program areas, project work will need to be aligned with standards selected or developed by previous and concurrent projects. By aligning projects in a program, as well as leveraging previous work, a baseline specification can be developed.

Figure 9: Alignment of projects to an emerging pan-Canadian vision

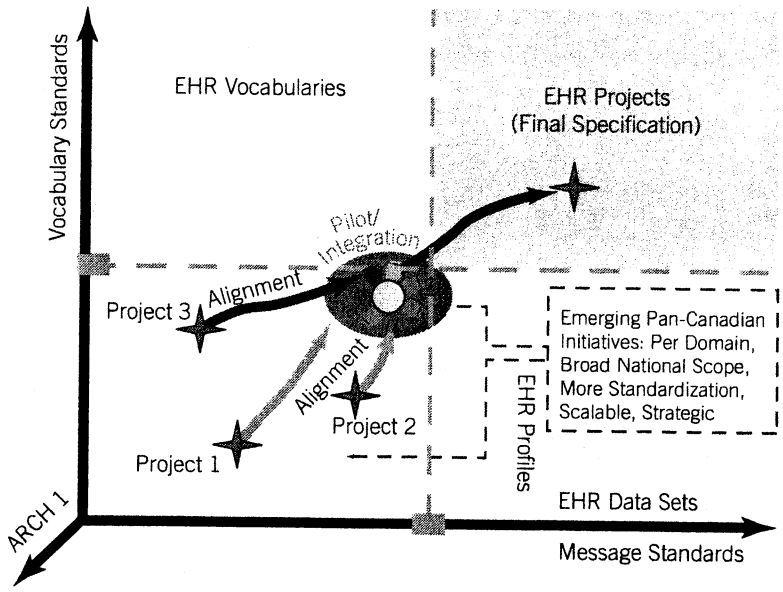


Figure 9 illustrates the alignment of projects to an emerging pan-Canadian vision. This alignment framework is multidimensional, taking into consideration EHR data sets, vocabulary and messaging standards to show how projects contribute to a final specification.

Alignment needs to be considered in various circumstances. First, there are a number of projects now underway that form the basis of an emerging pan-Canadian EHR vision. The projects will require a preliminary analysis to determine how well they align, and components will be added to their design to provide the flexibility needed to meet future interoperability requirements.

As new projects emerge, it will be easier to align the standards lifecycle with the project lifecycle and ensure that the standards work to support interoperability better informs the project plan. *Infoway* will also need to support a process by which projects already implemented are provided with the resources to align with the standards. As EHR standards evolve, projects will need to comply in order to be eligible for investment.

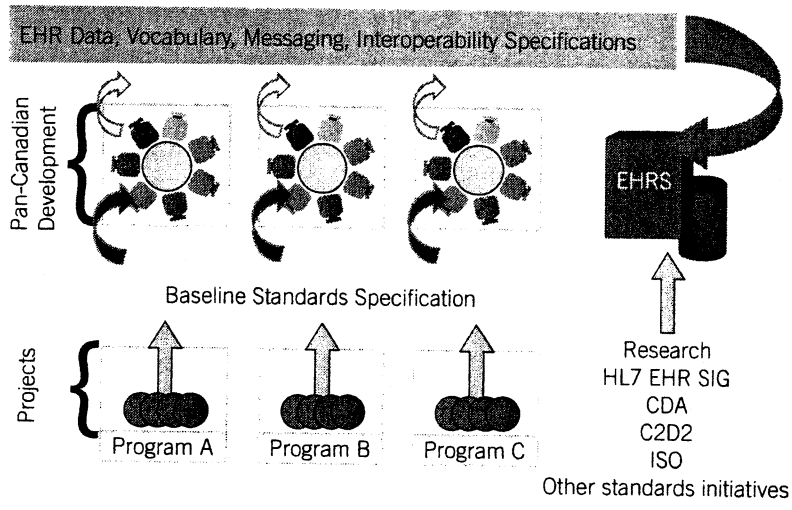
Figure 10 depicts the interoperability model and process for standards development within *Infoway* programs.

In order to facilitate incremental interoperability, *Infoway* projects within each program will come together to determine how best to leverage project experience and deliverables to:

- Demonstrate interoperability between projects;
- Develop baseline vocabulary and messaging standards based on the HL7 message development methodology;
- Establish broader stakeholder consensus around the development of a standard.

The project-driven standards development approach provides an

Figure 10: Interoperability model and process for standards development programs



opportunity to collectively move toward the goal of interoperability. In order to leverage the collective experience and solution-development momentum of investment projects, it will be critical to reach consensus among collaborating project groups and to coordinate subsequent activities effectively.

Consequently, the initial work is most important, in order to provide a robust baseline from which participants can collaborate to devise a workable strategy.

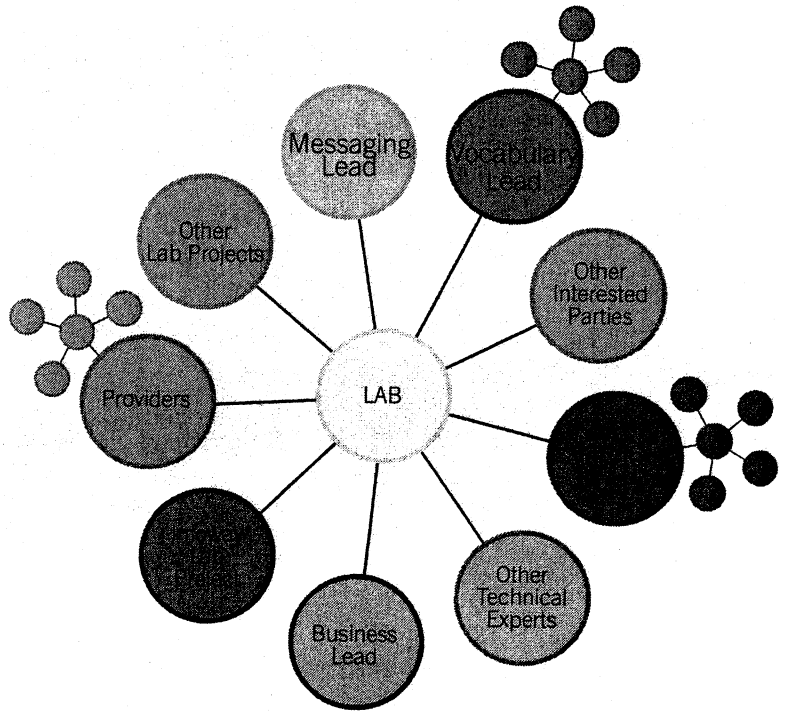
A variety of perspectives exist concerning a) what would constitute an accepted standard, and b) the process of developing such a standard and gaining consensus among the broader stakeholder community.

The stakeholder engagement model outlined in this document proposes a program-specific forum, encouraging pan-Canadian collaboration on standards.

Figure 11 provides an example of a pan-Canadian standards working group, in this case for a Laboratory Program.

The pan-Canadian standards working group would address EHR requirements from a variety of sources - *Infoway* projects, non-*Infoway* projects and other EHR stakeholders. It is anticipated that the working group will have a co-management model. A business expert would provide overall leadership to the initiative while a technical expert facilitates a standards development process.

Figure 11: Example of a pan-Canadian standards working group (laboratory program)



Membership for a pan-Canadian standards working group should not exceed 15 to 20 persons. However, representation may change based on the type of work undertaken. As an example, the group may be more heavily represented by business experts in the early stages.

To ensure that stakeholders have an opportunity for thoughtful and considerate input, interest groups may support the pan-Canadian standards working groups. For example, a physician interest group could contribute a focused clinical perspective.

It is anticipated that each program's pan-Canadian standards working group will report to the pan-Canadian EHR Standards Advisory Committee, and will be supported by a project manager and a business analyst, plus technical writing and secretariat resources as required.

4.2.5 The model within the broader health informatics context

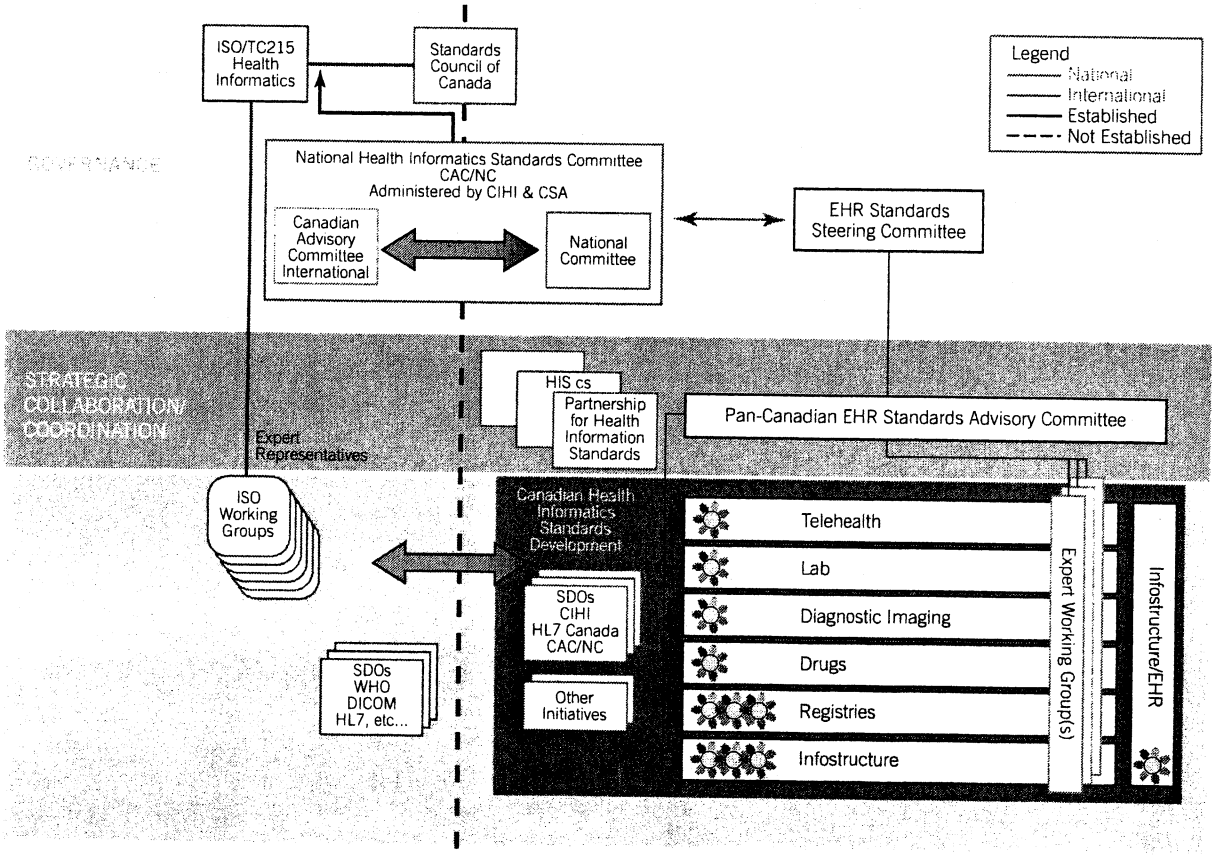
Infoway's mandate concerning standards is focused on enabling coherent representation of EHR data across sources and over time in relation to *Infoway*'s investment programs. It is recognized that this mandate, while significant, is not reflective of all health informatics work occurring in Canada.

The proposed stakeholder engagement model has been designed to integrate and align with existing structures and processes. Figure 12 depicts how the proposed model fits within the broader health informatics context in Canada.

The broader health informatics arena depicted in figure 12 illustrates both national and international standards mechanisms, together with their governance, collaboration and communication, plus development levels proposed in this document. It is critical that we recognize the role and influence that Canada currently has in the realm of international standards.

At the governance level, we anticipate that the proposed EHR Standards Steering Committee would operate at the level of the Canadian Advisory Committee/National[1] Committee (CAC/NC).

Figure 12: The Model Within The Broader Context



[1] Because the NC is not truly a technical committee but rather a domestically focused committee, we are referring to this group as the National Committee.

The CAC/NC represents a dual structure that is common for a domestic technical committee working within the National Standards System (NSS), with a particular scope of subject matter that corresponds with that of an ISO technical committee. The CAC/NC is jointly administered by CIHI and CSA.

The CAC operates principally in the ISO realm for a given scope of subject matter. (In the case of ISO/TC 215, this subject area is described as "health informatics.") The CAC reviews draft standards and, by member consensus, prepares Canada's positions or recommendations on those standards.

The CAC formally links with ISO/TC 215 through the Standards Council of Canada (SCC).

The NC, on the other hand, operates principally in the domestic realm to identify, approve and maintain national standards implemented in Canada.

The NC, in particular, considers whether a given ISO standard is suitable for adoption (or adaptation) to meet a domestic need, and where there is no such ISO standard available, the NC initiates development of a made-in-Canada solution.

The distinct operation of the CAC and the NC in their respective realms is important because the CAC can, for any given standards project, function with the participation of only a few Canadian experts.

In comparison, the NC works by consensus with a balanced matrix of members, each of whom must exercise a vote for every standard under development in order to approve a standard for publication. This does not preclude an ISO standard from being developed in order to serve a domestic need, or vice-versa if development of a given standard begins in Canada.

While the scope of the proposed engagement model outlined in this report is limited to clinical EHR standards, it seems clear that the EHR Standards Steering Committee could evolve into, or be replaced by, the NC.

In terms of collaboration and communication, there are several key structures that align with the proposed pan-Canadian EHR Standards Advisory Committee.

First, the Partnership for Health Information Standards is a forum for communication and collaboration concerning requirements and outputs related to standards work. In addition, the provincial or territorial health information standards councils (HISCs) currently in place across the country provide a key mechanism for prioritizing standards activities and coordinating activities within a jurisdiction. It is recognized that not all jurisdictions have a standards council and that standards councils that do exist are at varying stages of their evolution.

4.2.0 Mapping the model to the stakeholder engagement framework

As shown in Figure 13, the proposed stakeholder engagement model is well aligned with the framework outlined earlier in this document.

The stakeholders represented on the EHR Standards Steering Committee are those that will need to be consulted for authority if a standard is to be endorsed and implemented across the country.

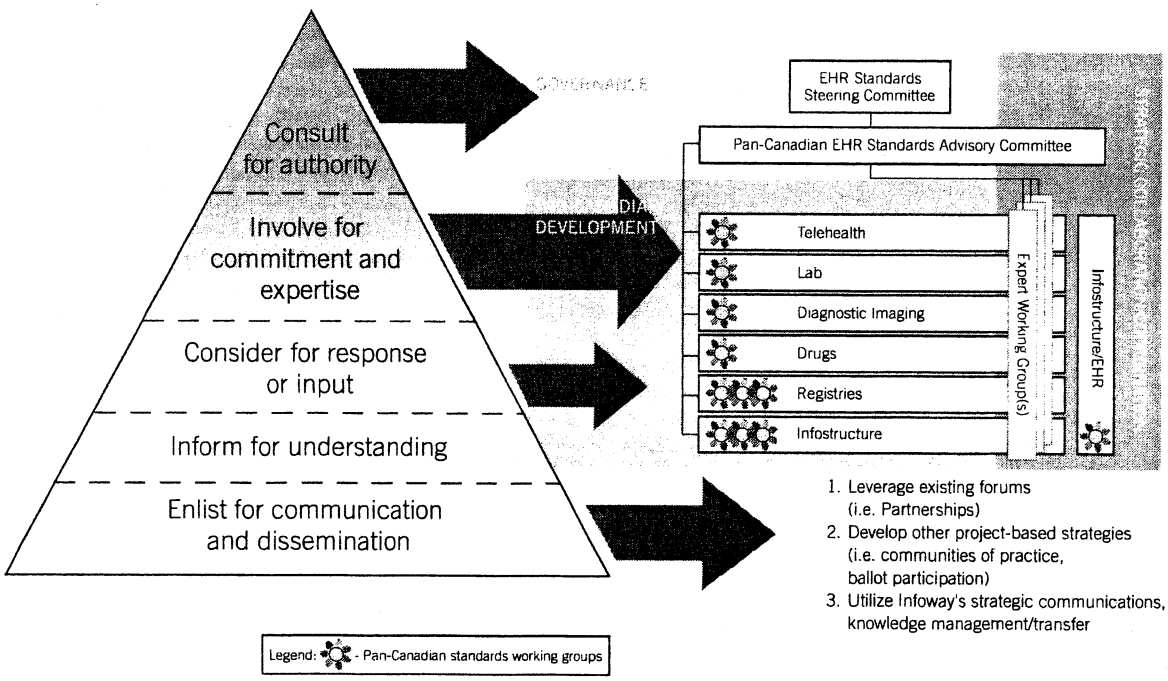
The Pan-Canadian EHR Standards Advisory Committee will consist of stakeholders who need to be consulted for authority or those who should be involved for commitment and expertise. For example, standards councils that in many cases will be required to support a standard, and bring necessary expertise to the table, are important stakeholders in this body.

The pan-Canadian development tables will be made up of stakeholders who need to be involved for commitment and expertise or who need to be considered for input. Typically, this will involve stakeholders who are impacted by the standard or have a particular interest in or perspective on it. The specific stakeholders for each table will be determined by conducting the detailed stakeholder segmentation and analysis process outlined earlier in the stakeholder engagement framework.

By and large, the proposed model does not provide for engagement below the level of considering for response. Alternative mechanisms will need to be identified for stakeholders who need to be informed for understanding, or enlisted for communication and dissemination of information. For example, there is an opportunity to leverage existing forums such as the Partnership for Health Information Standards.

Specific project-based strategies such as communities of practice may also be considered. Finally, there is an opportunity for *Infoway* to support these standards activities with its strategic communications and knowledge management services.

Figure 13: Mapping the model to the stakeholder engagement framework



4.2.7 Key attributes of the proposed stakeholder engagement model

In summary, the strength of the proposed stakeholder engagement model is based on key attributes listed below. Essentially, the model:

- Is supportive of and integrates with existing international and national standards processes;
- Is structured so that *Infoway* would not invest in operations but may facilitate the initial coordination;
- Leverages provincial or territorial standards councils to play an integral coordination, collaboration and communication role between jurisdictions and pan-Canadian standards processes;
- Provides for dedicated leadership and resources to support the establishment and implementation of standards;
- Provides for vendor involvement in establishing standards;
- Is committed to building capability and capacity for standards work now and in the future;
- Facilitates development of standardized methodologies and tools that support ongoing standards work.

4.3 PROPOSED INITIATIVES

The following initiatives are proposed to address the gaps and foundational work that will be required in support of interoperable EHR standards.

4.3.1 Foundational standards

The first group of initiatives are foundational standards components that will affect all of *Infoway*'s investment programs. These initiatives are outlined below.

Standard methodology for pan-Canadian unique identifiers

The EHRS Blueprint requires methods for uniquely identifying clients, providers and service locations on a pan-Canadian, cross-jurisdictional basis.

Throughout focus group meetings, our stakeholders have stressed the urgency of building standard methods for unique identification. It is proposed that a project leverage expertise gained on the Client Registry and Provider Registry projects and the CIHI Roadmap projects, to develop a consistent strategy and methodology for providing unique identification for clients, providers and locations across all *Infoway* programs. This strategy must incorporate the Blueprint concepts for locating data across multiple instances of the interoperable EHR.

Diagnostic and intervention information

Many programs will require the ability to accurately represent comparable information on diagnostic and intervention information. It is proposed that *Infoway* sponsor the development of a strategy for harmonizing these requirements across programs.

Encounter, episode and service delivery

Currently, there is no consistent definition for encounters, episodes of care or health service delivery programs in Canada. This makes correlation and interpretation of patient-related data across care settings, jurisdictions and systems difficult. Like all standards projects, this project will work with the broad stakeholder community to develop a consensus-based set of definitions that can be used to consistently view and report on information in the interoperable EHR

Pan-Canadian information models for EHR

This project would create a catalogue of publicly available EHR Information / Data Models proposed or in use globally. The catalogue will inform *Infoway* and the standards-development process of best practices in EHR models that may be applied to a logical data model for the pan-Canadian interoperable EHR.

Use-case development

This project will develop the tooling and methodology necessary to capture and build a cumulative catalogue of information use-cases for the interoperable EHR. These use-cases will be captured and applied in the process of defining business requirements to support interoperability within the *Infoway* EHRS framework. Use-cases of particular interest are those that will support the interaction between source applications and the EHR, via the HIAL infrastructure.

This catalogue will be available on-line and permit the addition of use-cases by registered users. This will provide ready access to stakeholders who can contribute to our knowledge of the requirements of the interoperable EHR, without requiring structured working meetings.

Entry and review of use-cases in the on-line catalogue could become a required component of due diligence on prospective investments, a method to formalize EHR solution requirements and provide test-cases for repeated, structured validation of the evolution of interoperable EHR solutions.

We do not expect to find many published examples, therefore much of this work will have to be developed through structured exercises with stakeholder groups in the context of *Infoway*'s existing program investments, along with projects initiated under the infostructure program.

A few examples of applicable use-cases include:

- Order entry across jurisdictions;
- Trust relationships, including data ownership and custodianship;
- Case management across multiple care providers and care settings.

A conceptual data model must be developed that outlines the key subjects of interest in the interoperable EHR, their relationships and proposed use. Such a data model will:

- Be built and validated through use of structured use-cases and methodologies;
- Facilitate further building and interpretation of uses-cases to define how the EHR meets business requirements of the health sector;
- Allow integration of concepts and data models from *Infoway*'s domain-centric program investments (Rx, Lab, DI);
- Allow integration of external information and data models into the interoperable EHR, particularly integrating constructs and patterns from the CIHI/Partnership Canadian conceptual health data model, and from the HL7 reference information model;
- Be used as the basis for the logical data model specification for the interoperable EHR.

In order to support development of interoperability components and the definition of common data standards across the various program investment projects, an EHR logical data model is needed. There are various strategies possible for building this data model, including:

- Synthesizing and adapting existing publicly available data models;
- Acquiring a commercially available data model;
- Developing a new model based on current software engineering techniques using business requirements derived from use-case and workflow analysis methodologies;
- Any combination of the above.

Realistically, this data model could be based on a synthesis of existing models that have been aligned and harmonized using the conceptual data model. This data model will be built assuming a comprehensive representation of the potential data required in an interoperable EHR.

The logical data model will then be validated and transformed into a physical implementation based on the use-cases and work done in the various investment program projects. This will occur on an iterative basis as the subject areas necessary to support *Infoway*'s project investments are developed. The logical data model will be used to harmonize the definition of data elements shared across *Infoway* programs, as well as the standards that apply.

In order to support consistent semantic meaning of the data that will be captured in the interoperable EHR across all sources, it will be necessary to provide metadata (data about the data) to provide a context for consistent interpretation.

There are various methods to achieve this, one of which is the Composite Clinical Data Dictionary (C2D2) concept. Given the importance of this work as a foundational component of the interoperable EHR, a proof-of-concept project is proposed to validate this concept and methods for its implementation.

The Rx, DI, and Lab programs will all require the ability to transfer and store narrative text information in their domain repositories. This will also be required extensively throughout the interoperable EHR. In order to facilitate the ability to access and reuse this information, an evaluation of HL7's Clinical Document Architecture (CDA) standard as a means of transmitting and storing text-based information in a more structured format will be conducted. This evaluation will include recommendations and a strategy for implementation.

Building on the work done by provincial / territorial standards councils and other international organizations, and in collaboration with these councils across Canada, *Infoway* proposes developing a methodology for evaluating and selecting standards used by *Infoway* programs.

This project will review the criteria findings of the EHR Data Definitions and Standards Project and will develop a methodology or measurement system for applying the standards criteria to determine if: an existing standard is appropriate for adoption, an existing standard requires adaptation, or a new standard should be developed.

To assist in identifying standards currently in use across the country, it is proposed that *Infoway* sponsor a project to develop an on-line catalogue of standards implemented across various jurisdictions. This project would leverage the work achieved by CIHI and sponsored by the Office of Health and Information Highway (OHIH), Health Canada, as described in the report "An Inventory of Standards for a Pan-Canadian Health Infostructure – Final Report".

This catalogue will be invaluable in tracking standards in our various investment program projects and as a tool for change management.

Many standards in the health sector are commercial products supported by various standards development, or maintenance, organizations. In order to use those standards, they must be licensed to organizations and jurisdictions that implement them.

In particular, *Infoway* proposes developing a strategy for licensing of vocabulary standards nationally. This strategy needs to consider the varying requirements of the interoperable EHR and existing clinical systems, evaluating for appropriateness of use, acquisition and maintenance costs, and potential implementation strategies.

This has particular implications for licensing of standards implemented on *Infoway*-funded projects, and must consider possible licensing requirements for jurisdictions that choose to replicate those solutions.

To help ensure pan-Canadian adoption of standards, *Infoway* proposes a project to invest in tools to support the implementation and maintenance of standards in both official languages (where required). These tools will provide mapping of coding and terminologies and will provide a consistent reference baseline for standards that are localized for the national realm. These tools must also support the versioning of standards in their various implementations across Canada.

Standards maintenance strategy

As part of the memorandum of understanding between *Infoway* and CIHI, a strategy must be developed to easily facilitate the transition of standards from implementation to maintenance.

This strategy will also provide for:

- Knowledge transfer from implementation projects to the maintenance team;
- Methods for communicating changes in standards to sites where they have been implemented;
- Methods for addressing updates and new requirements and necessary interactions with standards development and maintenance organizations responsible for the standard.

This project will use a collaborative approach involving *Infoway* and CIHI to develop a strategy for maintenance that is aligned with the goals of both organizations.

Quality conformance processes

Several initiatives will be required at a national level to establish a mechanism that ensures quality and demonstrates conformance and compliance with *Infoway* EHRS specifications and standards.

The most effective standards implementations include an operational model for testing solutions for conformance and compliance to declared specifications and standards. This is best done through an independent agency that can verify conformance and compliance. Doing so will require the development of a strategy for identifying the requirements for such an agency, how it will be utilized, and how it can provide certification of applications against approved standards and interoperability specifications.

Supporting compliance tools

The ability to influence the vendor community's support for selected standards will rely on the ability to test and validate compliance of vendor solutions against declared standards specifications. This will require investment in the development of tools to support the development and acquisition of compliant systems. These tools may include development workbenches to ensure standards are implemented in a consistent fashion, tools for transitioning between standards or versions of standards, environments for validating standards conformance and benchmarking specifications.

Specifically, *Infoway* would participate in international work in support of HL7 message interchange format (MIF) and will support the development of a message development workbench for HL7 version 3.

4.3.4 Standards development organizations (SDOs) and other capacity building

As part of its leadership role in defining standards and specifications, *Infoway* needs to participate in international standards development processes and organizations. Familiarity with various standards organizations and their work will be fundamental to allowing *Infoway* to conduct due diligence on proposed investments, to promote standards uptake by the vendor community and to ensure that standards endorsed by Canada in the international community align with the requirements of an interoperable EHR.

This requires active participation in working meetings to communicate Canadian requirements, to contribute to the evolution of standards and to support the development of our capacity to implement standards in the Canadian health sector. The following will be required to fulfill this role:

Participation in HL7 governance review

As part of the Memorandum of Understanding with CIHI, *Infoway* joined CIHI in a review of HL7 Canada's ability to support the anticipated dramatic increase in use of HL7 on multiple concurrent projects across the country.

This governance review has been completed and the recommendations are now with HL7 members for consideration and action. *Infoway* understands that the ultimate success of interoperable EHR solutions requires a strong and vital HL7 Canada as an international affiliate of HL7 Inc. *Infoway* has a vested interest in supporting the implementation of the HL7 governance recommendations.

As part of the implementation of HL7 version 3, *Infoway* may need to support the defense of standards proposals to SDOs. This occurs as part of the normal balloting process and will likely require *Infoway* attendance at HL7 harmonization meetings in which messaging requirements are rationalized against existing information models and implementations.

As well, it will be important for *Infoway* to participate in the "realm localization" of HL7 message standards in Canada. This is an activity that all HL7 international affiliates are expected to engage in, to define at a national level the vocabularies and message variants needed to meet requirements.

Infoway is currently participating in an international activity to define the baseline functional specifications for an EHR. This will directly affect the willingness and ability of the U.S. based vendor community to provide products that meet Canadian requirements. *Infoway* needs to participate more fully in this exercise, through final resolution of the ballot.

Canada is an active and contributing member of the ISO TC 215 standards group. *Infoway* must use standards endorsed by Canadian representatives in this international forum. For this reason, *Infoway* needs to actively participate as part of the Canadian delegation in defining those standards, so as to ensure they are aligned with pan-Canadian requirements.

Infoway has membership in national and international health informatics organizations that represent opportunities to engage with other standards-setting organizations, and to promote the standards agenda in Canada. This requires recurring annual membership costs and participation in meetings sponsored by these organizations, including: Canada's Health Informatics Association (COACH); Health Information Management Systems Society (HIMSS); CIHI Partnership for Health Information Standards.

The *Infoway* EHRS Blueprint includes several components that are directly enabled through the use of standards. The Health Information Access Layer (HIAL) requires HL7 messaging standards for the transfer of information to and from operational systems, between the HIAL and client / provider / location registries, between the HIAL and domain repositories (Rx, Lab, and DI) and between different instances of the EHR.

Because the concept of using HL7 messages to interact with an EHR is relatively new, we expect that only a limited set of existing HL7 messages will be applicable. We anticipate that *Infoway* will be responsible for identifying the use-cases for interaction with the EHR and, using HL7 message development methodology, developing messages specific to that type of interaction.

Our participation on the HL7 EHR SIG and other international EHR initiatives will help to ensure that messages will be reusable by Canada and other international jurisdictions.

While some of these messaging interfaces will be developed in the course of integrating the various domain repositories, others will be developed as clinical messages are exchanged with homegrown or vendor-provided operational systems.

To facilitate this process, *Infoway* needs to provide validated messaging interface specifications and perhaps application program interface (API) modules built to industry standards for broad use.

In addition, the HIAL provides for data normalization services when transferring data to and from operational systems and the Electronic Health Record Infostructure (EHRi). This component will need to be developed considering possible translation tables for code sets, metadata capture, and potential use of C2D2 as a normalizing agent. This basic capability will need to be developed as soon as we attempt to integrate data from two different source systems.

4.5.5 Knowledge management and standards

Fundamental to the building of standards capability and capacity in Canada is the need to capture and reuse both the tacit and explicit knowledge employed in establishing health information standards. What these knowledge objects are, how to capture them, and how to reuse them needs to be defined on a pan-Canadian level. As the stakeholder engagement strategy develops, a corresponding knowledge management (KM) strategy will be needed.

Part of that strategy will include tools for the capture and communication of information. Some of the initiatives already described will contribute to those tools, including the standards registry, as well as the use-case and data model catalogues. To further the knowledge management strategy for standards, the following KM initiatives have been identified:

[illegible]

A strategy will be required to identify the sources of knowledge in health information standards and to outline methods for engaging with sources, capturing knowledge artifacts and developing methods for dissemination and reuse of that knowledge. Essential to knowledge transfer will be the willingness to exchange information about the purposes, processes and results of standards projects. It will be important to define methods for promoting transparency of the standards process in projects.

[illegible] knowledge

As part of a KM strategy, it is important to identify appropriate sources of standards knowledge and to engage with those sources in a manner that will maximize knowledge capture and transfer without creating excessive additional effort in the course of doing standards work. Once the sources are identified, it will be important to incorporate these sources in the stakeholder engagement framework for standards.

[illegible]

Effective knowledge transfer also requires the ability to capture knowledge efficiently and understandably. The tools and methods for accomplishing this will constitute the KM Standards Framework. This framework will evolve by building knowledge object templates that are based upon best practices and proven sources. This will be facilitated by active KM participation in standards projects, so as to understand and capture the process and deliverables, and by leveraging lessons learned during implementation.

[illegible]

An evaluation of current communication vehicles and venues for standards work needs to be conducted to identify which mechanisms are effective, which need to be augmented, and where new mechanisms need to be built. Current communication vehicles include:

- Websites;
- Webcasts and other electronic broadcast tools;
- Conferences and working meetings such as HL7 Canada, CIHI Partnership,e-Health series and other events;
- Expert advisory panels.

[illegible] standards

Stakeholders across the country highlighted the need for structured change management and transition processes as a critical component of data definitions and standards initiatives moving forward.

There is general recognition that the recommendations and priorities highlighted in this report will change the context for EHR standards and, more importantly, will change the way standards work is undertaken in Canada.

The approach for undertaking EHR standards initiatives will require a new way of working for many stakeholders and will challenge some of the existing processes, roles and structures.

[illegible] for standards

To better understand the nature of the change management requirements, it is important to understand the magnitude of the changes that this report is prescribing. The following list summarizes the key changes that can be expected as we undertake EHR standards work to support the interoperable pan-Canadian EHR.

- To achieve the interoperability that is required to share health information across care settings and disciplines, it will be necessary to establish pan-Canadian consensus around EHR data definitions and standards. There is limited experience within Canada with the type of broad-based collaboration required to support this. Standards work has traditionally been undertaken within a specific jurisdiction, in which case the requirements are defined to meet specific local needs and are not typically adopted outside of the jurisdiction. Or work has been done at a national level based on more generic requirements and driven down to the jurisdictional level. In the proposed

model, there will be increased emphasis on a pan-Canadian approach to the development of EHR standards. This will require a level of transparency of process that is not currently understood nor sustainable under existing structures and processes.

- The recommendations outlined in this report will require changes to the way EHR standards are implemented and maintained. There will be increased accountability for conformance and compliance with the approved pan-Canadian standards.

- *Infoway* is committed to undertaking HL7 v3 for all new messaging standards. While Canada is recognized for its thought leadership in this area, and has gained international acceptance for the NeCST project, which is based on v3 messages, there is limited experience with v3 messages and the v3 methodology.

- The proposed standards stakeholder engagement model brings new governance models to the development, implementation and maintenance of standards.

- The recommendations outlined in this report highlight the need for continued focus on international integration and collaboration. A concentrated focus on contributing to international standards, and a commitment to leveraging international work within Canada, will be necessary.

- Interoperability and EHR standards may have implications for administrative and clinical workflow in the healthcare setting. These implications will need to be understood and stakeholders supported through the transition. Similarly, there may also be implications for current roles and responsibilities.

- The anticipated increase in volume of standards work and the new approach to standards work will require a broader base of expertise and capacity than currently exists within the country. To support the ongoing standards work associated with the evolution of the interoperable EHR, we will need to expand the current base of technical expertise. In addition, the base of experts who can provide facilitation and change management support to this work will need to be expanded. While there are many expected quantitative and qualitative benefits associated with the interoperable EHR, the expected increase in resources outlined above will required a financial investment.

- In addition, the recommendations and priorities have implications for how vendors are engaged in standards work. There is a real opportunity to collaborate at the pan-Canadian level and serve as a key enabler of the value proposition.

- Finally, it is anticipated that existing solutions and projects that are currently receiving funding from *Infoway* will need to be retrofitted to the new and evolving standards.

4.3.2 Approach to change management

The change management approach related to standards work will involve three phases. To begin, considerable effort will be needed to "position" for the change. This will involve strategic activities that define the value proposition for the interoperable EHR and the critical role that standards play.

Also required will be a concentrated effort to gain alignment for the identified priorities and recommendations. This stage ensures that the comprehensive planning required to support change and transition management is undertaken and understood. Without a concentrated focus on planning, it is unlikely that we will be able to fully leverage the opportunities and benefits outlined earlier in this report. This is a critically important phase requiring significant investment that is overlooked in many initiatives.

It is estimated that the effort for this phase should equate to approximately 20% of the total change effort. In the second phase, where 70% of the effort is typically expended, the focus is related to "actioning" the change. This is where the actual changes occur and the transition to the new state is supported and managed.

Finally, meaningful effort (approximately 10%) will be directed at "sustaining" the change at the end of a project. This will include post-implementation support, ongoing training and education, and the evaluation of change efforts.

Change management will be a component of all *Infoway* standards initiatives and will be integrated from the early planning stages through to evaluation. It is through this process that the change management plan and the stakeholder engagement model can evolve over time.

The change management methodology required to support the EHR data definitions and standards work is comprehensive and should include the following key components:

- Building Readiness for Change: Activities are focused on ensuring that there is a well-understood value proposition or case for pan-Canadian EHR standards and for the recommendations and priorities arising from this report. These activities will be targeted to stakeholder segments.

- Communication and Stakeholder Engagement: Activities are focused on stakeholder segmentation and analysis to understand how various stakeholders should be engaged. Any approach to stakeholder engagement must reflect the extremely complex healthcare environment and the unique relationships among stakeholder segments. In addition, communication strategies to support adoption and readiness at the system and specific initiative level will need to be developed. Again, these activities will be targeted to stakeholder segments.

- Training and Education: Activities are focused on ensuring that the required training and education strategies are developed to support the anticipated new roles and to build upon the existing capability and capacity that exists.

- Process and Structure Redesign: Activities are focused on ensuring that the required processes, roles and relationships to support the recommendations and priorities are understood and appropriately defined and developed.

- Transition Support: Activities are focused on supporting stakeholders through the change process.

