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## Advancing Primary Care Use of Electronic Medical Records in Canada

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### A Provincial/Territorial Health Reform Analysis

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## Abstract

In 2010, the federal government's *Economic Action Plan* funded Canada Health Infoway to co-invest with provinces, territories, and health care providers in electronic medical records (EMRs) in primary care. The goal is to help improve access to care, quality of health services, and productivity of the health system, as well as to deliver economic benefits. The decision to fund EMRs was consistent with a long-term framework for digital health established in consultation with stakeholders across the country, spurred by analysis demonstrating the economic impact of such investments and data on Canada's low rate of EMR use in primary care compared with other countries. The decision reflected widespread public and stakeholder consensus regarding the importance of such investments. EMR adoption has more than doubled since 2006, with evaluations identifying efficiency and patient care benefits (e.g., reduced time managing laboratory test results and fewer adverse drug events) in community-based practices. These benefits are expected to rise further as EMR adoption continues to grow and practices gain more experience with their use.

*En 2010, le Plan d'Action Economique du gouvernement fédéral a doté financièrement Inforoute Santé du Canada pour aider les provinces, les territoires et les producteurs de soins à investir dans l'utilisation des dossiers médicaux électroniques (DME) en soins primaires. L'objectif est d'améliorer l'accès aux soins, la qualité des services délivrés et la productivité d'ensemble du système de soins, ainsi que de soutenir l'économie. Cette décision de financer les DME découle logiquement d'un engagement de long terme en faveur de la santé digitale, établi après consultations des principaux acteurs à travers le pays, et motivé par une analyse établissant l'impact économique de tels investissements ainsi que des données sur le faible taux d'utilisation des DME en soins primaire relativement à d'autres pays. La décision reflète un consensus partagé parmi les acteurs et le public sur le fait que de tels investissements sont importants. Le taux d'adoption des DME a plus que doublé depuis 2006 et les exercices d'évaluations pointent des gains d'efficience ou pour les patients (par exemple, les délais de retour des examens de laboratoire pourraient être réduits, ainsi que la fréquence des événements iatrogènes médicamenteux) en médecine de famille. Ces gains devraient croître avec l'augmentation de l'adoption des DME, à mesure que les praticiens deviennent plus expérimentés dans leur utilisation.*

### Key Messages

- Federal investment in electronic medical records in 2010 was supported by strong policy and stakeholder consensus.
- Almost two-thirds of Canada's primary care physicians (64%) now use electronic medical records, up from 23% in 2006.
- Use of electronic medical records in community-based practices in Canada yielded efficiency and patient care benefits.

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- *L'investissement fédéral dans les dossier médicaux électroniques décidé en 2010 a reçu un large soutien politique et des acteurs du système de soins.*
  - *Presque deux médecins de soins primaires (64%) utilisent des dossiers médicaux électroniques aujourd'hui, contre 23% en 2006.*
  - *L'utilisation des dossiers médicaux électroniques en médecine de famille au Canada a généré des gains d'efficacité et de qualité pour les patients.*

## 1 BRIEF DESCRIPTION OF THE REFORM

Evolving Canada's health systems to meet current and future needs has been an enduring policy goal, and effective use of digital health is often cited as a key enabler to health system reform. Electronic medical records (EMRs) are an important part of the broader vision for digital health. Physicians and other health care providers use EMRs within a specific practice or organization to maintain electronic records on their own patients, including demographics, health and drug history, and diagnostic information such as laboratory results and findings from diagnostic imaging. EMRs are often integrated with tools that manage billing, scheduling, or other activities.

In 2010, the federal government's *Economic Action Plan* funded Canada Health Infoway to increase the number of community-based clinicians adopting and using EMR systems. Investments, undertaken in collaboration with provinces, territories, and health care providers, are directed at:

- Supporting jurisdictions and community-based clinicians to implement, adopt and use EMRs in physician and nurse practitioner offices, primary care centres and out-patient clinics;
- Upgrading and connecting EMRs so they are interoperable with the jurisdiction's electronic health record (EHR) system, which is a longitudinal record of a person's care available across settings;
- Helping clinicians achieve increased clinical value through the advanced use of EMRs, such as accessing more complete medication profiles, lab results history, immunization reports and hospital discharge summaries. (Canada Health Infoway 2014)

The objective of this paper is to present an analysis of this reform, from its history and context to the latest evaluation results.

