Lessons from the Canadian national health information technology plan for the United States: opinions of key Canadian experts

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ABSTRACT

Objective To summarize the Canadian health information technology (HIT) policy experience and impart lessons learned to the US as it determines its policy in this area.

Design Qualitative analysis of interviews with identified key stakeholders followed by an electronic survey.

Measurements We conducted semi-structured interviews with 29 key Canadian HIT policy and opinion leaders and used a grounded theory approach to analyze the results. The informant sample was chosen to provide views from different stakeholder groups including national representatives and regional representatives from three Canadian provinces.

Results Canadian informants believed that much of the current US direction is positive, especially regarding incentives and meaningful use, but that there are key opportunities for the US to emphasize direct engagement with providers, define a clear business case for them, sponsor large scale evaluations to assess HIT impact in a broad array of settings, determine standards but also enable access to resources needed for mid-course corrections of standards when issues are identified, and, finally, leverage implementation of digital imaging systems.

Limitations Not all stakeholder groups were included, such as providers or patients. In addition, as in all qualitative research, a selection bias could be present due to the relatively small sample size.

Conclusions Based on Canadian experience with HIT policy, stakeholders identified as lessons for the US the need to increase direct engagement with providers and the importance of defining the business case for HIT, which can be achieved through large scale evaluations, and of recognizing and leveraging successes as they emerge.

INTRODUCTION

The United States is currently making a historic investment in healthcare to improve the quality, value, and availability of health services while constraining costs. As a part of the American Recovery and Reinvestment Act of 2009, the Health Information Technology for Economic and Clinical Health Act (HITECH Act) includes support which will approach $50 billion in an attempt to bring about a major change towards achieving widespread and meaningful use of health information technology (HIT) so that it may be used as a tool for improving care. Appropriately, this commitment has created substantial debate regarding what policies will be most effective for achieving these aims.

Over the past decade Canada has faced and debated similar strategic issues related to public investment in catalyzing HIT. Since its inception in 2001, Canada Health Infoway (CHI) has functioned as an independent, federally-funded, not-for-profit organization and has worked as a strategic investor with Canadian provinces to accelerate the development of electronic health records (EHR) across Canada. With the goal of attaining a 50% EHR adoption rate among Canadians by 2010, CHI had invested $1.58 billion in 283 individual projects as of March 2009.1

Canada and the US face common challenges in encouraging widespread EHR adoption, and both have much lower adoption rates than other Organisation for Economic Co-operation and Development (OECD) countries.2 3 The failure to stimulate high rates of HIT adoption, in conjunction with the common characteristics of federal and state/province governance sovereignty, suggest that the countries share similar barriers to adoption and implementation. Indeed, many of the policy issues being considered today by the US Department of Health and Human Service’s Office of the National Coordinator (ONC), such as setting uniform standards, interoperability, HIT vendor roles, and financial incentives, have also been the focus of intense debate and policy initiatives in Canada in recent years.

The similarities in governance between both nations and the fact that Canada was in a similar position to the US in terms of HIT adoption 10 years ago, makes the Canadian experience valuable for drawing HIT policy lessons. Thus, we designed and conducted the National Initiatives to Implement Health Information Technology study, which consists of interviews with key HIT policy and opinion leaders in Canada. This study’s aim was to identify, from the perspective of policy and implementation strategy, the aspects of the Canadian HIT plan that succeeded, the features that were less successful, and future directions to improve HIT adoption in general and EMR specifically, while drawing relevant lessons for the US. In this report we focus on the potential lessons for the US from the Canadian experiences to date.