- Evaluation: This is a critically important component. Activities are focused on understanding how change management approaches and plans have supported adoption and delivered expected benefits. This applies not only to new standards but to new processes for establishing standards.

The following is a synopsis of proposed change management initiatives and priorities.

The model has been described and validated at the conceptual level. There is considerable work to be done around detailed design. Specifically, short term effort will be required to:

- Develop the Terms of Reference and identify membership for the EHR Standards Steering Committee.

- Develop terms of reference and identify membership for the pan-Canadian EHR Standards Advisory Committee.

- Develop terms of reference and identify membership for the expert working group.

This will include the development and documentation of the approach, principles, strategies, tools and templates.

Explore different options and strategies to build capacity and capability to support sustainability of the proposed engagement model. For example, would secondment of resources to *Infoway* standards initiatives provide the required capacity-building? Would this be a feasible option for the jurisdictions?

Evolve the stakeholder engagement framework by developing tools and standard templates to be used for the purposes of stakeholder segmentation and analysis for *Infoway* standards initiatives. This framework will be applied within each of *Infoway*'s investment programs.

Develop a targeted communication plan for *Infoway*'s standards strategy and evolve the existing tools and standard templates to support initiative-specific communication strategies.

Work with *Infoway*'s Business Intelligence Group to develop a framework and identify the key criteria / indicators for evaluating change management effectiveness for standards adoption.

In undertaking the above priorities and ensuring that standards initiatives are grounded in structured change management and transition processes, we can provide an environment in which stakeholders understand the need for change, support new standards initiatives and feel meaningfully engaged in the process. More importantly, this type of approach will facilitate adoption and ensure that we are moving toward the pan-Canadian EHR as effectively and efficiently as possible.

5 Summary and Conclusions

There have been many initiatives to support establishment of information standards in this sector. *Infoway*'s mandate to establish interoperable Electronic Health Records has created an imperative to address this issue on a national level in a timely fashion. The effective application of standards is a critical success factor in achieving this mandate.

As the team has conducted this first phase of work in understanding this landscape, it has become apparent that the challenge is large. The investment programs defined by *Infoway* will contribute a great deal to this work on a national level. But a much larger effort will be required by all stakeholders in the Canadian Health Sector to ensure that health information is accessible, timely, comparable and comprehensive.

5.1 Next Steps

The findings, resource material and recommended initiatives produced during the EHR Data Definitions and Standards Project will be incorporated into the investment strategy currently being defined for *Infoway*'s Infostructure Program. Many of the foundational standards projects that need to be undertaken will fall within that Infostructure program. The Infostructure Investment Strategy will go to *Infoway*'s board of directors early in 2004 and, once approved, projects will be formally defined and work will begin in earnest.

Standards work in other *Infoway* programs will be strongly influenced by these foundational deliverables, particularly the stakeholder engagement framework and the establishment of the EHR expert working groups as well as the pan-Canadian steering committee.

The standards criteria and principles expressed in this document will also have an influence on the investment criteria for programs which are defining their investment strategies, particularly in the domains of Telehealth and Lab. A willingness to embrace the standards resulting from this work will be a very important factor as well in *Infoway* funding for subsequent uptake and deployment of EHR solutions.

In conclusion, the team would like to once more thank all of the participants and contributors to this exercise.

We look forward to your continued guidance and appreciate your support.

Tab 4

Health Canada Santé Canada

Your health and safety... our priority. *Votre santé et votre sécurité... notre priorité.*

Pan-Canadian Health Human Resource Strategy

2006/07 Report
Accomplishments and New Projects

Canada

Health Canada is the federal department responsible for helping Canadians maintain and improve their health. We assess the safety of drugs and many consumer products, help improve the safety of food, and provide information to Canadians to help them make healthy decisions. We provide health services to First Nations people and to Inuit communities. We work with the provinces to ensure our health care system serves the needs of Canadians.

Published by authority of the Minister of Health.

Pan-Canadian Health Human Resource Strategy
2006/07 Report
Accomplishments and New Projects is available on the Internet at the following address:
http://www.hc-sc.gc.ca/hcs-sss/hhr-rhs/strateg/ar-ra-2007/index_e.html

Également disponible en français sous le titre :
http://www.hc-sc.gc.ca/hcs-sss/hhr-rhs/strateg/ar-ra-2007/index_f.html

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Table of Contents

Introduction

At the heart of any health care system are the people who deliver care – health human resources (HHR). Canada's health care providers are a part of a constantly evolving health care landscape in which factors such as an aging population and workforce, new technologies, and health care reforms play an ever increasing role.

The medical system's ability to provide access to high quality, effective, patient-centred and safe health services depends on HHR and on having the right mix of health care providers with the right skills in the right place at the right time.

With respect to HHR, Canada faces a number of challenges in terms of supply, mix, distribution, retention, recruitment and training.

The Pan-Canadian Health Human Resource Strategy (HHRS) seeks to respond to the 2004 Health Accord commitments, signed by Canada's First Ministers, to secure and maintain a stable and optimal health workforce in Canada while also supporting overall health care renewal.

The HHRS is comprised of three initiatives:

- Pan-Canadian Health Human Resource Planning
- Interprofessional Education for Collaborative Patient-Centred Practice
- Recruitment and Retention of Health Care Providers/Professionals

Health Canada continues to work collaboratively with provincial/territorial (P/T) governments, professional associations and other federal departments to advance the HHRS.

2000 Accord on Health Care Renewal:
First Ministers identify HHR as a P/T priority.

2003 Accord on Health Care Renewal:
First Ministers reaffirm HHR as an F/P/T priority and the federal government allocates $85M to HHR Renewal. Ongoing funding of $20M annually for the Pan-Canadian HHR Strategy.

2004 Meeting on the Future of Health Care:
First Ministers commit $5.5B over 10 years to wait times reduction, including ongoing collaborative work on HHR.

Budget 2005:
Government of Canada provides $75M in funding over 5 years for the Internationally Educated Health Professionals Initiative.

Many projects described within this report are being implemented through contribution agreements between Health Canada and various recipients. Health Canada provides funding to recipients (i.e. external organizations and P/Ts) to accomplish work which furthers the objectives of the Strategy.

In 2006/07

Number of new projects: 26

Funding allocated: $29,775,940

This report details all new projects funded during the 2006/07 fiscal year. The CD-ROM included with the paper version of this report, entitled *Pan-Canadian Health Human Resource Strategy Ongoing Projects in 2006/07*, highlights projects funded during the 2005/06 fiscal year that are still ongoing, as well as project amendments that were made during the 2006/07 fiscal year.

The Initiatives of the Pan-Canadian Health Human Resource Strategy

Pan-Canadian HHR Planning

Background

In the 2003 First Ministers' Accord on Health Care Renewal, the federal, provincial and territorial (F/P/T) governments made a commitment to work together to improve health human resources (HHR) planning.

As a result of this commitment, the Conference of Deputy Ministers of Health requested that the Advisory Committee on Health Delivery and Human Resources (ACHDHR) develop *A Framework for Collaborative Pan-Canadian Health Human Resources Planning.** The focus of the ACHDHR's work is to ensure Canada has the HHR to support the health system of the future.

A new pan-Canadian approach to HHR planning (as opposed to relying primarily on past utilization trends) will enable provincial and territorial jurisdictions to determine more accurately their HHR requirements based on system design and population health, which will lead to more responsive health systems.

The Pan-Canadian HHR Planning Initiative seeks to address collaborative planning issues by achieving the following objectives:

- Enhance and strengthen the evidence base and capacity for coordinated HHR planning to better support F/P/T, jurisdictional and nationwide activities; and
- Create a culture in which key HHR issues of jurisdictional, inter-jurisdictional and pan-Canadian concern can be identified and addressed.

* *The Province of Quebec considers health human resources planning its exclusive provincial responsibility. It did not participate in the development of the Framework nor does it intend to participate in a pan-Canadian strategy for collaborative health human resource planning. However, Quebec remains open to sharing information and best practices with other jurisdictions.*

Accomplishments

In 2006-2007, the following was accomplished through HHR Planning:

- Health Canada contributed to the National Physician Survey 2007, a joint venture by the College of Family Physicians of Canada, the Canadian Medical Association, the Royal College of Physicians and Surgeons of Canada, and the Canadian Institute for Health Information, to collect valuable physician information not found in any other source (e.g. working hours, locations of practice, types of services offered in different practice settings, and use of emerging technology).
- In February 2007, the Canadian Institutes of Health Research, Health Canada, and the Public Health Agency of Canada hosted a workshop titled Building an HHR Research and Knowledge Translation and Exchange Agenda. Policy-makers and researchers discussed HHR research, knowledge translation, and exchanged priorities and ways to coordinate efforts to advance in these areas.
- In February 2007, under the direction of the HHR Planning Subcommittee of the ACHDHR, government representatives, researchers, data collectors, modellers, and planners met and discussed ways to exchange knowledge, to address data and modelling issues in HHR management, and to assess the supply of and requirements for the health workforce.

The HHR Planning Initiative funds two projects that are referenced as priority activities under the Pan-Canadian HHR Planning Framework:

Health Human Resources Databases Development Project (HHR-DDP)

To develop national, supply-based databases and reporting systems for five regulated health professions: Pharmacists, Occupational Therapists, Physiotherapists, Medical Laboratory Technologists, and Medical Radiation Technologists.

Health Cross-Jurisdictional Labour Relations Database (HCJDB)

To permit partnering jurisdictions access to nationwide information regarding health sector labour agreements, including compensation.

For further information on these projects, refer to *Pan-Canadian Health Human Resource Strategy 2006/07 Report Ongoing Projects*.

The Framework for Collaborative Pan-Canadian HHR Planning

Background

The first edition of the Framework was approved by F/P/T ministers of Health in October 2005. The Action Plan contained within the Framework identifies priorities for joint action and sets out tangible objectives and specific actions that jurisdictions and stakeholders can achieve together to create a more stable and effective health workforce.

The Pan-Canadian Framework remains in constant evolution, being continually adapted to respond to the needs and input of stakeholders. Between the spring and fall of 2006, stakeholders, including ministries of Education, research entities, national Aboriginal groups, health sector organizations, health professional associations, and professional regulatory bodies, were consulted on the goals, objectives and activities listed within the Framework and Action Plan. This engagement process has strengthened the commitment of governments and stakeholders to work together in addressing HHR challenges.

The federal government, in consultation with its provincial and territorial partners and key stakeholders, will be using the Action Plan of the Framework as its guiding document for setting out future plans and priorities under the Pan-Canadian HHR Strategy.

Accomplishments

In 2006/07, the ACHDHR made progress by further defining the Framework and articulating the Action Plan within the Framework through the following initiatives:

- The ACHDHR's Subcommittee on Entry-to-Practice Credentials (CCETPC) reviewed and provided advice on two credential submissions from professional health organizations. The goal is to assist P/T governments in ensuring that changes in entry-to-practice education credentials consider the impact on health human resource planning and the implications for professional legislation and regulation, labour mobility, supply, changing models of service delivery, public policy, compensation and educational costs.
- In December 2006, a one-day workshop on research priorities was held to better understand the consequences of increasing the entry-to-practice requirements.
- An engagement process on the Action Plan of the Pan-Canadian Collaborative Framework for Health Human Resource Planning was completed with key stakeholders in October 2006. This included a one-day workshop to discuss the contribution and the involvement of stakeholders in the implementation of the Action Plan.
- The Physician Subcommittee of the ACHDHR reviewed alternative payment plans for physicians in Canada and the impact on patient satisfaction and physician productivity.

Pan-Canadian Framework Activities

The HHR Planning Framework and Action Plan was revised based on online stakeholders in the spring of 2006.

The HHR Planning Framework Stakeholder Engagement Consultation Workshop took place in October 2006.

Upcoming discussions of Pan-Canadian HHR priority objectives from the Action Plan at regional and national stakeholder levels will take place during the spring and summer of 2007.

Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP)

Background

Recent trends towards interprofessional team-based care suggest that the roles and responsibilities of various health care providers are changing.

Changing the way we educate health care providers is key to achieving system change and to ensuring that health care providers have the necessary knowledge and skills to work effectively in interprofessional teams within the evolving health care system.

The objective of the IECPCP Initiative of the Pan-Canadian HHR Strategy is to facilitate the adoption of these approaches across all health care sectors. The goals are to increase patient and provider satisfaction and ultimately, to improve patient care.

The IECPCP Initiative began in 2003 with the following objectives:

- Promote and demonstrate the benefits of interprofessional education for collaborative patient-centred practice;
- Increase the number of educators prepared to teach from an interprofessional collaborative patient-centred perspective;
- Increase the number of health professionals trained for patient-centred collaborative practice before, and after, entry-to-practice;
- Stimulate networking and sharing of best educational approaches for collaborative patient-centred practice; and
- Facilitate interprofessional collaborative care in both the education and practice settings.

Accomplishments

In partnership with provinces, territories, academic institutions and clinical settings, the IECPCP Initiative made progress during 2006/07. Knowledge generation and dissemination were once again key areas of focus for the Initiative, as well as future planning and sustainability.

The following key activities illustrate the advancements made in facilitating the adoption of IECPCP across the country:

- Nine new learning projects located across Canada received funding in spring 2006. These Cycle Two learning projects will help advance the IECPCP agenda in education and practice settings.
- A new complementary project received funding to establish the Canadian Interprofessional Health Collaborative (CIHC) in the summer of 2006. The CIHC is the focal point for best practices identification, dissemination, and knowledge translation in the area of IECPCP. This project will integrate knowledge from all of the IECPCP projects and activities funded by Health Canada and will result in a Pan-Canadian collaborative of IECPCP partners.
- On November 26, 2006, the CIHC held a workshop called Working Together on Research, to discuss measures suitable for research into IECPCP. The CIHC also held its inaugural meeting in Toronto on November 27 and 28, 2006.

- The CIHC actively supports the work of the National Health Sciences Students' Association (NaHSSA), a diverse network of 17 university- and college-based student chapters dedicated to advancing the IECPCP agenda within the health and human service student population. The third Annual NaHSSA Conference was held at the University of Saskatoon and provided student leaders the chance to meet and share ideas, discuss future directions and collaborate on national projects.
- Health Canada staff visited four Cycle One learning projects in 2006/07. These site visits provided an opportunity to share information and gain a greater understanding of project activities, successes, and lessons learned. Projects were visited in Manitoba, Ontario, British Columbia and Newfoundland and Labrador. In addition, meetings were held with project leads, and representatives from the provincial ministries of Education and of Health in Manitoba, Newfoundland and Labrador, and British Columbia to discuss project sustainability. Lessons learned from these visits will be shared with other projects through the CIHC, and will also be used to inform years 6 to 10 of the IECPCP Initiative.
- Several jurisdictions in Cycle One held provincial meetings during the year. British Columbia, Ontario and Newfoundland and Labrador held consultations, providing an opportunity for key stakeholders and interested parties to share expertise and knowledge and to talk about the future of IECPCP for their respective provinces. These meetings demonstrate how all levels of govern-ment are working together to make IECPCP a viable and sustainable option for learners and practitioners across the country.

Recruitment and Retention (R&R)

Background

As the health workforce continues to age and the population becomes increasingly diverse, demand for health care increases and the need to appropriately recruit and retain health care providers becomes essential. R&R aims to increase the supply of health professionals and to revitalize the current and future health care workforce by:

- Increasing interest in health careers, both generally and in specific areas of shortage;
- Increasing diversity of health care providers to reflect the Canadian mosaic;
- Increasing the supply of health care providers to ensure availability, when and where needed;
- Reducing barriers for internationally educated health care providers;
- Improving utilization and distribution of existing health care providers; and
- Making current workplace environments healthier for health care workers, thus supporting the provision of high-quality care.

Accomplishments

The success of the Recruitment and Retention Initiative is tied to the complementary efforts of the provinces and territories, appropriate health stakeholders, health care professionals, and various federal departments. In 2006/07, a number of collaborative projects were carried out:

- Project areas included an increase of support for family physicians in primary care, promotional strategies to enhance the image of family medicine, and a conference on the medical workforce in changing health care delivery systems.

- With the participation of family physician leaders in primary care, the Primary Care Toolkit was developed to ensure evolving family practice models of care meet the professional needs of doctors while also contributing to best practices.
- In order to enhance the image of family medicine among medical students, the College of Family Physicians of Canada created Family Medicine Interest Groups (FMIGs), which provide opportunities for dialogue and interaction among medical students, family doctors and the faculties of family medicine during the undergraduate years. The FMIGs invite family physicians who practice in large and small communities along with family medicine residents, teachers and researchers to meet regularly with medical students in informal settings to answer questions, take part in discussions and share information about family practice careers.

2007 International Medical Workforce Collaborative

In March 2007, Canada hosted an international conference of leaders in HHR research and policy from the UK, US, Australia and Canada. Participants examined the medical workforce in changing health care delivery systems. Within the overarching theme of Interprofessionalism, the conference examined the impact of physicians' roles and function on health outcomes in chronic disease management including timely access to diagnosis, treatment and continuing care. Other themes included: management and leadership functions of physicians during system change and how this affects timely delivery of services; service to remote, rural and isolated communities including minorities; and the impact of recruitment and retirement on the overall ability to respond to the provision of timely care.

- In September 2006, the Six Organizations to Advance the Renewal of Family Medicine (SOAR) Colloquium was held in Toronto. Six countries convened to share experiences and ideas to promote the renewal and transformation of family medicine. Representatives from Australia, Canada, Great Britain, the Netherlands, New Zealand and the United States discussed a variety of themes including: practice models; remuneration strategies; interdisciplinary training and practice; comprehensive continuing care and specialized family practice services, including approaches to public health and chronic disease management; and the deployment of family physicians and other health human resources.

Healthy Workplace Initiative (HWI)

Background

The HWI is a major component of the R&R Initiative under the Pan-Canadian HHR Strategy, and its accomplishments fall into one of four areas: the leading of practice application, knowledge generation, change management, and knowledge translation and transfer.

Accomplishments

Leading Practice Application:

- Eleven provincial projects and four national projects were funded through the HWI. Significant progress was made by both the provincial and national projects, which continued to show that healthy workplace interventions make a difference to the health and well-being of front-line workers. Projects collected data that demonstrated reductions in absenteeism and injury among health care workers as well as their related costs.
- Eleven HWI projects were amended during the fourth quarter of the year in an effort to capitalize on promising initiatives. Amended activities include: investments in Prince Edward Island to reduce the risk of musculoskeletal injury; a contribution to the Occupational Health and Safety Conference in Newfoundland and Labrador; and the extension of the Halton Healthcare's Kailo program to Georgetown, Ontario.

Knowledge Generation:

- On March 8, 2007, a workshop of 50 interprofessional researchers, decision makers, employers and union representatives met to explore the development of the National Survey on the Work and Health of Nurses (NSWHN) Research/Analytical Framework. The Framework will ensure that data from the NSWHN is used by researchers and decision-makers, and will articulate potential plans for an interprofessional survey on the work and health of Canada's health providers in the future.
- A special edition of Healthcare Papers was published in partnership with the Canadian Health Services Research Foundation, the Ontario Ministry of Health and Long-Term Care and the Victorian Order of Nurses Canada. The publication features articles on healthy workplaces for health workers and provides examples of effective teamwork in health care along with a series of commentary articles.

National Survey on the Work and Health of Nurses

Released on December 11, 2006, this national survey was done in partnership with the Canadian Institute for Health Information (CIHI) and Statistics Canada. It is the first nationally representative study of Canada's three categories of regulated nurses (Registered Nurses, Licensed Practical Nurses, Registered Practical Nurses). The study provides a benchmark against which to measure progress in the area of quality work environments for nurses.

- Five HWI research studies were completed and released by Health Canada's Health Policy Research Program in 2006/07. Each of the research reports outlines relevant information to ensure that the evidence base for healthy workplaces is used by decision-makers.
- The 13th edition of Health Canada's Healthy Policy Research Bulletin, entitled *The Working Conditions of Nurses: Confronting the Challenges*, was published and distributed in 2006/07. The Bulletin's final article underlines the importance of collaboration among stakeholders in moving toward healthy working conditions for Canada's health care providers.

Change Management:

- The Quality Worklife-Quality Healthcare Collaborative is the cornerstone of the HWI change-management strategy. The Collaborative made great strides this year, including the National Summit in December 2006, and the release of its Quality Healthcare Action Strategy. The Collaborative's mandate has been extended by one year in an effort to consolidate the gains made to date and to provide a vehicle for disseminating learnings throughout the HWI.

Knowledge Translation and Transfer:

- The second annual HWI Knowledge Exchange Days were held in November 2006. The projects funded through HWI and the Health Policy Research Program provided a unique opportunity to share lessons-to-date. The Quality Worklife-Quality Healthcare Collaborative hosted the exchange days. As a result of the Knowledge Exchange Days, a virtual network of Canada's Healthy Workplace Champions was created, and it continues to facilitate communication and the exchange of information.

Aboriginal HHR Work

Background

Health Canada has formed a unique relationship with First Nations and Inuit communities by working closely with them to enhance their health services and improve health outcomes. This is an ongoing commitment of the federal government, resulting from a series of reports and commissions on Aboriginal health, including *Gathering Strength: Canada's Aboriginal Action*, *Building on Values: The Future of Health Care in Canada* and the Royal Commission on Aboriginal Peoples. Health Canada's First Nations and Inuit Health Branch (FNIHB) works to ensure that First Nations and Inuit health care needs are addressed and, where possible, integrated into larger pan-Canadian strategies.

FNIHB is directly responsible for implementing the Pan-Canadian HHR Strategy from a First Nations and Inuit perspective and seeks to accomplish the following goals:

- Ensure that the current and future supply, mix and distribution of First Nations and Inuit HHR are optimized and respond to the needs of First Nations and Inuit through a coordinated approach to HHR planning;
- Achieve and maintain an adequate supply of qualified health care providers who are appropriately educated, distributed, deployed and supported, to ensure culturally appropriate and safe health care services are available to First Nations and Inuit;
- Increase the number of First Nations and Inuit entering into health careers, and the number of health care providers working in First Nations and Inuit communities;
- Ensure that First Nations and Inuit HHR data collection is ongoing, coordinated and systemic, and that the process involves First Nations and Inuit organizations; and
- Promote interprofessional education for health care workers and collaborative patient-centred practice that addresses the holistic health care needs of First Nations and Inuit. This is intended to increase client satisfaction and ultimately, to improve patient outcomes.

Accomplishments

Examples of accomplishments in the area of Aboriginal Health Human Resources in 2006/07 include:

- A final draft report on Core Competencies for Wellness and Primary Health Care Providers for First Nations and Inuit Community Health Representatives.
- A framework of core competencies to support Faculties of Medicine in developing and teaching Aboriginal health curricula in medical schools.
- A report on issues and recommendations for inclusion of Aboriginal indicators in the National Minimum Data Set for collection of data on Aboriginal health providers.
- A forum on Aboriginal HHR based on Saskatchewan's innovative approaches to recruiting and retaining Aboriginal health providers.

Internationally Educated Health Professionals Initiative (IEHPI)

Background

Canada faces shortages of doctors, nurses and other health professionals. At the same time, there are many internationally educated health professionals (IEHPs) who live in Canada but have been unable to practice in their chosen profession.

Through the IEHPI, Health Canada continues to work with provinces, territories and stakeholders to enable more IEHPs to put their skills to work in Canada's health system. This will help address shortages of health professionals and assist efforts to reduce wait times for care.

The IEHPI is currently focusing on seven professions which include: medicine, nursing, medical laboratory science, medical radiation technology, pharmacy, physiotherapy, and occupational therapy.

Accomplishments

National and regional approaches that maximize the resources available, combined with a high level of engagement by stakeholders, have contributed significantly to the success of the initiative to date.

Key achievements in 2006/2007 include:

- New centres and services for IEHPs are being developed in Ontario, Manitoba, British Columbia and Saskatchewan. Services provided will respond to the need for front-end information, counselling and referral by IEHPs so that they can quickly access the supports they need.

The Ontario Centre, launched in December 2006, received more than 100 calls within the first week of opening.

- Specialized employment coaching services for IEHPs in Nova Scotia resulted in over 200 counselling sessions in 2006.
- A number of innovative bridging programs were launched, allowing individuals who are currently under-employed within their profession to optimize their full skill set within the health sector.
- Led by the University of Toronto's Faculty of Pharmacy, a collaborative between seven health professions and a number of P/Ts launched the first phase of a multiprofessional program designed to provide IEHPs with an orientation to the Canadian health care system.
- The Internationally Educated Nurses Taskforce, created in 2004 to help find solutions to the issues being faced by internationally educated nurses in Canada, continues its work on areas identified for development, including a common information source, education, assessment and bridging, and data management, including the concept of a personal identification number. Additionally, many P/Ts and pan-Canadian initiatives funded through the IEHPI will also address these issues.

IEHPI Strategic Outcomes:

Preparedness and Integration

IEHPs will be aware of the route to practice for their given profession

IEHPs will be oriented to the Canadian health care system

IEHPs can self-assess their readiness to complete exams

Assessment

Credentials are verified and IEHPs have access to licensure assessments and examinations

Faculty Development

Faculty, clinical instructors and community-based preceptors are trained and available to provide assessments and clinical training for IEHPs

Clinical Placement

IEHPs have access to clinical placements and upgrading programs

Integration – Employment

IEHPs are able to integrate into the health workforce

Regional Collaboration

Jurisdictions collaborate to maximize impact of investments

International Medical Graduate (IMG) Initiatives

Background

Prior to the creation of the IEHPI in 2005, efforts were already underway to reduce barriers to licensure for International Medical Graduates (IMGs). In the summer of 2002, the creation of the Canadian Taskforce on Licensure of IMGs was a key step in addressing the issues faced by IMGs in Canada.

The Task Force made six recommendations which were endorsed by the F/P/T ministers of Health in February 2004. The recommendations included the following:

- Increase capacity to assess and prepare IMGs for licensure.
- Work towards standardization of licensure requirements.
- Expand or develop support/programs to assist IMGs with the licensure process and requirements in Canada.
- Develop orientation programs to support faculty and physicians working with IMGs.
- Develop capacity to track and recruit IMGs.
- Develop a national research agenda, including evaluation of the IMG strategy.

Accomplishments

Initiatives to address the recommendations of the IMG Task Force have either been fully implemented or are nearing full implementation. An evaluation of these activities began in November 2005, and will span 30 months. Achievements under IEHPI for IMGs in 2006/07 include:

- From July 1, 2006 to February 28, 2007, the IMG website (www.img-canada.ca) received an average of 432 daily visits.

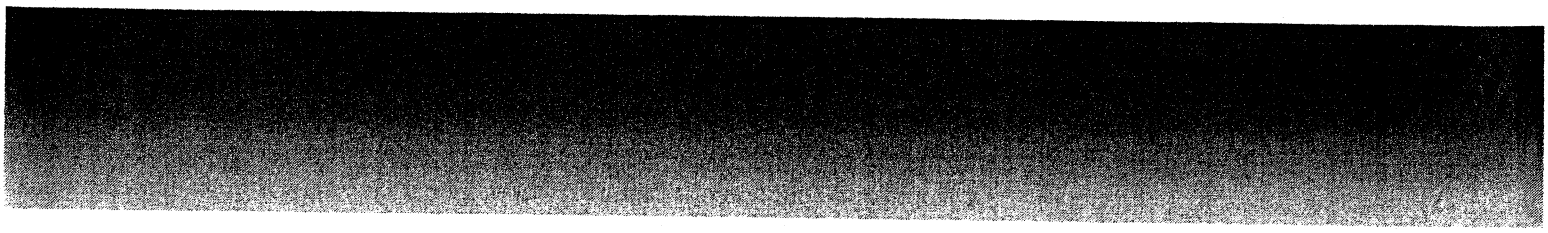
  This website enables IEHPs to access a single source of detailed, clear information about the requirements to practise as a medical doctor in Canada. Over the last year, other health professions and jurisdictions have made strides in developing communication tools to ensure easy access to clear and relevant information about licensure and practice in Canada.

- The Medical Council of Canada is bringing together its partners to develop common tools for the assessment of IMGs. This initiative builds on the significant development work already achieved with the goal to create a consistent and transparent approach to IMG assessment across the country.

- A multi-media faculty development program for teachers of IMGs was launched with 17 faculties of medicine across the country and has received overwhelming support.

IEHPI annual meeting

Held on January 31, 2007 in Toronto, the meeting provided opportunities for provinces, territories, stakeholders and representatives from seven health professions to share information, collaborate and discuss next steps for the IEHPI. Participants identified future priorities including profession-specific language assessment and the development of an IEHPI framework.



Pan-Canadian Health Human Resource Planning Project Initiated in 2006/07

National Physicians Survey

Amount/ Duration	$300,000 2006/07 to 2007/08
Recipient	The Canadian Institute for Health Information (CIHI)
Objective	Create a National Physicians Survey (NPS) to strengthen the evidence base for medical workforce health human resource planning in Canada. The NPS is a comprehensive medical workforce survey sent to all physicians, second-year medical residents and all medical students in Canada from January to May 2007. The data will be collected using both online and paper versions of the survey instruments. Physicians will receive one of two versions of the survey, either a 5-page questionnaire or a 12-page questionnaire. Second-year medical residents and all medical students will be surveyed online. This survey will help identify health workforce issues such as trends, gaps and risks for future health human resource planning. Additionally, it will provide valuable information not collected in any other existing information source (e.g. working hours, locations of practice, types of services offered in different practice settings, and use of emerging technology).
Activities	Survey all physicians, second-year medical residents and medical students in Canada in 2007. Ensure the greatest possible number of potential participants be made aware of, complete, and submit the 2007 National Physician Survey. Ensure that the medical community, researchers and academics, legislators, policy-makers, planners, employers and educators become more aware of the NPS results and use them in their research, advocacy work and decision-making.
Anticipated Results Output	Produce a coordinated, enhanced, updated, relevant and comprehensive physician database that will be used to inform policy-makers and managers, and enhance evidence-based decision-making. The survey will also produce a comprehensive assessment of what all physicians in Canada are currently doing, as well as the perspectives of Canada's future physicians in responding to health care needs across Canada.

Contact Information

Canadian Institute for Health Information | 495 Richmond Road, Suite 600 | Ottawa, ON | K2A 4H6 |
Telephone: 613-241-7860

Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP) Projects Initiated in 2006/07

Cultivating Communities of Practice for Collaborative Care

Amount/ Duration	$799,887 2006/07 to 2008/09
Recipient	Cancer Care Nova Scotia
Objectives	Cultivate a community of practice composed of professionals in Nova Scotia and Prince Edward Island who will facilitate the education of community-based practitioners. Improve collaborative patient-centred practice among those who provide care to oncology patients and their families, including health professionals from First Nations communities. Develop, deliver and evaluate a facilitator training program and develop shared knowledge, skills and attitudes among participants attending the Interprofessional Core Curriculum (ICC) modules. Cultivate a community of practice among those facilitators and modify the existing ICC for oncology to be culturally sensitive to First Nations groups. Increase patient satisfaction and awareness of and access to existing resources. Engage in knowledge transfer, dissemination and networking activities. Provide opportunities for nursing students to engage in collaborative patient-centred practice.
Activities	Develop, deliver and evaluate a competency-based facilitator program to ensure that health professional facilitators gain necessary skill sets. Deliver modified interprofessional core curriculum modules that highlight cultural sensitivity and sustain a community of practice among facilitators by: incorporating modules into the nursing undergraduate program, knowledge transfer, dissemination and networking.
Anticipated Results Output	Improved ICC modules; enhanced competencies for collaborative patient-centred practice among health professionals providing oncology care to patients and families. Improved curriculum for nursing students and improved patient satisfaction. More than 1,400 health care professionals are expected to complete the modules.

Contact Information

Mrs. Anne Murray | 1278 Tower Road, 5th Floor Bethune Building | Halifax, NS | B3H 2Y9 |
Telephone: 1-866-599-2267

An Innovative National Distance Education Initiative for Interprofessional Practice in Psychosocial Oncology

Amount/ Duration	$749,608 2006/07 to 2008/09
Recipient	Capital Health District Authority, Nova Scotia
Objectives	Address gaps in formal education in interprofessional psychosocial oncology by developing a distance course using blended learning strategies for graduate students that will also be adapted and provided as a web-based professional development course for practicing professionals. Establish a Canadian network of psychosocial oncology educators and researchers committed to enhancing the health of Canadians affected by cancer through collaborative and interprofessional initiatives.
Activities	Through an Advisory Committee, activities and deliverables will include environmental scans and national-level focus groups to inform research; an interprofessional, blended learning, psychosocial oncology-focused course in French and English; a web-based professional development course; local workshops; and a national educator/research network.
Anticipated Results Output	Increased availability of qualified psychosocial oncology specialists; increased access for patients and families to interprofessionally educated health care providers.

Contact Information

Dr. Deborah McLeod, Capital Health District Authority | 5820 University Avenue | Halifax, NS | B3H 1V7 |
Telephone: 902-473-2964

Projet ECIP: Éducation à la Collaboration Interprofessionnelle centrée sur le Patient

Amount/ Duration	$746,450 2006/07 to 2008/09
Recipient	Université de Montréal
Objectives	Create model environments for training and practice in collaborative patient-centred care for patients affected by chronic diseases. Develop, among a group of university professors, health care professionals, students, patients and their families, the competencies necessary for collaborative patient-centred practice in chronic disease. Develop, establish and evaluate communities of practice in a clinical setting. Identify and evaluate the key success factors in communities of practice before implementing them in other clinical teams for chronic disease management.
Activities	Project deliverables include developing a curriculum and training activities relating to collaborative practice for chronic disease; establishing two communities of practice that allow for learning and collaborative interprofessional care; establishing and evaluating training activities in the communities of practice; and developing a community of practice clinical model based on collaborative practice.
Anticipated Results Output	Establishment of practice settings with clinicians, teachers, students, and patients and their families linked together. This will be attained by improved co-operation among the stakeholders, facilitating knowledge transfer and its application into practice.

Contact Information

Dr. Hassan Soubhi | Université de Montréal | Faculté de médecine |
C.P. 6128, succursale Centre-ville | Montréal QC | H3C 3J7 |
Telephone: 514-340-2800 ext. 3147

A Process-Oriented Approach to Enhancing Interprofessional Education and Collaborative Relationship Centred Care (PIER)

Amount/ Duration	$667,892 2006/07 to 2008/09
Recipient	McMaster University, Faculty of Health Sciences
Objective	Develop and evaluate a process-oriented demonstration project that will enhance interprofessional team function and education from pre-licensure curricula to practice settings.
Activities	Create a Project Operations Group and a Project Steering Committee comprised of students, learners, and representatives from each site. Launch a project website. Create two sub-projects that focus on enhancing patient care and interprofessional learning; facilitate two workshops for sharing experiences and best practices; host an Immersion Conference to involve external participants; enhance faculty development through a team course provided by external consultants; create learning narratives that map increments of change; and develop several tools that will provide demographic scans and a qualitative evaluation of the entire project.
Anticipated Results Output	Enhanced understanding between team members of each other's roles and scopes of practice; increased learning opportunities in project sites; increased quality care; and recruitment of additional partners.

Contact Information

Susan Baptiste | 1400 Main Street West, Room 412 | Hamilton, ON | L8S 1C7 |
Telephone: 905-525-9140 ext. 27804

Teaching Collaborative Patient-Centred Practice through the Humanities

Amount/ Duration	$749,980 2006/07 to 2007/08
Recipient	Sisters of Charity Organization (SCO) Health Services - Élisabeth Bruyère Research Institute
Objective	Provide health professional learners with planned interactions with an interprofessional team during their clinical rotations. Increase understanding for preceptors and professors of Humanities in health care, adult education and learning technologies through a bilingual Interprofessional Patient-Centred Humanities (IPCH) learning module. Improve interprofessional patient-centred teamwork and understanding of collaborative patient-centred care in long-term care, complex continuing care, rehabilitation, and palliative care programs at SCO Health Service. Increase understanding for learners at SCO Health Service of Humanities in health care and interprofessional collaborative practice through an Interprofessional Patient-Centred Humanities (IPCH) learning module.
Activities	Develop a bilingual, replicable Interprofessional Patient-Centred Humanities Learning Module. A preceptor and professor training manual will also be created.
Anticipated Results Output	Development of a bilingual, sustainable, and replicable Interprofessional Humanities Learning Module that will assist any level of health professional learner practising in similar clinical practice settings.

Contact Information

Dr. Pippa Hall | 43 Bruyère Street | Ottawa, ON | K1N 5C8 |
Telephone: 613-562-4262 ext. 4013

Dr. Susan Brajtman | 451 Smyth Road, Room 3249C | Ottawa, ON | K1H 8M5 |
Telephone: 613-562-5800 ext. 8418

A University of Manitoba Initiative: Interprofessional Education for Collaborative Patient-Centred Practice

Amount/ Duration	$749,753 2006/07 to 2008/09
Recipient	University of Manitoba
Objectives	Establish interprofessional groups comprised of faculty and students who value, understand, practice and promote collaborative patient-centred practices. The focus is to involve practice sites in northern and remote communities, particularly those with Inuit and Aboriginal populations as well as under-served populations in Winnipeg. Specific objectives are to affect a change in values, attitudes, skills, behaviour and culture that will improve the quality and safety of patient care while also improving collaboration and patient-centred practice. This project will evaluate the effect of such change on patient and professional outcomes.
Activities	Create a demonstration project. Project phases include: Developing awareness through presentations and engaging staff and students; Demonstrating effectiveness through electives and preceptors in four practice sites; Implementing core curricula into multiple, large- and small-group sessions; and Developing a research platform that will address the initiative's sustainability.
Anticipated Results Output	Creation of a collaborative base of professionals which will be an academic resource for ongoing collaboration in education, practice and research settings. The project will also engage learners in setting their own expectations for interprofessional collaborative modes of practice at the post-licensure level.

