

Electronic Health Records

in Canada

**AN OVERVIEW
OF FEDERAL AND
PROVINCIAL AUDIT REPORTS**

APRIL 2010



PARTICIPATING LEGISLATIVE AUDIT OFFICES

Alberta • British Columbia • Nova Scotia • Ontario • Prince Edward Island • Saskatchewan • Canada

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Electronic Health Records in Canada

AN OVERVIEW OF FEDERAL AND PROVINCIAL AUDIT REPORTS

In brief

Implementing electronic health records in Canada is a pan-Canadian initiative that requires the collaboration of stakeholders, including the federal government, Canada Health Infoway Inc., and the provincial and territorial governments, as well as other organizations involved in the delivery of health care. Every audited jurisdiction has at least one core electronic health record (EHR) system in place, and some provinces have almost finished implementing their EHR systems. Given the significant challenges of this undertaking and the substantial potential benefits of EHRs, stakeholders need to work together to comprehensively report to legislatures and Canadians on progress made and benefits achieved.

Introduction

Electronic health records (EHRs) are secure and private lifetime records that describe a person's health history and care. They are made up of information from a variety of sources, including hospitals, clinics, doctors, pharmacies, and laboratories. This information is critical for treatment and is accessible to health care professionals.

Implementing EHRs is a pan-Canadian initiative that requires the collaboration of the federal government, Canada Health Infoway Inc. (Infoway), provincial and territorial governments, as well as other organizations involved in the delivery of health care.

The Auditor General of Canada and the auditors general/provincial auditor of six provinces (Alberta, British Columbia, Nova Scotia, Ontario, Prince Edward Island, and Saskatchewan) conducted concurrent performance audits of the development and implementation of EHRs in their respective jurisdictions. A committee, composed of representatives from each of the participating legislative audit offices, developed common objectives and criteria for the EHR audits. The findings summarized in this overview report apply only to the named jurisdictions.

The Auditor General of Canada focused on Infoway and Health Canada. The provincial auditors general/provincial auditor concentrated on the ministries of Health and other organizations responsible for developing and implementing EHRs within their jurisdiction. While each office determined the scope of its own audit, all agreed to examine planning, implementation, and public reporting of results. Some audit offices undertook audits with broader scopes that included, for example, privacy and security, and administrative issues. In addition, some provincial audits included projects funded entirely by the provincial ministries of Health, as well as projects funded by Infoway.

Over the past year, the federal and participating provincial audit offices each tabled a report in their legislature (see the Appendix for a list of individual audit offices and websites where their audit reports can be found). The audit reports discussed in this overview were issued to the respective legislatures between October 2009 and April 2010. This overview report does not reflect any progress that may have been made to address the audit findings and recommendations.

Context

A fully functional electronic health record (EHR) will allow health care professionals to view and update a patient's health record. Ideally, to support the provision of high-quality care, an individual's EHR will be available to their authorized health care professionals anywhere and anytime (Exhibit 1).


Core components of an EHR include the following:

- Client registry—a list of all patients and their relevant personal information
- Provider registry—a list of participating health care professionals who are authorized to use the system
- Diagnostic imaging system—electronically collects, stores, manages, distributes, and displays a patient's images and reports, such as x-rays, ultrasounds, MRIs (magnetic resonance imaging) and CT (computed tomography) scans
- Drug information system—allows health care professionals to access, manage, share, and safeguard a patient's medication history

- Laboratory information system—no matter where a patient is tested, allows laboratory technicians to enter results into a database that will be linked to the patient’s EHR and will be available for viewing
- Interoperable EHR—allows authorized health care professionals to view and, in some cases, update a patient’s essential health information

EHRs are intended to solve a number of persistent problems in Canada’s health system, some of which may be caused by the use of paper health records. In particular, electronic records are more likely to be legible and available when needed, and can be retrieved more easily and quickly. Potential benefits for patients include improved health care and decreased risks (such as adverse drug reactions or duplicate, invasive, or expensive tests). Health care professionals should be able to make better decisions, thanks to up-to-date, comprehensive patient information. Overall, EHRs are expected to reduce costs and improve quality of care.