## 2 HISTORY AND CONTEXT

Pan-Canadian discussions about how best to leverage digital solutions in the health sector stretch back several decades (Health Canada 2012). In the late 1990s, the Advisory Council on Health Infostructure recommended setting up a nation-wide 'information highway'. This recommendation was a key driver in the creation of Canada Health Infoway in 2001, a not-for-profit corporation whose members are the country's 14 Deputy Ministers of Health. Similarly, consensus on the value of electronic health records was reflected in the 2003 First Ministers' Accord on Health Care Renewal (Health Canada 2006).

Broad consultations led to agreement on an Electronic Health Record Solution Blueprint, a technology framework that provides a shared vision and direction for appropriate sharing of clinically-relevant health information (Canada Health Infoway 2006). It describes how point-of-service applications, such as EMRs, can connect to a shared infostructure using agreed standards. While initial government investments focused primarily on the development of this shared infostructure, readiness to support point-of-service systems for

community-based practices grew over time. Alberta began enrolling physicians in provincial EMR support programs in 2003, followed by Ontario and Nova Scotia in 2005 and British Columbia in 2008. Most other provinces have initiated EMR programs more recently.

### **3 GOALS OF THE REFORM**

According to budget documents, the federal government's goals were to "to speed up the implementation of electronic medical record systems for physicians and integrated points of service for hospitals, pharmacies, community care facilities and patients" in order to "enhance the safety, quality and efficiency of the health care system, and create thousands of sustainable, knowledge-based jobs throughout Canada" (Government of Canada 2009; 2010). The investments thus reinforced pan-Canadian policy directions, such as primary health care reform, improved management of chronic disease, a focus on quality and safety, and a need to ensure long-term sustainability of the health system.

### **4 FACTORS THAT INFLUENCED HOW AND WHY**

During the 2000s, a pan-Canadian policy focus on primary health care reform was simultaneously reinforcing the need for EMR adoption (e.g., because EMRs make chronic disease management and inter-professional practice much easier) and fostering an environment more fertile for their use (e.g., by encouraging groups of clinicians to work together). At the same time, studies conducted by the Commonwealth Fund and by academics (e.g., Protti 2007) showed that Canada was falling behind global leaders in the adoption of EMRs in primary care.

A wide-ranging consensus on the need and readiness for government investment in EMRs emerged. For example, the Standing Senate Committee on Social Affairs, Science, and Technology (2002) noted that six different provincial reports on primary health care between 1999 and 2002 stressed the need for electronic records. Likewise, the Commission on the Future of Health Care in Canada said that "primary health care should be a major focus for actions designed to implement electronic health records" (2002).

Stakeholders outside of government were also supportive. For instance, in 2008, the Canadian Medical Association noted that EMRs would lead to "significant improvements in data comprehensiveness, clinical relevance and quality—and this, in turn, will lead to improved clinical decision support, core data sets and health statistics that meet the primary goal of enhancing health care delivery, treatment and outcomes" (Canadian Medical Association 2008). A Conference Board of Canada analysis also noted the ability of capital investment through Infoway to create jobs, contribute to gross domestic product, and reap other economic benefits (2007). This analysis was important in coupling the concept of investment in EMRs with the government's focus on jobs and growth in the Economic Action Plan.

Federal investment in EMRs through Canada Health Infoway, an existing mechanism for pan-Canadian cooperation in the area of digital health, was first announced in Budget 2009. Confirmation of the funding was, however, delayed by a year as questions regarding e-health initiatives in several parts of the country prompted further review. Concurrent audits were undertaken by the Auditor General of Canada and six provincial audit offices. The federal audit concluded that “Infoway has accomplished much in the eight years since its creation” and that “it established appropriate governance mechanisms” (Auditor General of Canada 2009). Their report reinforced the perception of a need for wider adoption of EMRs and confirmed that the chosen mechanism for investment was appropriate.