Contact Information

Dr. Judy Anderson | Faculty of Medicine | 730 William Avenue | Winnipeg, MB | R3E 0W3 |
Telephone: 204-789-3559

Education for Collaborative Patient-Centred Chronic Disease Care

Amount/ Duration	$749,790 2006/07 to 2008/09
Recipient	University of New Brunswick
Objectives	Provide useful strategies and tools to assist leaders in continuing care across Canada in facilitating transitions within their organizations, specifically related to Licensed Practical Nurses (LPNs).
Activities	Simulate care experiences in chronic disease to assist in developing a model of health care education that will equip students to work in interprofessional patient-centred teams. This will be achieved by integrating literature and using case studies and simulated patient care situations in curricula for both pre- and post-licensure students and practising professionals. Create a faculty development package that supports the integration of the Interprofessional Patient-Centred Practice model into curricula and workshops. Identify successful best practices for a sustained interprofessional education and faculty education program.
Anticipated Results Output	Increase in the number of professionals trained in collaborative patient-centred practice, while demonstrating and emphasizing its benefits on the continuum of care in chronic disease management.

Contact Information

Dr. Keith De'Bell | P.O. Box 5050 | Saint John, NB | E2L 4L5 |
Telephone: 506-648-5577

Interprofessional Disaster/Emergency Action Studies (IDEAS)

Amount/ Duration	$792,011 2006/07 to 2008/09
Recipient	Centennial College
Objectives	Improve interprofessional team performance in patient-centred practice and increase the perceived efficiency of health care systems in a disaster/emergency or pandemic situation. Develop a competency-based interprofessional curriculum for disaster/emergency preparedness. Implement and assess the curriculum's impact on the ability of health care and first responders to work collaboratively to deliver care. Assess the effect of interprofessional collaboration curriculum on student learning, and whether the knowledge and skills obtained translate into sustained professional practice.
Activities	Create several committees to oversee and guide the project. Produce a competency-based curriculum to support pre-licensure students in interprofessional education. Establish a web-based model to deliver and track integrated interprofessional education and disaster/emergency studies. Use a disaster/emergency simulation to assess team learning needs. Develop a high-fidelity disaster/emergency simulation to assess team performance. Provide faculty training.
Anticipated Results Output	Improved student readiness for interprofessional education and performance within a collaborative patient-centred team. Enhanced transferability and sustainability of interprofessional education skills in the practice setting. Improve perceived system efficiency through the integration of student teams in disaster/emergency preparedness plans.

Contact Information

Ms. Renee Kenny | P.O. Box 631, Station A | Scarborough ON | M1K 5E9 |
Telephone: 416-289-5000 ext. 8070

Creating Interprofessional Collaborative Teams for Comprehensive Mental Health Services

Amount/ Duration	$741,000 2006/07 to 2008/09
Recipient	University of Western Ontario
Objectives	Facilitate interprofessional collaborative mental health care in both education and practice settings. Socialize faculty, student and practitioners in client-centred interprofessional collaborative practice focusing on mental health services to vulnerable populations by stimulating networking and sharing of best education approaches and increasing the number of educators and health professionals trained in interprofessional collaborative practice.
Activities	Annual half-day retreat for student leaders, community partners, consumers, and faculty members. Organize and develop workshops and simulation exercises for students. Develop online modules for self-directed problem-based learning. Develop curriculum that teaches interprofessional collaborative care and team collaboration in community settings.
Anticipated Results Output	Creation of a sustainable infrastructure and curriculum to support interprofessional education and practice through training faculty, students and community partners, including providing services to the homeless and other disadvantaged groups.

Contact Information

Dr. Cheryl Forchuk | 1151 Richmond Street, Suite 2 | London, ON | N6A 5B8 |
Telephone: 519-858-8500 ext. 77034

Canadian Interprofessional Health Collaborative (CIHC)

Amount/ Duration

$775,000 2006/07 to 2007/08

Recipient

University of British Columbia

Objective

Develop a pan-Canadian collaboration of Interprofessional Education for Collaborative Patient-Centred Practice (IECPCP) partners.

The CIHC will:

Promote and demonstrate the benefits of IECPCP.

Stimulate networking and sharing of best practices.

Facilitate collaboration in education and practices, a research agenda for IECPCP, and transfer knowledge to appropriate communities.

Support sustainable change in IECPCP.

Foster, support and develop IECPCP in new and creative ways.

Support the National Health Sciences Students' Association with the creation and implementation of their sustainability plan.

Activities

Deliverables include: the creation of a CIHC, with a component to support interprofessional students' efforts across Canada; establish key research questions; develop and implement a best practice dissemination framework including a website, a blog and listserv; host two national IECPCP best practice workshops; and translate the knowledge gained into practice settings.

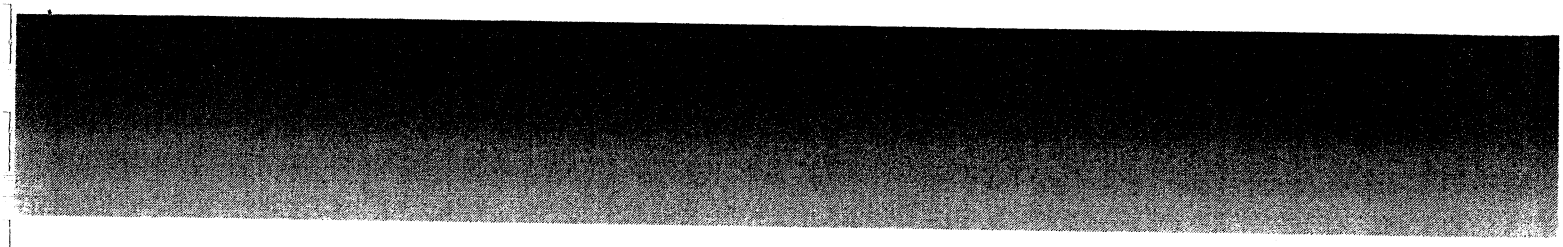
CIHC will formulate a 3-year business plan acquiring business knowledge and skills necessary for achieving sustainability and transferring knowledge to future business leaders to support the National Health Sciences Students' Association.

Anticipated Results Output

Improved collegial sharing and exchange in the area of IECPCP; more effective translation and uptake of the research findings emanating from Cycle One and Two IECPCP projects and related efforts; and in the long term, the creation of a permanent collaborative dedicated to advancing IECPCP across Canada.

Contact Information

Dr. John Gilbert, Principal Researcher | University of British Columbia |
400-2194 Health Sciences Mall | Vancouver, BC | V6T 1Z3 |
Telephone: 604-562-1492



Recruitment and Retention Projects Initiated in 2006/07

National Physician Health Survey

Amount/ Duration	$100,000 2006/07 to 2007/08
Recipient	Canadian Medical Association (CMA)
Objectives	Develop a bilingual National Physician Health Survey designed to establish a baseline of data on the mental and physical health of Canadian physicians in practice to assist in health human resource planning.
Activities	Develop a survey; data collection; analysis; and publication of analysed results.
Anticipated Results Output	Provide a comprehensive picture of the mental and physical health of practising Canadian physicians.

Contact Information

William Tholl, Secretary General & CEO | 1867 Alta Vista Drive | Ottawa, ON | K1G 3Y6 |
Telephone: 613-731-8610 ext. 2236

International Medical Workforce Collaborative

Amount/ Duration	$66,033 2006/07
Recipient	University of British Columbia
Objectives	Provide a pre-conference program that will give delegates insight into Canadian innovation in interprofessional practice as well as logistical support for the 10th International Medical Workforce Collaborative (IMWC) conference from March 20-25, 2007, in Vancouver, British Columbia.
Activities	Develop and conduct a pre-conference day to showcase Canadian innovation in interprofessional health human resource education, a component of which is the use of technology and long-distance education to provide active synchronized medical education in more distant regions. Showcase collaborative physician human resource planning in Canada and facilitate knowledge transfer among the participating countries. Provide support for the conference, including logistical arrangements for all participants, general support to the organizing committee, transportation of participants to and from venues, on-site support, accreditation of the conference and proceedings for continuing professional development. Produce two executive summaries (pre-conference and conference) for delegates and meeting stakeholders.
Anticipated Results Output	Conference will facilitate the transfer of knowledge across participating countries and increase the effectiveness of physician human resource planning within Canada.

Contact Information

Luke Ferdinands, Acting Director | University of British Columbia |
105-2194 Health Sciences Mall | Vancouver, BC | V6T 1Z3 |
Telephone: 604-822-6434

Simulated Learning and Medical Laboratory Education

Amount/ Duration	$36,028 2006/07 to 2007/08
Recipient	Canadian Society for Medical Laboratory Science
Objectives	Complete a research project on simulated learning in medical laboratory education. The project is intended to create an evidence base for the use of simulated learning experiences in medical laboratory education, in order to inform educational practices, policy- and decision-making processes, and potential directions for further research. Without evidence to support the educational validity of simulations, educational programs are in a poor position to justify shifts in their curricula when responding to accreditation issues and challenges.
Activities	Data collected will answer research questions regarding current practices in simulated learning for medical laboratory science (MLS) students. Study will involve data collection comprised of telephone/email contacts and written surveys.
Anticipated Results Output	Examine current literature, practices and expertise related to simulations in order to construct a much-needed evidence base for simulated learning in MLS programs in Canada.

Contact Information

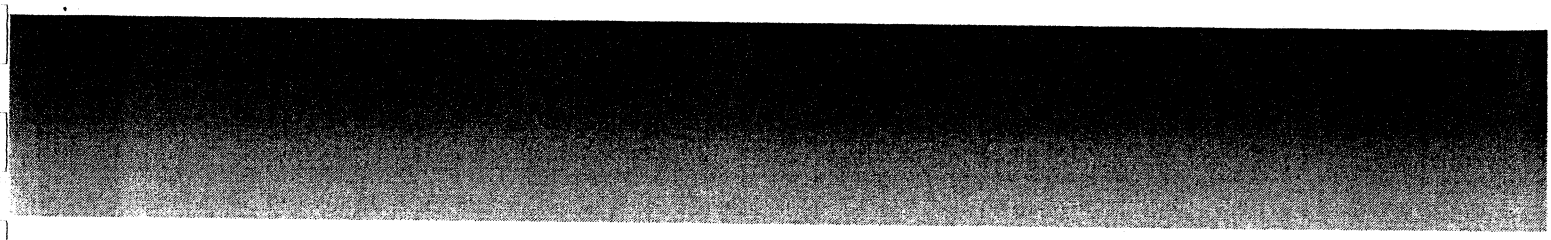
Kurt H. Davis, Executive Director | Canadian Society for Medical Laboratory Science |
P. O. Box 2830, LCD1 | Hamilton, Ontario | L8N 3N8 |
Telephone: 905-528-8642

Collecting Data and Information Relative to Emergency Obstetrical Care to Support a National Birthing Strategy for Canada

Amount/ Duration	$479,228 2006/07 to 2007/08
Recipient	Society of Obstetricians and Gynaecologists of Canada (SOGC)
Objectives	Establish a process for the compilation and analysis of quality, timely data on emergency obstetrical care and services in Canada.
Activities	Project will encompass research, consultation, and communication. The research component will take the form of environmental scans, literature reviews, focus groups, surveys and interviews, and aims to answer a number of key questions regarding supply and demand and trends that affect emergency obstetricians and other maternity care providers.
Anticipated Results Output	Data collected will contribute to long-term planning, as well as provide provincial and territorial governments with up-to-date information on the availability of emergency obstetrical care in their jurisdiction. Adequate data and information available will also help accurately assess and address the health human resource crisis relative to emergency obstetrical/perinatal care in Canada.

Contact Information

Dr. André B. Lalonde, Executive Vice-President | Society of Obstetricians and Gynaecologists of Canada |
780 Echo Drive | Ottawa, Ontario | K1S 5R7 |
Telephone: 905-528-8642



Provincial/Territorial/Regional Projects Initiated in 2006/07

Standardization of the Description of Competencies of Atlantic Region Licensed Practical Nurses

Amount/ Duration

$295,320 2006/07 to 2007/08

Recipient

Alberta Health and Wellness

Objective

Build on work done in the first phase of the Standardization of the Description of Competencies of Western Canadian Licensed Practical Nurse (LPN) Practitioners, featured in the 2005/06 Annual Report, by expanding the common process for describing a competency profile for LPNs working in the Atlantic Region (Newfoundland and Labrador, New Brunswick, Nova Scotia and Prince Edward Island).

Specific objectives are:

Review and validate the Alberta LPN competencies through a series of workshops by a representative sample of LPNs including LPN educators and practitioners in the Atlantic Region.

Prepare a separate competency profile for LPNs in each of the Atlantic Region provinces.

Prepare a common LPN competency profile document that represents the full scope of practice and utilization of LPNs in Western Canada and the Atlantic Region.

Evaluate the project.

Distribute the LPN competency profiles to key stakeholders for use in health care planning, education and training, recruitment, placement, and human resource management.

Activities

Hold initial project planning meeting.

Conduct LPN competency validation and develop competency profile in each Atlantic province and then prepare a common LPN competency profile document.

Develop an evaluation plan, collect data at the completion of workshops, and analyse the data to produce a final evaluation report to be submitted to Health Canada and Alberta Health and Wellness.

Anticipated Results Output

Creation of a common LPN competency profile document that captures the full scope of practice and utilization of LPNs in eight provinces (including two in Western Canada and two in the Atlantic region) and produce a report that can be used by other stakeholders to conduct similar projects.

Contact Information

Dr. Bill DuPerron, Director of Health Workforce Education and Immigration | Alberta Health and Wellness |
17th Floor Telus Plaza North, 10025 Jasper Avenue | P.O. Box 1360 - Station Main | Edmonton, AB | T5J 2N3 |
Telephone: 780-422-2528

Internationally Educated Health Professionals Initiative (IEHPI) Projects Initiated in 2006/07

Implementation Strategies for Faculty Development Program for Teachers of International Medical Graduates (IMGs)

Amount/ Duration	$168,000 2006/07 to 2007/08
Recipient	Association of Faculties of Medicine of Canada (AFMC)
Objective	Invite Canada's 17 faculties of medicine to organize training sessions for teachers of IMGs, using the materials developed in the Faculty Development Program.
Activities	Dissemination of materials developed by the Faculty Development Program through training sessions, enabling faculty development leaders and teachers to utilize and apply these materials effectively. Invite the 17 faculties of medicine, through the AFMC website and newsletter, to submit a proposal to organize a training session. The faculties will also be encouraged to invite the provincial IMG program in their area to attend the local sessions so they can pilot the Faculty Development Program for their IMG teachers.
Anticipated Results Output	Physicians and teachers working effectively and collaboratively to prepare IMGs for Canadian practice.

Contact Information

Association of Faculties of Medicine of Canada | 774 Echo Drive | Ottawa, ON | K1S 5P2 |
Telephone: 613-730-0687

Establishing a National Assessment Collaboration

Amount/ Duration	$100,000 2006/07
Recipient	Medical Council of Canada (MCC)
Objective	Harmonize the tools utilized across the country for the assessment of International Medical Graduates (IMGs) and bring a level of national consistency to this process.
Activities	Development of standardized assessment tools for IMGs that will determine the readiness of these individuals for one of two streams: ready for practise; ready for residency training. Creation of a national, centralized administration of the assessment tools to support regional IMG programs. This includes the development of procedure manuals and logistics guides for all assessors and IMG program directors, central support for scoring, decision standards, appeal procedures, national data, and quality improvement programs.
Anticipated Results Output	It is expected that this initiative will lead to a fair, transparent and consistent approach to IMG assessment in all regions of the country by facilitating knowledge transfer of work already completed on standardized assessment.

Contact Information

Medical Council of Canada | 2283 St. Laurent Boulevard | P.O. Box 8234 - Station T | Ottawa, ON | K1G 3H7 |
Telephone: 613-521-6012

Understanding the Canadian Health Care System, Culture, and Context: An Orientation Program for Internationally Educated Health Professionals (IEHPs)

Amount/ Duration	$599,915 2006/07 to 2007/08
Recipient	University of Toronto (U of T)
Objectives	Development of a pan-Canadian orientation program for IEHPs by U of T, in collaboration with Health Canada, six professions and the provinces of Ontario, Saskatchewan, Nova Scotia, and Newfoundland and Labrador.
Activities	Stage One will involve collation and analysis of existing orientation programs for IEHPs to identify gaps and develop a comprehensive learning needs profile for IEHPs. Vehicles for delivery of programming (e.g. print, face-to-face, internet, etc...) will be examined to establish the most effective and efficient learning platform for teaching and learning. A comprehensive program will be developed in Stage Two. The developers will design the program in a format that is sustainable using the analysis from Stage One, with optimal delivery methods to enable a maximum number of IEHPs to access this resource.
Anticipated Results Output	A structured and systematic pan-Canadian orientation program for IEHPs will be developed that will focus on the many dimensions of practicing as a health care provider in the Canadian health care system. An analysis of existing IEHP orientation programs and delivery mechanisms.

Contact Information

University of Toronto | 144 College Street | Toronto, ON | M5S 3M2 |
Telephone: 416-978-2889

Formation des professionnels francophones de la santé formés à l'étranger

Amount/ Duration	$1,000,000 2006/07 to 2009/10
Recipient	Consortium national de formation en santé (CNFS)
Objectives	Develop three initiatives to increase the number of health professionals available for delivering health services in minority francophone communities outside of Québec.
Activities	Establish an inter-cultural training program focusing on minority francophone communities. This program will enable faculty, teachers and staff working with francophone IEHPs to promote their integration into these communities. Create a training program to promote the success of francophone internationally educated nurses in writing the nursing licensing examination. Enable consultation sessions, and the development and implementation of an action plan to promote the availability of training, assessment and integration programs for IEHPs in French.
Anticipated Results Output	Increased number of health professionals available to deliver health services in minority francophone communities outside of Québec.

Contact Information

Consortium national de formation en santé | 260 Dalhousie Street, Suite 400 | Ottawa, ON | K1N 7E4 |
Telephone: 613-344-7837

Évaluation des diplômés internationaux en médecine au Québec

Amount/ Duration	$586,500 2004/05 to 2006/07
Recipient	Laval University
Objective	Establishment of intake internships by provincial faculties of medicine; purchase of authorized equipment and materials by the Association québécoise des médecins diplômés hors du Canada et des États-Unis in order to establish their assistance service; and development of a project proposal by the faculties of medicine for their funding.
Activities	Provide financial support for training and evaluation costs for International Medical Graduates (IMGs) who are registered with Recrutement Santé Québec, who meet the priority needs of the Ministère de la Santé et des Services sociaux and who have been invited by the Collège des médecins du Québec to participate in the evaluation internship. Provide support to the Association québécoise des médecins diplômés hors du Canada et des États-Unis to purchase materials, rent rooms and purchase books in order to provide assistance to their members. Provide support to the province's faculties of medicine to develop an intake internship for IMG applicants who have been offered residency.
Anticipated Results Output	Enhanced capacity to assist IMGs gain residency positions within Québec faculties of medicine, while providing adequate support both financially and with resource assistance.

Contact Information

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Telephone: 418-656-2131 ext. 12400

Provincial/Territorial/Regional Projects (IEHPI) Initiated in 2006/07

Internationally Educated Health Professionals Centre

Amount/ Duration	$15,952,445 2006/07 to 2009/10
Recipient	Government of Ontario, Ministry of Health and Long-Term Care
Objective	Create an Internationally Educated Health Professionals (IEHP) Centre to provide a single point of access to comprehensive information, resources and counselling that will assist internationally educated health professionals to access the information, assessment, education, and training required to practice in Ontario. A Centre for the Evaluation of Health Professionals Educated Abroad (CEHPEA) will be established and linked with the IEHP Centre. CEHPEA will develop and deliver competency assessment services for IEHPs in professions beyond medicine.
Activities	Develop and operate two new and linked programs: the IEHP Centre and the CEHPEA. This project builds on the environmental scan and strategic planning that Ontario completed in 2005/06 which indicated a need to increase access to assessment for IEHPs in a range of health professions, and to establish a "one-stop" centre for IEHPs to provide counseling, referrals and access to information and services.
Anticipated Results Output	A single point of access to comprehensive information, resources and counselling that will assist IEHPs to access the information, assessment, education, and training required to practice in Ontario.

Contact Information

Ministry of Health and Long-Term Care | 12-56 Wellesley Street West | Toronto, ON | M5S 2S3 |
Telephone: 416-314-5518

Internationally Educated Health Professionals Initiative – Manitoba Projects

Amount/ Duration	$1,403,601 2006/07 to 2009/10
Recipient	Manitoba Health
Objective	Develop five different projects that will have a direct impact on International Medical Graduates (IMGs), medical laboratory technicians, pharmacists, pharmacy technicians, medical radiologists, health unit clerks, sterile processing, dental assistants, physiotherapists, and occupational therapists and massage therapists.
Activities	Creation of an Internationally Educated Health Professionals coordination office that will provide orientation about the Canadian medical system and access to resource information required for career development. Develop and deliver an Internationally Educated Pharmacists exam preparation course. This course will focus on the Canadian health care system, practicing pharmacy in Canada and developing English language and communication skills required for practice. Develop and deliver a 12-week English language course for health care professionals at the Red River College Language Training Centre. Create a Medical Laboratory Technician Upgrade Program for unemployed or under-employed internationally educated medical laboratory technicians. Produce an IMG Resource Guide that will provide comprehensive information including: the licensing system, exam preparation and support services.
Anticipated Results Output	Increased number of IEHPs entering practice in health professions, increased capacity to assess credentials and experience of IEHPs, and ability to provide clinical training.

Contact Information

Manitoba Health | 1043-300 Carlton Street | Winnipeg, MB | R3B 3M9 |
Telephone: 780-427-7164

Internationally Educated Health Professionals – Alberta Projects

Amount/ Duration	$723,499 2006/07 to 2008/09
Recipient	Alberta Health and Wellness
Objective	Development of an assessment program focusing on language fluency and communication readiness, as well as a competency-based assessment of nursing knowledge and skills of Internationally Educated Nurses (IENs).
Activities	Provide an assessment of the competencies of IENs in comparison to the entry to practice competencies of nurses in Canada. Provide IEN candidates with the necessary preparation, including workshops and study materials, to assist them in preparing for assessment and provide recommendations for preparation and integration into practice and employment in Canadian health care settings. Provide information and support to other interested and appropriate agencies across Canada in their plans and processes for the assessment of IENs.
Anticipated Results Output	An ongoing program of assessment by way of an IEN Assessment Centre at Mount Royal College in Calgary, Alberta, that has the capacity to assess the knowledge, skills and competencies of IENs.

Contact Information

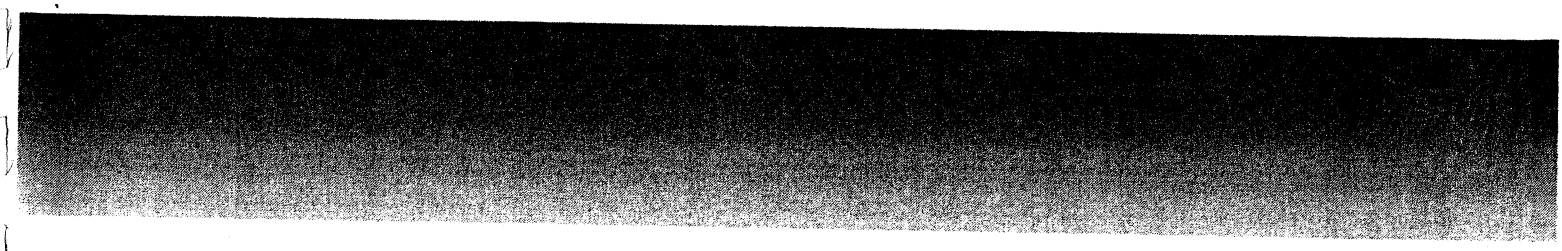
Alberta Health and Wellness | 17th Floor Telus Plaza North, 10025 Jasper Avenue | Edmonton, AB | T5J 2N3 |
Telephone: 780-427-7164

Integration Framework for Internationally Educated Health Professionals Initiatives

Amount/ Duration	$394,000 in 2006/07
Recipient	Nova Scotia Department of Health
Objective	Nova Scotia, on behalf of Prince Edward Island, New Brunswick and its own jurisdiction, will begin the process of building a unified and focused integration framework for Atlantic Canada through two projects for IEHPs seeking registration and licensure as practical nurses.
Activities	Build on the environmental scan funded in 2006 by Health Canada, which identified a need for a strategic and coordinated approach for project implementation, in Atlantic Canada. Complete a strategic planning process to build a unified and focused integration framework to meet the needs of IEHPs in Atlantic Canada. Expand Atlantic Canada's IEN web portal to include a specific section with clear and comprehensive information on becoming a Licensed Practical Nurse (LPN). Increase the Nova Scotia Community College's capacity to develop portfolios specific to LPNs. A portfolio is a tool that enables a nurse to move through the licensure and workforce integration process.
Anticipated Results Output	Production of a unified and focused integration framework for IEHPs seeking registration and licensure as practical nurses in Atlantic Canada.

Contact Information

Nova Scotia Department of Health | 1690 Hollis Street | Halifax, NS | B3L 4H9 |
Telephone: 902-424-5818



Aboriginal HHR Projects Initiated in 2006/07

Western Regional Forum

Amount/ Duration	$50,000 2006/07
Recipient	Saskatchewan Association of Health Organizations
Objective	Hold a three-day forum (policy and practice) that will demonstrate the innovative skills development and human resources best practices utilized in the implementation of Saskatchewan's Aboriginal workforce strategy including: Transition and access programs, career pathing, laddering, collective agreements, workplace readiness. Supporting the adoption and sharing of Aboriginal health human resources practices. Research on access programs. Providing participants with the opportunity to network and to discuss opportunities for partnerships.
Activities	Hold a three-day forum on Aboriginal Health Human Resources in Regina from May 29-31, 2006. Provide accommodations and meals for approximately 300 attendees (accommodations and meals for federal public servants are not allowable under the terms of this agreement).
Anticipated Results Output	A three-day networking and sharing Forum on Aboriginal Health Human Resources policy, programs, practices and research based on Saskatchewan's innovative approaches.

Contact Information

Saskatchewan Association of Health Organizations |
144 Park Street | Regina, SK | K1P 5Z9 |
Telephone: 306-347-5568

Conclusion

The Pan-Canadian HHR Strategy is a truly collaborative undertaking. In developing the Strategy, consultations took place with a wide variety of stakeholders including P/Ts, professional/regulatory/evidence-based organizations, educational institutions, and other federal departments.

The delivery of the Strategy continues in this spirit of collaboration. Although the Health Human Resource Strategies Division (HHRSD) of Health Canada leads the overall implementation of the Strategy, responsibility for many aspects of the Strategy rests with the department's Office of Nursing Policy (ONP) and the FNIHB, in close collaboration with the F/P/T Advisory Committee on Health Delivery and Human Resources.

More specifically, ONP leads the development and implementation of the HWI and, in partnership with the HHRSD, leads the development and implementation of the IECPCP initiative. FNIHB leads the development and implementation of HHR activities targeted towards First Nations and Inuit populations.

In 2006/07, projects and activities detailed within this report continued to build the evidence needed to strengthen and revitalize the health workforce in Canada.

Need more information?

For up-to-date information on the status and activities of the Pan-Canadian HHR Strategy, please visit our web site at:

www.health-human-resources.ca

Health Human Resource Connection

The electronic newsletter "Health Human Resource Connection" is designed to highlight initiatives and activities underway through the Strategy.

To subscribe to the newsletter from the HHRSD, send an email titled "Database Addition" to:

hhrconnection-connexionrhs@hc-sc.gc.ca

Include the following details: name, organization and email address.

Additional feedback or comments on the e-newsletter are welcome.

Tab 5

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STRENGTHENING THE POLICY–RESEARCH CONNECTION

ISSUE 8, MAY 2004

Health Policy Research Bulletin

Health Human Resources: Balancing Supply and Demand

Health care delivery is highly labour intensive. As a result, an effective and sustainable health care system depends on having the right number and mix of health care workers. Increasingly, reports of current and impending work force shortages are becoming the subject of public concern and debate.

This issue of the *Health Policy Research Bulletin* identifies the key policy levers that are available to address the imbalances in health human resources (HHR) in Canada and explores the type of evidence that is shaping the current planning and policy development process. In particular, this issue focuses on:

- paid health care providers and the complexity of the health care work force
- how pressures on both HHR supply and demand contribute to work force imbalances and create HHR "shortages"
- the challenges in assessing HHR shortages and emerging evidence about where these shortages are
- the influence of demographic trends such as population growth and aging on escalating HHR requirements "down the road"
- how improving working conditions can help ease current imbalances and attract new recruits
- the need to situate HHR issues within the global context and how integrating foreign-trained health care providers helps address short-term HHR imbalances

A clear message emerges from these articles: averting future HHR shortages requires a committed and sustained effort now, with researchers and forecasters working closely with planners and policy makers to develop sound, evidence-based decisions.

In this Issue

Health Human Resources

Canada

Federal/Provincial/Territorial Reports

Following are web links to a sampling of relevant reports.

Senate Standing Committee on Social Affairs, Science and Technology: *The Health of Canadians — The Federal Role: Final Report on the State of the Health Care System in Canada* (Kirby), 2002, pp. 185–199
<http://www.parl.gc.ca/37/2/parlbus/commbus/senate/com-e/soci-e/rep-e/repoct02vol6highlights-e.htm>

Commission on the Future of Health Care in Canada: *Building on Values: The Future of Health Care in Canada* (Romanow), 2002, pp. 91–114
<http://www.hc-sc.gc.ca/english/care/romanow/hcc0086.html>

BC: *Patients First: Renewal and Reform of British Columbia's Health Care System*, 2001
<http://www.legis.gov.bc.ca/cmt/37thparl/session-2/health/reports/healthtoc.htm>

AB: *A Framework for Reform* (Mazankowski), 2001
<http://www.premiersadvisory.com/reform.html>

SK: *Caring for Medicare: The Challenges Ahead* (Fyke), 2001
<http://www.health.gov.sk.ca/mc_dp_commission_on_medicare-bw.pdf>

MB: *Worklife Task Force: Renewing our Commitment to Nurses*, 2001
<http://www.gov.mb.ca/health/documents/worklife.pdf>

ON: *A Public Dialogue on Health Care*, 2002
<http://www.health.gov.on.ca/english/surveys/archives/sur_02/dialogue_0701/dialogue_report.pdf>

QC: *Emerging Solutions* (Clair), 2001
<http://ftp.msss.gouv.qc.ca/publications/acrobat/f/documentation/2001/01-109-01a.pdf>

NB: *Health Renewal Report from the Premier's Health Quality Council*, 2002
<http://www.gnb.ca/0089/phqc/pdfs/health.pdf>

NS: *A Study of Health Human Resources in Nova Scotia*, 2003
<http://gov.ns.ca/health/hhr/default.htm>

PE: Nursing Recruitment and Retention Strategy, 2003
<http://www.gov.pe.ca/hss/recruitment/nursing.php3>

NL: *Healthier Together: A Strategic Health Plan for Newfoundland and Labrador*, 2002
<http://www.gov.nl.ca/health/strategichealthplan/pdf/HealthyTogetherdocument.pdf>

NT: *Retention and Recruitment Plan for the Northwest Territories' Allied Health Care Professionals, Nurses and Social Workers*, 2002
<http://www.hlthss.gov.nt.ca/Content/Publications/Publication_index.htm>

YK: *Report to Yukoners on Comparable Health and Health System Indicators*, 2002
<http://www.hss.gov.yk.ca/docs/health_indicators_2002.pdf >

NU: *Our Words Must Come Back To Us*, 2003
<http://www.gov.nu.ca/hsssite/Inungni%20Sapujjijiit%20E.pdf>

Our mission is to help the people of Canada maintain and improve their health.

Health Canada

About the Health Policy Research Bulletin

Health Canada's *Health Policy Research Bulletin* is published three times a year. The Bulletin is part of a larger policy research dissemination program designed to enhance Health Canada's policy-relevant evidence base.

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We welcome your feedback and suggestions. Please forward your comments and any address changes to bulletininfo@hc-sc.gc.ca. Electronic HTML and PDF versions of the Bulletin are available at: <http://www.hc-sc.gc.ca/arad-draa>.

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Projecting the HHR Impacts of Demographic Change

Kisalaya Basu, *Microsimulation Modelling and Data Analysis Division, Applied Research and Analysis Directorate, Information, Analysis and Connectivity Branch, Health Canada, and*
Cliff Halliwell, *former Director General of the Applied Research and Analysis Directorate, Information, Analysis and Connectivity Branch, Health Canada*

Being able to project broad trends in future supply and demand for health care workers is critical to effective planning. This article illustrates how information about Canadian demographic changes can be used to predict future health human resources (HHR) requirements and supply.

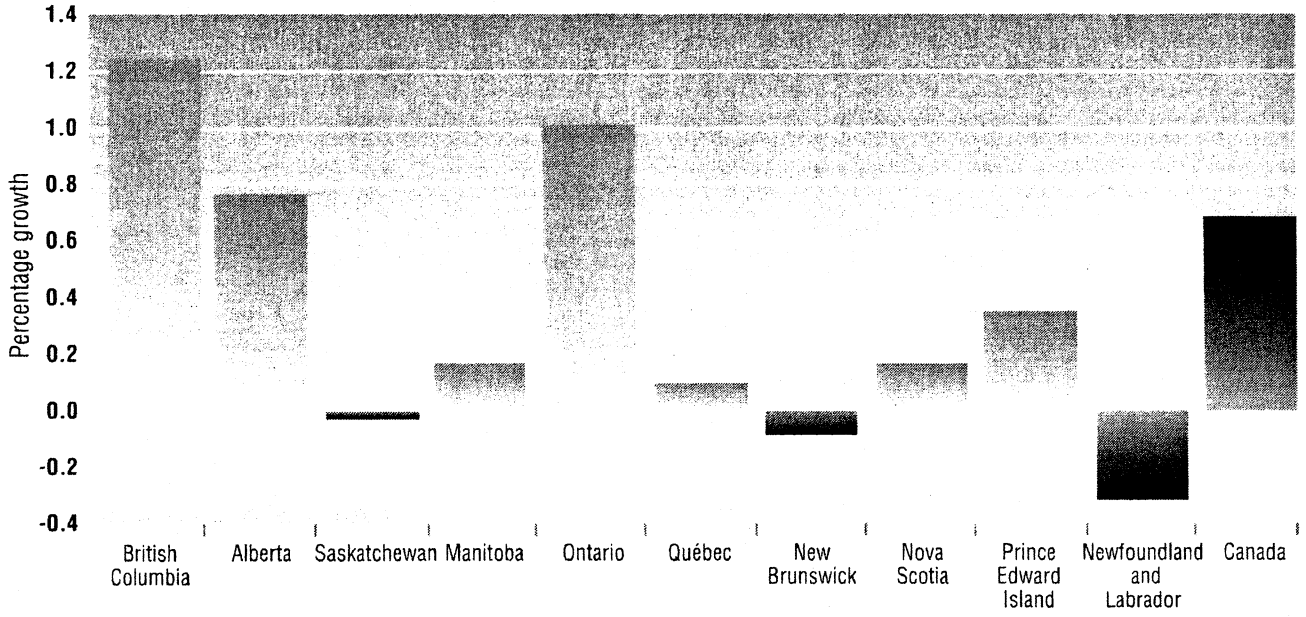
Introduction

Broad Canadian demographic changes have a substantial impact on HHR requirements and supply. Demographic trends are particularly critical as they affect the quantity and type of HHR services required, as well as the actual and potential supply of health care workers. Not only is the projected number of Canadians important, but also the population's demographic composition, particularly the aging of Canada's large baby boom generation. Another key factor is the geographic location of health care workers.

The good news is that demographic change is fairly easy to predict, as it is slow to develop. The projections presented in this article suggest two conflicting pressures: future demographics will significantly increase the demand for HHR over the next two decades (and beyond); and without significant changes, the supply of HHR may well decrease as today's health care professionals age.

Numerous other factors also influence HHR requirements and supply; however, they are more difficult to predict (see previous article on page 12). For instance, the healthier lifestyles of today's baby boomers may postpone and "smooth out" their age-related health care needs, making the next generation of seniors healthier than ever before.[1,2] That being said, demographics are likely the most powerful driver of HHR requirements and supply. For this reason, the country's demographic

Figure 1: **Average Annual Growth in Population, by Province, 2000–2020**



makeup will have a substantial influence on the HHR issues that policy makers across Canada face over the coming years.