Exhibit 1: An example of what an EHR might look like

<ul style="list-style-type: none"> • Help • Logout 	Patient Details  <p>GME0000 Smith, Caroline</p> <p>Sex: Female DOB: 1940/01/01 Next of kin: John Smith</p> <p>Phone: 365-565-9090 Address: 19 Provincial Rd. Edmonton AB T6M 1R7</p>		GP Details Name: Jones, Evans Phone: 333-465-5545 Address: 11 Terrence Ave., Edmonton, AB T4Y 8U9																																																																																							
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Source: Adapted from a Canada Health Infoway Inc. illustration.

Note: The individual is fictional.

Shared responsibility

Each of the stakeholders in this initiative has an important role to play.

Canada Health Infoway Inc. (Infoway). Created in 2001 as a not-for-profit corporation that operates at arm's length from governments, Infoway describes its role as that of a “strategic investor” that makes focused investments to foster and accelerate the development of electronic health records across the country. It works with the provinces and territories, which are responsible for delivering health care, to set a national direction, and it helps to ensure that provincial and territorial strategies are aligned with national priorities.

Infoway funds projects with the provinces and territories on a first-come, first-served basis, paying up to 75 percent of the eligible costs of the approved projects. It also participates in project planning and monitors the implementation of projects by the provinces and territories as well as the quality of deliverables.

Although each province and territory will have an EHR system adapted to its needs, it is important that provincial and territorial systems are based on an agreed set of principles and characteristics. To this end, Infoway—in consultation with the provinces, territories, and other stakeholders—identified the key requirements and core components of an EHR and developed the Electronic Health Record Solution Blueprint to guide the national development of EHRs. Released in 2003, the Blueprint is a technology framework for sharing health information securely and appropriately across Canada. It was revised in 2006 and now includes more detail on how standards support the sharing of health information. It also includes more on how they comply with federal, provincial, and territorial requirements as well as privacy and security requirements across jurisdictions. Infoway believes that provincial and territorial alignment with the Electronic Health Record Solution Blueprint and compliance with standards are essential to achieving EHRs that are compatible across the country.

Provinces and territories. The provinces and territories are responsible for developing their own EHR strategies and for proposing projects to Infoway that align with the Electronic Health Record Solution Blueprint, the standards, and the eligibility criteria. They are responsible for implementing the projects, and for the cost of operating and maintaining EHR systems. Because the total amount of funding that Infoway will provide for a project is capped when the project is approved, the provinces and territories assume all the risk of cost overruns.

Provinces and territories also provide funds to regional health authorities and hospitals to cover other EHR initiatives. They are responsible for ensuring that the implemented EHR systems comply with their own privacy laws. Finally, provinces and territories are responsible for helping doctors, nurses, pharmacists, and other health care professionals understand and use EHRs.

Funding for electronic health records

Since Infoway was created in 2001, the federal government has granted the corporation \$1.6 billion. By 31 March 2009, Infoway had spent about \$615 million on the electronic health record (EHR) initiative and had committed about \$614 million—for an approximate total of \$1.2 billion. Exhibit 2 illustrates where the expenditures and commitments were made. The remaining \$400 million was allocated to related priorities.

Exhibit 2: Infoway’s expenditures and commitments to electronic health records— as of 31 March 2009

Jurisdiction	Expenditures (\$ millions)	Commitments (\$ millions)	Total (\$ millions)
Alberta	87	36	123
British Columbia	84	79	163
Manitoba	21	32	53
New Brunswick	18	20	38
Newfoundland and Labrador	37	28	65
Northwest Territories	6	6	12
Nova Scotia	26	20	46
Nunavut	2	5	7
Ontario	132	171	303
Prince Edward Island	11	0	11
Quebec	107	188	295
Saskatchewan	42	25	67
Yukon	1	1	2
Pan-Canadian	41	3	44
Total	615	614	1,229

Source: Canada Health Infoway

Note: Figures have been rounded to the nearest million and include payments made to cover the eligible costs of the projects, taxes and the allocation of Infoway’s management costs.