BACKGROUND

Many countries have established national initiatives to implement HIT to improve safety, quality, and efficiency, and Canada is no exception.4 5
Building on the experience with HIT in many provinces, such as primary care electronic medical records (EMR) in Alberta, population drug information in British Columbia, and regional interoperable health networks in Sault St Marie, the Canadian government established CHI to accelerate the e-health agenda and create an interoperable pan-Canadian EHR.6 7

In 1997 an Advisory Council on Health Info-structure was established by the federal Minister of Health to provide recommendations on the development of a comprehensive Canadian health info-structure. Through three working groups (Key Policy Issues, Health Information for the General Public, and Technology/Applications) the Council presented its final report in 1999 which concluded that establishing a nationwide health information highway would lead to improved quality, accessibility, and efficiency in health services. This laid the foundation for a national HIT vision and the consequent establishment of CHI.

CHI adopted an unique strategy to develop a national EHR system. Unlike other countries that had achieved high rates of EHR adoption by leveraging local initiatives towards a national system,4 8 the CHI e-health plan set out to establish a national infrastructure that would enable the exchange of health information from coast to coast. Core components of this plan included the establishment of a national architecture and standards, patient and provider registries that would enable information to be linked for the same patient, and the implementation of regional drug and laboratory repositories and digital imaging to improve efficiency in clinical information exchange in ambulatory care. Canada Health Infoway also developed a change management plan to guide the implementation of these e-health care initiatives at a pan-Canadian level.6

On the other side of the border, the US is embarking down its own path as it sets out to improve healthcare safety, quality, and effectiveness through the adoption of HIT. The approach taken by Congress and the Obama administration, as expressed through HITTECH Act, is to promote the meaningful use of qualified, certified EHRs as a means to achieve health and efficiency goals. The administration is hoping to accomplish this by determining what is considered meaningful use, encouraging providers to achieve meaningful use through incentives and funding programs, and gaining public support for HIT by securing privacy and fostering continued HIT innovation.9 Already, the meaningful use regulations have been set for the participating providers Medicare and Medicaid, as well as regulations that laid out a process for the certification of EHRs, so that providers can be assured they are capable of meaningful use.10 Table 1 summarizes the main national policy initiatives adopted by each country by the seven HIT domains we will later explore.

Clearly, the Canadian and US healthcare systems are different. Not surprisingly, their HIT policy approaches have also differed. While the Canadian approach focused on creating a single architecture for the country that would enable a longitudinal EHR system and on sponsoring provincial HIT initiatives through gated funding, the US approach has been to incent adoption of EHRs in the inpatient and outpatient setting as well as clinical data exchange, with a strong focus on attempting to