Canada's Evolving Demographics

The overall relationship between demographics and HHR requirements is relatively simple. First and most obviously, the more Canadians there are, the greater the HHR requirements. Based on Statistics Canada's medium-growth population projection, the population of Canada will increase at an annual average rate of 0.68 percent between 2000 and 2020, the slowest rate of growth in decades. Nonetheless, the Canadian population will increase by 14.5 percent over this period.

There will also be changes in where Canadians live. As Figure 1 shows, some provinces will experience strong annual growth, including British Columbia (1.2 percent), Alberta (0.8 percent) and Ontario (1.0 percent). Between 2000 and 2020, Ontario's population will increase by over 22 percent. In contrast, some provinces will have declining populations, including Saskatchewan (-0.01 percent annual decrease), New Brunswick (-0.07 percent), and Newfoundland and Labrador (-0.3 percent).

Figure 2: **Percentage of Population Aged 65+ in 2000 and 2020, by Province**

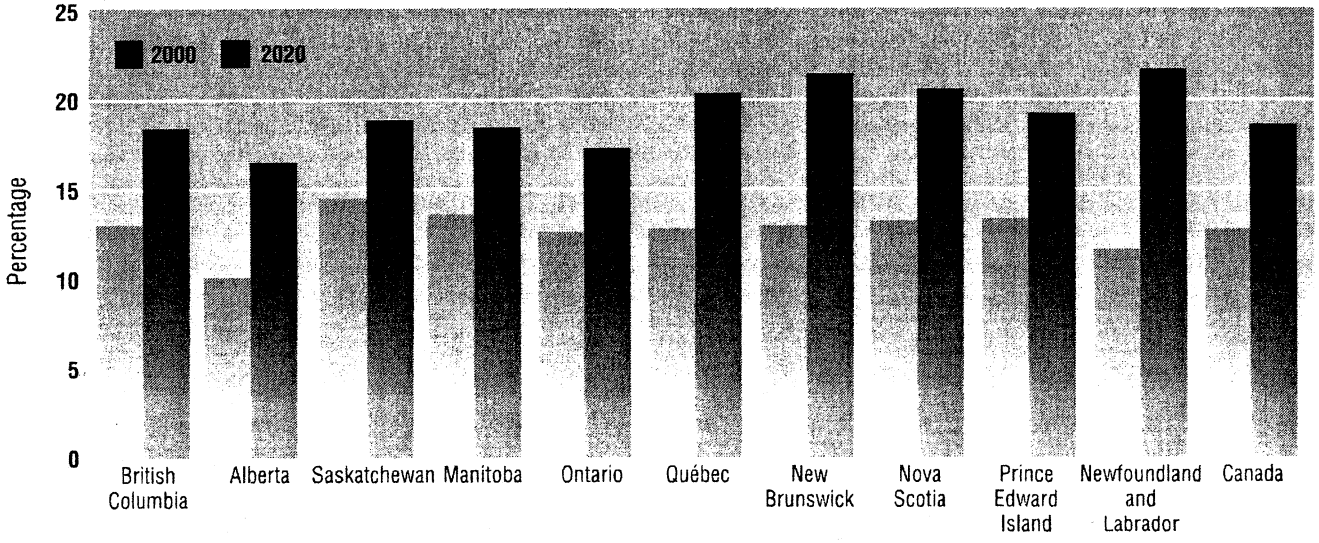


Table 1: Utilization for Physicians and Registered Nurses (RNs) per 100,000 Population, by Age Group, Nova Scotia, 2000

Age group	Family	Medical	Surgical	Diagnostic	All physicians	RNs
0–64	71.53	44.42	16.70	5.98	139.83	330.89
65+	204.02	104.37	57.90	23.64	389.94	1,410.36
Ratio	2.85	2.35	3.47	3.95	2.79	4.26

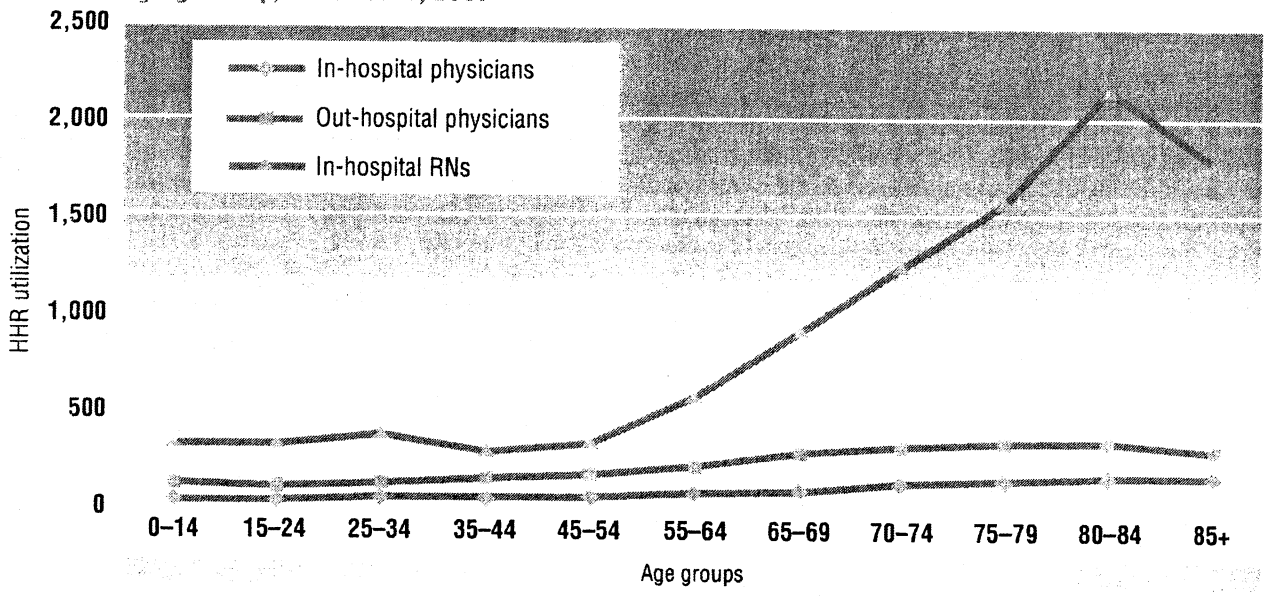
More importantly, the composition of the population will change. As shown in Figure 2, the percentage of Canadians aged 65 and over will increase by 5.8 percentage points between 2000 and 2020. While all provinces will experience increases in their population aged 65 and over, provincial increases will vary widely — from 5.3 to 10.3 percentage points. This variation reflects an increasing reliance on immigration for population growth, with settlement primarily in major urban areas. As well, there will be out-migration of working age populations from less advantaged regions, with some people returning to their home regions when they retire. Newfoundland and Labrador is a good illustration: in 2000, the province had the second lowest share of the 65 and over population, but is projected to have the highest by 2020.

Demographics and HHR Requirements

Population composition is critical in determining HHR requirements. The dominant driver is that older Canadians use much more HHR than do younger Canadians. Nova Scotia serves as an illustrative case study, with physician data from the Nova Scotia Physician Billings Data and Registered Nurse (RN) data from CIHI's Discharge Abstract Data and Registered Nurses Database.

The aging of Canada's population will lead to a marked increase in age-related ailments, notably for people 65 years of age or older. For example, consider that over the next 20 years, Nova Scotia will see a modest total population increase of 3.5 percent, but the proportion of the population aged 65 and over will rise from 12.6 percent to 18.4 percent. Assuming other factors remain the same,[3] there will be significant increases in treatment requirements for diseases of the circulatory system (38 percent), neoplasm (29 percent), endocrine, nutritional and metabolic diseases, and immunity disorders (29 percent), as well as diseases of the blood and the blood-forming organ (liver) (23 percent). However, demographics will drive down requirements in other areas, such as complications related to pregnancy, childbirth and the

Figure 3: In-/Out-Hospital Physicians and In-Hospital Registered Nurses (RNs) per 100,000 Population, by Age Group, Nova Scotia, 2000



puerperium, which are expected to decline by 11 percent over the same period. For paediatric patients, the incidence of all diseases will decline as well.

Table 1 compares the utilization for physicians in four key specialities, as well as utilization for RNs (in hospitals), by residents of Nova Scotia who are less than 65 years of age and those aged 65 and older. On average, the older age group uses 2.8 times more physicians and 4.3 times more RNs than the younger group.

Figure 3 shows how the utilization for full-time equivalent (FTE) in-hospital and out-hospital physicians and in-hospital RNs in Nova Scotia increases with the age of the patient. The utilization for in-hospital RNs and physicians starts to increase at age 55 and continues to grow till 84. Beyond 84 years, the utilization for both RNs and physicians decreases (note that this refers to in-hospital RN utilization only; utilization in other care facilities such as nursing homes may continue to rise).

Implications for HHR Requirements

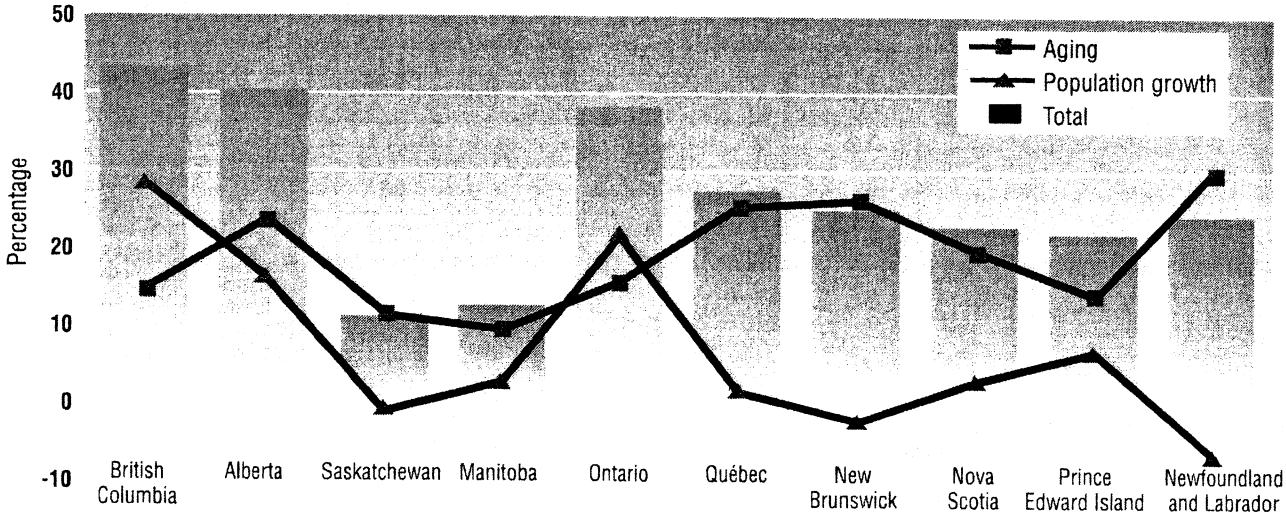
Physician and in-hospital RN demand models built by Health Canada's Microsimulation Modelling and Data Analysis Division are able to project the requirements for both physicians[3] and RNs in Nova Scotia.[4] The projections are made by a series of mapping exercises for a base year (2000): HHR allocation of effort by treatment category; treatment activities by diagnosis categories; and diagnosis categories by patient age and sex cohort, using utilization data at the patient level. Future HHR requirements can then be projected based on forecasted demographic changes.

Clearly, utilization-based models such as these have weaknesses. Perhaps most importantly, they assume that prevalence of disease by age-sex cohort and utilization rates will remain constant. Utilization is also not a perfect measure of demand because use is influenced by other factors such as supply. But utilization-based models also have strengths. One important attribute is that they are based on actual utilization of HHR resources at the patient level, making them a valuable tool and a good starting point in the complex field of HHR demand modelling. As well, these models can project requirements based on "what if" situations, such as how future requirements will be affected if the prevalence of certain diseases changes or if productivity affects utilization.

According to Health Canada's projection tool, HHR requirements for doctors in Nova Scotia will rise by 18.3 percent and 23.4 percent for in-hospital nurses from 2000 to 2020. These increases are primarily due to aging, as Nova Scotia's overall population will only increase by 3.5 percent during the same period.

In fact, aging will offset some of the slowed growth in regional HHR requirements that would otherwise result from slow population growth, as affected provinces will tend to face greater aging pressures. Figure 4 illustrates this phenomenon by showing a provincial breakdown of demographically driven future requirements for in-hospital nurses into: (1) the contribution from overall population growth, and (2) the contribution from population aging. This shows the diversity

Figure 4: Percentage Growth in Registered Nurse (RN) Requirements Due to Population Growth and Aging, by Province, 2000–2020



and magnitude of the effects across different provinces over 20 years. Provinces with low population growth tend to have a higher aging effect (clearly evident in Atlantic Canada) and vice versa.

Projecting the Supply of Physicians an RNs

Demographics exert a strong upward pressure on HHR requirements, but it is also important to examine how they will affect the supply of health care providers. With this in mind, Health Canada has developed preliminary physician and RN supply models based on national data. Some of the methodologies and data for the physician supply model are described in *Using Canada's Health Data* on page 36. The RN supply model is conceptually similar to the physician supply model.

The models show that the overall supply of full-time equivalent (FTE) physicians and RNs will not even keep up with general population growth over the next 20 years if other factors remain at current levels (e.g., the flow of new entrants, patterns of immigration, emigration and retirement, and the death rates of physicians and RNs). This negative growth reflects a key underlying factor: Canada's current HHR stock, which includes a significant number of baby boomers, is aging and a high proportion will retire or die over the next two decades.

If immigration, emigration, retirement and mortality rates remain the same over the next 20 years, to meet the requirements due to both population growth and aging, Canadian medical school admissions and nursing school admissions must have average annual growth rates of 3 percent and 13 percent, respectively. About half of this growth is to keep up with population growth and the other half is to keep pace with population aging. However, as Figure 4 shows, there will be substantial provincial variation in population and aging effects on HHR requirements. For example, while New Brunswick's total population will decline and British Columbia will experience strong growth, the aging effect in New Brunswick will be almost double that of British Columbia. As a result, the two provinces will face significantly different HHR challenges over the next 20 years, both in the amount and type of HHR they will require.

If immigration, emigration, retirement and mortality rates remain the same over the next 20 years, to meet the requirements due to both population growth and aging, Canadian medical school admissions and nursing school admissions must have average annual growth rates of 3 percent and 13 percent, respectively.

A Final Word

Although a range of factors affect HHR requirements and supply, demographics are one of the most powerful influences. Over the next two decades, planners can expect that: (1) the population of Canada will continue to grow, so that by 2020 there will be 14.5 percent more Canadians than in 2000, and (2) the population will be older everywhere in Canada and thus will require even more HHR services. Moreover, the provinces with the lowest (even negative) population growth will tend to experience the most population aging. In contrast, the supply of both physicians and nurses will diminish if current baseline trends and policies continue. For two reasons, the gap between supply and demand will be greater for RNs than physicians: the supply of RNs is more vulnerable to decline under status quo assumptions; and requirements for their services will grow faster than for physicians (note that these models do not account for nursing requirements outside of hospitals). The projected gap in nursing supply and demand is an important issue as there are almost five times as many nurses as physicians. While many other factors may change between now and 2020, only prompt policy action can be relied on to offset the powerful impact of demographics on HHR.

Acknowledgements

Special thanks to Teklay Messele and Louise Meyer of Health Canada for helpful discussions, Dr. Keith Jackson of the Nova Scotia Ministry of Health for providing the Physician Billing Data, and Jeremy Karn and Aakarsh Nair for outstanding research assistance.

Click here for references.

Tab 6

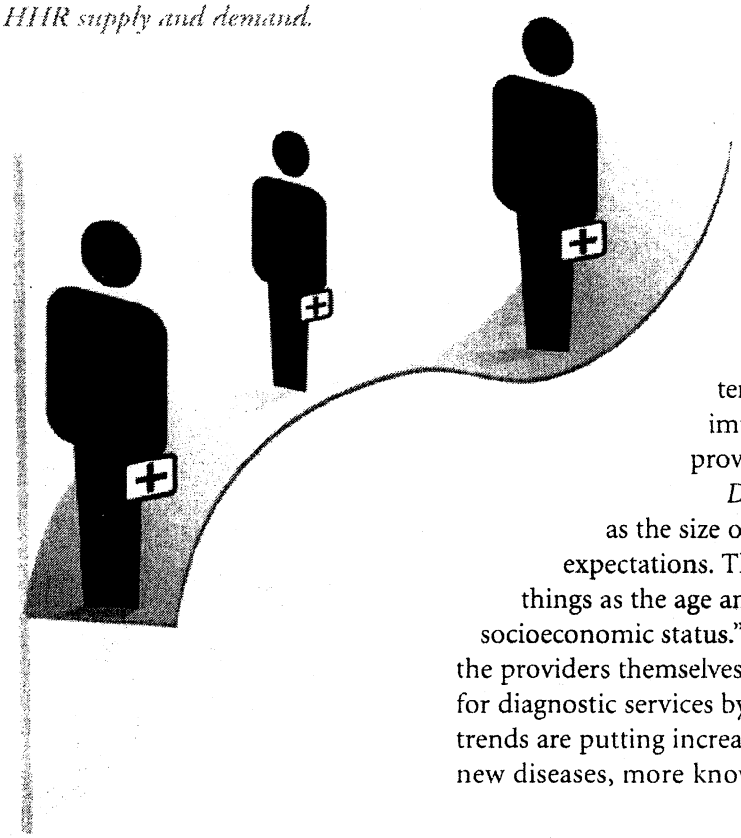
Work Force Shortages: A Question of Supply and Demand

Frank Cesa and **Suzanne Larente** *Health Human Resource Strategies Division, Health Policy and Communications Branch, Health Canada*

There is a growing body of evidence highlighting serious current and impending shortages in the supply of health care providers.[1] This article examines the factors that influence the supply and demand of health human resources (HHR) and presents an overview of reported shortages. It also points to the urgent need for action now to meet the HHR needs of the future and describes tools that can help policy makers forecast HHR supply and demand.

Planning is Essential

There are indications that Canada is experiencing shortages in its supply of health care providers. In simple economic terms, a shortage occurs when demand exceeds supply. For years, the supply of health professionals has been characterized by "boom and bust" cycles. At times, planners have perceived an oversupply of health care providers and, at other times, a shortage (see the timeline on page 6). Cycles such as these are typical of markets where there are lags between when decisions are made — such as increasing medical school enrolment — and when the impacts of these decisions become apparent. Policy makers now recognize that smoothing out these cycles requires an improved evidence base for HHR planning, including regular forecasting of future supply and demand.

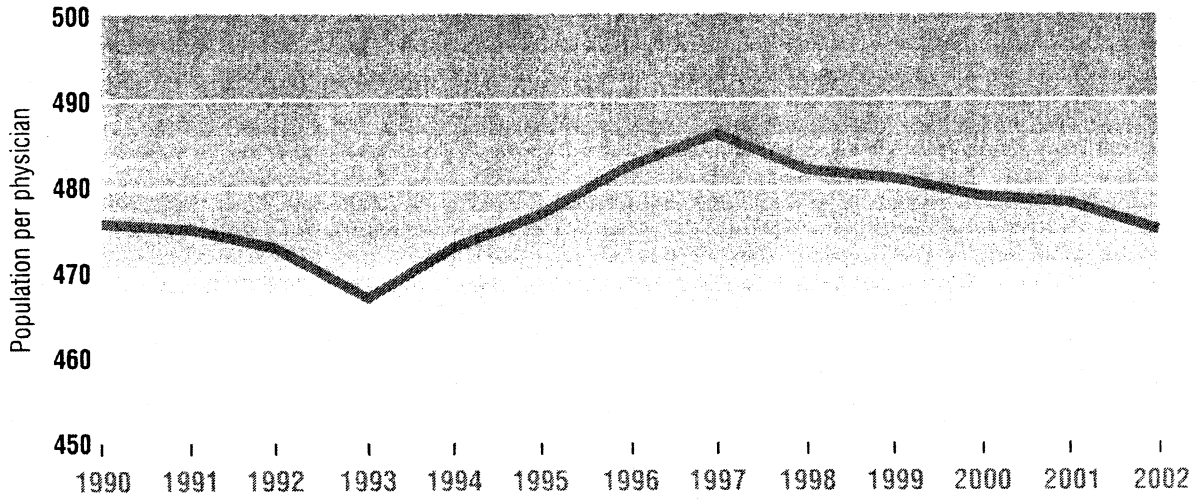


Influences on Current Supply and Demand

The *supply* of HHR services is a function of how many providers are available, their workload and their productivity. Productivity is further affected by other inputs to the system, such as technology.[1] Government policies have a strong impact, as the number and types of providers trained are controlled by provincial and territorial governments. Government policies also affect immigration, as well as the number of foreign health care providers licensed to practise.

Demand for HHR services "depends on such factors as the size of the population, the prevalence of disease and public expectations. The latter two factors are, in turn, influenced by such things as the age and gender of the population, education level and socioeconomic status."[1] Demand is further influenced by the activities of the providers themselves. For instance, physicians can increase the demand for diagnostic services by ordering more tests. A number of other factors and trends are putting increasing pressure on the demand for services, including new diseases, more knowledgeable consumers, new technologies and

Figure 1: **Population per Physician, Including Interns and Residents, 1990–2002**



Source: Canadian Institute for Health Information, Supply, Distribution and Migration of Canadian Physicians, 2002, Table 5.2.

pharmaceuticals, changes in professional practice and an aging population.[2] While "upstream" interventions characterized by a health promotion/population health approach can also influence demand, their impact is difficult to evaluate.[3]

Measuring Supply and Demand

Current health care work force data are limited, affecting analysts' ability to determine the supply of many types of health care providers. Other than for physicians and Registered Nurses (RNs), data-gathering activities for the health care professions is primarily limited to conducting head counts (see *Who's Doing What?* on page 32).

Demand for HHR can be approximated using utilization-based measures. Utilization is the degree to which the population uses the health care system. For example, utilization of physician services can be measured by looking at billing data and the number of visits to a practitioner. However, utilization-based measures do not take account of demand that is unmet. In many cases, estimating the size of a shortage comes down to making an "educated guess" based on anecdotal evidence such as longer wait times for patients or providers complaining about their workload. Sometimes, supply-side measures such as vacancy rates are used to identify a shortage. However, all these types of information tend only to reveal larger problems. By the time problems are apparent, it can take years before they are corrected because of the long lag time before policy adjustments are evident in the system.

In the absence of the best possible information, some simple measures of shortages do exist. For example, the provider-to-population ratio is the crudest but most widely known measure.[1] Unfortunately, this measure does not account for factors affecting supply or demand and gives no information on the best provider-to-population ratio. For example, Figure 1 shows that the current physician-to-population ratio is about the same as it was in the early 1990s. However, planners then believed there was a surplus of physicians, while the common belief now is that there is a shortage.[1]

Where Are the Gaps?

Despite their shortcomings, it is important to use currently available measures to attempt to identify shortages and surpluses. Several national reports provide evidence based on available data.[4-6]

Nurses

According to research, there are nursing shortages in certain practice areas and an uneven distribution of nurses across geographic regions, especially in rural and remote areas. A recent report by the Canadian Institute of Health Information (CIHI) shows that the number of RNs per 10,000 Canadians declined from 75.1 in 1998 to 73.4 in 2002.[7] The Canadian Nursing

Advisory Committee perceives a shortage of nurses, suggesting that 16,000 additional nurses are needed to achieve the same ratio of nurses to population in Canada today as 10 years ago.[8]

Physicians

An analysis by the Association of Canadian Medical Colleges (ACMC) indicates that the current production of physicians will not meet future demand.[9] The ACMC estimates that, to maintain the existing physician-to-population ratio of 1.9:1,000, Canada needs to increase annual medical school enrolment to 2,500 by the year 2007 from the current level of approximately 2,000. In addition, 500 more international medical graduates (IMGs) are also needed each year to offset exits from the system through emigration and other routes.

Shortages are also evident in rural communities. For example, recent research suggests that the rural physician-to-population ratio will grow from the current 1:1,235 to 1:1,887 in 2021. Although rural shortages have been a long-standing problem, shortages are now being reported in major urban areas as well. According to the College of Family Physicians of Canada, 16 percent of Canadians in metropolitan areas do not have a family doctor, compared to 12 percent in rural areas.[10] The College has stated that Canada requires a total of 3,000 more family physicians alone to meet current demand, which could be achieved through licensing more IMGs and increasing medical school enrolment.[11] However, as Figure 2 shows, fewer medical school graduates are choosing family medicine as a career. Figure 2 presents the results of the Canadian Resident Matching Service (CaRMS), which matches medical school graduates with post-graduate medical training (residency positions) over two iterations.

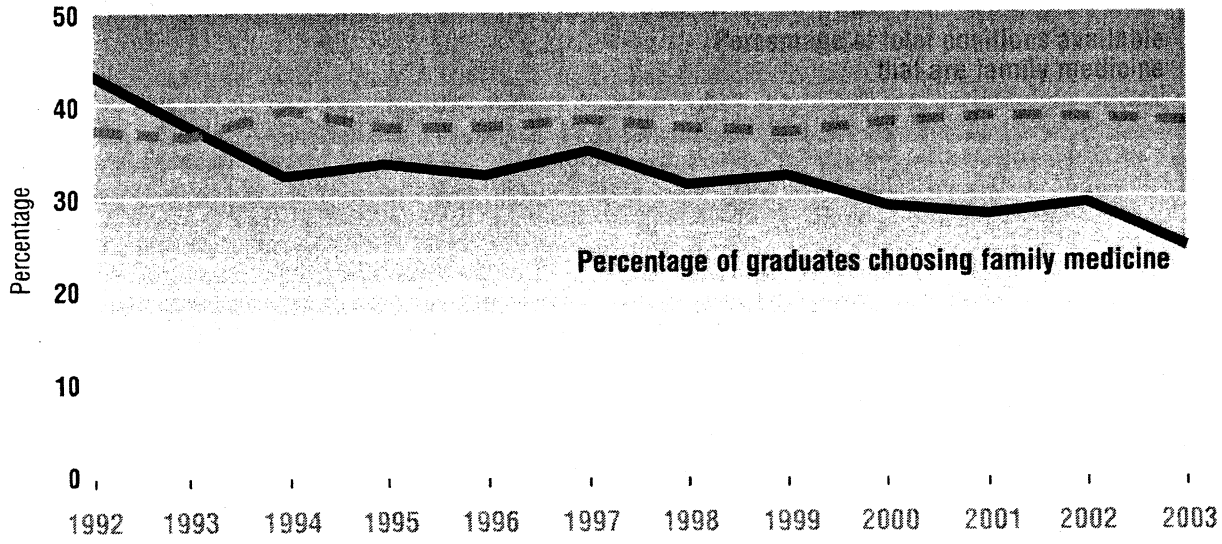
Many provincial medical associations and specialty societies have published estimates of shortages in their areas. For instance, while the current radiologist-to-population ratio is 1:18,000, the Canadian Association of Radiologists (CAR) suggests that 1:13,000 is a more appropriate target.[12]

Other Health Professionals

Limited data make it difficult for policy makers to identify shortages in professions other than nursing and medicine. With support from Health Canada, five professional groups began preliminary work in 2002–2003 to identify sources and availability of data, as well as gaps and future requirements.

Attention has recently been focused on reported shortages in the pharmacy, medical laboratory

Figure 2: **History of Family Medicine as the Career Choice of Canadian Graduates, 1992–2003**



Source: Sandra Banner, CaRMS PGY-1 Match Report 2003, Table IX, p. 10.

technology (MLT) and medical radiation technology (MRT) professions. For example, the Canadian Pharmacists Association (CPA) reports a current shortage of pharmacists, based on observations of an increased number of vacancies, longer times to fill these vacancies and increases in overtime. Similarly, the Canadian Association of Occupational Therapists (CAOT) reports widespread shortages, along with significant variations in regional distribution and clusters in high-density population areas.[13]

Planning for Change

Reports from professional associations underscore the need for concerted, ongoing HHR planning to identify gaps early on and develop appropriate policy responses. The Canadian health care system depends heavily on health care providers, yet the system has a limited capacity to respond quickly to shortages. It takes years to change immigration policy and the capacity of medical schools and other programs, not to mention training new providers. This highlights the importance of predicting and planning for changes in supply and demand to ensure the health care system's long-term sustainability.

National planning is crucial because many jurisdictions do not have the capacity to collect data or engage in major planning exercises. In addition, several provinces and territories do not have medical schools and rely on other jurisdictions to train their physicians.

The First Ministers' 2003 Health Accord directed health ministers to undertake collaborative strategies to strengthen the evidence base for national planning, improve recruitment and retention, and ensure the supply of needed health care providers. National planning is crucial because many jurisdictions do not have the capacity to collect data or engage in major planning exercises. In addition, several provinces and territories do not have medical schools and rely on other jurisdictions to train their physicians.

Factors Affecting Future Supply and Demand

Many of the factors affecting current HHR supply and demand will have an impact in the future. Supply will continue to be affected by demographics, discipline choice, retention, workplace health, job satisfaction and changes to the way care is delivered (see *Interdisciplinary Teams* on page 22). As outlined in *International Medical Graduates* on page 28, Canada's ability to integrate internationally trained health care providers into the system will also affect the supply of providers.

The future supply of HHR will also be affected by what health care providers do in practice. For example, a recent Health Canada funded study of general internal medicine specialists showed that 19 percent were sub-specializing in an area of internal medicine without the required credentials.[14] Similarly, over 50 percent of general surgeons are sub-specializing without the required credentials.[15] This indicates that there are likely fewer physicians practising general internal medicine and general surgery than estimated, and more practising sub-specialties of internal medicine and surgery. If this behaviour indicates a response to demand, it could help planners provide the right mix of HHR. On the other hand, the overall lack of data on practice patterns such as these could negatively affect planners' ability to "get it right."

Clearly, planners need to understand what the demand for health care services will be if they are to predict the required number of health care providers. Given the apparent trend towards specialization and sub-specialization, HHR planning must also incorporate the appropriate number and mix of specialities. Among the planning challenges are estimating the impacts of changing technologies, reform initiatives, chronic diseases, emerging and re-emerging infectious diseases, individual behaviours and scopes of practice.

Canada's aging population is a major influence on future demand, as it will lead to a higher prevalence of age-related diseases and increases in the demand for certain types of HHR. For example, the Canadian Nurses Association expects the demand for nursing services to rise by as much as 46 percent by 2011.[16]

Modelling: Projecting the Future

Modelling is a tool for projecting future supply and demand. One of the strengths of modelling is that it can incorporate a number of variables related to, for example, aging, immigration and school graduates,

and determine what happens to supply and demand when these variables change. If the variables are known to be moving in a particular direction, then the model can simulate those changes and demonstrate the potential outcomes. This can help to identify possible gaps that need to be addressed.

Modelling has limitations, however. While it can account for current productivity in HHR, predicting future productivity is much more difficult. On the demand side, these models tend to have a utilization-based approach with a population-based utilization rate. This assumes that the current delivery model and level, and mix and distribution of services are appropriate and meet existing health care requirements. It is difficult for models to account for changes in future utilization resulting from factors such as new technologies.

Predicting Shortages

Predictions about future shortages or oversupply must grapple with the uncertainty of a changing population, complex institutional structures and health care reform initiatives. As the following discussion shows, professional associations have traditionally been the major source of HHR forecasting information.

Physicians

Forecasting studies predict shortages in family medicine. Today, 51 percent of physicians are family doctors and 49 percent are specialists.[17] Figure 2 shows that well below 50 percent of medical graduates are choosing family medicine residency positions in the CaRMS match each year, so based on existing trends the proportion of family physicians is expected to decrease over time. Some specialties will also experience shortages. For example, in 2000, there were only 144 geriatricians in Canada, far fewer than the estimated 481 that were needed. By 2006, the forecast is that there will be 198 geriatricians, but a requirement for 538.[18] There is also evidence that, if current trends prevail, medical school graduates will continue to choose subspecialties, leaving a void in general internal medicine and general surgery.

Many reports project that the current shortage of nurses will worsen. At a time when an aging population will require more nursing services, a large cohort of nurses will be retiring and will not be replaced by a similar number of new graduates. A shortage of 78,000 RNs is predicted by 2011 and 113,000 RNs by 2016.

Nurses

Many reports project that the current shortage of nurses will worsen. At a time when an aging population will require more nursing services, a large cohort of nurses will be retiring and will not be replaced by a similar number of new graduates. A shortage of 78,000 RNs is predicted by 2011 and 113,000 RNs by 2016.[6]

Other Health Professionals

The acute lack of comprehensive data on other health professionals adds to the difficulties in forecasting shortages. However, a report on medical laboratory technologists and medical radiation technologists indicated that shortages for both groups had increased from 1998 to 2001 and further increases are expected.[19]

In Conclusion

The benefits of advance planning and forecasting the supply and demand of HHR are clear. While the field is still developing, available models are useful tools in helping planners determine the number and mix of HHR required to meet Canadians' future needs. As an example, the following article describes a set of models developed at Health Canada that can help project the effects of population growth and aging on the future supply and demand for physicians and RNs.

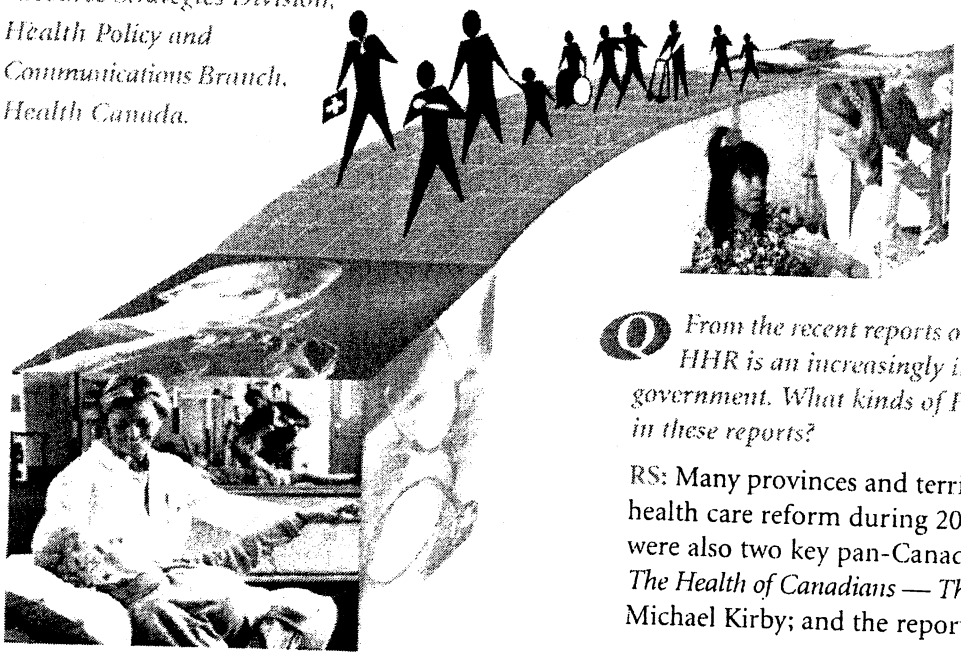
Click here for references.

Tab 7

Health Human Resources:

A Key Policy Challenge

In this issue, Nancy Hamilton, Managing Editor of the Health Policy Research Bulletin, *speaks with* **Cliff Halliwell** (CH), *Director General of the Policy Research and Coordination Directorate, Strategic Policy and Planning Branch, Human Resources and Skills Development Canada (former Director General of the Applied Research and Analysis Directorate, Information, Analysis and Connectivity Branch, Health Canada);* **Judith Shamian** (JS), *Executive Director of the Office of Nursing Policy, Health Policy and Communications Branch, Health Canada; and* **Robert Shearer** (RS), *Director of the Health Human Resource Strategies Division, Health Policy and Communications Branch, Health Canada.*



Q *When policy researchers use the term "health human resources" (HHR), what do they mean?*

RS: The term "health human resources" generally refers to those individuals who provide health care or health services to the public, from physicians, nurses and allied health professionals — such as medical laboratory technologists, pharmacists, psychologists and physiotherapists — to family and volunteer caregivers. The health care work force is extremely complex. It's made up of a mix of regulated and unregulated workers, unionized and non-unionized workers, as well as those working under various public and private funding arrangements, such as dentists and chiropractors.

JS: I'd like to reinforce Robert's point about complexity. There are several dozen professional regulated and non-regulated categories of health care workers in Canada, with the former being regulated at the provincial and territorial level.

RS: We also need to recognize how labour intensive health care really is. The health and social services sector accounts for approximately 10 percent of the overall work force in Canada and employs over 1.5 million Canadians.

CH: Another point worth emphasizing is the tremendous amount of voluntary labour within the health system. Of the total hours of effort going into the system, about half are contributed by volunteers. So, for every hour of paid work, there is about one hour of unpaid work, although in some cases the unpaid work is for personal care services rather than strictly health care services.