For most provinces, the EHR initiative is just one part of an overall electronic health strategy. Provinces also fund other components of their electronic health strategies, for example, computerizing primary care doctors' offices and hospital systems and developing systems that focus on child health or chronic disease management, such as diabetes. Although Infoway's costs are known, all provinces have not consistently tracked their total costs. Therefore, the total costs to date of the EHR initiative are unknown. Some experts have estimated the total cost of implementing EHRs Canada-wide at over \$10 billion and the total annual benefits at \$6 billion.

Reported audit findings

Each province's approach to electronic health records is unique. Their definitions of electronic health strategies, priorities, timelines, and approaches are distinctive. Nevertheless, the audit reports had some themes in common, as described in the following sections.

Planning for electronic health records

An undertaking as large, complex, and costly as developing and implementing a compatible electronic health record (EHR) system across Canada requires the collaboration of all parties and requires that strategic and operational plans be made to guide and coordinate their activities. It represents a significant challenge for the provinces and the territories.

Infoway, in collaboration with the provinces and territories, has accomplished much in the eight years since its creation. As previously mentioned, Infoway—in consultation with the provinces, territories, and other stakeholders—identified the key requirements and core components of an EHR and developed the Electronic Health Record Solution Blueprint to guide the national development of EHRs. Infoway's strategic plans identify priorities, along with measurable goals and targets, and provide a roadmap for the development of the various component systems of an EHR.

The provinces and territories needed to go beyond the Blueprint, which represents the pan-Canadian architecture for EHRs, and develop their own EHR strategies. The following are some of the key findings at the provincial level:

- Alberta had a current and comprehensive strategic plan for EHR systems.

- British Columbia had a strategic plan at the start of the initiative, but it was not comprehensive. It now has a new strategic plan.
- Prince Edward Island’s EHR strategic plan was not updated to reflect the completion of the EHR to Infoway standards.
- Nova Scotia, Ontario, and Saskatchewan started their EHR initiatives without having a comprehensive strategic plan.
- Ontario only finalized its strategic plan in 2009, after nearly a decade of effort toward creating an EHR.
- Saskatchewan recently created a governance body to provide strategic advice on the implementation of EHRs. It is in the process of developing an EHR strategic plan.
- No province had plans for individual projects that adequately linked to strategic plans. British Columbia has recently made progress in addressing this issue.

A complete EHR requires the development or upgrading of a number of systems. When there is no EHR strategic plan at the provincial level or when links between plans are weak, it is unclear when component systems will be developed or upgraded; it is also unclear which systems will need to be upgraded. Furthermore, there is a risk that the projects undertaken will not be consistent with the goals and priorities of the overall EHR initiative and that the needs of the users will not be met.

Implementing electronic health records

When implementing electronic health records (EHRs), it is important to ensure that they are compatible, so that no matter where an individual seeks medical attention, the information will be accessible to health care professionals.

At the federal level, the audit reported that Infoway was exercising due regard in managing funds from the federal government to achieve its goal related to the implementation of EHRs across Canada. As a strategic investor, Infoway approves each project based on the project’s potential for success and commitment to satisfying requirements, such as aligning with the Blueprint and complying with standards. It funds projects using a gated funding model that ties reimbursement to the achievement of project milestones. The federal audit found that Infoway has established and consistently applied an approval process that assessed proposed projects against requirements for EHRs, including the key requirement that they be compatible nationwide. Infoway has also established legal agreements for each project with the provinces and territories, to obtain greater assurance that the requirements will be respected.

To ensure that projects have satisfied these requirements, it is important that systems be tested. However, Infoway does not obtain from the provinces and territories the results of conformance testing on EHR systems, to ensure that standards have been correctly implemented. Consequently, Infoway does not have sufficient assurance that EHR systems will be compatible across the country. Infoway has a planned approach to ensure compatibility of systems across Canada in those instances where there are variances in the conformance with standards.