<table>
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<tr>
<th>Domain</th>
<th>Canada</th>
<th>US</th>
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<tr>
<td>Health professional adoption</td>
<td>Engaged professional associations to accelerate adoption by clinicians</td>
<td>A nationwide system of Regional Extension Centers (RECs) support and serve healthcare providers so that they can quickly become adept and meaningful users of EHRs</td>
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<td></td>
<td>Developed a structured approach to measure the return on investment and benefits derived from HIT investments (including patient safety and clinician productivity)</td>
<td>Beacon Community Program—A grant program for communities to build and strengthen their health IT infrastructure and exchange capabilities</td>
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<td>Improving safety and</td>
<td>Implementation of regional drug, laboratory, and digital imaging</td>
<td>Funding research through the Strategic Health IT Advanced Research Projects (SHARP) Program focused on achieving breakthrough advances that would lead to improved adoption through the meaningful use rule, objectives and measures have been set that must be met for providers to be eligible to qualify for Medicare and Medicaid incentive payments</td>
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<td>effectiveness in</td>
<td>repositories</td>
<td>The Office of the National Coordinator (ONC) has facilitated a variety of activities to catalyze progress in clinical decision support development and deployment in support of enhanced health and care</td>
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<td>healthcare delivery</td>
<td></td>
<td>The State Health Policy Consortium and the State Alliance for e-Health are both local consensus groups working to promote new inter- and intrastate-based policies that would enable electronic health information data exchange within and across state lines</td>
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<td>Interoperability</td>
<td>Encourage the use of similar commercial solutions across jurisdictions through establishment of preferred pricing agreements with vendors Creating patient and provider registries</td>
<td>The state-level Health Information Exchange Consensus Project provides a forum for ONC to work with states to ensure all health information exchange activities throughout the US align</td>
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<td>Financing and incentives</td>
<td>Employed gated funding for HIT projects carried out at the jurisdictional level to reduce financial risk and increase motivation</td>
<td>Reimbursement incentives, through the Centers for Medicare &amp; Medicaid Services (CMS), for eligible professionals and hospitals that are successful in becoming ‘meaningful users’ of certified EHR technology</td>
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<td>Technical infrastructure</td>
<td>National standards efforts coordinated by a single organization involving all key stakeholders Establishment of a national infrastructure architecture Gated funding linked to the use of data standards that would support interoperability</td>
<td>Standards and Certification Criteria for Electronic Health Records issued by the ONC identify the standards and certification criteria for the certification of EHR technology</td>
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<td>and data standards</td>
<td></td>
<td>Establishment of certification program for testing and certifying health information technology</td>
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<td>Vendor engagement</td>
<td>Vendors sit on the national HIT standards committee</td>
<td>The nationwide health information network (NwHIN) is a set of standards, services, and policies that enable secure health information exchange over the internet</td>
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<td>Public health</td>
<td>Developed a Canada-wide communicable disease surveillance system in partnership with the provinces and territories</td>
<td>Vendors are represented on the Federal Advisory Committees—both the HIT Policy Committee and the HIT Standards Committee</td>
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Table 1 National policy initiatives and activities around the seven HIT domains for Canada and the US

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ensure that EHRs will be used in ways that improve healthcare quality and effectiveness. On the other hand, many similarities exist, such as the setting of national standards and infrastructure to enable country-wide data sharing. Taking these differences and similarities into account, the advantage of being able to look back and explore the outcomes of the Canadian approach may carry important implications that can be applied to the current US plan.

METHODS
Scope and definitions
To identify the main policy issues to be addressed by this study, we began by reviewing material available through the websites of both CHI and the ONC and categorized the policies for each. In addition, we identified specific barriers to adoption that policies may address, including the costs of implementation, uncertain financial payoffs, a lack of financial incentives, difficulties with technology, a lack of standardization, number of vendors involved, security concerns, and physicians' attitudes.11–15 Based on the literature review, we categorized policies into seven broad themes: (1) national planning for interoperability, (2) technical infrastructure and information policies into seven broad themes: (1) national planning for interoperability, (2) technical infrastructure and information standards, (3) HIT vendor engagement, (4) financing and incentives, (5) health professional adoption, (6) improving safety and effectiveness in healthcare delivery, and (7) public health. These themes emerged from an overview of the main policy literature and after internal discussions among the researchers and served as the basis for building the interview instrument.

We used the Healthcare Information Management Systems Society’s (HIMSS) and HIMSS Analytics definitions for EHR and EMR.16 An EHR was defined as a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting, while an EMR was defined as an application environment used by healthcare practitioners to document, monitor, and manage healthcare delivery within a care delivery organization.

Identifying informants
We planned to conduct interviews with approximately 25 leaders, a number we anticipated would be sufficient to reach saturation on relevant HIT policy issues using the standardized qualitative methodology described below. Informants were chosen to be broadly representative of key HIT policy communities at the national and provincial level. The sample was chosen to provide views from different stakeholder groups including national/regional agencies responsible for HIT, quality/safety and research institutes, health professional groups, and EMR and health infrastructure vendors. We selected three Canadian provinces to assess regional perspectives: the most advanced province in terms of HIT adoption (Alberta), the least advanced province (Ontario), and a province that has made intermediate progress in HIT adoption (British Columbia). We completed interviews with 29 informants (all informants approached were interviewed). Ten of these informants belonged to the national/regional agencies responsible for HIT group, seven to the quality/safety and research institutes group, seven to the health professional group, and five to the EMR and health infrastructure vendors group.