Q *From the recent reports on health care reform, it's clear that HHR is an increasingly important priority for all levels of government. What kinds of HHR policy issues were identified in these reports?*

RS: Many provinces and territories commissioned reports on health care reform during 2001–2002 (see page 2). There were also two key pan-Canadian reports: the Senate report, *The Health of Canadians — The Federal Role,* chaired by Senator Michael Kirby; and the report of the Romanow Commission,

Building on Values: The Future of Health Care in Canada. Both reports highlighted HHR shortages and called for a national strategy to increase the number of physicians, alleviate nursing shortages and obtain more data on allied health professionals. The Romanow Commission, however, also recommended a new, more integrated approach to HHR that would focus on scopes of practice, having the right provider mix in rural and remote communities, and interdisciplinary education and training.

Q *The HHR issues raised in these reports are not really new, but there seems to be a growing urgency in policy discussions. What makes the current situation so pressing?*

CH: Certainly these issues are not new. For example, we've always worried whether there are enough physicians. Governments have to be concerned since they control the primary levers governing the supply of health care workers — namely, medical and nursing school enrolments, and the flow of immigrants into the country. However, concerns are mounting, and this is largely due to the demographics of the "baby boom" generation (see page 17). While population aging will inevitably increase service demand, its effect will be most immediate on HHR supply — the "bow wave" of population aging. In this decade alone, many of today's health care workers will retire and will need to be replaced at a time of overall slowing in population and labour force growth.

We're also trying to fundamentally alter how we deliver health care — especially primary health care. This has implications for the workers required, what they do and the training they need. Given the lengthy training times for most health professionals, we need to take action now to avert shortages in the future.

Q *Are these challenges unique to Canada's health care system?*

CH: No, quite the contrary. The fact that the rest of the industrialized world is facing similar pressures is actually causing more concern here in Canada.

JS: I agree. This is an international problem, but it poses a particular challenge for Canada being a neighbour of the United States, with an HHR shortage 10 times greater than ours.

RS: We need to approach this from a broad international perspective, looking at both the industrialized and the developing world. The World Health Organization and the Organization for Economic Cooperation and Development play a leadership role in this regard, and Canada must be prepared to participate since about 23 percent of our present physician work force is foreign trained.

The dynamics are global. The industrialized world is about to face very slow labour force growth, a critical concern for a labour-intensive sector like health care.

CH: The dynamics are global. The industrialized world is about to face very slow labour force growth, a critical concern for a labour-intensive sector like health care. In contrast, the developing world faces explosive labour force growth. However, at present their service levels are low relative to their requirements. This poses important policy questions about the appropriateness of industrialized countries drawing human capital from countries where the needs are infinitely greater.

RS: Because of this, the Commonwealth countries have signed a Code of Ethics stating that it is not appropriate to actively recruit significant numbers of trained health care providers from countries like South Africa. However, we need to distinguish between active recruitment and simply ensuring that unnecessary barriers are not preventing foreign-trained professionals who are already in Canada from working in the health field (see page 28).

Q *In light of these dynamics, what will be the most critical gaps in the health care labour force of the future?*

CH: While we are living longer, the evidence suggests that our extra years of life are a mixture of years in good and less than good health. With advances in medical technology, people are living with conditions they might not have survived a few years ago. This increasing prevalence of chronic disease suggests that the greatest pressures will be in areas like nursing and

family practice that provide more continuous levels of care. The pressures may be less in medical and surgical specialties, although this depends on what technologies are in place and whether health problems require surgery or pharmaceutical treatment.

RS: Although we are not certain about the direction of all of the demand pressures, we are beginning to see some trends in HHR supply. For example, while in the past there has been a near 50-50 split between family physicians and specialists, recent statistics show a major reduction in the percentage of new physicians entering family practice (see page 12).

CH: We can also expect to see the usual regional differences in work force distribution, which may be exacerbated by the demographic trends. For example, pressures from population aging will likely be greatest in the Atlantic region and in rural and remote communities where many people leave to find work and eventually return to retire.

Q *Cliff pointed out that nursing is likely where we'll see the first shortages. What are some of the factors contributing to the situation facing Canada's nurses?*

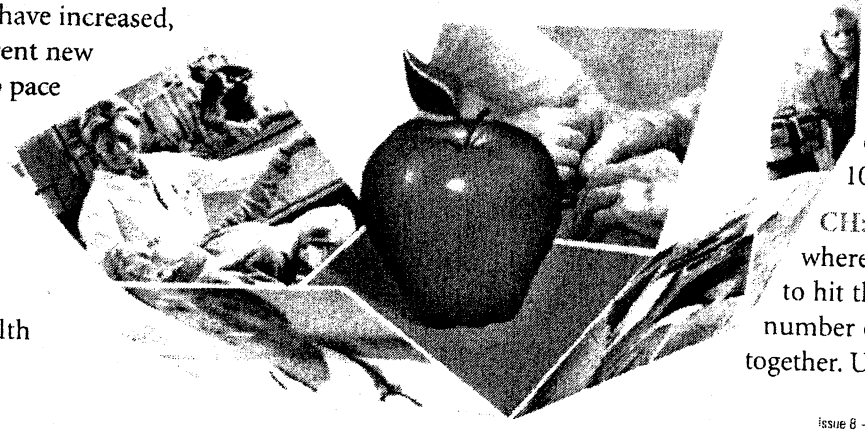
JS: We can look at this in several ways: "Who is in nursing now?", "Who is going to be there in the coming years?", "Who is coming in?" and "Who is staying?" Evidence shows that the nursing work force is aging, with a large number of nurses expected to retire in the next five to ten years. Although nursing school enrolments have increased, the number of current new entries will not keep pace with retirements.

We also need to look at "what nurses do" — both now and in the future. We know there is a major health care transformation under way that will have significant implications for the nursing work force (see page 22). Initiatives like primary health care, home care and public health all bring requirements for an additional nursing work force, often with different competencies and scopes of practice than at present. There is growing recognition and long-standing science suggesting that situations like chronic illness can be dealt with more effectively with a collaborative team approach. Health Canada is taking steps to ensure that the necessary educational investments are made to support this new, patient-centred, interdisciplinary team approach.

The evidence suggests that our extra years of life are a mixture of years in good and less than good health. With advances in medical technology, people are living with conditions they might not have survived a few years ago. This increasing prevalence of chronic disease suggests that the greatest pressures will be in areas like nursing and family practice that provide more continuous levels of care.

Q *Addressing these HHR challenges will involve more than simply having the right number of health care workers. What other factors will have to be considered?*

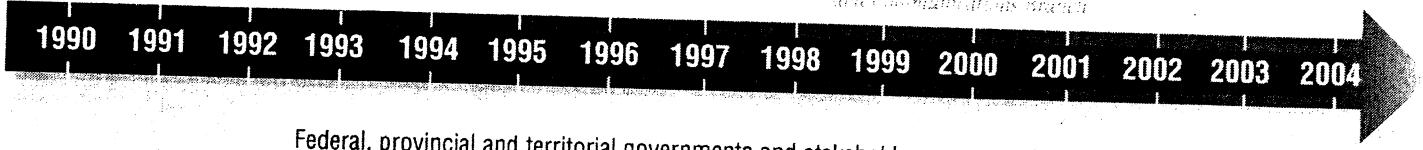
JS: Yes, various policy levers have been used and must be used to address these challenges. It's important to recognize that our current shortages are "policy driven" and related to the downsizing that took place through the 1990s (see timeline, page 6). Also related to this are accounts that health care professionals are not happy with their workplaces. This is a relatively new phenomenon that emerged in the 1990s and it has major implications for being able to retain health care workers, especially nurses. Nursing is experiencing significant rates of absenteeism (see page 23). In Canada, for example, nursing has an 80 percent higher absenteeism rate than 47 other occupations and absenteeism is equivalent to about 10,000 positions per year.



CH: I think nursing is where the "rubber is going to hit the road" because a number of factors are coming together. Unlike the situation 30

Major Trends and Initiatives in HHR

Joshua Tepper, M.D. and Suzanne Larente



Federal, provincial and territorial governments and stakeholder groups review HHR situation; launch of HHR sector studies and/or strategies specific to nurses, physicians and allied health professionals

Higher educational prerequisites for physicians, RNs and many allied health professions

Increased ability of IMGs to work in Canada

10% reduction in medical school seats

Focus on regionalization, amalgamation and hospital restructuring

Rotating internship and corresponding general licence are eliminated

Increased focus on training medical students and residents in community and rural settings

Improvements in rural and community medical education with creation of a new northern medical school in Ontario and satellite medical school campuses in Ontario and British Columbia

Decrease in number of residency positions relative to graduating medical students

Reduction in nursing positions; many remaining jobs converted to part time or casual and many nurses emigrate or quit due to increased workloads

Some provinces and territories without medical schools purchase additional training positions in neighbouring provinces; other countries (including the U.S.) also purchase positions

Series of measures limit the role of IMGs

Many provinces increase number of medical school positions

Minimum of five years for all physician specialty training programs; many are longer as sub-specialties and fellowships proliferate

Primary care reform initiatives implemented in most provinces; interdisciplinary teamwork encouraged and information technology slowly introduced

Growth in number of RNs employed in nursing: 0%

Growth in number of RNs employed in nursing: 1%

Growing efforts to collect data on allied health personnel

Several provinces utilize disincentives to push new graduates to practise in certain geographic locations

Increasing numbers and types of third year training for family physicians

Significant decline in number of medical students interested in family medicine

years ago, women today can pursue almost any career they want; at the same time, the educational investment to enter nursing is higher than ever. As Judith said, the working conditions are often difficult and the work can become physically trying with age. Finally, since many nurses are in public sector-type benefit pension plans, retirement becomes increasingly attractive as nurses move into their fifties with 30 years of service behind them.

JS: Despite these factors, it's interesting to note that for every nursing school seat there are two to three applicants.

Q What type of evidence will be needed to address these challenges and what role should Health Canada play in developing this evidence base?

CH: I'll preface my remarks by saying that, while Health Canada need not do this itself, the department should push to ensure that it is done. What is needed is a framework for assembling the evidence and systematically thinking about the issues. We need to explore the broad brush issues in HHR supply and demand, and then build and operate the forecasting, scenario-building and policy-testing tools that can help us understand the emerging pressures and their potential solutions. We also need a focused and committed effort to assemble the projections into regularly updated reports that are tested against outcomes on a year-to-year basis. This is especially important in light of the long time horizons with which HHR planners are working. Although not necessarily easy, with the right investments in data and a committed effort, we could do much better than we have to date.

JS: Cliff is right. There is a lot of "noise" but no "music." Even if we were able to collect all the data, analyses would be difficult since HHR issues are measured differently across the country. Consequently, we've been unable to take the rich expertise and draw it together into a national HHR story. However, Canada does have some of the leading international thinkers in this area.

CH: I believe it's also important that the work be carried out independent of organized interests, so that the results will not only be objective but will be perceived to be objective. Another key will be having the necessary "buy-in" — something that will require a truly collaborative effort with researchers and forecasters working together with planners and policy makers.

Q Although the analytical tools might not be as robust as we would like, there is a growing evidence base. How is this evidence being used in the HHR planning process and what role does the federal government play?

RS: In the past, HHR planning was primarily initiated by individual jurisdictions. However, since health care providers are a mobile resource, a coordinated approach to HHR issues is important to reduce competition within and among provincial/territorial labour markets. Recognizing this, the 2000 First Ministers' Health Accord directed federal, provincial and territorial governments to strengthen the evidence base for national HHR planning. Consequently, in 2003, the federal government committed $90 million over five years to improve HHR planning, including better forecasting of HHR needs. To facilitate dialogue, Health Canada plays a crucial role on the Federal/Provincial/Territorial Advisory Committee on Health Delivery and Human Resources, which is currently grappling with priority HHR issues, including entry-to-practice credentials, international medical graduates and the concept of a pan-Canadian HHR plan.

CH: I'd like to underscore Robert's last point. Coordinating opportunities for provinces and territories to discuss what works in different jurisdictions is an important federal role. The federal government also plays a role in other areas — including data and research — where individual jurisdictions are unable to make sufficient individual investments. For example, Statistics Canada has always been the primary locus of Canada's national statistical systems and has been a key source of HHR data along with, more recently, the Canadian Institute for Health Information.

On a final note, I'd like to emphasize the importance of moving forward *now* to address the challenges we've been discussing. Ten years ago, we may have had a 15-year window for dealing with these pressures. Now, we have five years at the outside!

Canada's Health Care Workers: A Snapshot

Gordon Hawley, *Microsimulation Modelling and Data Analysis Division, Applied Research and Analysis Directorate, Information Analysis and Connectivity Branch, Health Canada*

A "healthy" health care system is one that can meet its health human resource (HHR) requirements adequately. This article profiles the major categories of health care workers underpinning Canada's publicly funded health care system and identifies work force characteristics contributing to current and future HHR challenges.

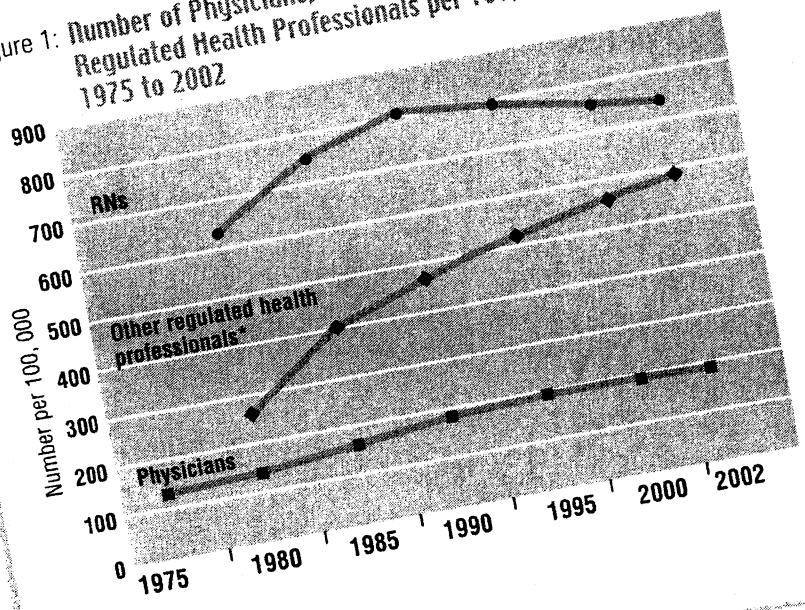
The Big Picture

Canada's health care sector is labour intensive, with most of the $112 billion in health expenditures in 2002 spent on health care services — including incomes to health care providers — as opposed to goods such as pharmaceuticals and medical equipment.[1] Health care providers include physicians, nurses and other health professionals regulated by provincial legislation, as well as unregulated health care providers.

Figure 1 provides an overview of the number of physicians, nurses and other regulated health professionals from 1975 to 2002. The number of Registered Nurses (RNs) per 100,000 population has declined steadily since peaking in 1990, while the number of physicians remained fairly stable during the same period. However, simple "head counts" don't give a complete picture about the supply of health professionals. For example, many nurses work part time.

Other regulated health professionals, such as dentists, social workers, pharmacists, chiropractors and nutritionists, typically require a diploma or, increasingly, a degree to enter practice. Some of the increase in other regulated health professionals depicted in Figure 1 is due to the regulation of previously unregulated groups and the inclusion of certain groups, such as pharmacists and midwives, in data collection efforts during this period (see Figure 1).

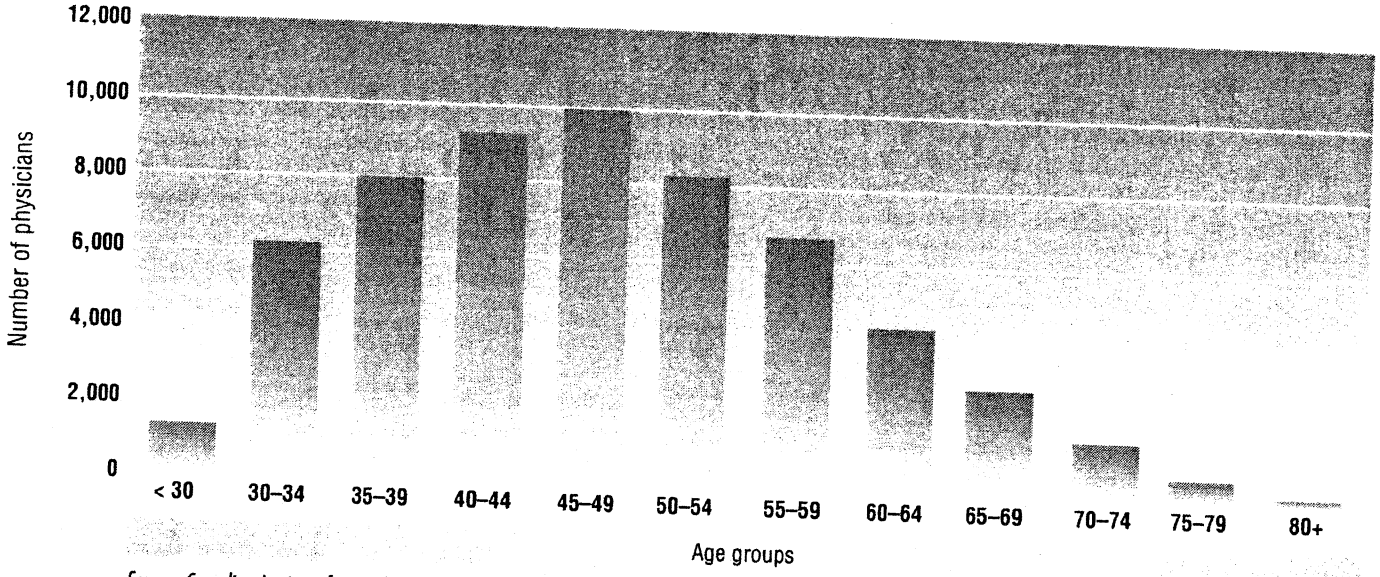
Figure 1: Number of Physicians, Registered Nurses (RNs) and Other Regulated Health Professionals per 100,000 Population, 1975 to 2002



Source: See references 2–9.

Other regulated professionals included in Figure 1: chiropractors, dental hygienists, dentists, dietitians, health record professionals, health service executives, medical laboratory technologists, medical radiation technologists, midwives, occupational therapists, optometrists, pharmacists, physiotherapists, psychologists, respiratory therapists and social workers. Registered Psychiatric Nurses and Licensed Practical Nurses are not included in the figure.

Figure 2: **Number of Physicians, by Age Group, 2002**



Source: Canadian Institute for Health Information, Southam Medical Database.

Unregulated health care providers, such as nursing aides and orderlies, also make an essential contribution to the publicly funded health care system. Complementary and alternative health care providers — who may be regulated or unregulated, depending on the province or territory and type of practice — make up a significant part of the continuum of care as well.[10]

Volunteers also play a pivotal role in the provision of health care. A recent study found that informal volunteers contributed 2.3 billion hours of care per year while volunteers with recognized organizations contributed an additional 93 million hours. In comparison, paid workers provided 1.7 billion hours of health care per year.[11] Historically, the family has been key in providing care. Today, however, most women participate in the paid labour force and have less time to meet the needs of family members who are ill, especially when they must care for their own children as well. In addition, the nature of in-home informal care is becoming increasingly complex. These challenges make providing care to family members more demanding than in the past.

Canada's Physicians

Family Practice: On the Decline?

In 2002, 49 percent of physicians were specialists and 51 percent were family physicians (FPs).[12] However, this ratio has been changing as FPs have made up less than 40 percent of new practice entrants since 1993.[13] Among the reasons for this shift are that students can no longer revert to general practice if they dislike a specialty field, and specialists' higher incomes make it worthwhile to invest in the additional years of training (see *Did You Know?* on page 34). The relative decline in FPs is a concern because they have typically acted as the "gatekeepers" to the rest of the health system — 86 percent of Canadians have a family physician[14] and look first to their FP for most routine or ongoing care.

The Changing Face of Canada's Physicians

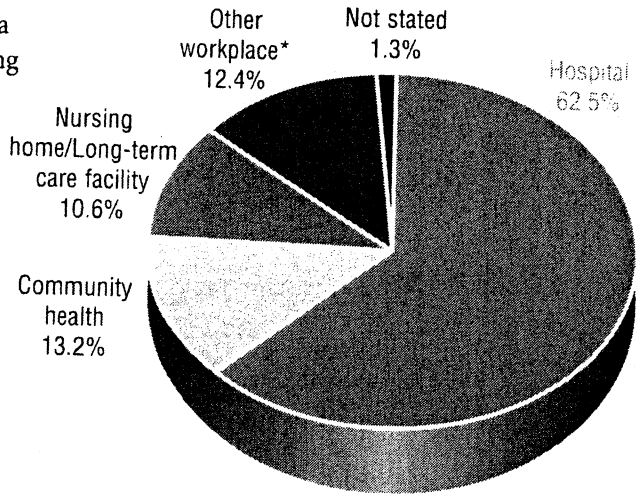
In 2002, the average age for FPs was 46.6 years and 48.8 years for specialists,[12] compared to 39 years for the general labour force (see article on page 17). As Figure 2 illustrates, new entrants to medicine (physicians under age 35) make up 13 percent of the physician population, while 16 percent of physicians are potential retirees (physicians age 60 or over).

In 2002, about 30 percent of physicians were women. That proportion is rising as slightly more than half of medical students are now female.[15] Most family practice trainees are women (60.5 percent), while a smaller proportion are in medical specialties (48.5 percent), lab medicine specialities (50 percent) and surgical specialities (34.5 percent).[13] By 2030, it is expected that women will make up half of the medical profession.[16] This has implications for projecting the

future physician supply because, on average, female physicians work 10 fewer hours per week than male physicians.[15]

As discussed in the article on page 28, Canada has a long tradition of including international medical graduates (IMGs) as part of the physician work force. IMGs tend to be older than Canadian-educated physicians(47 percent are age 55 or older, compared with 29 percent of all physicians) and a smaller proportion are female (22 percent versus 30 percent).

Figure 3:
Percentage of Registered Nurses (RNs) Employed in Nursing, by Place of Work, 2002



Such as industrial settings, government, self-employed and physicians' offices

Longer Training Time

After a four-year medical degree, graduates begin post-Medical Doctor (MD) training with residency programs that range from two to three years for family medicine to five to seven years for some specialties. From 1993 to 1998, the average length of FP training increased from 1.8 to 2.3 years, while the length of specialist training rose from 4.5 to 5.3 years. These increases are the result of physicians taking a third year of family medicine[17] and selecting specialty training with longer residency requirements,[17] as well as the elimination of one-year rotating internships in 1993.[18]

Canada's Nurses

Nurses are the largest group of health care workers, totalling almost 300,000 in 2002, or five for every doctor. Canada has three groups of regulated nurses: Registered Nurses (RNs), Registered Psychiatric Nurses (RPNs), and Licensed Practical Nurses (LPNs).

Registered Nurses are the largest group of regulated nurses, with the broadest and most independent scope of practice and generally the highest level of decision making and education. RPNs share many characteristics with RNs, such as high employment rates, years of training, wages and average age.

RNs are the largest group of regulated nurses, with the broadest and most independent scope of practice and generally the highest level of decision making and education. RPNs share many characteristics with RNs, such as high employment rates, years of training, wages and average age. However, they differ in two significant ways: 24 percent of RPNs[19] are male, whereas only 5 percent of RNs are male;[20] also RPNs are educated and regulated only in the four western provinces.[19]

LPNs need a diploma or equivalency for certification,[21] whereas most provinces now require RNs to have a baccalaureate degree.[22] Consequently, LPNs have a narrower scope of practice and usually work with less complex cases. Although LPNs and RNs share similar age and sex profiles, almost 40 percent of LPNs work in geriatric/long-term care, compared to 10 percent of RNs. Since the most comprehensive nursing data available are for RNs, the remainder of this article focuses on that group.

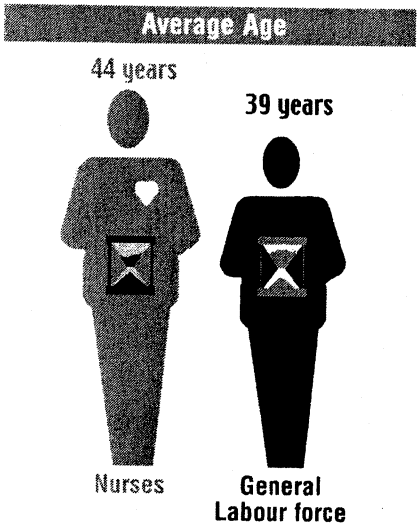
Where Nurses Work

In 1981, 74 percent of RNs worked in hospitals, but this proportion fell to 63 percent by 2002. As Figure 3 demonstrates, a substantial proportion of RNs now work in various locations outside of hospitals.[21]

In 2002, 86 percent of RNs worked in direct health care delivery.[20] Slightly more than half of nurses work full time (54 percent), with 34 percent working part time and 12 percent on a casual basis.

The Work Force is Aging

Data for 2002 show that the nursing work force is older than the general labour force, with an average age of 44 compared to 39.[20] A third of RNs were 50 years of age or older in 2002, compared to 21 percent of all working Canadians. While the demand for nursing services is expected to increase as the population ages (see article on page 12), the current replacement rate for nurses is less than the pending retirement rate. For example, for every RN aged 35 or less, there are 1.7 nurses aged 50 or more.[20] The average age of retirement for nurses is 56. Assuming that all RNs work until age 55, Canada is poised to lose 64,248 RNs to retirement or death by 2006, an amount equal to 28 percent of the 2001 work force.[23] Currently, there are 44,499 RNs under 35 years of age, 19,749 fewer than the number of pending retirees.[20]



More Education

Seven provinces require a baccalaureate degree in nursing (BNS) to register as an RN, while a two- or three-year diploma or certificate is sufficient in other provinces.[22] After completing their degree, RNs may get an advanced degree in nursing or national certification in 14 specialities. Nurses with additional education can become, for example, clinical specialists, nurse midwives, educators or nurse practitioners (NPs).

Some 912 nurses identified themselves as NPs in 2002.[20] Because NPs can offer some services typically provided by physicians, such as ordering tests, diagnosing illness and prescribing drugs,[24] they play an important role in isolated or inner city communities, including where physician shortages occur.

Canada's supply of nurses is enhanced through immigration. Today, almost 7 percent of Canada's RNs graduated from a foreign nursing program, with the highest proportion coming from the Philippines (27 percent) and the United Kingdom (24.5 percent).

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In Closing

Many of the work force characteristics outlined here will have an impact on the future supply of HHR in Canada and are examined further in the following articles. A better understanding of the challenges posed by these characteristics, notably training requirements, age distribution and the work intensity of each profession, can lead to more appropriate policy solutions.

Acknowledgements

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Tab 8

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Health human resource planning in Canada: A typology and its application

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Abstract

A series of group interviews were conducted with key stakeholders in Canadian health human resource (HHR) planning. Interviews revealed that innovative HHR models arose primarily in response to perceived needs at the front line. At the same time global HHR initiatives were implemented by policy makers based on population level estimates of need. A large disconnect is identified between the top down and the bottom up approaches to HHR planning. This paper makes two important contributions. First, it provides a comprehensive typology of HHR models currently being utilized in Canada. The classification of existing HHR models is a necessary first step to standardized evaluation of effectiveness of various HHR approaches in terms of improving access to care and health outcomes. Second, the creation of a new type of health care professional is proposed—the collaboration agent. The collaboration agent is to provide much needed leadership to bottom up endavours at the front line. Furthermore, the collaboration agent is to mediate between the top and the bottom, thereby improving deficient communication and funding channels.

Keywords: Health policy reform; Collaborative interdisciplinary care

1. Introduction

Research in health economics, health policy and health program evaluation relies heavily on characterizations of health care (HC) systems in terms of selected features. Typically health systems are characterized along the dimensions of funding arrangements, insurance schemes, gatekeeping arrangements, physician density, physician remuneration methods and the degree of centralization and structure [1–5].

To date health human resource (HHR) models have been omitted as a dimension along which to classify health systems. A comprehensive typology of HHR models does not exist in the literature. Due to the lack of a classification system, the effectiveness of HHR models can only be evaluated on a case by case basis. Case studies, while they provide rich and detailed information, lack external validity. A classification system allows for a systematic generalizable approach to evaluation of HHR models [6].

This paper provides a typology of HHR models, based on Canadian primary qualitative data and supplementary literature. The typology is embedded within

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the context of HC system challenges, for which a separate classification system is provided. The two major categories of innovative HHR approaches are: micro-level initiatives and macro-level strategies. Micro-level strategies are most often initiated at the front line of HC provision, while macro-level strategies are global and top down in nature. The sporadic ad hoc emergence of HHR approaches necessitates the deductive creation of a typology and conceptual framework.

Persistent barriers to system-wide implementation of innovative HHR models include lack of information, policy making realities, poor funding structures, organizational cultures and lack of solid leadership and management. A possible solution is the introduction of a collaboration agent (CA) to be assigned to regions of the country. The CA is a strategic HHR manager, and in addition acts as a liaison between policy maker, funder, information collector and provider. The CA's role is complex and requires a detailed understanding of the system of HC delivery.

Section 2 of the paper provides a detailed description of methodology. Section 3 presents the classification system for HHR challenges. The typology of HHR models is presented in Section 4. Section 5 discusses linkages between HHR challenges and HHR models, as well as between HHR models themselves and identifies points of breakdown in these linkages. Recommendations for strengthening of linkages are provided in Section 6, followed by a conclusion in Section 7.

2. Methodology

Qualitative data were obtained from three principal sources:

- A series of 10 interactive group interviews with key informants.
- Content analysis and review of documents and websites provided by interview participants.
- Supplemental reviews of academic and grey literature.

Key informants included health policy makers, academics working in the HC field, front line HC providers and managers of HC organizations or RHAs. All of them were attendants at a 2.5-day conference held in September of 2005 by the School of Public Administration at Dalhousie University in Halifax, Nova Scotia, Canada (with funding from Health Canada). The conference was titled: "Mainstreaming Health Human Resource Innovations". The goal of the conference was to produce a set of national guidelines for the implementation of HHR strategies across Canada.

Conference participants were allocated into 10 working groups. Each group was designated to focus on a specific topic, a conference theme and each group was heterogeneous with respect to participant types. Conference themes were:

- Re-defining roles of health professionals.
- Optimizing working towards full scope of practice.
- Promoting inter-professional collaboration.
- Changing delivery mechanisms to support innovations.

Each participant was asked to present a case study of an innovative approach to HHR planning in which they were involved. Many presentations were supplemented with written materials supplied by participants. The presentations provided a starting point for a series of interactive group discussions. Participants were asked to synthesize discussions, where the first day focused on discussion of health system challenges, to which case studies of HHR models were to respond. The second day focused on the overcoming of identified barriers to implementation of HHR models, as well as on approaches to mainstreaming HHR innovations at a national level.

Group discussions followed a semi-structured format. Participants were engaged in several brainstorming activities the following topics:

- Similarities and differences among HHR strategies and projects presented within the group.
- Identification of Canadian HHR challenges.
- Match between strategies employed and challenges identified.
- Exploration of critical success factors in implementation of HHR strategies.
- Discussion of implementation barriers and solutions.

Assigned themes served as guidance; discussion around themes was led by participants' concerns.

An observer was allocated to each group to track progress and information shared. Observers were instructed to focus on discussions of HHR models, and track their characteristics, such as geographical location, types of services delivered, types of

providers involved, patient target groups, scale of projects, paths to implementation, implementation barriers encountered and strategies used to overcome barriers. Observers also noted discussions between representatives of micro-level initiatives, academics and policy makers, to identify reasons for dissonance between front line initiatives and policy level strategies. Notes from observation, output created by conference participants, as well as the background report based on literature review and interviews, conference documents and conference proceedings [7] served as data sources for the production of this paper.

3. HHR planning within the healthcare system

3.1. Conceptual framework

A HC system is composed of five spheres: HC providers, services, education, policy and information. Planning is complicated by the nature of linkages between these spheres, feedback loops and overlap. HC system components include:

- *Information*: Data on all aspects of population health, population health needs, HC service provision, structures, funding levels and flows of funds.
- *Providers*: Allopathic and alternative physicians and other HC providers.
- *Services*: Actions taken by HC providers aimed at the maintenance or improvement of patient health or alleviation of symptoms.
- *Education*: College and university education, as well as associated residency programs that result in credentialing and certification of HC providers. Education also includes continuing education for practicing providers, which may or may not conclude with certification.
- *Policy*: Public sector efforts aimed at regulation, funding and stabilization of the HC sector, as well as programming to deliver HC services directly to the public.

Diagram 1A visualizes linkages between HHR planning spheres. The broader context of HHR planning includes policy and information. Policy facilitates regulates and stabilizes the delivery of HC services by providers, and the credentialing of qualified providers within the education system. In order for policy to create an effective framework for HHR planning, data on the five spheres of the system and on population needs are required.

Embedded within the broader context of policy and information are providers, services and education. The education system influences beliefs and behaviours of HC providers, and consequently their daily practice. In turn, HC providers often become educators of new providers within the discipline. The education they deliver is based their own education, as well as accumulated experience, new knowledge, information, evidence and policy.

Services provided are a shaped by provider behaviour, policy, professional guidelines and population needs. The mix of services heavily depends on the mix of providers graduated by the education system, and the geographical distribution of providers. If all linkages functioned as expected, the goal of serving population health needs would be achieved. In the ideal case, population needs are identified at the broader information level and funneled to the service provision level through policy and education systems. Providers at the front line are enabled to provide services most needed by their patients through the education they receive, the funding from the public sector and information regarding needs, best practices and clinical guidelines. HHR planning is based on information flows regarding needs, and reflected in funding levels to various disciplines within the education system. HHR planning at the policy level creates the optimal mix and distribution of providers to service population health needs. Unfortunately, linkages within the Canadian HC system do not function as expected.

3.2. HHR planning challenges

3.2.1. Provider shortage

There is a general shortage of HC practitioners in Canada, especially well documented is a shortage of medical physicians. The shortage is more severe in rural and remote areas of the country, where recruitment and retention difficulties are profound [8–11]. Shortages result in unreasonably high workloads for physicians, and access difficulties for patients, as manifested in long waiting times. Paradoxically, HC providers other than medical doctors are not being utilized to full scope of practice [7].

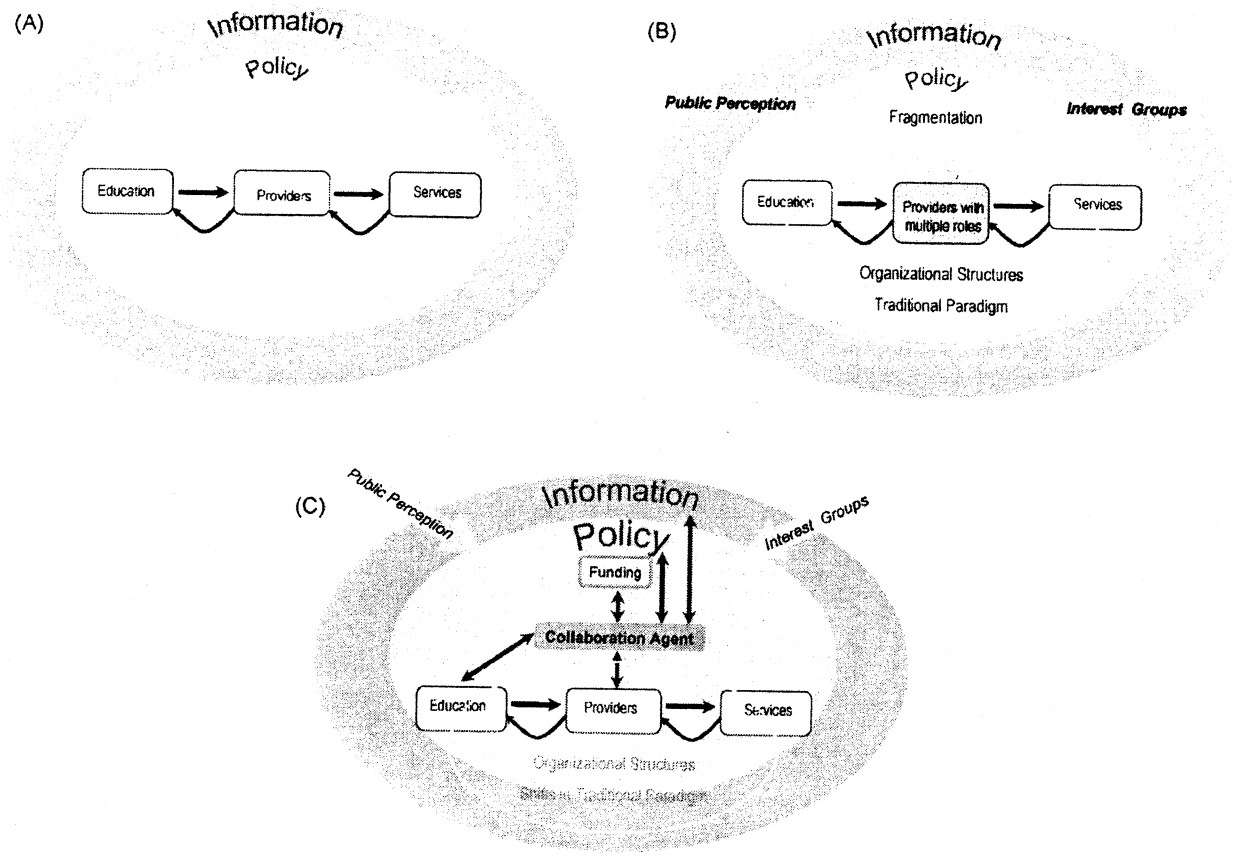

Diagram 1. (A) Health care spheres; (B) barriers to implementation and (C) pathways to implementation.