It appears that the focus for the provinces is to ensure compatibility within their jurisdictions. This approach is based on the fact that the majority of people seek health care within their home province. Provinces have reported that they intend to comply with standards, but it is too soon to have certainty about whether the systems in their jurisdictions will be compatible. In addition, it is not clear when existing systems will be upgraded, if necessary, to meet standards for compatibility.

Good project management, when an EHR system is being implemented, is also important for achieving objectives, monitoring performance, and mitigating risks in an effective and economic manner. Audit findings indicated that project management practices varied from province to province, as follows:

- In British Columbia and Nova Scotia, project planning and monitoring, risk mitigation, and reporting on the status of individual projects were in line with best practices.
- In Saskatchewan, individual projects were managed according to recognized project management methodology, except for the fact that overall costs and timelines were not monitored.
- In Alberta, EHR projects were managed according to a recognized project management methodology. However, the audit noted that the business cases to justify the components of the EHR were not developed consistently, and better monitoring of total costs was needed.
- In Ontario, inadequate oversight of project expenditures and deliverables and significant scope creep (expansion of the original scope) of projects were reported.
- In Prince Edward Island, project management weaknesses were identified for the period 2005 to 2007. Significant improvements were made in 2007, but monitoring and reporting of project costs continued to be a problem.

Ministries of Health with inadequate project management processes are less able to properly manage costs, risks, and problems. As a result, projects may not meet the ministries' timelines or user expectations.

Complex EHR systems require clear leadership and direction from a central authority. The Ontario audit reported weaknesses in the governance structure for its EHR initiative, which resulted in ineffective oversight and unclear accountabilities. The British Columbia audit reported similar weaknesses early on; however, the ministry has since created a more streamlined governance structure with clear roles and a broader group of stakeholders. Oversight of the EHR initiative in Prince Edward Island had been inadequate, but the audit noted that oversight improved after 2007. The Alberta audit reported a need to improve the oversight of its EHR systems. At the federal level, the audit reported that Infoway had appropriate governance mechanisms in place and that its Board of Directors uses appropriate practices in exercising its stewardship role. Other participating audit offices did not audit the governance structure.

Reporting on progress to the public

The stated goal for Infoway and the provinces and territories consists of two elements:

- By 2010, every province and territory, and the populations they serve, will benefit from new health information systems that will help transform their health care system.
- By 2010, 50 percent of Canadians and, by 2016, 100 percent will have their electronic health record available to their authorized health care professionals.

The first element of the goal has been met; every jurisdiction has at least one new health information system in place. With respect to the second element, Infoway reported that, as of 31 March 2009, 17 percent of Canadians lived in a province or territory where all core components of an EHR system are available.

Infoway depends on the provinces and territories to achieve the goal. Each province has established its own timeline for completing its electronic health strategies, and some are nearer completion than others. For example, Alberta has made good progress in completing the core components of its EHR system. British Columbia has also made progress; four of the six core components are substantially built, but not necessarily adopted or used yet. Nova Scotia expects its system to be operational by March 2010, although initially it will not include a drug information system. In Prince Edward Island, many of the core components are complete, but further work is needed for the EHR to be fully interoperable within PEI and to complete the system according to national standards.

Infoway collaborated with provincial officials and agreed on what actions each jurisdiction would take to meet the pan-Canadian target by 31 December 2010. Infoway, the provinces, and the territories need to work together to develop performance measures and reporting standards for each core system of the electronic health record, so they can report consistently and sufficiently to their legislatures on progress toward the goal.

There is limited public reporting on progress at the provincial level. Provinces are hampered by the lack of comprehensive information, including costs, baselines, and performance measures for the overall initiative. However, there are some initiatives underway. For example, Nova Scotia is participating in a joint initiative with two other Atlantic provinces to develop performance indicators, and Alberta has made progress developing key benefit-evaluation components, although no benefit evaluations have been performed. Prince Edward Island has conducted preliminary benefits evaluations for some projects and plans to carry out a more comprehensive evaluation at a later date.