Interview instrument
We developed a semi-structured interview instrument to delineate the key policy strategies used to stimulate national HIT implementation and adoption in the two countries, with a particular focus on Canada. We have addressed separately each of the seven domains identified in the literature review. For each of these we attempted to understand the informant’s perspectives on how well policy addressed this issue in Canada, concerns they might have regarding this domain, practical examples from their jurisdictions, and suggestions for Canada and the US as both move forward.

Interviews were designed to take approximately 45 min and were conducted by one of three researchers (EZ, RR, or MT). Interviewee consent to recording was given verbally and each was informed about the confidentiality of their responses. Recorded interviews were transcribed by one professional transcriber.

Qualitative analysis
We used the grounded theory principles of coding and theme abstraction (rather than strict adherence to the original Glaser and Strauss theory17 18) to analyze the interview transcripts. This revised technique has been widely used in similar studies.14 15 19 20 Through iterative readings of a subset of transcripts, we developed a code list to characterize the factors relating to each HIT policy topic. The investigators (EZ, RR, CS, YJ, and RT) coded all transcripts into a complete list of codes. Then, a team of three investigators (EZ, RR, and CS) through iterative readings of transcripts and linked quotes and in-depth discussions, continued to modify and organize the code list to further delineate the relationships among the emerging themes. Only themes that were agreed upon by the three researchers as representing the opinions of the informants were included in the final results. The coding and relationship linkage of the transcripts was executed with Atlas.ti, a qualitative data analysis software tool (Scientific Software Development, Berlin, Germany). Since standard qualitative software does not keep track of ‘new code generation’ statistics as a marker of saturation, we assessed saturation in code forming subjectively within the research coding group. We agreed that saturation was achieved (codes being redundant, ie, already identified in earlier transcript analysis) following the 12th to the 20th interview, depending on domain.

Electronic survey
After the interviews were completed, a separate, computerized survey was electronically mailed to all interviewees (http://SurveyMonkey.com). In this survey, informants were asked to rank in order of importance the seven policy domains we identified to determine views on their relative priority as a factor in contributing to successful implementation of HIT. Based on the follow-up survey, we rated the domains in order of importance as averaged from the responses of the policy leaders/experts. The follow-up mailed-in survey was completed by 27 of the 29 informants.

RESULTS
A description of the themes that emerged from the analysis, organized by domain, is given below. Average importance rates, as measured through the on-line survey, are presented in table 2. Examples of selected quotes per theme are given in box 1.

Health professional adoption
Informants believed the Canadian government should have taken a more active role in promoting health professional adoption. They felt that the government should have worked closely with regulatory and professional bodies, and that insufficient focus had been placed on this. Specifically, respondents believed that a structured program was needed that not only
took into account policy addressing financing through incentives, disincentives, and setting standards, but also regarding leadership, engagement of physicians during planning, and the support of change management. An example of a successful structured program that was cited was Alberta’s Physician Office System Program,21 which was tasked with enabling the use of EMRs by Alberta’s physicians through a combination of funding, information technology services, and change management services (box 1, quote A1).

Informants believed that health professionals should be engaged early in the process in ways that would help them understand the added value of HIT solutions. As one of the informants stated, ‘If you haven’t got the end users involved and they are not driving adoption—it just isn’t going to happen.’ A general notion was that there needs to be a strong healthcare value ‘business case’ (mostly in terms of quality of care) to push adoption forward. This was frequently mentioned as being more important than financial incentives or disincentives (box 1, quote A2).

As a successful Canadian initiative that has resulted in health professional adoption, informants have mentioned the rapid acceptance of the picture archiving and communication systems. This was found by some to be a direct result of CHI’s engagement with widespread provider acceptance across provinces (box 1, quote A3). This implementation success was also attributable to the fact that providers appreciated the added value to quality of care of having direct access to imaging archives, or as one informant suggested, ‘it almost seems to be a no-brainer.’