Financial incentives offered to recruit and retain physicians to rural and remote areas do not sufficiently compensate for unattractive living and working conditions. A geographical imbalance in provider distribution is created [12]. Shortages in rural and remote areas are partially attributed to providers feeling unwelcome by communities, and undervalued in terms of services they can deliver, and unable to develop a sense of culture and belonging [13].

Adding to geographical imbalance is the self proclaimed central role of the medical profession, its gatekeeping function, and its unwillingness to delegate to other providers, who might be more interested in locating in rural and remote areas [7].

3.2.2. *Service provision*

Service provision is often criticized with respect to timeliness, focus and appropriateness. Waiting times for HC services are high partially due to physician shortages, and partially due to service delivery being inadequately planned. Focus in delivery is on short term acute care, as opposed to preventive care or chronic care. A disconnect exists between what communities need and what institutions provide. Furthermore, services are provided in segregation, are dominated by the traditional medical model, with insufficient possibility for interdisciplinary team work [14–17].

Service provision is a direct result of providers' workload, job satisfaction, and general living conditions. The positive association between job satisfaction and employee performance, and the impact on client satisfaction is well documented in HR management literature [18]. Providers who are overloaded, burdened with tasks they do not consider a part of their responsibility (as discussed shortly), and not satisfied with their working and living environment provide lower quality services, which has negative effects on patient adherence and care effectiveness.

3.2.3. Education

Lack of interdisciplinary collaboration begins at the level of HC education, giving providers little insight into other health professions [19,20]. HC education is a contributor to what has been termed "silo culture" of future service delivery, where, again, the traditional medical model dominates. In addition, HC education is geographically not sufficiently accessible to students from remote and rural areas, contributing to shortages in those regions [15].

3.2.4. Policy

HHR policy and planning lack rigorous structure. Health planning and promotion are not based on population needs, nor grounded in evidence based analysis. It is felt that policy decisions are often dominated by politics rather than evidence. There is pressure to create national models, despite regional differences and legislative barriers. There is pressure to provide accountability, sustainability, productivity, yet these concepts are not clearly defined, nor measured [7]. Furthermore, legislation limits full SoP for many non-medical HC providers. Providers cannot work to full SoP, which in itself is often not clearly defined nor understood.

3.2.5. Information

The lack of data measurement and availability is a key challenge that stands in the way of evidence based planning. Macro-level records re. physicians, services and patients, are collected in a non-systematic manner. There is also a lack of financial analysis. At the micro-level, patient records do not follow the patient, contributing to the difficulty of delivering care in a holistic multidisciplinary manner. Technology to support information systems is difficult to manage [7].

4. Innovation in HHR models

In response to persistent problems identified in HC provision in Canada, providers, managers and policy makers have created and implemented innovative approaches to HHR utilization across the country. HHR is used here to mean arrangements, which define the roles and responsibilities of HC providers, and define their daily working conditions, as well as all practices used to manage those arrangements.

Diagram 2A depicts the traditional model of HHR roles, in which general practitioners (GPs) act as gatekeepers in the center of the publicly funded system. They are the first point of contact with patients, and the channel to services provided by specialist medical physicians, or other HC providers funded within the public system. Patients are also able to contact other HC providers directly, but must pay out of pocket. Financial and non-financial barriers are created to accessing providers other than GPs.

GPs have control over SoP allocation within the system. Wherever there is overlap between SoP sets of GPs and other providers, the GP can practice to full SoP and crowd out other providers. Patients choose the GP over non-funded providers for financial reasons, and the GP directs patients to specialists or alternative providers.

Table 1 shows the typology for non-traditional HHR models, which are classified into two broad categories, micro-level initiatives, and macro-level strategies. Micro-level initiatives are implemented on a project by project basis, generally in direct response to a concrete need of the community. They address challenges within the provider and services sphere, and sometimes within the information sphere, but do not in general address policy or education issues. Communication is weak between micro-level initiatives, and a systemic approach to their design, implementation and evaluation does not exist. Macro-level strategies occur at the broader policy level and take a more systematic approach; generally in response to a need as identified at the aggregate population level.

Micro-level HHR initiatives are divided into four categories:

- Enabling service provision to full scope of practice.
- Re-definition of roles of HC professionals.
- Interdisciplinary collaboration.
- Creation of supporting technology and information systems.

Macro-level HHR strategies are divided into two categories:

- Changes in education approaches.
- Changes in policy and or regulation.

As shown in Diagram 2B, enabling service provision to full SoP refers to each provider being given the opportunity to use all skills and knowledge within her/his SoP set. In areas of overlap between any two

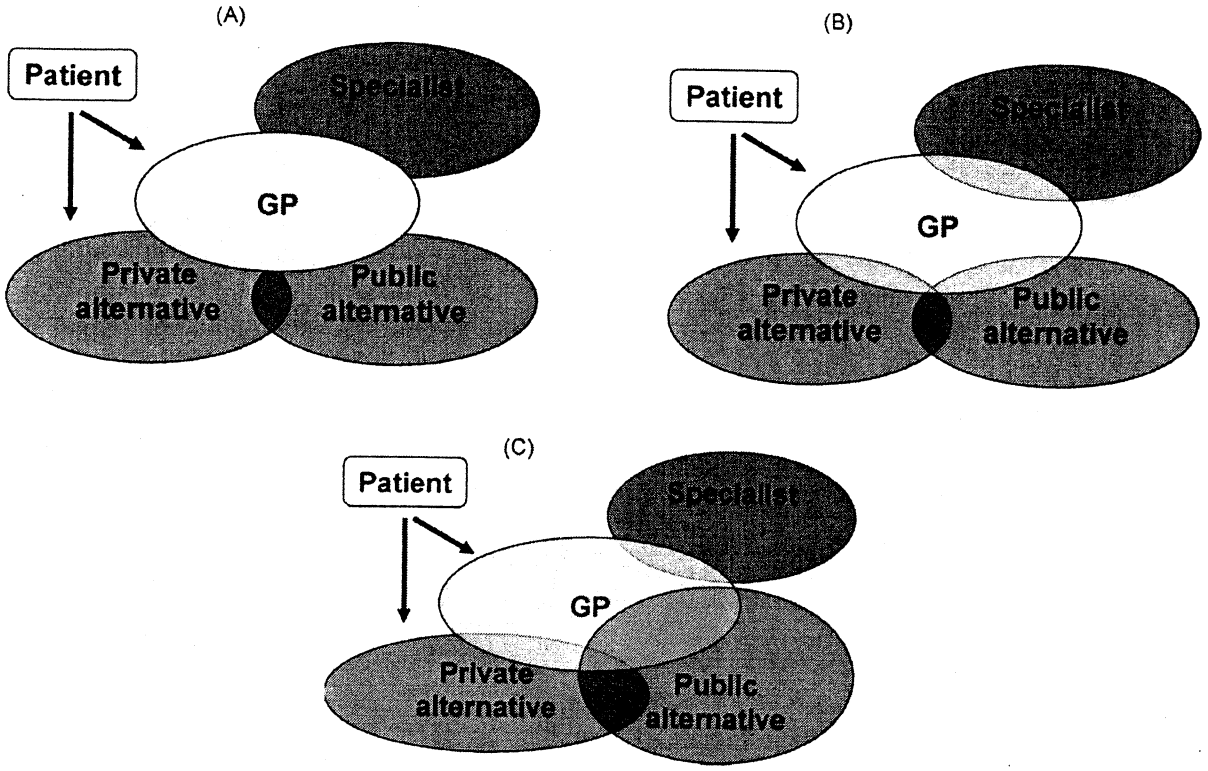

Diagram 2. (A) Scopes of practice traditional model; (B) working to full scope of practice and (C) re-defining scopes of practice.

providers, both are entitled to and able to deliver services. Success of this type of initiative necessitates that SoPs be clearly defined and communicated to all HC providers. Interdisciplinary collaboration and non-fee-for-service provider payment methods are often used as compliments.

Examples include the Maximizing the Use of Advanced Practice Nurses in Hospitals, and the Emerging Model of Physiotherapy Practice in the Canadian Forces. The first initiative is based in Durham, Ontario. Care is provided in multidisciplinary HC teams (also an example of interdisciplinary collaboration), within which greater roles are assigned to Advanced Practice Nurses. Roles fall within their SoP, but have previously been performed by physicians. This initiative is a direct response to a shortage of physicians in the region. The second initiative aims to provide physiotherapy (PT) services to all members of the Canadian Forces in all 10 Canadian Provinces and overseas. Access to PT care is to be unrestricted and care targeted at the unique employment demands of Canadian Forces members. PTs in this model are to act as primary HC providers, and their SoP is maximized via the removal of the GP's gatekeeping role [7].

A redefinition of roles of HC professionals constitutes an action where a HC provider is assigned new roles previously outside their SoP. Diagram 2C shows an expanding of the SoP set for a provider type. It might create greater overlap in SoP with another provider, or might constitute entirely different skills and tasks. In response to shortages of physicians, there is a tendency toward shifting HC responsibilities traditionally carried out by GPs onto other types of HC providers. This approach has also been used to unburden HC providers other than physicians, such as for instance nurses. The approach is meaningful only if accompanied by measures to enable provision to full SoP.

A common approach is to expand the responsibilities of nurses within the hospital setting, to include testing, and some diagnostic rights in test interpretation. An example is the use of Advanced Practice Nurses in hospitals, particularly older nurses nearing retirement. Nurses are assigned training and mentoring responsibilities to teach young incoming nurses.

Table 1
HHR model classification system

Type of approach	Key elements	Examples
Micro-level initiatives		
Enabling to work to full SoP	• Clear definition of SoP for each provider	• Maximising the use of Advanced Practice Nurses in hospitals
	• Acceptance of each other's SoP set	• Emerging Model of Physiotherapy Practice in the Canadian Forces
	• Equal right to all providers to carry out all tasks within own SoP	
Re-definition of SoP	• Addition or subtraction of tasks and responsibilities from existing SoPs	• Physician assistants—partners in medicine
	• Expansion/shrinkage of SoP sets	• Retaining and valuing experienced nurses
	• Clear statement of new SoPs	
Interdisciplinary collaboration	• Working together of several types of providers	• Multidisciplinary hypertension education/management session
	• Patient/community centered care	• MPC^2: Multidisciplinary Collaborative Primary Maternity Care Project
	• Match of service to need	
Supporting technology and information systems	• Patient information and tracking	• Health Professionals Registration Database
	• Provider information	• Telehealth applications in head and neck oncology rehabilitation
	• Micro-data collection to facilitate delivery at micro-level and planning at macro-level	
	• Standardization of data collection tools and supporting technology	
Macro-level strategies		
Changes in education	• Changes in curriculum to increase interdisciplinary awareness and collaborative provision	• Nursing education via streaming video
	• Changes in method of delivery to connect education systems with students (bringing education to students)	• Interprofessional Education for Collaborative Patient Centered Care (IECPCP)
Changes in policy	• Finding opportunities to micro-level HHR developments	• Pan-Canadian HHR strategy
	• Efforts to coordinate between jurisdictions	• Recruitment and Retention Initiative
	• Changes in physician remuneration	• Canadian Collaborative Mental Health Initiative
	• Changes in national strategies to secure and maintain a stable health are workforce in Canada	• Aboriginal Health Human Resource Initiative

Modalities of this approach have been used in B.C., Alberta, Manitoba and Ontario. The strategy is a direct response to a nursing shortage in Canada, and aimed at improving working conditions for both older and younger nurses.

Another example is the introduction of the position of Physician Assistants (PA) in the Canadian Armed Forces—HC professionals who are licensed to practice medicine under the supervision of a licensed medical physician. Her/his scope of practice is defined on an ad hoc basis by agreement between the PA and the supervising medical physician. The position has been introduced in several Canadian provinces. The physician's role is re-defined from HC provision to supervision and instruction [7].

Nearly all approaches discussed in this paper involve some degree of interdisciplinary collaboration (IC). IC is based on the working together of several types of HC professionals to assist the client and their family with health decisions. It is shown in Diagram 2B as involvement of all providers within areas of SoP overlap. This form of HC delivery is focused on patient needs, patient health outcomes and care continuity. The abilities and scopes of providers are matched with identified needs, but do not serve as a basis for HC choices. IC requires knowledge of each other's SoPs, as well as support from patients, families and the general public. Within collaborative practice, a re-definition of SoP is often necessary. Collaboration is a method for achieving maximization of existing SoPs.

Two examples presented at the conference are the Multidisciplinary Hypertension Education/Management Session in Wolfville, Nova Scotia and the MCP^2: Multidisciplinary Collaborative Primary Maternity Care Project. In the first example, a multidisciplinary team consisting of a Physician, a Nurse Practitioner, two Kinesiologists, a Dietician and a Psychologist, delivers an education and exercise program to patients with or at risk of hypertension. The goal is to deliver knowledge to patients, who manage their own disease.

The MCP^2 model is a national strategy, which aims to bring together all professions who are traditionally involved in pregnancy, birth and early childcare within specific sites. The project is spearheaded by an executive committee of representatives of Ob/Gyn related professions, who determine details of guidelines for care delivery, national standards, terminology, SoPs, information sharing and promotion of multidisciplinary care. Women are given the option to consult non-medical providers through, and non-medical are given the opportunity to provide care and inform women about birthing options [7]. For additional examples see, e.g. ref. [17].

Seamless functioning of HHR planning efforts at the micro- and macro-levels requires adequate supporting technology and information systems. Initiatives aiming to improve information and technology often bridge micro-level front lines with macro-level long term planning. For example, databases are created at the micro-level, but can be linked and aggregated to provide macro-level information.

Improvements in technology increase efficiency of daily HC delivery. They range from small changes, such as upgrades in computer billing systems, to large changes that implement new technology, such as electronic patient records, telehealth and telemedicine applications. Electronic patient records create the possibility for records to follow patients horizontally between different types of primary providers, geographically between locations or vertically between primary providers, specialists and tertiary care.

The Application of Telehealth in Head and Neck Oncology Rehabilitation, which is a part of the Manitoba Telehealth Network allows patients in remote areas to access a variety of providers from a distance, without needing to travel between regions. HC providers working in remote and rural areas of the Province are able to transmit images of patients' cancers to sites in Winnipeg via internet. Specialists interpret or even diagnose images, and recommend further steps for patient care.

Macro-level information is required for planning, evaluation and monitoring on an ongoing basis. Collection of data on patient characteristics, health outcomes and physician characteristics takes place at the micro-level, and is aggregated across patients and providers. Efforts at the macro-level also include the linking and standardization of existing databases in order to pool information, such as the Health Professionals Registration Database in Prince Edward Island [7].

The HC education system can be subject to two types of changes: changes to curriculum or changes to the method of delivery. Changes in content and organization of curriculum increase exposure to non-medical HC to counteract the silo culture common within the

medical profession. The goal is to decrease resistance to collaboration.

The Inter-professional Education for Collaborative Patient Centered Care Initiative (IECPCP) provides funding to medical schools to facilitate interprofessional collaborative patient centered care across all HC professions and sectors. Medical schools in Saskatchewan, Ontario, Nova Scotia and Newfoundland have made use of this funding.

The traditional method of education delivery is characterized by four years of course-based on-site instruction, delivered primarily in urban centers [20,21]. Medical education made available via distance is aimed at increasing recruitment and retention rates. Students who originate in remote or rural communities are more likely to locate there, and continuing education possibilities improve retention [21].

Tesson et al. [19] distinguishes between three types of medical education programs with a rural component. Mixed urban rural schools are those that are located in urban centres, yet incorporate a rural focus into their courses. DeFacto Rural Schools are those that are located in rural areas, although their curricula may not serve a rural mandate. Stand Alone Rural Schools are those created in rural areas with the specific purpose of supporting rural medical practice [19]. The Red River College in Winnipeg, Manitoba uses distance education to deliver nursing education to remote areas via Streaming Video. Some credit courses are taken on site initially. Nurses educated in their own community are more likely to remain there [7].

Changes in regulation, policy, planning and public perception create the framework for all other approaches. Canadian governments have implemented much of the necessary policy infrastructure, often in the form of funding opportunities to the micro-level. In addition, policies have aimed at coordination of efforts between jurisdictions. Examples of legislative changes at the macro-level were not presented at the conference. Governments have also introduced changes to remuneration structures of physicians. Remuneration methods are one enabler to changes in organization of HC delivery.

The federal Pan-Canadian HHR Strategy aims at the securing and maintenance of a stable HC workforce in Canada, and the support of overall HC renewal. The strategy is comprised of three funding initiatives: the Pan-Canadian HHR Planning Initiative is geared to improve planning and achieve the right number, mix and distribution of HC professionals; the IEPCPC; the Recruitment and Retention Initiative aims to increase the supply of HC professionals and improve their work environments. Funding is also made available for HHR research. The federal Advisory Committee on Health Delivery and Human Resources (ACHDHR), the Canadian Collaborative Mental Health Initiative and the Aboriginal HHR Initiative are additional examples of broad macro-level strategies [7].

5. Implementation barriers

Despite positive qualitative assessment of innovative HHR models by stakeholders, barriers to implementation across jurisdictions remain. Barriers can be similar to challenges discussed in Section 2, but the latter are drivers of change, whereas the former stand in the way of systematizing solutions.

Funding was criticized as insufficient, and incompatible in structure with needs. Funding is often granted on a one time basis as a lump sum for project start up. HHR initiatives face large difficulties with sustainability once the grant is exhausted. Paradoxically, federal and provincial governments invest large efforts into making funding available for HHR initiatives. There is concern on the government's side that funds are not reaching their intended recipients. The dichotomy in perception between funder and funding recipient suggests a breakdown in communication channels and funding flows, which is exacerbated by the following barriers.

Lack of information is both a driver of change, and the barrier that stands in the way of change. Information deficiencies decrease the ability to plan at the policy/regulatory level. Transporting of micro-strategies between geographical locations is not supported by solid evidence of success or failure. Data are not collected and systematic evaluation studies are not carried out. Planning in education is not backed by evidence of changing curricula having a positive influence on multidisciplinary care delivery. Lack of workforce data make impossible system wide planning with respect to HHR distribution.

Organizational structures are inflexible, and characterized by a hierarchical division of power, silo cultures and turf protectionism. This clinical culture is fuelled

by medical professionals who tend to reside at the top of this hierarchy [7,22–23]. More powerful professions crowd out less powerful professions whenever there is overlap in SoPs, especially if tasks within the overlap are remunerated. All professions, particularly the medical profession, and their educational institutions and associations require adjustment to structures, mindsets, collaborative competencies [7].

Hierarchical structures are not optimal with respect to strategic HHR management. A control based management model results in low worker morale and poor performance. A commitment based management model creates a positive work environment, better provider performance and improved patient satisfaction through undermining of the hierarchical division of power. The approach relies on creating an environment where employees are committed to their organization, work autonomously, are capable of self-discipline, seek responsibility and exercise initiative, ingenuity and self-direction [24,25].

The crucial role of sound HHR management was emphasized at the conference and in the literature alike, and the lack of leadership was identified as a primary barrier. The ability to manage HR within an organization, or HR capability, is a key determinant of efficiency in production [24,25]. Greater efficiency allows for provision of greater quantities of services with the same amount of resources, which is a partial solution to provider shortages.

Many micro-level initiatives are spearheaded by HC providers with have little training in administrative and management responsibilities. Filling the roles of administrator, or HHR manager, is neither within their scope of practice, nor generally within their interest. In contrast with large hospitals, within these smaller organizations, the ideal conditions for a commitment based management model exist [22]. The unique feature is the lack of solid management, planning, guidance and monitoring.

The political context of HHR planning cannot be ignored. Political decision making is fuelled by public perception and interest groups, neither of which tend to be supportive of multidisciplinary collaboration or expanded scopes of practice. Patients perceive the traditional medical model as superior, and often feel that quality of care is compromised through collaboration or substitution. GPs influence perceptions of patients through their role as gatekeepers of the HC system. Policy makers are resistant to creating policies that are not perceived favourably by the public.

Planning is further restricted by the fragmentation of government. The Canada Health Act spans across provinces, but decisions with respect to regulation, legislation and resource allocation rest with the provinces. Regions vary in terms of population needs, funding requirements, organizational structures and cultures [26]. A national panacea model is not feasible.

Barriers to implementation are illustrated in Diagram 2. At the macro-level, planning and delivery of HC services is situated within the traditional medical paradigm. Pressures from the public, lobby groups and other stakeholders prevent a paradigm shift. In addition, policy making is fragmented. At the micro-level, providers often play multiple roles. Aside from HC provision, they are charged with management roles outside of their SoP and interest.

6. Implementation pathways

The goal of HHR planning in Canada can be stated as:

To implement a systematic nation wide approach to planning, so as to facilitate interdisciplinary collaborative care delivery that is responsive to community and patient needs.

The goal is not being approached with systematic planning, although supported with ad hoc sporadic establishment of HHR initiatives. Implementation has been predominantly bottom up, with some top down facilitation [7]. The advantages of a bottom up approach to planning in general are the responsiveness to community needs and culture, as well as the sense of empowerment created for the community.

The disadvantage of the bottom up process is the general lack of theoretical framework, lack of standardization, no information sharing and no systematic evaluation. Critical success factors are not understood, making global planning and transferability of good ideas between provinces difficult.

HHR planning in Canada requires systematization. Pre-requisites to systematization are improved funding, information, and leadership, and changes to organizational structures, and policy making realities.

Improvements in funding, information and leadership can facilitate changes in organizational cultures and the policy making environment.

Funding structures must be changed to annual secure funding flows. The security of committed and sustainable funding will enable long term planning at the grass roots level, and make possible increased risk taking with expectation of greater payoff. Furthermore, communication between funder and intended target audience must be improved (see CA below).

Some organizational bottlenecks, such as inflexible union contracts, can be addressed through legislation. Changes to legislation should be spearheaded by interdisciplinary committees. In addition, the similar committees should be charged with providing clear statements of SoPs, as well as complementarity and substitutability between them.

Standardized data collection at the micro-level is a requirement for virtually all policy interventions, including definition of SoPs, changes to funding and any other planning. Quantitative generalizable analysis of effectiveness of HHR models is possible only if data collection is coordinated and managed centrally.

To sum up, the following are supporting objectives to the goal of systematic planning:

- Improved funding structure to increase project sustainability.
- Improved funding channels to ensure flow of funds to intended recipients.
- Increased flexibility in legislation, such as union contracts and other organizational structures.
- Clear definition of scopes of practice and communication thereof to all providers.
- Systematic collection of specified data at the micro-level.
- Evaluation of micro-level initiatives, and reporting on determinants of success.

A *Collaboration Agent* (CA) can take on the missing leadership function. The CA is an HHR manager, with additional responsibilities to support requirements for HHR innovations. Creation of this position strengthens HR capability, which in turn increases efficiency, yielding more HC services with a given set of HHR [22,27]. A CA should possess the following competencies desirable for HHR management within the public sector [27,28]:

- Knowledge of the business of HC provision, collaboration between providers, recognizing community needs, understanding government funding opportunities and understanding data collection needs and standardized tools.
- Sensitivity to clinical culture and issues of turf protection.
- Training in HR management, and ability to strategically align HR management with broader system goals.
- Leadership ability and enthusiasm.
- Personal credibility, and trust from HC providers, and policy makers.
- Ability to liaison between the community and HC providers.
- Ability to liaison between HC providers and policy makers.
- Ability to identify funding opportunities and write applications.
- Ability to understand data collection needs and implement standardized tools.

The CA would be trained in areas of HHR funding structures, funding applications and processes, data collection at micro-level, data analysis and understanding of scopes of practice, leadership, change management and external communication. This kind of person would work with one or several HHR micro-level initiatives to provide guidance, liaison with policy makers, communicate with other HHR initiatives and disseminate information to public and stakeholders. Diagram 1C illustrates the introduction of the CA into the HC framework.

The CA serves several functions within this framework. First, (s)he is responsible for the seamless channeling of funds from existing federal and provincial strategies, to micro-level initiatives. The CA identifies appropriate sources of funds for their initiative(s), deals with the application process and administers funds for the initiative. Second, the CA is put in charge of standardized data collection to track progress of the initiative, track strengths and weaknesses and support larger scale external evaluations. Third, the CA is made responsible for leadership of several initiatives. And fourth, the CA is to maintain external relations with other initiatives, with policy makers, with educational institutions and with the

public. Her/his communication efforts will support changes in public perceptions, and overall paradigm shifts.

The choice of person for this position is crucial. The CA cannot be an active provider, who does not have sufficient time. The ideal person to serve as CA is a former HC provider, who is no longer actively involved in service provision. A large pool of potential candidates is the population of retired nurses, who tend to be quite young (on average 45 years old), familiar with the business of HC, trained in showing sensitivity to needs, trained outside of the medical silo and often looking for a second less physically demanding career.

The position of CA can be housed within the regional health authority structure of general HC management in Canada. (S)he could be charged with overseeing several innovative HHR models within the region, providing her with a broader perspective, and giving rise to some economies of scope. The exact number of CAs required per region is an empirical question beyond the scope of this paper.

This solution is ideal, since providers are freed up from any HHR management responsibilities, as well as any funding applications. The CA becomes central in terms of coordination in the system of HC delivery and strategic HHR management. The CA is charged with repairing linkages that break down due to various external pressures, and combines a global perspective with clear understanding of issues encountered at the front line of HC delivery.

Literature advocates HR management that offers a high degree of control to employees. The situation in Canadian HHR is unusual, in that the high degree of control by professionals exists, but the leadership is lacking. Completion of the model with a CA will result in the kind of HR management model that has been associated with higher retention and lower quit rates [29]. Investment in HR management and improvements in human capital increases the efficiency of organizations, while decreasing the mobility of human capital within them [30].

7. Concluding remarks

Given the high strategic importance of HR management in the health care setting, the issue has been given surprisingly little attention in academic literature, and insufficient attention in Canadian health policy research. The landscape of Canadian HHR is characterized by a number of innovative models that deviate from the traditional medical provider centered model of health care delivery. Motivated and creative individuals stand behind the implementation of these models. These individuals are often not qualified for the role of HHR management, and are ready to pass this torch to trained leaders.

The sporadic and ad hoc nature of HHR models has created a situation of confusion for the policy maker. An adequate system wide approach to HHR planning does not exist. Although governments provide funding and some policy direction, a breakdown in funding flows and communication has been observed—money infused into the system by government does not reach the front line provider in the format that was intended.

This paper contributes twofold: an immediate improvement to HHR management in Canada is proposed, and future research is facilitated. The lack of leadership in HHR innovation can be remedied by introducing into the system CAs—trained and qualified individuals, who take charge of strategic HHR management in health care delivery, and who act as liaison between government and front line providers. Desired competencies of the CA are discussed in the paper (Table 2).

Sound strategic HHR management is advocated as leading to improved efficiency, increased HR capacity use, better creativity and higher productivity. A quantitative generalizable empirical assessment of the effectiveness of HHR models in the Canadian setting is not available. In the way of a system wide evaluation of HHR models stands the lack of a classification system, which defines HHR model characteristics that can serve as variables in empirical estimation. This paper provides the necessary typology, where HHR models are classified along several dimensions. The next step in this research agenda is a collection of health care output, or health outcome data, and the comparison of HHR models in terms of their health effects. Ideally, recommendations of optimal design of HHR models will be available to policy makers and CAs across the country.

Table 2
Barriers to implementation of innovative HHR strategies

1. Funding	• Insufficient • Block grants structure decreases sustainability • Funding made available at policy level does not reach front line of care provision
2. Information	• Insufficient patient data hampers collaboration between providers and delivery of care via distance • Insufficient aggregate data inhibit comprehensive, systematic, evidence based policy planning
3. Organizational structures	• Educational institutions support silo culture within health professions • Lack of collaborative competencies, skills and training within most organizations • Union contracts inflexible and not accommodating to change • Restrictive legislation, inflexible to re-definition of SoP's
4. Leadership and change management	• Lack of leaders and managers for micro-level HHR initiatives • Health care providers cannot perform both health service provision and leadership of HHR initiatives • Changes taking place require management in order to be expanded
5. Policy making realities	• Decision making is often political, as influenced by public perception, lobby groups or pressure from stakeholders • Fragmentation of government makes comprehensive national planning difficult

Appendix A Conference presentations

Author	Presentation
Enabling to work to full scope of practice	
Acorn, M., Whyte, S.	Maximizing the use of Advanced Practice Nurses in hospitals: an innovative solution [CARE Model]
O'Hare, S.	Canadian Practical Nurses Association working toward full utilization of the LPN/RPN across Canada
Cannon, M.	Maximizing the use of Advanced Practice Nurses in hospitals: an innovative solution
Hebert, L.	The Emerging Model of Physiotherapy Practice in the Canadian Forces
Mayrand, R.	Kaizen Approach: to mobilize human resources beyond the usual results
Harnett, N.	Advanced practice for radiation therapists in Ontario
Re-defining scope of practice	
Rhule, C.	Physician assistants (partners in medicine)
Silas, L.	Retaining and valuing experienced nurses
Goggan, C.	Skill mix staffing complements and collaborative practice: achieving the sustainability of service delivery in healthcare
Hirsch, G.	Providing healthcare for persons with hepatitis C in Nova Scotia
Beanlands, H.	Individuals' views on taking care of and deciding about their own bodies: implications for PHCNPs
Hirsch, G.	Providing healthcare for persons with hepatitis C in Nova Scotia
Jong, M.	Strengthening rural practice strengthening rural practice
Hamilton, L.	Retention of retirement aged nurses in Nova Scotia
Spooner, R.	Chronic disease management in a community family practice network
Cogswell, D.	The role of the nurse in emergency rooms of regional health authorities
Interdicsiplinary collaboration	
Gillingham, F.	Multi-disciplinaryhypertension education/management session
Maclean, C.	Family medicine group practice model
Sanders, J.	Supporting interdisciplinary practice: the family physician nurse practitioner educational and mentoring program [SIP]

Appendix A (*Continued*)

Dort, N.	Moving forward together: mobilizing primary health care in Newfoundland and Labrador
Gurnham, M.	Challenging the scope of practice: from tribalism to collaboration
Jackson, K.	Optimizing professional roles while achieving quality outcomes
Gilbert, J.	Promoting interprofessional collaboration
Maranta, A.	Multidisciplinary Collaborative Primary Maternity Care Project MCP2
Rowe, P.R.	The primary care renewal initiative in the canadian forces—collaborative, multi-disciplinary practice
Service, J.	Enhancing interdisciplinary collaboration in primary health care initiative (EICP)
Supporting technology and information systems	
Doyle, G.	Health Professionals Registration Database
Sweete, D.	Canada Health Infoway Information Session
Mah Wren, A.	Transforming home support through redesign interior health authority, B.C.
Myers, C.	Telehealth applications in head and neck oncology rehabilitation
Changes in education	
Warman, S., Higgins A., Scott, J.	New Brunswick Critical Care Nursing New Brunswick Critical Care Nursing Program (NBCCNP)
Macdonald-Rencz, S.	Interprofessional education for collaborative patient-centred practice
Sharpe, D.	Collaborating for education and practice: an interprofessional education strategy for Newfoundland and Labrador
Achtemichuk, M.	Community Therapy Assistant Program Development in Nunavut, Canada
Clare, D.	Nursing education via streaming video
Flett, H.	Federal government family residency elective program
Rourke, J.	The Association of Faculties of Medicine of Canada Today's Research, Tomorrow's Doctors
Hunter, M.	Community education for HHR innovation: changing the delivery system
Watts, J.	Closer to home: Nunavut Health Human Resource Strategy
Changes in policy	
Gerbremariam, K.	The aboriginal health human resources initiative
Gubbels, V.	Building a representative workforce through career pathing
Brascoupe, S.	The aboriginal health human resources initiative
Brown, S.	Developing a provincial health human resources strategy for Ontario hospitals
Cripps, S.	Paving the way to a representative workforce
Elliott, S.	Health Care Human Resource Sector Council: building HHR capacity through Research
McElroy, H.	The Pan-Canadian Health Human Resource Strategy
O'Brien-Pallas, L.	Advances in nursing productivity: evidence to optimize utilization of nursing services
Rajendram, M.	Health human resources innovations
Wall, R.	Building the Public Health Workforce for the 21st Century: a Pan-Canadian framework for public HHR planning
Klaiman, D.	Towards best practice for caseload assignment and management for occupational therapy in Canada
Rankin, S.	Annapolis valley health: journey to organizational health
Buske, L.	Task force two and the national physician survey
Gavel, S.	Human resource survey tools
Dalton, C.	Management structure in an integrated health authority
Booth, H.	Evolving, collaborating and having fun
Button, L.	Creative staffing for outpost nursing stations
Carr, M.	B.C. acute care geriatric nurse network/geriatric emergency networking initiative
Kay, D.	A Rural Physician Workforce Agency—Alberta's Rural Physician Action Plan (RPAP)
Kettler, K.	Strategic framework: increasing the participation of first Nations, Inuit and Métis in health careers
Lys, J.	Recruitment and retention in aboriginal communities
Dudgeon, S.	Canadian Collaborative Mental Health Initiative
Grimard, F.	Family physician remuneration models and primary health care renewal: literature review
Kazimirski, J.	Physician resource planning at capital health
Marrie, T.	Preliminary outcomes of implementing an ARP in the Department of Medicine at the University of Alberta
Brygidyr, S.	Manitoba's new approach to primary care

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Tab 9

Healthcare Systems and Organizations: Implications for Health Human Resources*

Michael B. Decter

What will the healthcare system and healthcare organizations look like in the year 2020? What requirements will they have for health human resources? These two questions require both a careful consideration of the general direction of change in health systems and a consideration of the pace of change over the next 15 years. The geographical focus of this article is Ontario, although broader international and Canadian trends are also considered in arriving at answers.

This article is organized in five brief sections, beginning with looking backward to look forward and proceeding through key trends, organizational evolution by sector an future health organizations and concluding with 10 implications for health human resources.

In the 1990s, we witnessed decisions on both physician human resources and nursing education that were taken in different manners, but both ended up moving the health system in the wrong direction.

Looking Backward to Look Forward

Do organizational changes impact on health human resource requirements? The answer, looking at the history of the past 15 years in Ontario, is a resounding "yes." It is worth considering major health and human resource policy decisions taken in the past 15 years with a view to gaining insight into those decisions in the go-forward 15-year period. It is also worth considering the organizational changes that the healthcare system has undertaken to see trends. Put briefly, in the 1990s, we witnessed decisions on both physician human resources and nursing education that were taken in different manners, but both ended up moving the health system in the wrong direction. We reduced our training and education capacity at exactly the wrong time in nursing and medicine. Worse still, it took nearly a decade for corrective actions to be taken. A central reason for the policy errors was a lack of explicit linkage between organizational change and health human resource decisions. In the case of medical education, explicit decisions were based on intended organizational changes that were not implemented. In nursing education, organizational changes that were implemented led to unintended reductions in nursing education numbers.

The physician decision was taken at the national level based upon the Barer-Stoddart study (Barer and Stoddart 1992). The study and its implementation missed two important realities. First, the physician population was shifting from male dominated to more balance between male and female physicians. This held the implication that the average future physician would deliver less care than the average current physician. Second, recommendations were cherry-picked, that is, only some were implemented. Therefore, physician numbers were based on a prediction that did not unfold. In particular, the reform of

* Paper based on a presentation hosted by the Change Foundation, January 2006.

primary care, a subject to which we will return shortly because it has great relevance to the next 15-year period, was not undertaken in parallel with the training reductions. In fact, it may be that one of the most powerful decisions in terms of health human resource planning in the next 15 years turns significantly on the success of the movement to interdisciplinary teams in primary care, for reasons that will be outlined subsequently.

The nursing decision was not taken on the basis of any overall study; it resulted from dozens, if not hundreds, of individual decisions at university, community college and hospital levels, all of which led to a dramatic reduction in the number of nurses educated. Organizational consolidation unrelated to nursing education had the impact of dramatically reducing the number of nurse graduates.

Both the decisions regarding physicians and nurses have been reversed. Significant increases in the number of nurses and physicians being trained are under way. It is not clear whether the increases are sufficient to offset just current shortages or whether they will also be sufficient to address an increase in retirements. Over the next 15 years, the retirements of baby boomers, who constitute a significant percentage of professionals in the health labour force, will represent a major shift.

Looking backward should tell us that there is an important connection between how we choose to organize health services and what human resource requirements result. For example, reordered primary care with multidisciplinary teams will require fewer doctors than solo practice family medicine. However, a shift of nursing work from hospital settings to home settings will not require fewer nurses.