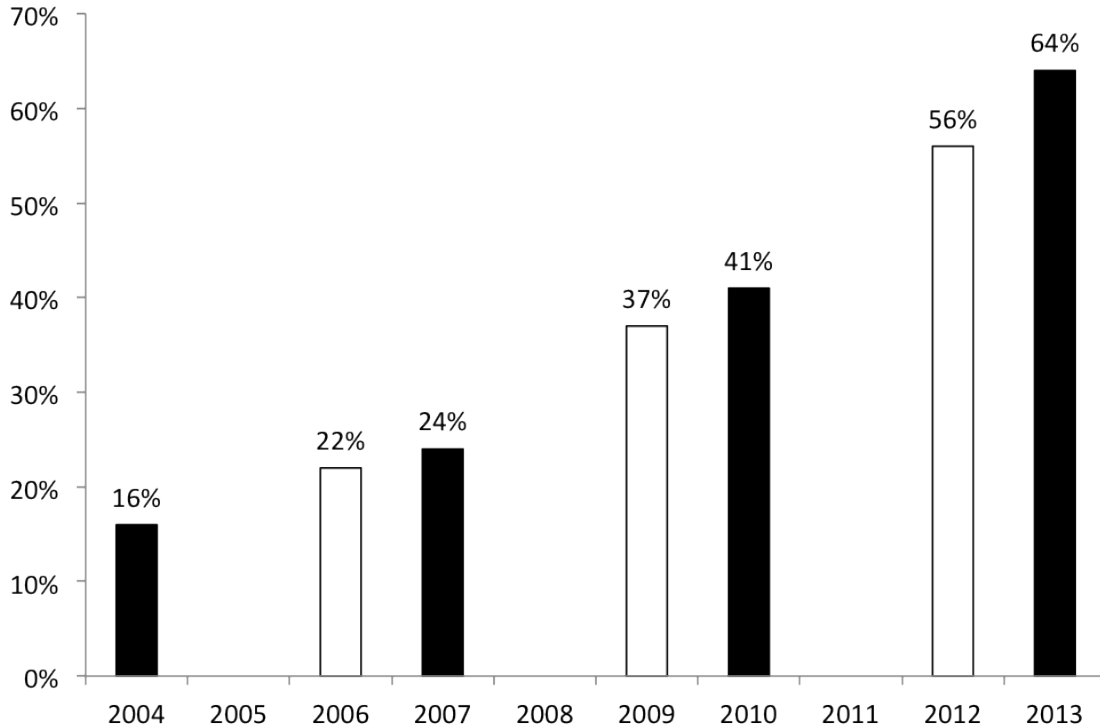
## 5 HOW THE REFORM WAS ACHIEVED

Once funding was confirmed following Budget 2010, Infoway established a program to support jurisdictions, clinicians and vendors in accelerating the implementation and use of EMRs and their connection to jurisdictional electronic health record (EHR) infrastructures. This included:

- Start-up funding for jurisdictions that did not have EMR programs in place;
- Co-investment based on a 50/50 funding ratio between Infoway and jurisdictions to accelerate the implementation and use of EMRs with over 15,000 physicians and nurse practitioners in community-based settings, enrolled as of the end of 2013. Funding is ‘gated’ with payment dependent on achievement of initial adoption and Clinical Value milestones (e.g., use for a range of basic and advanced clinical functions, certification, and interoperability);
- Support for clinicians through investment with partners such as peer support networks, educational and change management resources, and preparing students to practice in technology-enabled environments;
- Upgrading EMR products to meet jurisdictional and national interoperability specifications (e.g., to connect to provincial repositories of lab or prescription drug information) and to enhance functionality (e.g., e-prescribing);
- Certification of EMR solutions against agreed privacy, security, and interoperability criteria;
- Support for appropriate health system use of information from EMRs and other clinical systems for clinical, health system management, population health and research purposes;
- Adoption monitoring and benefits evaluation; and
- Development of an EMR Forum for cross-jurisdictional knowledge exchange.

## 6 EVALUATION

Use of EMRs in primary care rose from 23% in 2006 to 64% in 2013 (see Figure 1). Establishment of EMR support programs appears to have been a successful strategy for accelerating adoption. Those jurisdictions with programs before 2011 had adoption of at least 72% in 2013; those who launched in 2012 or had not yet launched had rates of 35% or lower (National Physician Survey 2013).



SOURCES: The National Physician Surveys are periodic surveys sent to every medical student, resident and licensed physician in Canada by a partnership that includes the College of Family Physicians of Canada, the Canadian Medical Association and the Royal College of Physicians and Surgeons of Canada. The graph shows general practitioner and family physician responses to a question regarding whether they “use electronic patient health records” (2004) or “use electronic records to enter and retrieve clinical patient notes” (2007, 2010, 2013). Data only include physicians currently providing care. The Commonwealth Fund International Health Policy Surveys of primary care physicians are conducted every three years. The graph above shows Canadian physicians’ response to the question, “Do you use electronic patient medical records in your practice (not including billing systems)?”