Improving safety and effectiveness in healthcare delivery
Informants strongly believed HIT can improve patient safety and effectiveness in healthcare delivery. In particular, clinical data sharing across the continuum of care was believed to be critical for improving safety and effectiveness, especially electronic prescribing and drug management in the near term. Informants felt the most important data types were prescription drug information, laboratory and digital imaging information, medical history and co-morbidity, allergies and adverse events, and expert interpretation and e-referrals (box 1, quote B1). Informants placed priority on policies that would enable clinical data sharing, including modifications that will be needed to existing laws and regulations.

Other components of HIT that were mentioned as promoting safety and quality included computerized decision support and order entry and the ability to incorporate data from disparate diagnostic and therapeutic HIT systems (box 1, quote B2).

To improve patient safety, informants believed performance monitoring and comparative feedback of safety and quality indicators (eg, infection rates, adverse drug event rates), and investigation of the causes of adverse events should be enabled through HIT (box 1, quote B3). Informants also commented on safety problems that can be created by HIT, specifically when systems are badly designed or implemented, hybrid paper and electronic charts are maintained requiring double entry, or HIT is applied to support an unsafe process (box 1, quote B4).

Interoperability
Informants believed policy on interoperability should address all healthcare settings within a jurisdiction. However, interoperability at the national level was not felt to be a priority and there was consensus that attempts should be focused on achieving effective regional interoperability first (box 1, quote C1). Respondents stated that to overcome both political, leadership, and technological barriers and achieve interoperability would require policy makers to set guidelines and strategy that would describe the ‘end state,’ balancing time and money while leveraging existing local legacy investment (box 1, quote C2).

Financing and incentives
Informants felt that financial incentives should be provided to both healthcare institutions and professionals. However, they believed that these should be tied to predetermined outcomes as part of a comprehensive adoption strategy. From the analysis of the interviews, it was obvious that financial incentives are considered only part of the equation in trying to promote HIT adoption (box 1, quotes D1 and D2). One informant mentioned the experience in Ontario of requiring electronic billing for reimbursement, which was highly effective for increasing HIT use (box 1, quote D3).

Technical infrastructure and data standards
The prevailing view emerging from the interviews was that that policy should be setting expectations and requirements to guide development and implementation of technical infrastructure and data standards solutions. Informants made it clear that they believed there is a need for strong leadership and structure to achieve successful implementation and adoption of technical
Box 1 Informants quotes by health information technology domain

A. Health professional adoption
A1. ‘I think the POSP [Physician Office System Program] system has a huge impact on this province (Alberta). And I think the fact that the funding was tied to not just implementation costs but also to change management, has made this such a success.’
A2. ‘HIT [health information technology] is solving a legitimate business need, a hospital or a doctor doesn’t put in a computer system because it pleases the government. They put in the computer system because they have a business need for it.’
A3. “… one of the things that seems to me that has gotten REALLY RAPID professional acceptance in more than one province, and has been the direct result of Infoway’s engagement, has been the use of the PACS [picture archive and communications system]. It has created an immediate availability of the images, it’s been very nicely accepted by docs who benefit from the convenience and the quality of the images. So, to me, that’s one of the success stories, for sure!’

B. Improving safety and effectiveness in healthcare delivery
B1. ‘The ability for the different parts of this healthcare system to have access to the same data… is absolutely critical. So I think THAT’S where you’re going to get the big payoffs.’
B2. ‘… drug safety would be one area where HIT has played a role and, you know, probably could continue to play a role… On the drug side it’s the reminders, it’s the contraindications, all that kind of things.’
B3. ‘… start with electronic prescribing, and then follow that up with real time, post-marketing surveillance on adverse drug reactions. That Vioxx thing would never be found by the current voluntary system.’
B4. ‘There’s an over-reliance on HIT with the expectation that it would improve patient safety and effectiveness. But, it could actually go both ways. HIT can equally cause errors which, up until now, have not been studied extensively.’