Key Trends

It is my objective in this section to separate key trends that have an inherent impact on organizational structure in healthcare delivery from those that do not. The broad categories of trends include demographical change – largely the aging of the population – movement to a more consumer-driven health system and technological change. Having devoted an entire book, *Four Strong Winds*, to the forces of change several years ago, it is my intention to focus on those trends most likely to impact on organizational structure (Decter 2000).

The past 15 years have witnessed significant growth in the provision of non-traditional care. By *non-traditional*, two different dimensions are indicated. A range of providers beyond the traditional professional categories is providing more healthcare, for example, in fields of massage therapy and acupuncture aromatherapy. There has also been significant growth in the rehabilitation field; physiotherapy and chiropractic have expanded as the population has aged and there has been an increased need for these fields. These services are not provided within the hospital and physician sectors of healthcare. They will demand a greater number of skilled professionals. However, this trend is not likely to impact structure.

By contrast, management of chronic diseases is another sphere with both unmet needs and future growth. Ontario will experience the same phenomena as other jurisdictions of an aging population coping with an array of chronic conditions. Increasingly, experts are noting that better outcomes are obtained by managing chronic diseases such as diabetes in a tighter fashion. By 2020, it is probable that more than one million Ontario residents suffering from chronic diseases will be enrolled in formal disease management programs. The successful implementation of such programs will require structural change, particularly to primary care. Disease management cannot be carried out readily in a solo family physician setting. Multidisciplinary teams and robust information technology including electronic patient records are necessary elements.

Patient demands for timelier, more appropriate and higher-quality care are also likely to force structural changes in healthcare delivery. Overall, a movement toward greater integration of care is likely to meet these consumer-type demands. As well, greater investments in health information are inevitable to meet the needs for greater information on the part of patients about their care journey.

By 2020, it is probable that more than one million Ontario residents suffering from chronic diseases will be enrolled in formal disease management programs.

Organizational Evolution by Sector

Although stated goals for healthcare delivery reform espouse a more integrated system, Ontario's current realities are still a health organizations differentiated by the care they are delivering. Unlike provinces such as Alberta or Saskatchewan where a regional health authority delivers hospital care, home care, public health, chronic care and other types of care, in Ontario the organization form varies by sector. The mandate of the 14 Local Health Integration Networks (LHINs) is to plan, coordinate and fund health services, not to directly deliver care services.

Hospitals

For more than a decade, the major trend affecting hospitals worldwide has been a continual shortening of length of stay. Due to technological change as well as financial pressure, hospitals have moved 70–80% of their surgeries to a day basis. For the remaining surgeries, there has been an ongoing effort to shorten the lengths of stay. In many cases, this shortening has been dramatic. For example, in obstetrics, an average length of stay of five to seven days was not unheard of two decades ago. Now 24- and 48-hour lengths of stay are more typical. Whole

classes of surgery have been moved from an in-patient to an outpatient basis. In addition, the entire enterprise of surgery of an exploratory nature has given way to much improved diagnostic imaging.

In 2005, for the first time in a decade, average length of stay, including that in Ontario hospitals, increased slightly. Whether this marks the reaching of a plateau, to be followed by an increase in length of stay, or whether it simply marks a deceleration in the shortening of length of stay will require several more years of data. What is significant is that the most dominant trend driving staff requirements for hospitals seems to have come to a resting point. The stabilization of lengths of stay coupled with the demographics of an aging population will result in more hospital-based surgeries, particularly for procedures such as joint replacements. (The trend is less clear in the case of cardiac surgery, where the innovation of coated stents seems to be driving a reduction in cardiac bypass surgery.) Overall, the trends seem to suggest that the decline in the hospital sector from roughly 50% of total health spending and total healthcare activity to about one third is stabilizing and is likely to remain in this range or even to begin to increase slightly. The implication for health human resources is that hospital staffing will require replacement on the demographic basis of all those workers retiring over the next 15 years.

The most dominant trend driving staff requirements for hospitals, reduction in lengths of stay, seems to have come to a resting point.

Primary Care

If primary care in Ontario continues to move from a largely fee-for-service family physician model toward the larger practice groups with multidisciplinary teams, this will have a profound impact on health human resource planning. At the present time, the Ontario physician population of some 22,000 is equally divided between family physicians (48.5%) and specialists (51.5%). Over the next 15 years, not only will Ontario's population grow by perhaps 20–30%, the population will significantly age. The percentage of the population over the age of 80 years will expand dramatically, and that of the population over age 65 a little less dramatically. Both of these trends will increase the need for primary care. In particular, the need will be greater for assistance to patients and their families for the management of chronic diseases such as diabetes, heart disease, asthma, arthritis and cancer. The burden will not be easily borne by a system organized around the solo practice family doctor.

In 2004, Ontario had 10,656 family physicians. Of this group, 6,859 (64%) were men and 3,797 (36%) women. If one looks at those physicians over the age of 55 years – that is, those likely to retire by 2020 – a different picture emerges. In this group, there are 3,124 physicians, 2,541 (81%) of whom are men. By 2020, the family physician workforce in Ontario will experience the retirement of 29% of its ranks. The new physician population will be close to gender balanced. The dominant form of primary care organization will have ceased to be the solo practice family physician. Reordered multidisciplinary primary care teams will have become the dominant form of organization.

Major efforts are already under way by the second successive government to create more integrated primary care. The main obstacles are threefold: (1) provider resistance, largely from the longer established members of the professions, (2) the electronic patient records needed for technology integrated care and (3) the absence of sufficient numbers of non-physician health professionals to make up the multidisciplinary teams. Simply put, team practice will substitute nurse practitioners, nurses, dietitians, physiotherapists and others for family physicians. If there are insufficient numbers of these other health providers, the reform will fail.

By way of example, one were to contemplate in Ontario a ratio of one nurse practitioner to every three family doctors, one would require 3,000–4,000 nurse practitioners. Yet only 800 nurse practitioners exist in the whole of Canada at the present time. Ontario's current policy directions favour increasing the number of physicians and nurses but show little trend toward increasing the number of nurse practitioners. If, instead, that ratio were one nurse practitioner for every two family doctors, Ontario would need 6,000 nurse practitioners. It is likely that some nurses already employed in primary care will upgrade their skills; nonetheless, a clear implication for health human resource planning in Ontario is not only the direction of primary care reform but its pace. At times, ambitious targets have been set by governments (80% within three years, by the Honourable Tony Clement) and not met (Ontario Ministry of Health and Long-Term Care 2002).

Home Care

Home care continues to expand as an aging population requires more care in the home, both to prevent hospitalizations and to allow recovery post-hospital procedures. The impacts of the purchaser-provider split and a tendering system implemented through the community care access centres (CCACs) have been to consolidate the home care sector into larger province-wide delivery organizations.

Health Informatics

Another major challenge facing the Ontario healthcare delivery system with implications for health human resources is the implementation of the electronic health record. Although Smart Systems for Health exists and employs a considerable group of

direct employees and consultants, the bulk of the activity in health informatics is taking place at the level of individual health organizations. Hospitals and other healthcare organizations are revamping their spending on informatics from 1–2% to 5–6% of their budgets. This trend can be expected to continue with significant implications to the number of people employed in health informatics throughout the provincial health delivery system.

It is unlikely that there will be an emergence of a major single dominant employer in the health informatics area, although it is possible that the winds could bring some entity into being with a specific focus. If there were a strategic investor modelled on Canada Health Infoway, the employment implications might be similar, with 100 total staff. The number of health informatics employers throughout the health system is likely to rise steadily through the next 15 years.

The pace of investment in health informatics will drive the pace at which the electronic health record is implemented in Ontario. Even on a slow track without a Malcolm Gladwell tipping point to accelerate it, it seems clear that all Ontarians will have an electronic health record by 2020. Their maintenance will employ thousands, if not tens of thousands, of personnel within the health system. This will be the second major group of new employees within healthcare.

It seems clear that all Ontarians will have an electronic health record by 2020. Their maintenance will employ thousands, if not tens of thousands, of personnel within the health system.

Future Health Organizations

Further consolidation of the hospital system is likely in the next 15 years. Over the past 15 years, Ontario reduced the number of hospital organizations by 25%, from 240 to 180. Whether further merger and consolidation will follow the regionalization model of other provinces is not clear. The LHIN reforms could lead to a further consolidation of delivery; but in the first several years as the LHINs commence, they are more likely to stick to a purchaser role and use competition among providers to improve efficiencies and outcomes. At some point, this process will lead to hospital organizations that are not as strong, further weakened by their inability to compete to be merged. A future government may consider a less gradual consolidation, but that is speculative. In an evolutionary scenario, Ontario might retain as many as 150 hospital organizations by 2020. In a more radical consolidation into integrated health systems, the number of organizations might be reduced to perhaps 60. The notion that the 14 LHINs will become monopoly provider organizations with the elimination of individual hospital and other care provider boards strikes me as unlikely given the political power of the Ontario Hospital Association and individual hospital boards.

The implementation of the CCAC purchasing model for home care has led to a consolidation of home care delivery into fewer, larger organizations. Although, with the anticipated integration of the CCAC function into the LHINs and the implementation of some of the Caplan Report recommendations, it is uncertain whether this will continue. In fact, the proposal of Elinor Caplan to allow CCACs to extend contracts will likely diminish the competitive aspect and secure market share for existing providers in the short to medium term. Nor are new national agreements on minimum home care standards likely to affect Ontario as the province has already financed care in excess of the minimum package required by the 2004 accord among the governments.

Pharmaceutical Care

Pharmaceutical care is worth consideration. As the population ages and life expectancy continues to slowly rise, the continuing growth of pharmaceutical care will impact human resources requirements. The most obvious trend is expanded pharmacies and the displacement of community pharmacies with chain drug stores. Organizations such as Shoppers Drug Mart will continue to expand their market share. They are also likely to continue to increase their offerings of products for self-testing and patient management of their own health. A range of new diagnostic tests will be made available on a direct-to-consumer basis. The pharmacist's role will include assisting patients not only in managing prescription medications but in choosing non-prescription medications for common ailments. The supply of pharmacists and pharmacy assistants will expand steadily to meet these requirements. It is also possible that, in smaller centres, other health professionals such as physicians will locate in the chain drugstores.

Research

The past decade has witnessed impressive growth in the overall health research enterprise in Ontario. Not only have the hospital-based research foundations expanded, the government of Canada has significantly boosted funding for health research through the reformation of the Medical Research Council into the Canadian Institutes of Health Research.

Conclusions: Implications for Health Human Resources

Organizational change has important implications for health human resources. But more powerful may be the grinding of demography on both the health workforce and the patient population. Let us consider the top 10 list (with apologies to David Letterman) of areas in which organizational form and pace of investment will have the most impact on health human resource requirements:

1. The emergence of larger-scale primary care organizations staffed with a mix of physicians, nurse practitioners, midwives, pharmacists, nutritionists and dietitians will be the major driver of change. The pace at which this happens will be critical. The key impact will be a sustained demand for non-physician health professionals for these new organizations.
2. In the gradual consolidation scenario, the restructuring of healthcare delivery services will likely involve the replacement of a significant portion of the hospital workforce through this period. Nurses will be the largest group with possible supply problems. Replacement of nurse retirees will dominate the agenda. In nursing education, a shortage of educators to cope with the needed expansion of education will be a challenge.
3. In the scenario of radical consolidation into some 60 integrated health delivery systems, the human resource requirements will likely be met by more direct action. In jurisdictions with larger systems, much more direct linkage to educational institutions is evident; the integrated systems will enter into direct relationships to ensure access to new graduates in sufficient numbers. They will also initiate more robust internal training and upgrading programs.
4. Home care sector growth will need to be accommodated by specific training efforts so that home care is not the poor cousin to hospital nursing with high turnover.
5. The pace of health informatics will cause a significant demand for informatics personnel in health delivery organizations including hospitals, home care, LHINs and others. By 2020, every resident of Ontario will have an electronic health record that will require continual updating.
6. The continuing growth in the scale and sophistication of pharmaceutical care will require increased numbers of pharmacists and pharmacist's assistants. Changes to scope of practice and reimbursement that might permit prescribing of some medications by nurse practitioners and pharmacists could also expand human resource needs in this sector.
7. Larger, more integrated health services delivery organizations tend to develop more sophisticated and effective health human resource development programs. In the documented cases of Capital Health in Edmonton, a more rigorous planning and forecasting model has been adopted to predict future needs. In the Montreal Region, these efforts have included very organized mid-career, middle management training.
8. The LHINs are likely to require staff with specialized skills not readily available in the current healthcare system. It will be worth considering the 14 LHINs as a separate human resource need to be met with a combination of measures including mid-career training in purchasing.
9. The research enterprise in health will continue to expand with a need for professionals with PhDs as well as lesser-skilled technical personnel. Health research will grow most rapidly in the molecular and gene therapy fields as well as in health services.
10. Organizational changes have consequences for health human resource requirements – sometimes unintended and unpredicted consequences. This fact leads to a broad point pertaining to the entire health workforce. It is a reasonable goal to educate a sufficient number of providers to achieve a modest surplus. Only with a modest surplus can organizational changes be accommodated without imposing excessive overtime and resultant injuries on the existing workforce. A modest surplus is also a way to avoid poor-quality care.

With regard to timing, the two most significant drivers of health organization change in Ontario will be the pace and scope of LHIN implementation and the speed of primary care reform. HQ

Acknowledgement

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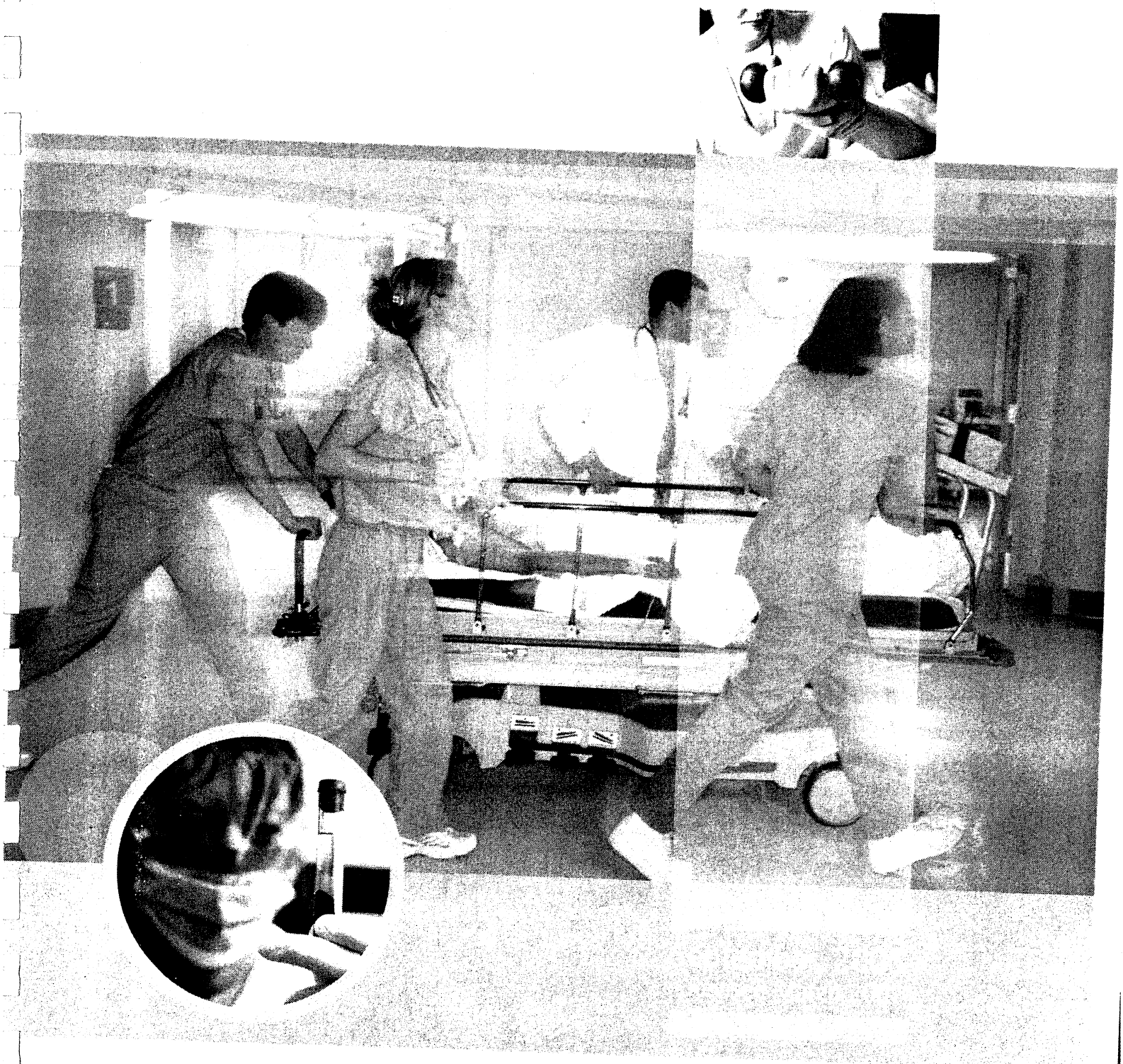
About the Author

Michael B. Decter is a leading Canadian expert on health systems, with a wealth of international experience. In 2003, he was appointed as founding Chair of the Health Council of Canada. Most recently, he was the Chair of the Canadian Institute for Health Information. He continues to serve as Chair of St. Elizabeth Healthcare, and the Ontario Cancer Quality Council. He is a Board Member of The National Ballet of Canada and George Brown College as well as part of the Advisory Council at the School of Policy Studies, Queens University.

Tab 10

A Framework for Collaborative Pan-Canadian Health Human Resources Planning

Federal/Provincial/Territorial Advisory Committee on Health Delivery and Human Resources (ACHDHR)



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Fall 2007

Dear Health Human Resources Planners:

The Advisory Committee on Health Delivery and Human Resources (ACHDHR) is excited to share the *Framework for Collaborative Pan-Canadian Health Human Resources Planning* and its accompanying *Action Plan* with you. We invite you to review the activities outlined in the *Action Plan* and keep them under consideration when addressing your specific Health Human Resource (HHR) planning needs.

The Framework was developed at the direction of the Conference of Deputy Ministers of Health (CDM) in 2004-05. In the Fall of 2005 it was presented to and approved by the CDM and subsequently received the endorsement of the FPT Ministers of Health.

In 2006, ACHDHR consulted government and non-government stakeholders, (including provincial/territorial governments, federal health partners, research institutes, national Aboriginal groups, health sector organizations, health professional associations, and professional regulatory bodies) to solicit feedback on the *Framework* and determine the role stakeholders could play in the implementation of the *Action Plan*. This engagement process has strengthened the commitment of both governments and stakeholders to work together in addressing HHR challenges.

The *Framework* is designed to help facilitate the enhancement of partnerships between government and stakeholders and builds a case for a pan-Canadian collaborative approach to planning. Moreover, it identifies the challenges, outlines priorities for collaborative action and sets out tangible and specific actions that jurisdictions can take together to achieve a more stable and effective health workforce.

Each jurisdiction, with its respective stakeholders, will continue to be responsible for developing and implementing its own HHR policies, plans and service models. However we encourage everyone to do so within the context of this framework.

We believe this is an excellent opportunity to increase communication and collaboration amongst governments and stakeholders who are committed to improved health human resource planning. If you have any questions, please contact the ACHDHR Secretariat by e-mail at: ACHDHR_CCPSSRH@hc-sc.gc.ca

Sincerely,

Co-Chairs of ACHDHR

Introduction

Canadians want timely access to high quality, effective, patient-centered, safe health services. To meet public expectations, jurisdictions across Canada must plan and manage their health delivery system, including planning for the health human resources (HHR) required to provide care within their system. As part of the *"10-year Plan to Strengthen Health Care"*, signed by First Ministers in September 2004, provinces and territories agreed to complete health human resource action plans by December 31, 2005.

HHR planning does not occur in isolation, but within the context of the broader health care delivery system. Each province and territory in Canada designs its health care delivery system based on: population health needs, reliable evidence about the services that are effective in improving the health of individuals and the population, and available resources. In addition, health care delivery design is shaped by intergovernmental agreements, such as First Ministers commitments to improve patient safety, reduce wait times for medically necessary procedures, provide home care programs, and increase disease prevention initiatives. Health system design also occurs within the prevailing social, cultural, economic and political environments, which can create both opportunities and constraints.

Governments, in their role as policy makers and funders, work with partners and stakeholders — including educators, public and private sector employers, providers, Aboriginal organizations, professional associations, patients, and the public — to determine the delivery models (e.g., primary health care, acute care facilities) to deliver effective accessible services needed by their populations. Different levels of need require different levels of service, and the types and levels of service determine the requirement for health human resources.

Toward More Effective Health Human Resources Planning

People are the health care system's greatest asset. Canada's ability to provide access to "high quality, effective, patient-centered and safe" health services depends on the right mix of health care providers with the right skills in the right place at the right time.

People are also the single greatest cost in the system. Between 60 and 80 cents of every health care dollar in Canada is spent on health human resources (and this does not include the cost of educating health care providers).[1] The province of Saskatchewan reports health human resources account for 73% of its health care budget.[2]

All jurisdictions in Canada are currently experiencing shortages of health care providers, waiting times for many services, and escalating costs. The situation is particularly acute in Aboriginal communities.

Faced with a potential health human resources crisis, it is time to rethink how we plan for and deliver health care services. It is time to design health service delivery models that encourage health care providers to work collaboratively and to their full scope of practice. There are opportunities for provinces and territories to learn from one another, and share effective HHR and service delivery strategies.

In the 2003 First Minister's Accord on Health Care Renewal, the provinces, territories and federal government made a commitment to work together to improve health human resources planning. While each jurisdiction will continue to be responsible for planning its own service delivery system, all have come together to demonstrate leadership in responding to common issues that would benefit from a collaborative approach.

1 Kazanjian A, Hevert M, Wood L, Rahim-Jamal S. Regional Health Human Resources Planning & Management: Policies, Issues and Information Requirements. Centre for Health Services and Policy Research, University of British Columbia. Vancouver. January 1999.

2 Ministry of Health, Saskatchewan, 2004.

At the 2003 meeting, the First Ministers also recognized that, despite some improvements, the health status of Aboriginal peoples in Canada continues to lag behind that of other Canadians. They acknowledged that addressing the serious challenges to the health of Aboriginal peoples will require dedicated ongoing efforts both within the health sector and on the broad determinants of health.

At their meeting in September 2004, the First Ministers agreed to: "continue and accelerate their work on health human resources action plans and initiatives to ensure an adequate supply and appropriate mix of health care professionals"; "foster closer collaboration among health, post-secondary education and labour market sectors"; "increase the supply of health professionals, based on their assessment of the gaps"; and, by December 31, 2005, make public their action plans (including targets for training, recruiting and retaining professionals).

The Role of the Advisory Committee on Health Delivery and Human Resources

In June 2002, the Conference of Deputy Ministers (CDM) of Health established the Advisory Committee on Health Delivery and Human Resources (ACHDHR). Its role is to:

- provide policy and strategic advice to the CDM on the planning, organization and delivery of health services including health human resources (HHR) issues
- respond to requests for advice from the CDM
- identify emerging issues and develop recommendations for Deputy Ministers
- provide a national forum for discussion and information-sharing of F/P/T issues.

The focus of the ACHDHR's work is to ensure Canada has the health human resources to support the health system of the future.

At that meeting, the federal government made a commitment to:

- accelerate and expand the assessment and integration of internationally trained health care graduates for participating governments
- develop targeted efforts to increase the supply of health care professionals to work in Aboriginal communities
- take steps to address the health needs of official language minority communities
- take steps to reduce the financial burden on students in specific health education programs
- participate in health human resource planning with interested jurisdictions.

On September 13, 2004 as part of the First Ministers Meeting (FMM), First Ministers and Aboriginal leaders met to discuss joint actions to improve Aboriginal health and adopt measures to address the disparity in the health status of the Aboriginal population. At the FMM 2004, the federal government announced funding of $100M over five years for an Aboriginal Health Human Resources Initiative (AHHRI). The three main objectives of the AHHRI are to:

- increase the number of Aboriginal people working in health careers
- improve the retention of health care workers in First Nations, Inuit and other Aboriginal communities
- adapt current health care educational curricula to make it more culturally relevant and enhance the cultural competence of health care providers working with Aboriginal peoples.

Based on advice from all jurisdictions and key stakeholders, and recent reports on the health care system (i.e., Romanow, Kirby, Fyke, Clair and Mazankowski), the Advisory Committee on Health Delivery and Human Resources (ACHDHR) has developed a pan-Canadian framework that will help shape the future of HHR planning and health service delivery. This document, prepared by the ACHDHR:

- recognizes the jurisdictional responsibility for health system design and HHR planning as well as determining the resources available to deliver health care
- affirms that – because of the small number of training programs across the country and highly mobile nature of the health workforce – jurisdictions cannot plan in isolation and require a collaborative pan-Canadian approach to certain aspects of HHR planning
- proposes a framework for collaborative pan-Canadian HHR planning that will support system planning
- describes the challenges in HHR planning, identifies priorities for collaborative action, and sets out tangible specific actions that jurisdictions can take together to achieve a more stable effective health workforce.

The key differences between the proposed pan-Canadian approach and the traditional approach to HHR planning are that the proposed approach is collaborative, and it is driven by the delivery system design which, in turn, is based on population health needs. In the proposed pan-Canadian approach to HHR planning, each jurisdiction* will continue to plan its own health care system, develop its own service delivery models, and develop and implement its own HHR policies and plans; however, it will do so within the context of a larger system that shares information and works collaboratively to develop the optimum mix and number of providers to meet all jurisdictions' needs.

Each jurisdiction will determine the scope of its delivery system, its needs now and in the future, and the types of service delivery models that will best meet its population's needs. It will then be able to determine more accurately its HHR requirements. Planning health human resources based on system design and population health needs — as opposed to relying primarily on past utilization trends — will lead to more responsive health systems. This type of planning provides an opportunity to identify: the services needed, innovative ways to deliver those services, the types of professionals required, and how to deploy them to make the best use of their skills (i.e., maximize scope of practice) — rather than continuing to plan based on how and by whom services are delivered now. The goal is to develop and maintain a health workforce that will support health care renewal.

* The province of Quebec considers health human resources planning its exclusive provincial responsibility. It did not participate in the development of this report nor does it intend to participate in a pan-Canadian strategy for collaborative health human resources planning. However, Quebec remains open to sharing information and best practices with other jurisdictions

The traditional approach to health human resources planning in Canada has relied primarily on a supply-side analysis of past utilization trends to respond to short-term concerns. For example, faced with shortages in a certain profession, jurisdictions tend to add training positions; faced with surpluses, they cut training positions; faced with budget pressures, they cut or reduce full-time positions. This approach has a number of critical weaknesses:

- health care system needs are defined based on past utilization trends rather than emerging population health needs, so jurisdictions tend to plan for the past rather than the future
- planning is based on traditional service delivery models rather than considering new ways of organizing or delivering services to meet needs
- health human resources planning has tended to focus almost exclusively on physicians and nurses rather than the full range of health care providers
- planning has been based on weak data and questionable assumptions
- our planning models have tended to view health human resources as a cost rather than an asset that must be managed effectively (i.e., decisions made to respond to immediate budget pressures are not always assessed for their long-term impact on recruitment and retention)
- there has been insufficient collaboration between the education system, which produces health care providers, and the health system that manages and employs them, so the number and mix of providers the education system produces each year are often influenced by academic priorities rather than population health or service delivery needs (e.g., number of students required to maintain budgets, teaching programs and support research; educational trend to increasing specialization)
- in most jurisdictions, planning has not included effective strategies to ensure the availability of appropriate health human resources.

The negative impact of past planning approaches has been exacerbated by the fact that, historically, each province and territory in Canada has worked independently to design its service system, develop service delivery models and plan HHR. This has resulted in competition between jurisdictions for limited health human resources.

Risks Associated with the Status Quo

The status quo approach to planning has the potential to create both financial and political risks, to limit each jurisdiction's ability to develop effective sustainable health delivery systems and the health human resources to support those systems, and to fall short of the Canadian public's expectation (as reported by both Romanow and Kirby) of a seamless system from province to province.

Utilization-Based Planning

If jurisdictions continue to plan based primarily on past utilization, they will continue to experience:

- lack of capacity to anticipate and respond to changing population and health system needs
- cycles of over and under supply (i.e., peaks and valleys) of physicians, nurses, and other health providers
- high turnover and attrition
- destabilization of the health workforce
- greater competition for limited resources.

Traditional approaches to recruitment into the health professions and curriculum design will not allow jurisdictions to deliver on their

commitment to improve the health status of Aboriginal peoples or to fulfill other health commitments, such as increasing home care.

Planning in Isolation

While each jurisdiction in Canada will continue to be responsible for planning and managing its health care system, it faces inherent risks if that planning is done in isolation, including:

- **Unintended impacts.** Decisions made by one jurisdiction can have unintended impacts on other jurisdictions. For example:
  - A change in one jurisdiction's health care system design could have a negative impact on the supply of certain providers for other jurisdictions. The risks are greater in the current reform environment where unilateral action by any one jurisdiction could undermine system stability and affect other jurisdictions' ability to deliver on health commitments (e.g., reducing wait times, improving the health status of Aboriginal peoples).
  - Not every jurisdiction has training programs in all health professions. If a jurisdiction that produces a significant proportion of a certain type of health provider for other parts of the country (e.g., medical perfusionists) reduces enrollment in that program, it may severely disadvantage other provinces.
  - If one province decides to increase the number of training positions for specialist physicians, it may draw students away from family medicine programs in other provinces, and exacerbate the current shortage of family physicians.
  - A decision to increase entry-to-practice requirements in one jurisdiction puts pressure on other provinces and territories to do the same. Changes to entry-to-practice requirements may have an impact on the quality and safety of health services, compensation, labour supply and distribution, the post-secondary education and health systems, and labour mobility – both within the jurisdiction where the change occurs and in other provinces and territories.
  - If one jurisdiction increases wages paid to health care providers, it may draw health care providers from other provinces and territories or trigger demands for higher wages that make it more difficult for other jurisdictions to manage health care costs.
  - Incentives offered by some jurisdictions can encourage inappropriate mobility, drawing providers from one under-serviced area to another.
- **Mismatch between supply and needs.** Insufficient collaborative planning between jurisdictions (and between the health system and the education system) contributes to the oversupply of some providers and undersupply of others.
- **Costly duplication.** All jurisdictions are investing resources in developing HHR data, forecasting/simulation models, and planning frameworks. Without collaboration, these efforts will result in unnecessary duplication as well as forecasting models that are unable to capture the impact of decisions in other jurisdictions.
- **Inability to respond effectively to international issues/pressure.** The international licensing and quality control issues created by both global competition for a limited number of providers and new technologies are often beyond the capacity of any one jurisdiction in Canada (e.g., digital teleradiology systems will give people in small, remote communities better access to MRIs and CT scans but there is a risk that the scans could be read by radiologists outside Canada who are not licensed to practice here). Canada may be at a disadvantage compared to other governments in presenting a united front on HHR issues if its jurisdictions are not collaborating on issues of international interest.

Where We Want to Be: Systems Based, Collaborative Planning

Jurisdictions across the country want to give all Canadians timely access to high quality, effective, patient-centered, safe health services. To do this, they need a collaborative approach that supports

their individual efforts to plan and design health systems based on population health needs, and identify the HHR required to work within their service delivery models. The appendix describes one example of a conceptual HHR planning model, which illustrates the range of factors governments must consider when designing their health systems and identifying their HHR requirements.

Given the relatively small number of health education programs across the country and the mobility of health human resources, jurisdictions across Canada are already highly interdependent in health human resources. It is in everyone's best interests to participate in a more collaborative approach to HHR planning.

Experience with HHR Collaborations to Date

Canada has already had some experience and success with collaborative HHR planning, including collaboration between different ministries at both the regional and pan-Canadian levels. For example:

- The Atlantic Provinces (Nova Scotia, Newfoundland & Labrador, Prince Edward Island, and New Brunswick) are working together to develop current and future HHR requirements for 30 major health occupations. Through the Atlantic Advisory Committee on Health Human Resources (AACHHR), Atlantic government departments responsible for health and post-secondary education are assessing the adequacy of health education and training programs in the region in relation to the demand. Each province has completed a labour market analysis to determine current and future supply and demand for major health occupations based on the current health care system of the four Atlantic Provinces. This work will provide an HHR simulation model that will allow the provinces to identify the possible impact of policy decisions on HHR requirements, gaps and major issues. These projects were supported by a financial contribution from Human Resources and Skills Development Canada (HRSDC). As a result of these initiatives, the provinces will have: supply and demand data, an inventory of both pre-service and continuing education and training programs, an environmental scan of education and training issues, and a scenario-based education and training program forecasting tool. Regional collaboration has enhanced the work that each province does individually, improved the region's ability to predict future health education and training needs, helped develop strategies to maintain a skilled, adaptable health workforce, provided opportunities for jurisdictions to share information, and strengthened the region's capacity to address labour market and health human resource issues.
- Since 2002, the ministries of health and post-secondary education in the Western Provinces (British Columbia, Alberta, Saskatchewan, and Manitoba) and the Northern Territories (Yukon, Northwest Territories and Nunavut [since 2005]) have been collaborating within the Western & Northern Health Human Resources Planning Forum. The Forum, which was initially established as an information sharing process, has been transformed into an active regional collaborative body. All members were acutely aware of the growing need for cross-jurisdictional work in HHR planning and met the challenge by establishing a Secretariat. The Forum has now undertaken 20 regional projects (each one involving a number of jurisdictional partners) with funding from Health Canada's HHR Strategy. All projects have committed to sharing the outcomes among the members, with some having pan-Canadian implications. Projects have included initiatives such as: developing a standardized approach to describing core competencies for licensed practical nurses (LPNs; developing best practices for clinical education; establishing a health science clinical placement network; developing an assessment process for international medical graduates; and holding a national meeting on physician compensation.
- Through the Canadian Task Force on Licensure of International Medical Graduates, the provinces, territories and federal government have developed a series of recommendations designed to create a "nationally integrated approach to

the assessment and training of international medical graduates" (IMGs) that maintains rigorous standards for licensure while giving all jurisdictions greater access to foreign-trained physicians. The recommendations – which include a standardized evaluation process, more supports and programs to train IMGs, and a national database to increase capacity to recruit and track IMGs) – have been approved by the Conference of Deputy Ministers and are now being implemented. The process was so successful that it is now being applied to the assessment, training and licensure of internationally educated nurses and allied health professionals, beginning with those professions with severe supply problems (i.e., pharmacists, medical laboratory technicians, medical radiation technology, occupational therapists, and physiotherapy).

- In October 2004, federal, provincial and territorial Ministers of Health announced the creation and implementation of a pan-Canadian process to manage proposals for changes in entry-to-practice credentials for medical and health professions. The aim is to determine whether proposed changes are based on sound evidence and serve the interests of patients and the health care system. The Coordinating Committee on Entry-to-Practice Credentials analyzes each proposed change and prepares a report for provincial and territorial governments summarizing its strengths and weaknesses as well as its impact on patients, quality and safety of health services, labour supply and distribution, the post-secondary education and health care systems, and labour mobility. (The province of Quebec is not participating in this initiative, but continues to collaborate by sharing information.)
- At the request of the Advisory Committees on Population Health and Health Security and Health Delivery and Human Resources, a subcommittee – with representatives from the federal and provincial governments, the public health delivery system, and academics – worked together to create a framework that sets out goals, key objectives, and proposed strategies for collaborative public health human resources planning. The framework is designed to help all jurisdictions develop a vibrant sustainable public health workforce. In June 2005, the Deputy Ministers of Health approved the framework in principle and asked the Pan-Canadian Public Health Network and the Public Health Agency of Canada to take the lead on pan-Canadian aspects of public health human resources planning, to refine the strategies, to determine priorities and required resources, and to address dissemination and implementation issues.

The Benefits of a Systems-based, Collaborative Approach to Planning

A more collaborative, pan-Canadian approach to certain aspects of planning would have immediate benefits, including:

- greater capacity to implement policies and priorities to improve both access to and quality of health care services at a cost Canadians can afford
- greater capacity to influence the factors that drive the health care system, determine health human resource needs, share best practices, and affect health status and system outcomes
- less costly duplication in planning activities, and better forecasting/simulation models
- improved information sharing to support compensation and related collective bargaining processes
- better understanding of the interjurisdictional and national picture of the workforce (through a common minimum data set) and greater capacity to address common HHR issues
- greater workforce stability in all Canadian jurisdictions, and more appropriate labour mobility
- health systems that are less vulnerable to global pressures, and better able to retain providers educated in Canada and compete in a global market for skilled health care workers.

3. The Challenges

Challenges in Applying the Framework

In moving to a more collaborative system design and needs-based approach to planning, Canada faces a number of challenges. All Canadian jurisdictions are limited in their ability to apply the proposed framework by the lack of:

- high quality, consistent data on all major health disciplines, and the lack of national data standards, including common definitions and a common approach to collecting data
- consistent information on HHR productivity, workload, utilization, demand and efficacy
- information about educational facilities and their capacity
- capacity to assess health needs, model delivery systems, and forecast the demand for health human resources
- capacity to analyze HHR data and translate it into useful knowledge
- funding for ongoing data and modeling initiatives.