As a result, the provincial ministries of health and the public are currently unable to assess whether the initiative is achieving its goals and objectives, on time and within budget. Additional information on progress and on the availability and use of EHRs is needed so the legislatures and Canadians can determine whether they have received value for the investments made thus far, and whether they will do so in the future.

Meeting important challenges

While progress has been made in developing and implementing electronic health records (EHRs) across Canada, continued collaboration between Infoway, the provinces and territories, and other stakeholders will be needed to deal with the issues that were raised in our audits and to address the significant challenges outlined below. As governments and Infoway move forward in implementing EHRs, continued attention to the following critical questions is required over the medium term:

Achieving the goal. Infoway has determined that the risk of not achieving the goal is high. As of 31 March 2009, only 17 percent of Canadians were living in provinces where an EHR is available to their health care professionals. Will the objective of having the electronic health records of 50 percent of Canadians (100 percent by 2016) available to their authorized health care professionals be met by the end of 2010? Will the EHR system be finished on time, as defined by each jurisdiction?

Realizing benefits. Two studies commissioned by Infoway have indicated that, once they are in place, EHRs will save an estimated \$6 billion each year. Will the cost savings and efficiencies be realized for Canada? What will be the other benefits? When will jurisdictions establish baselines to start measuring the benefits?

Upgrading systems. Not all completed EHR projects have implemented the standards required for national compatibility. Who will provide the funding needed to ensure that all systems will be compatible and when will this funding be provided? Do the jurisdictions have plans for upgrading systems to ensure national compatibility? Will EHRs be available to health care professionals anywhere and anytime to support the provision of high-quality care?

Implementing computerized systems in doctors' offices. EHRs are being implemented in institutional settings, such as hospitals, clinics, pharmacies, and laboratories. However, Infoway has estimated that about 80 percent of patient encounters with the health care system take place with doctors and specialists outside an institutional setting. A 2007 study reported that a limited number of Canadian primary care doctors use computerized systems in their offices to communicate and share information. Unless there is a significant increase in this number, the potential benefits of EHRs will not be fully realized. How can the number of primary care doctors using computerized systems be increased significantly?

Consumer health solutions. New health information systems that allow patients direct access to and control over their personal health information are becoming more common. For the systems to exchange information properly, the vendors of these new systems will need to offer solutions that are compatible with the systems that have already been funded. Infoway has launched a certification service to ensure that consumer health solutions available for sale meet the requirements for privacy, security, and compatibility. Will further steps be needed to ensure that consumer health solutions or personal health records are compatible with EHR systems already in place?

Sharing personal health information. Sharing personal health information among the provinces and territories is critical to having EHRs that are accessible across the country—particularly for Canadians who live in smaller provinces and territories and need specialized care that is available only in larger centres. This also concerns Canadians who move from one part of the country to another, travel often, or live in one place but work or study in another. How will differences in provincial and territorial laws regarding the collection, use, protection, and disclosure of personal health information be resolved, to facilitate the sharing of this information between jurisdictions?

Funding the initiative. Finally, questions remain about how the initiative will be funded. What will be the total cost to complete the EHR initiative?

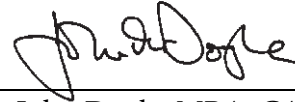
Going forward

The federal and provincial governments have an opportunity to take stock and re-affirm or re-establish priorities, objectives, budgets, and timelines. The overall success of implementing electronic health records depends on this. Given the significance of the investments made, the potential benefits, and Canadians' interest in health care, this is also an opportunity for the committees of each legislature to, individually and/or collectively, continue to monitor the audit findings and provide future oversight of EHRs.