C. Interoperability
C1. ‘I think we are too worried about interoperability across the entire healthcare system… I would argue that health regions need to have interoperability first.’
C2. ‘Interoperability, based on leveraging existing investments, to me is a very achievable [goal], and very significant. The political paymasters, for example, still believe that the investments made in multiple disparate systems are wasted because systems cannot talk to one another. So, we have a major challenge here; in addition to the technology issues, we have major political issues’

D. Financing and incentives
D1. ‘Financial incentives can be helpful, but the financial incentives on their own will not encourage health professionals to adopt HIT.’
D2. ‘… financial subsidy has mixed success, at best. Because what that does is, it puts computers on doctor’s desks, but it doesn’t put them in service of healthcare outcomes.’
D3. ‘… we had no trouble getting all practitioners in Ontario to submit billing electronically when we said NO more reimbursement would occur with paper transmission. Overnight! Everybody transmitted electronically. We had to provide computers, but that was a small price to pay.’

E. Technical infrastructure and data standards
E1. ‘… here is where you need very strong leadership in order to ensure that the provincial bodies that are adopting lab, digital imaging, drug standards, etc, are all adopting according to the same playbook.’
E2. ‘… the blueprint they (Canada Health Infoway, CHI) developed, which is six or seven years old now, is too rigid. They developed something that wasn’t designed to be flexible. And, as the system evolved, and as we developed insights on how health IT should be implemented, adopted, and used, the blueprint was not able to adjust flexibly enough to allow for those changes.’
E3. ‘Some of the resistance that we’ve had has obviously been around investment in legacy systems and the ability to transform those systems into what is becoming an accepted norm around standards.’

F. HIT vendor engagement
F1. ‘… [the government should] establish early collaboration. And that means bringing representatives of vendors and vendor organizations into consultations, workshops, roundtables, and committees early in the process.’
F2. ‘… [the] government has a strong role to play in driving the standards, but I think in terms of picking the vendors, the free market needs to be allowed to work.’
F3. ‘… the national certification standards should raise the bar significantly. And there shouldn’t be as many that are passing that certification as we’re seeing. So, I’m very strongly in favor for a much more rigid and much more significant national certification process.’

G. Public health
G1. ‘… in terms of the lessons for the US, get those sorts of public health uses on the table, up-front, and see how they align with what the electronic medical record is going to be able to do.’
G2. ‘I think this is an area where we should be making more use of portals and existing health information technology. For example, the outbreaks of H1N1 were much more apparent on Google and Yahoo, long before they were tracked by public health… So, we HAVE actually a lot of information that we choose not to use, because we’ve got an old-fashioned notion of public health.’
infrastructure and data standards. They also emphasized the importance of building consensus and gaining buy-in. These issues need to be addressed as early as possible by policy makers and end users to insure that healthcare goals are met (box 1, quote E1).

Informants also believed that the plan around setting and adjusting standards needed to evolve over time, and many felt that the CHI blueprint was too rigid (box 1, quote E2). Another challenge with setting policy on standards and technical infrastructure is dealing with legacy systems and IT silos (box 1, quote E3).

**HIT vendor engagement**

Informants felt that federal government should take an active role in encouraging vendor engagement, without exercising control (box 1, quote F1). More specifically, a number of informants believed that government should confine itself to setting the framework (e.g., facilitating the selection of specific standards) and then let the free market run its course (box 1, quote F2). Allowing the market to work in this fashion allows costs to be minimized while stimulating innovation and new IT solutions. As stated in an interview, ‘...you need policy direction guidance to factor in the development capabilities into the broader IT agenda...’