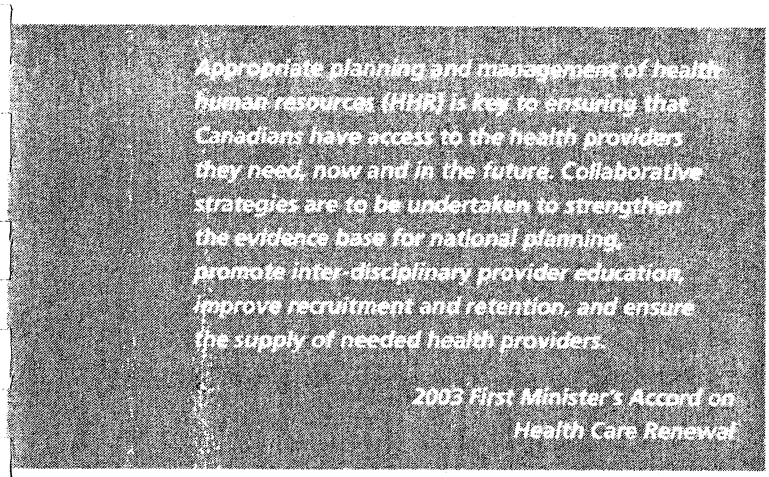
Challenges in Collaborative Planning

While there are advantages to taking a more collaborative approach to some aspects of planning, there are also challenges. For example:

- How can Canada enhance its capacity for collaborative HHR planning, while still ensuring that each jurisdiction has the flexibility to make its own system planning decisions?
- How will jurisdictions determine which activities are shared responsibilities and which are more appropriately pursued at the provincial, territorial, regional or federal levels?
- How can the system avoid creating another structure that might limit rather than enhance HHR planning capacity?
- How will collaborative HHR planning link with other provincial, territorial, regional and federal health human resource initiatives currently underway?
- How will collaborative pan-Canadian efforts involve other key players? The need for collaboration and coordination around HHR planning is not limited to governments. Others who share responsibility for shaping health system design and implementing service delivery models — including educators, public and private sector employers, providers, Aboriginal organizations, professional associations, patients, and the public — must also play a key role. Closer links among all players will ensure that the number, skills and mix of providers reflect the health needs of the population and the needs of the health system.

The Action Plan

According to a survey of jurisdictions across Canada, a collaborative HHR framework will be accepted and effective if it adds value to the planning provinces and territories are currently doing, and gives them access to data, tools, models, approaches and influence that they cannot achieve on their own.



The ACHDHR has developed an action plan designed to support collaborative pan-Canadian HHR planning. The plan sets out the principles for collaboration and identifies key actions jurisdictions can take together to: overcome barriers to implementing system-design, population needs-based planning; avoid the risks and duplication associated with the current jurisdiction-by-jurisdiction planning approach; and increase their HHR planning capacity — while respecting jurisdictional authority and regional planning initiatives.

The proposed action plan addresses the FMM 2003 Accord, and supports and builds on the FMM 2004 commitments – including the Aboriginal Health Human Resources Initiative – to "continue and accelerate their work on health human resources action plans and initiatives to ensure an adequate supply and appropriate mix of health care professionals", to "foster closer collaboration among health, post-secondary education and labour market sectors" and improve Aboriginal health and adopt measures to address the disparity in the health status of the Aboriginal population. Specifically it supports the federal, provincial, territorial governments' agreement to "increase the supply of health professionals, based on their assessment of the gaps" and, by December 31, 2005, to develop action plans (including targets for training, recruiting and retaining professionals).

Assumptions

The action plan to support collaborative pan-Canadian HHR planning is based on the following assumptions:

- As jurisdictions design their systems to meet population health needs, the types of professionals required and the way they are deployed may change. HHR planning must consider the design of each jurisdiction's health care system and its chosen service delivery models.
- Pan-Canadian collaboration will enhance each jurisdiction's capacity to plan the health workforce, to monitor trends, to anticipate future needs, and to achieve planning goals.
- Effective HHR planning requires timely accurate information. As the quality of data to support HHR planning improves, planning models may have to be refined or adjusted.
- Effective HHR planning requires better integration between the education system that prepares providers and the health system that employs and deploys them.
- The HHR sector – unlike other (market driven) workforces – will continue to be largely publicly funded and, therefore, will require a different (i.e., non-market driven) approach to forecasting both supply and demand.
- Strategic investment in health human resources planning, including recruitment, retention and healthy workplace initiatives, has the potential to significantly reduce costs associated with absenteeism, workers' compensation, and staff turnover.

- Effective HHR planning will ensure greater accountability for HHR decisions which, in turn, will lead to more appropriate, better quality of care (i.e., it will help ensure appropriate providers are providing appropriate care, and reduce or eliminate inappropriate services).
- Resource deployment and utilization remain the responsibility of the appropriate jurisdictions.

Principles

Effective coordinated and collaborative pan-Canadian health human resources planning will:

- enable each jurisdiction to design its health care system based on population health needs and identify the human resources required through a process that is patient-centred, culturally sensitive, evidence-based, and outcomes directed
- be responsive to health care renewal and changes in system design
- foster patient safety
- be culturally sensitive and responsive to health needs of Aboriginal people
- provide a flexible health workforce that has the knowledge, skills, and judgement (i.e., competencies) to work in quality driven, innovative, cost-effective, interdisciplinary service delivery models
- support the provision of safe and healthy workplaces
- actively engage educators, employers, funders, researchers and providers in the planning process
- respect jurisdictional differences and jurisdictional responsibility for service delivery, and reflect the shared responsibility to provide leadership within the health care system
- strive towards greater self-sufficiency in HHR.

Vision

Improved access to appropriate, effective, efficient, sustainable, responsive, results-based health care services for Canadians, and a more supportive satisfying work environment for health care providers through collaborative strategic provincial/ territorial/ federal health human resources planning.

Goals

1. To improve all jurisdictions' capacity to plan for the optimal number, mix, and distribution of health care providers based on system design, service delivery models, and population health needs.
2. To enhance all jurisdictions' capacity to work closely with employers and the education system to develop a health workforce that has the skills and competencies to provide safe high quality care, work in innovative environments, and respond to changing health care system and population health needs.
3. To enhance all jurisdictions' capacity to achieve the appropriate mix of health providers and deploy them in service delivery models that make full use of their skills.
4. To enhance all jurisdictions' capacity to build and maintain a sustainable workforce in healthy safe work environments.

The tables, beginning on page 14, set out the priority objectives to achieve these four goals, as well as short-term, medium-term, and long-term actions for each objective, and the expected outcomes.

Critical Success Factors

To apply the planning framework and implement the action plan, jurisdictions must continue to work together to:

- clarify and guide the planning agenda
- identify ongoing mutually beneficial opportunities for coordinated and collaborative action
- increase capacity for HHR planning, monitoring, analysis and strategic decision making by providing infrastructure support for data development, research and forecasting
- develop and encourage the consistent use of appropriate management and accountability mechanisms and implementation tools.

Actively pursuing a collaborative action plan will also help ensure that HHR planning is a strategic priority in all jurisdictions and is appropriately resourced, and that health system decisions with HHR implications made in one jurisdiction do not have unintended consequences for other jurisdictions.

The success of the framework and the action plan depends on the commitment of all involved to making the transition from the status quo to a more collaborative approach. The critical success factors to applying the framework and building that commitment are:

1. Appropriate stakeholder engagement

Future HHR planning will be driven by health system design and service delivery models which are based on population health needs. As providers work within new service delivery models, their jobs may change, and they may have to develop new skills and competencies. Because of the variety of factors that affect the health workforce, a wide range of stakeholders must be engaged.

Stakeholder engagement will evolve over time. Based on the significant progress already made in collaborative HHR planning at all levels, effective stakeholder engagement will involve consultation and timely communication, as well as incentives to support new ways of doing business.

2. Strong leadership and adequate resources

Effective change requires leaders. The system must identify leaders at all levels – within each jurisdiction, in the education system, among employers, among providers – who will work as a team to champion collaborative HHR planning and share the vision.

Effective collaborative HHR planning will also require government commitment and is dependent on First Ministers, Ministers and Deputy Ministers continuing to allocate resources to support the planning function, including inter-governmental and inter-jurisdictional (regional) planning.

3. Clear understanding of roles and responsibilities

HHR planning initiatives are occurring at many levels. Some issues are best managed at a local health care agency level, some at a provincial/territorial level, some through bi-lateral agreements between jurisdictions, some through regional collaboration and some through pan-Canadian collaboration. For collaborative pan-Canadian efforts to succeed, all those involved must have a clear understanding of their roles and responsibilities.

4. A focus on cross-jurisdictional issues

The focus of the pan-Canadian approach will be on cross-jurisdictional issues. Leaders will work to add value to existing jurisdictional planning, and to develop tools that will support and enhance each jurisdiction's or region's ability to develop HHR policy and plans.

Priorities will be established based on consultation with all jurisdictions, and will reflect common cross-jurisdictional issues. Key issues will be identified, and plans developed to address them.

5. *A change in system or organizational culture*

A more collaborative pan-Canadian approach to HHR planning will involve a change in culture. To make these changes, the system must understand the current cultural landscape (e.g., the attitudes and expectations of educators, employers and providers; traditional ways of working), the changes required, the changes already occurring, and the readiness to change.

As part of assessing the current culture, the stakeholders will focus on health care providers as a valuable asset, and take into account their needs and aspirations. Systems planning will include identifying issues that affect recruitment and retention, and making decisions that support healthy workplaces and increase job satisfaction.

6. *Flexibility*

A Pan-Canadian HHR Framework must be flexible and responsive to any jurisdiction's changes to its system design and the impact of those changes on HHR.

7. *Accountability*

Ongoing monitoring and reporting on progress will help ensure that the Action Plan is continually revised and updated to reflect changes in population health, health system, and HHR needs.

IV Objectives and Actions

The following tables list the objectives for each of the four goals, the actions to be taken to achieve the goals and objectives, the time-frame for initiating actions (i.e., within two years, within four years, after four years), and the potential outcomes. (Note: actions initiated in the short-term or medium-term are ongoing.)

The tables illustrate how a broad range of activities relate to one another and how they come together to form a strategic approach to collaborative HHR planning. Investments from the provinces, territories and the federal government will be required to implement all the proposed actions and achieve the desired outcomes. The amount of investment required will be specified in the more detailed work plans.

Goal 1: To improve all jurisdictions' capacity to plan for the optimal number, mix, and distribution of health care providers based on system design, service delivery models, and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
1.1 Improve capacity to assess population health needs, and demand for services, including Aboriginal health needs	Plans and tools that inform jurisdictions in preparing Dec/05 action plans An inventory of forecasting/ simulation tools and models	Need-based models for scenario planning that take into account various service delivery models Forecasting/simulation models to assess the impact of different service delivery models and project HHR requirements Indicators to monitor HHR demand	Ongoing development and enhancement of forecasting/ simulation models	Increased capacity to articulate future service delivery and HHR needs as a basis for planning

Goal 1: To improve all jurisdictions' capacity to plan for the optimal number, mix, and distribution of health care providers based on system design, service delivery models, and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
1.2 Support jurisdictions' capacity to: develop, implement and evaluate innovative service delivery models that meet population health needs; and share results across jurisdictions	An analysis of success factors that support appropriate use of HHR Cross-jurisdictional sharing of information about innovative models to manage/reduce wait times in the five priority areas (i.e., hip and knee replacement, cancer surgery, cardiac procedures, cataract surgery, diagnostic scans)	Updated success factors and an evaluation of how they are being integrated into the delivery system Increased uptake of interprofessional collaborative practice models Sharing of lessons learned from the Primary Health Care Transition Fund (PHCTF) collaborative practice models for system innovation	An expert analysis of the impact of a knowledgeable health care consumer, the increasing role of self-care, and the increasing demand for alternative care providers (e.g., midwives, naturopaths, chiropractors, traditional medicine) on HHR needs over the next decade Evaluation of the implementation and impact of innovative service delivery models (e.g., collaborative practice models, wait times models)	Enhanced interprofessional patient care management Better monitoring and evaluation of health reform initiatives (e.g., innovative service delivery models, changes in professional roles). More flexible health service delivery models that meet the changing needs of the population (i.e., aging population, increased incidence of chronic disease) Increased access to health care services resulting in reduced wait times in five priority areas (i.e. hip and knee replacement, cancer surgery, cardiac procedures, cataract surgery and diagnostic scans)
1.3 Develop a comparable approach to collecting HHR data	Minimum data set (including ethnicity of health professionals) to guide HHR data collection and standards for collecting comparable data on new professional groups Indicators to monitor the supply of health professionals produced by the education system	Changes in how data are collected in all jurisdictions Strategies to improve the timeliness of data Development of supply-based profession-specific databases for pharmacists, occupational therapists, physiotherapists, laboratory technologists, and radiation technologies	Unique identifier for all health professionals Development and implementation of additional selected supply data databases Effective ways to link databases	More consistent comparable HHR data Better information and key descriptors on HHR supply Increased capacity to plan for a range of health care providers Better understanding of workload, productivity and utilization

Goal 1: To improve all jurisdictions' capacity to plan for the optimal number, mix, and distribution of health care providers based on system design, service delivery models, and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
1.3 (cont'd)		New methodologies that can be used to capture information on workload, productivity and utilization		A 5-10 year data master plan to support HHR planning, forecasting, monitoring, and evaluation
1.4 Improve data on the Aboriginal health workforce, including developing the data to assess current participation rates and monitor progress	An assessment of current gaps in data on the Aboriginal workforce, and strategies to address them	An Aboriginal health workforce database for non-traditional workers		Increased capacity to plan and manage HHR to meet the needs of Aboriginal communities
1.5 Enhance collaboration and provide evidence on issues such as number, mix and distribution of health providers	Physician, Nursing and Pharmacy sector studies, and Health Executives situational analysis	Other possible agreed upon studies (e.g., cancer care) Opportunities to examine the number, mix, and distribution of health providers within the context of collaborative practice models A national forum to discuss and define self-sufficiency, and recommend a policy and goals for achieving self- sufficiency		Increased capacity for all jurisdictions to do evidence-based planning with mutual understanding and recognition of the roles of different partners including health providers, educators and employers Fewer profession specific and sector based studies
1.6 Enhance collaboration with the international community to address global HHR issues	Sharing knowledge about major HHR global issues and potential lines of action Collaboration with partners to meet needs for health providers and reduce pressure to recruit from under-resourced countries	Mechanisms to share and support best practices in HHR planning, training, and management such as voluntary networks of policy and technical expertise to support mutually agreed upon collaborative initiatives with international community Policy direction on ethical recruitment of health professionals from other countries	Continued international collaboration to address issues such as international migration, and to strengthen health systems	Greater awareness of global HHR issues Greater awareness of ethical issues and implications of recruiting IEHPs from countries with HHR shortages Increased capacity to address global health workforce issues Increased self sufficiency in HHR

Goal 1: To improve all jurisdictions' capacity to plan for the optimal number, mix, and distribution of health care providers based on system design, service delivery models, and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
1.7 Improve capacity to identify, track, and share HHR planning information that supports health system evolution and change	Opportunities for multistakeholder groups (i.e., regulators, educators, employers, unions, associations, funders) to engage in planning for the number, mix, knowledge, skills and attributes of future health providers Exploring mechanisms to identify, track and share HHR planning information Interjurisdictional collaboration to identify the role of HHR in reducing wait times in the five priority areas	Strategies and initiatives to share information on current and emerging HHR issues, as well as information on medium and longer-term HHR supply, demand and utilization An assessment of the need for more strategies, supports, and models for deploying HHR	Options for more coordinated ongoing mechanisms to acquire, transfer and/or exchange knowledge related to pan-Canadian HHR issues and health system design needs	Increased capacity for all jurisdictions to do evidence-based planning, taking into account current and emerging health system needs Greater knowledge transfer and awareness of pan-Canadian HHR issues

Goal 2: To enhance all jurisdictions' capacity to work closely with employers and the education system to develop a health workforce that has the skills and competencies to provide safe high-quality care, work in innovative environments, and respond to changing health care system and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
2.1 Improve our understanding of health education and training systems	Minimum dataset for education capacity and student demographics A report on the production capacity of education programs including education curricula, and an analysis of the extent to which current curricula align with health system needs and health policy (based on established indicators)	A database of education programs for all other professions (regulated and unregulated, publicly and privately funded) A strategy for career laddering in the health professions Collaboration on priority education needs	Identification of future capacity required within education programs (including faculty/physical infrastructure) to train the number and mix of health care providers to meet the health needs of Canadians	Better understanding of the current and future production capacity (i.e., number and mix) of education programs More opportunities for career development and increased retention

Goal 2 To enhance all jurisdictions' capacity to work closely with employers and the education system to develop a health workforce that has the skills and competencies to provide safe high-quality care, work in innovative environments, and respond to changing health care system and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
2.1 (cont'd)	A database of nursing education programs An inventory of training opportunities that support career laddering within and among health professions and disciplines			
2.2 Align education curricula with health system needs (urban and rural) and health policy	The active engagement of education institutions in planning for the number, mix, knowledge, skills, and attributes of future health providers/managers/leaders An analysis of the extent to which current education curricula align with current and future health system needs and health policy innovations, and prepare providers to work in both urban and rural settings Pilot projects in interprofessional education A consistent approach to responding to requests to increase entry-to-practice requirements, including principles and an evidence-based process to review and evaluate proposed changes	Proposed changes to education curricula to provide greater alignment with current and future health system needs and health policy Development of interprofessional curricula Identification of best practices and leaders in education reform Tools to increase access to clinical training and placements (e.g., simulation technology, best practices in recruiting preceptors and providing clinical placements, guidelines for preceptors, recognition programs for clinical instructors, clinical placements as a recruitment and retention tool)		An increase in the number of students enrolled in interprofessional education programs An increase in the number of providers prepared to work in collaborative interprofessional teams A flexible workforce with the skills to respond to health needs. An education system that supports continued competence (e.g. career-laddering, shifting) Changes in entry-to-practice requirements will not have a negative impact on costs or access to services Changes in entry-to-practice requirements will lead to better health outcomes

Goal 2 To enhance all jurisdictions' capacity to work closely with employers and the education system to develop a health workforce that has the skills and competencies to provide safe high-quality care, work in innovative environments, and respond to changing health care system and population health needs

Objectives	Actions			Outcomes
	Short-Term 1–2 years	Medium-Term 2–4 years	Long-Term 4+ years	
2.3 Develop targeted efforts to recruit Aboriginal people to health careers	A promotion campaign on health careers targeted to Aboriginal youth	Strategies and supports to increase the number of Aboriginal students in health education programs, such as expanding bridging programs that help Aboriginal students make the transition from high school to health professional training		An increase in the number of Aboriginal health professionals More care and more culturally sensitive services for Aboriginal people
2.4 Develop targeted efforts to develop a culturally and linguistically diverse workforce that can respond to population health needs		Strategies and supports to increase the number of students from official language minority communities in health education programs		An increase in the number of health professionals from official language minority communities More culturally sensitive health services for official language minority communities
2.5 Reduce the financial burden on health students	Assessment of new loan and loan repayment strategies for students in all health professions	Strategies to address the financial burden on students in health professional programs		An increase in high quality applicants for health education programs
2.6 Provide opportunities for health care providers to have access to life-long learning in their field of expertise	Active engagement of the education sector and employers to develop strategies to improve the accessibility of career development opportunities, re-entry programs, and continuing education	Strategies to support continued professional development within collaborative practice		Better trained health care providers, which will lead to better quality health services

Goal 3: To enhance all jurisdictions' capacity to achieve the appropriate mix of health providers and deploy them in service delivery models that make full use of their skills.

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
3.1 Make more effective use of all health professionals' competencies (i.e., knowledge, skills, judgement)	An examination of the potential role of new providers and provider assistants Strategies to ease HHR mobility and support the FPT strategic agenda	Strategies to address any legal, regulatory, professional, personal barriers to collaborative practice Change management approaches to promote interprofessional practice in the workplace (e.g., mentors, champions, models) Assessment of health professionals' unique and shared competencies to support interprofessional practice Models of effective interprofessional practice Standardization of unique and shared competencies to assist in prior learning assessments/mobility Recognition across the country of credentials accepted in any one jurisdiction	Evaluation of the impact of collaborative practice on patient outcomes, patient safety, and wait times Mechanisms to support inter-jurisdictional practice Mechanisms to enhance employers' and providers' understanding of the roles and abilities of all health providers and how they practice collaboratively	Increased ability to optimize the health workforce and make effective use of their knowledge, skills and judgement Increased ability of jurisdictions to optimize the health workforce Greater labour mobility Increased satisfaction of providers Greater efficiency in recruiting and retaining HHR
3.2 Develop more common approaches to addressing HHR compensation issues	Common principles for negotiating physician schedules and payments A cross-jurisdictional Health Labour Relations database	Evaluation of the continued relevance of the cross-jurisdictional Health Labour Relations database	Compensation models that support appropriate HHR supply, mix, and mobility	More appropriate HHR mobility A level playing field among jurisdictions

Goal 4. To enhance all jurisdictions' capacity to build and maintain a sustainable workforce in healthy safe work environments.

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
4.1 Accelerate and expand the assessment and integration of internationally educated health professionals (IEHPs)	Removal of barriers to the assessment, training and licensure of *international medical graduates (IMGs)* Consistent processes to assess, license and train IMGs A central website / portal where IMGs can access comprehensive information on assessment, training, licensure, and practice across Canada Development programs and supports for faculty teaching IMGs and internationally educated nurses (IENs) Assessment of the costs of prior learning assessments and training programs with recommendations on ways to reduce their impact on IEHPs	Removal of barriers to the assessment, training and licensure of *IENs* Consistent processes to assess, license and train IENs Orientation programs for IEHPs Assessment, remediation and bridging programs for a range of IEHPs An inventory of options for IEHPs who need additional training for licensure and certification A central website/portal where a range of IEHPs can access comprehensive information on assessment, training, licensure, and practice across Canada	Removal of barriers and better access to assessment, training and licensure for IEHPs, beginning with priority professions (i.e., pharmacy, physiotherapy, occupational therapy, medical laboratory technology, medical radiation technology) Consistent processes to assess, license, and train IEHPs in the priority professions Increased capacity in clinical settings to assess and train IEHPs in the priority professions Development programs and supports for faculty teaching IEHPs in the priority professions	IEHPs are aware of the route to practice for their given profession Teachers of IEHPs are trained and available to deliver programs IEHPs have increased access to assessment, remediation, and bridging programs IEHPs are oriented to working as a health professional in the Canadian health system An increased number of IEHPs practice in their profession of training An increase in qualified health care providers
4.2 Enhance attractiveness of careers in health care	A general marketing campaign promoting all health careers A framework for public health HR An action plan to enhance the attractiveness of family medicine, with recommendations for key stakeholders and jurisdictions	An inventory of best practices in career promotion Innovative strategies to enhance and promote careers in specific sectors, based on health system design and service delivery models		A more stable workforce An adequate supply and mix of public health professionals to meet population and community needs An increase in the number of post-graduate medical students who select family medicine as their first choice for residency programs

Goal 4: To enhance all jurisdictions' capacity to build and maintain a sustainable workforce in healthy safe work environments.

Objectives	Actions			Outcomes
	Short-Term 1–2 years	**Medium-Term 2–4 years**	**Long-Term 4+ years**	
4.2 (cont'd)				An appropriate supply of health providers Greater job satisfaction for health providers Greater retention of health providers Increased applications to and enrollments in health professions and careers to support health system design
4.3 Increase the capacity to address health and safety issues, and reduce work-related illnesses, injuries and absenteeism	Healthy workplace initiatives and best practices Jurisdictional collaboration with Worker's Compensation Board, employers, and unions to reduce work-related illnesses	Collaboration with Canadian Patient Safety Institute and employers to reduce patient risks. Mechanisms to ensure sharing and uptake of best practices to create healthy workplaces, taking into account the aging workforce	Evidence-informed strategies to address occupational issues Research on the relationship between workload, quality of patient care, and providers' health	Workplace health and safety improves Costs related to illness and disability drop Retention improves Patient safety improves
4.4 Increase capacity to retain health care providers	A summary of promising initiatives in retention from the implementation of each jurisdiction's HHR Action Plan	Sharing of recruitment and retention strategies – including strategies that target career-cycle issues and help retain experienced practitioners Sharing of innovative approaches to creating healthy workplaces	Strategies to encourage health care settings to make the creation and maintenance of healthy work environments part of their ongoing business planning	Retention improves More stable health workforce Greater capacity to deliver health services that meet population health needs Increased access to health care services resulting in reduced wait times

V. Conclusion

Health human resources planning occurs within a health system, and is driven by health system design and models of service delivery which, in turn, are based on population health needs.

Health human resources planning is an evolving science. All players will have to continually assess the impact of service design decisions on HHR, and make adjustments: trying different strategies, reflecting on their impact, and making corrections as required. In this way, all players will work together to maximize the potential benefits of collaboration, while minimizing any unintended consequences of a pan-Canadian approach.

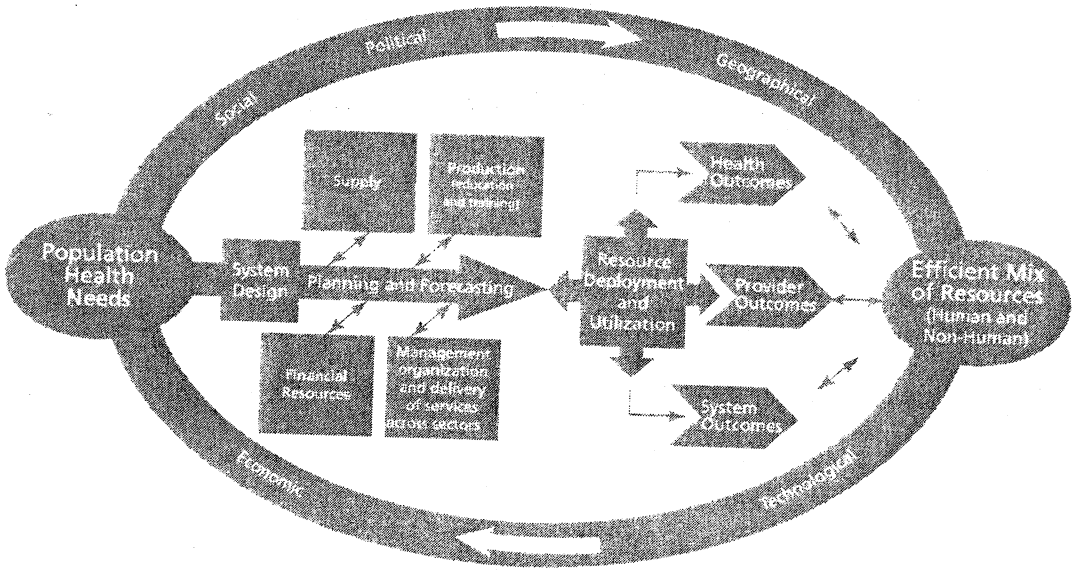
Jurisdictions and their health care systems must be clear about what they expect to achieve through collaborative HHR planning. Collaborative pan-Canadian HHR planning has the potential to help each jurisdiction develop and maintain a health workforce with the skills to support its service delivery system and give its citizens timely access to high quality, effective, patient-centered, safe health services. To ensure that pan-Canadian HHR planning achieves these outcomes, jurisdictions will establish realistic milestones and develop mechanisms to monitor progress.

Illustrative Example of a Conceptual Model for HHR Planning

by Gail Tomblin Murphy

Figure 1 illustrates a conceptual model for population needs-based, system design driven HHR planning. It was developed by O'Brien-Pallas, Tomblin Murphy, Birch, and Baumann (2005). [Fig. 1]. The model has been adapted from earlier work by O'Brien-Pallas, Tomblin Murphy, Birch, Baumann (2001) and O'Brien-Pallas and Baumann (1997), and has been constructed from Anderson's (1995) service utilization model, Donabedian's (1966) quality of care framework, Leatt and Schneck's conceptualization of technology in human services organizations (1981), and work of a Canadian think tank summarized by Kazanjian, Pulcins and Kerluke (1992). It is designed to include the essential elements of health human resource planning in a way that captures the dynamic interplay among a number of factors that have previously been conceptualized in isolation of one another (O'Brien-Pallas, 2002). It provides policy makers and planners with a guide to decision-making which takes account of current circumstances (e.g., supply of workers) as well as those factors which need to be accounted for in HHR planning (e.g., fiscal resources, changes in worker education and training). This conceptual model considers factors that, though important in the HHR planning process, may not have been considered in planning to date. These factors include social, political, geographic, economic, and technological factors. At the core is the recognition that health human resources must be matched as closely as possible to the health care needs of the population (O'Brien-Pallas 2002).

Figure 1: Health System and Health Human Resources Conceptual Model*



* O'Brien-Pallas, Tomblin Murphy, Birch, and Baumann (2001) adapted from O'Brien-Pallas and Baumann (1997)

When used to guide planning, a conceptual model like the one above can help policy makers and planners take into account the impact a range of dynamic variables on:

- current circumstances (e.g., supply of workers)
- the number and skills required which need to be accounted for in HHR planning (e.g., fiscal resources, changes in worker education and training)

- other factors important in the HHR planning process that may not have been considered in the past, such as social, political, geographic, economic, and technological factors.

Planners can use this type of model as the basis for simulations which, in turn, can provide needs-based estimates of the health human resources required to achieve health, provider and system outcomes.

Elements of the Conceptual Model

The description of the elements of the conceptual model is based on the work of O'Brien-Pallas (2002).

Population health care needs (Needs-Based Factors) reflect the multivariate characteristics of individuals in the population that create the demand for curative as well as preventative health services. Population health needs are influenced by several factors (Eyles, Birch, & Newbold, 1993) such as actual and perceived population health status, socio-economic status, demographics, and health behaviours. Health need is influenced by social, culture, political, contextual, geographical, environmental and financial factors. Population health needs are also influenced by the determinants of health including such things as: people's biological endowment and individual responses, the social and physical environment in which they live, the economic conditions (i.e., productivity and wealth) of their society, and the accessibility and quality of the health care system.

It is important for researchers and planners to have an accurate picture of the current and predicted health status of the population. As Figure 1 illustrates, population health needs are influenced by, and in turn influence, a number of other elements of the conceptual model (O'Brien-Pallas, 2002). The failure of utilization and supply driven approaches to HHR planning can be traced to the failure to adequately link planning to the health care needs of the population.

System Design. The design of health care services impact human resources requirements. The health system is designed to address the given level of need of the population. Governments (policy makers and funders) in partnerships with stakeholders determine the delivery models (e.g. primary health care and acute care facilities) to deliver services, and the associated level of services required. These planning activities are also shaped by inter-governmental agreements such as First Ministers commitments to improve patient safety, reduce wait times for medically necessary procedures, provide home care programs, and increase disease prevention initiatives.

Planning and Forecasting reflects the varieties of available HHR planning practices and models, their assumptions, methods, data requirements, and limitations. It relates to the *actual* methods used to predict human and other resource requirements. Predictions of health care provider requirements will vary according to the methods used to make those predictions. The choice of method will be determined by a number of factors including: traditional practices, data availability, political pressure and, most importantly, the question that is being asked. It is important that forecasting and planning activities be conducted continuously with regular data analysis and outcomes assessment.

Supply reflects the actual number, type, and geographic distribution of regulated and unregulated providers; it also recognizes that supply is fluid and is related to production as well as to factors such as recruitment and retention, licensing, regulation, and scope of practice. Supply is subject to alteration according to a number of labor market indicators such as: participation rates, provider-to-population ratios, demographic and educational characteristics of providers, employment status, and employment sector (International Labour Organization). Death, retirement, and emigration or immigration also affect the supply of providers. The geographic distribution of providers may vary according to general economic trends, work incentives, and life-style choices. Distribution of providers within health labor market segments may depend on production related factors, such as number of medical residency spaces available and the level of competition, availability of post-graduate nursing specialty training, and the technological sophistication and working conditions of competing market segments.

Supply also includes the type of service each provider is competent to provide. This is related both to production as well as to issues of standards and scope of practice, and governance (i.e., certification, licensure, regulation and local employer control) (O'Brien-Pallas, 2002).

Financial Resources provide an 'economic context' for HHR decisions and involve estimating the future size of the economy from which the particular health human resource and competing services will be funded. This allows planners to estimate the proportion of total resources that might be allocated to health care, and the share to be devoted to health human resources. Decisions about the allocation of resources to health care and other public programmes are likely based on, among other things, the level and distribution of needs in the population, and the role health human resources play in meeting those needs. It refers to the total portion of the Gross Domestic Product (public and private) that is allocated to health care (preventative and curative), health provider education, and health related research. Balance must be sought between human and physical capital. This involves determining the appropriate quantity, mix, and distribution of health services. Careful choices need to be made on the basis of the best available research and in the context of broader social choices as reflected in current fiscal realities. Financial resources must be directed to those initiatives and capital expenditures that are most likely to meet the health care needs of the population. The mix of financial resources for health must strike a balance between non-human resources (e.g., technology, drugs, hospital beds, etc.) and human resources (WHO, 2000; O'Brien-Pallas, 2002).

Production (education and training) involves the education and training of future health providers. Educational programs differ in the level of qualifications required and approaches to learning. The number of formal positions offered in any educational institution is influenced by financial resources and designated number of funded seats. The link between population health care needs and future capacity to meet those needs ought to be considered in setting production targets for seats in any health discipline (O'Brien-Pallas, 2002). This relationship has not been well explored to date.

Management, Organization and Delivery of Health Services contribute indirectly to outcomes (O'Brien-Pallas, 2002). They are key variables that influence how care is delivered (i.e. changing health care delivery models) across all sectors. Management and organizational characteristics (such as structural arrangements, the degree of formalization and centralization, environmental complexity, and culture) each influence the way work gets done, the amount and quality of care provided, provider health and satisfaction, costs associated with delivery of services, and outcomes (O'Brien-Pallas, 2002).

Resource Deployment and Utilization reflects the amount and nature of the resources deployed to provide health services to the population at large. Utilization reflects the nature and type of resources utilized by the population to meet health care needs. The efficiency and effectiveness of service delivery depends to a great extent on the efficient and effective deployment and use of personnel. Decisions made about the deployment and use of personnel across all sectors of the system influences access to services and utilization by the population and outcomes (O'Brien-Pallas, 2002).

Health Outcomes are classified into those focusing on individual health and the health of populations or communities. Many indicators of health status have been developed from both primary and secondary sources including population health surveys, vital statistics mortality data, cancer registry data, hospital discharge diagnoses, and the diagnoses submitted on claims from physicians visits. Examples of some of these indicators include: premature mortality rate (PMR; i.e., death before 75); life expectancy; standardized mortality rates; mortality from cancer, injury, and chronic diseases; disease incidence; medical conditions associated with poor functional status and poor-perceived health status; low birth weight; and prenatal care outcomes. These indicators capture various dimensions of community health ranging from mortality and morbidity from

cancer, injuries, and chronic diseases to disability among youth, medical conditions associated with functional limitations, and restricted activity days among the elderly (O'Brien-Pallas, 2002).

Provider Outcomes include factors such as: provider health status, retention rates, turnover rates, sick time, job satisfaction, and levels of burnout and other individual responses to work and the work environment (O'Brien-Pallas, 2002).

System Outcomes are the consequences in terms of costs (financial and other), benefits, and changes associated with the provision and use of health care resources. Measures include: hospitalization and readmission rates, home visits, expenditures on the various health sectors, the number of people treated in each health sector, the neediness of the population being serviced, case intensity, cost efficiency, discharge efficiency, proportion of acute versus non-acute care, outpatient and inpatient surgery rates, and bed occupancy rates (O'Brien-Pallas, 2002).

Contextual Features include the social, political, geographical, technological and economic context in which general resource allocations and specific HHR allocations are made. These factors influence HHR planning insofar as they represent social choices and limitations on that portion of social resources committed to health and health care. They also draw attention to the broad policy framework within which health and HHR policy must operate. HHR planning decisions are also influenced by the presence or absence of political will to incur the costs of promoting health care system reform among competing priorities. In this country, access to services, including human resources, and population health also depend on geographic considerations. The introduction of new technologies – together with the expectation such advances create – affect the production, supply and efficiency of providers. Economic factors contribute to both the health status of the population, and the degree to which health care needs can reasonably be met. The opportunity costs of providing greater levels of health human resources will always need to be weighed carefully against other social spending priorities. In addition to these contextual factors, planners need to consider the possibility of unanticipated "shocks to the system" which happen from time to time and may influence the health human resource process (e.g., sudden down or up swings in the economy, epidemic disease, catastrophic political or social upheaval) (O'Brien-Pallas, 2002).

Efficient Mix of Resources (Human and Non-human) is simply the number and type of resources that are required to achieve the best health, provider and system outcomes (O'Brien-Pallas, 2002).

The conceptual model provides the basis for health system simulations which, in turn, provide needs-based estimates of HHR requirements aimed at optimizing the range of outcomes of interest. The model is informed by research at the micro, meso, and macro level. This is necessary in order to capture the complexity of the relationship among elements of the health human resource process (O'Brien-Pallas, 2002).

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