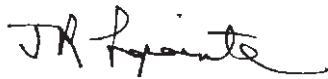
Signatures of the officials of the participating legislative auditing offices



Merwan Saher, CA
Acting Auditor General of Alberta



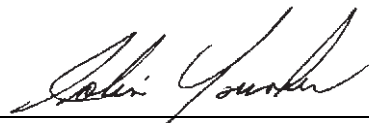
John Doyle, MBA, CA
Auditor General of British Columbia



Jacques R. Lapointe, CA
Auditor General of Nova Scotia



Jim McCarter, FCA, MBA, CISA
Auditor General of Ontario



Colin P. Younker, CA
Auditor General of Prince Edward Island



Fred Wendel, CMA, CA
Provincial Auditor for Saskatchewan



Sheila Fraser, FCA
Auditor General of Canada

Comments from audited governments and Canada Health Infoway

Comments from Governments of Canada, Ontario, Nova Scotia, British Columbia, Prince Edward Island, Saskatchewan and Alberta, and Canada Health Infoway

The Electronic Health Record audits have shown that progress is being made on this important pan-Canadian initiative. Individual governments and Infoway have responded to their respective EHR audits with plans and activities to address the recommendations raised in them.

Beyond these issues, the *Electronic Health Records in Canada—An Overview of Federal and Provincial Audit Reports* concludes with a number of important cross-cutting challenges, which are well understood by all parties involved in this complex endeavour. Governments and Infoway remain committed to working together to address these challenges and have already initiated action on them.

Jurisdictions and Infoway have achieved much toward **achieving the goal** of 50 percent of Canadians having an EHR available to their health professionals by 2010. In measuring progress, Infoway does not include a jurisdiction or region in their calculation until it has every EHR building block in place, so considerable progress on individual systems is not reflected in this metric. Currently, Infoway's forecast indicates the country will come very close to the goal by 2010 and will cross the 50 percent threshold in the first half of 2011.

Infoway and provinces and territories recognize that it will take time to assess **benefits**, since systems must be complete and in use before impacts can be evaluated, and are currently laying the groundwork for evidence-based evaluations. Infoway has developed a "Benefits Measures Framework" to define indicators for each of its investment programs with respect to access, quality and productivity. An evaluation of Diagnostic Imaging systems, which are implemented in all jurisdictions, illustrates the significant benefits these investments have.

Many jurisdictions implemented EHR components prior to Infoway's existence and thus have a need for **upgrading systems**. Infoway is working with jurisdictions and vendors to develop strategies for this. For those newer systems co-funded through Infoway, the approval process requires that they comply with all standards set out by Infoway. Governments and Infoway are committed to seeing that, ultimately, all systems will be able to communicate.

Regarding **computerized systems in doctors' offices**, Canada's approach to eHealth initially focused on establishing the overarching jurisdictional systems (i.e., the EHR), with connecting individual clinical settings (e.g., doctor's offices) as a second phase. Jurisdictions and Infoway have collectively articulated a go-forward strategy and new funding has been allocated in this area.

The Deputy Ministers of Health have mandated Infoway to play a pan-Canadian leadership role to help ensure that **consumer health solutions** (personal health records) will be interoperable with EHRs in Canada. In February 2009, Infoway initiated a certification service to support this process.

Governments are committed to developing an appropriate policy and legal framework for the **sharing of personal health information** between jurisdictions.

Recent government **funding** decisions related to EHRs reflect the ongoing jurisdictional commitment to this initiative. The transfer of an additional \$500 million by the Government of Canada to Infoway, confirmed in Budget 2010, will be accompanied by additional jurisdictional investments.

These activities illustrate the ongoing commitment of jurisdictions and Infoway to work together to address the important challenges identified in the *Electronic Health Records in Canada—An Overview of Federal and Provincial Audit Reports*.

Appendix—List of audit offices and websites

Each office's audit reports can be found on its website.

Office of the Auditor General of Alberta	www.oag.ab.ca
Office of the Auditor General of British Columbia	www.bcauditor.com
Office of the Auditor General of Nova Scotia	www.oag-ns.ca
Office of the Auditor General of Ontario	www.auditor.on.ca
Office of the Auditor General of Prince Edward Island	www.assembly.pe.ca (under Assembly Offices/Office of the Auditor General)
Office of the Provincial Auditor for Saskatchewan	www.auditor.sk.ca
Office of the Auditor General of Canada	www.oag-bvg.gc.ca