Figure 1: Primary Care Physician Use of Electronic Medical Records in Canada

The outcomes of EMR investments on access, quality, and productivity (e.g., efficiency gains or cost savings) have been evaluated in a variety of ways in Canada and internationally. For example, a systematic review by Bassi and Lau (2013) reflects a range of published work on economic evaluation.

To understand through the literature and project evaluations how EMR use is influencing the health system, Canada Health Infoway commissioned independent investigators to conduct a quantitative study of the effects of EMRs (pwc 2013). This study followed an established analysis and modelling process, starting with hypotheses regarding their influence (including the use of various functions that may be enabled by EMRs) on productivity, access, and quality of care and a comprehensive literature review. An economic model was developed to estimate the value of benefits achieved at a pan-Canadian level for hypotheses where sufficient evidence was available. While there are limitations in the precision possible from models of this type, an understanding of trends and the order of magnitude of effects informs policy discussions and implementation decisions.

The authors drew on academic/grey literature; EMR adoption and maturity of use data from the Commonwealth Fund Survey of Primary Care Physicians and the National Physician Survey; and Canadian cost and other data. Where available evaluation/economic data were insufficient for modelling, researchers assessed effects from a qualitative perspective or using survey data. A panel of clinical, policy, and academic experts acted as advisors and participated in a formal review process to validate the findings.

Overall, the authors tracked efficiency and patient care benefits related to the use of EMRs by community-based practices valued at \$1.3 billion between 2006 and 2012 (pwc 2013). They identified four main areas of benefit, of which the first two had sufficiently strong and comprehensive quantitative evidence to be included in the modelling process:

- Community-based practices experience efficiencies in workflow as staff time is redeployed;
- EMR use results in health system level benefits, such as reduced numbers of duplicate tests and adverse drug events;
- Advanced use of EMRs can improve health outcomes and patient safety through preventive care and chronic disease management; and
- EMR use supports improved interactions and communications among care team members and between providers and patients (pwc 2013).

The authors also noted that benefits, in both clinical and productivity terms, are expected to rise as EMR adoption continues to grow and practices gain more experience with their use. While the current state of EMR adoption enables important early benefits, there is a mixed level of implementation progress and use of more advanced functions. In this regard, the authors noted emerging evidence that supports the utility of associated investments in clinical engagement, change management, and interoperability improvements. Activities such as clinical peer networks, implementation support, and adoption models were identified as effective, complemented by Clinical Value milestones that tie funds under Infoway's investment program to measurable adoption benchmarks at the practice level.



Likewise, the recent National Physicians Survey (2013) found that two out of three family physicians who use EMRs felt that the use of electronic health records facilitates better quality of care and almost half reported increased productivity. The findings also suggest that both quality and productivity increase substantially over time as practices gain experience with EMR use, including their more advanced capabilities.

## 7 SWOT ANALYSIS AT TIME OF POLICY DECISION

Table 1: SWOT Analysis

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Potential to benefit individual Canadians, clinicians, and the health system</li> <li>• Enables and is complementary to health policy directions and to federal policy focus on jobs and growth</li> <li>• Broad public and stakeholder consensus on importance of investments in this area</li> </ul>	<ul style="list-style-type: none"> <li>• Canada lagged behind global leaders in EMR adoption in primary care</li> <li>• Varying levels of readiness for, and use of, EMRs across the country</li> <li>• Mixed interoperability between then-current EMR products and shared electronic health record assets</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Build on agreed digital health architecture and successful examples of provincial EMR support programs to accelerate EMR use across Canada</li> <li>• Leverage proven mechanisms for federal, provincial, and territorial cooperation with regards to investment in digital health</li> <li>• Incent EMR interoperability and use of more advanced EMR functions to increase clinical value</li> </ul>	<ul style="list-style-type: none"> <li>• Public questions about management and effectiveness of e-health initiatives in several parts of the country</li> <li>• Competing priorities for investment and focus as part of health care reform efforts</li> </ul>

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## 9 FOR MORE DETAIL

### 9.1 Government documents

Budget 2009: <http://www.budget.gc.ca/2009/pdf/budget-planbugetaire-eng.pdf>

Budget 2010: <http://www.budget.gc.ca/2010/pdf/budget-planbudgetaire-eng.pdf>

### 9.2 Links to Provincial/Territorial EMR initiatives

EMR programs: <https://www.infoway-inforoute.ca/index.php/programs-services/investment-programs/emr-and-integration/regional-emr-programs>

Clinical peer support networks: <https://www.infoway-inforoute.ca/index.php/communities/pan-canadian-clinician-peer-network/jurisdictional-peer-to-peer-networks>