Finally, in response to our question on certification of vendors, the general opinion was that certification for vendors should be set by a single centralized organization that represents all stakeholders, setting a high standard for vendors (box 1, quote F5). Although there was not a strong consensus on the level at which certification should be set, it was generally accepted that the organization involved should be independent, and should not be the same organization handling the national HIT budget to minimize conflicts of interest.

**Public health**

Public health was ranked as the lowest priority among the HIT domains. Informants thought that policy dealing with public health issues needs to define the expected target populations and domains, expected functions/features, and measurable benefits of HIT for public health (box 1, quote G1).

They felt that new IT-enabled public health practice needs to leverage existing and emerging EMR and internet data sources to produce value-added benefits in disease monitoring, early detection of outbreaks, and vaccination monitoring, and overall allow for higher quality, standardization, and timely access of public health data (box 1, quote G2).

Finally, informants felt, based on the experience in Canada, that trying to develop a national HIT public health solution might be a waste of time and money as no single application can usefully address all public health related issues: ‘...it’s a very important thing to do, but it’s not an easy thing to do at a national level, trying to have a single product do everything.’

**DISCUSSION**

The approach taken by CHI to promote HIT by developing a national EHR system and encouraging EMR adoption focused first on addressing issues around standards and interoperability, in particular large scale provincial data exchanges. While this infrastructure is important, this approach has not resulted in EMR adoption, and the data exchanges have in general been relatively little used to date.

Informants felt that it would have been more helpful to focus more on provider engagement, and that has been perhaps Canada’s most important missed opportunity to date. This view has been also expressed by several other Canadian critics lately.12–24 While eventually, a ‘bottom-up clinical-needs-first’ or a ‘top-down foundation-first’ approach may lead to the same endpoint, the top-down method was considered too slow, expensive, and inefficient by some of our informants to be viable. Stakeholders involved in implementing the national interoperable health record in Britain, the National Program for Information Technology, expressed similar sentiments.14 15

Despite many early successes, the British national plan now faces serious challenges.15 Insufficient engagement with providers almost certainly contributed to this. In the US, the ONC has made extensive efforts to involve the specialty societies, has held many hearings and has convened a group to discuss the many issues involved jointly with the Institute of Medicine. In addition, the Regional Extension Centers will assist individual providers. However, provider engagement represents a considerable challenge for any such national effort.

Overall, Canadian stakeholders were positive about the approaches being taken in the US, as formulated so far.9 Specifically, they endorsed the focus on provider adoption, establishment of the meaningful use criteria which will have an outcome focus eventually, and the financial incentives associated with meaningful use. They also believed there were several specific opportunities for the US based on shortcomings in the Canadian approach that they recommended. The informants underscored working more on direct engagement with providers especially through physician groups, better defining the business case for providers, sponsoring large scale evaluations as adoption occurs to see whether or not it is having the desired effects, and identifying support for refining standards as they are used and problems are identified. Finally, they suggested raising the profile of imaging and picture archiving and communication systems in the US, as this particular aspect of HIT in Canada played a key role in engaging more skeptical clinician and policy makers as an ‘easy win.’ Attaining interoperability of EMRs was repeatedly rated as a top priority for policy makers; however, stakeholders believed the key initial target should be regional interoperability of legacy systems rather than nationwide interoperability.

With regard to EMR vendor certification, provinces in Canada have followed one of two distinct approaches: limiting the number of certified products by setting the bar high and setting minimum specifications criteria which EMR must meet, thus offering a wider range of choices. While we have found that our informants favored setting a high standard to certify products and limit the number of products available, other reports from Canada have favored the latter approach.26 The US policy on vendor certification, as expressed by the HIT Policy Committee’s recommendations to the National Coordinator, is aligned with the ‘passing grade’ approach, but requires re-assessments and adjustments to the specifications set over time.26

Public health was considered to be the least important domain of those considered with respect to its effect on implementation of HIT. As currently formulated in the US, the meaningful use definitions are addressing public health goals ranging from submitting immunization data to automated real-time surveillance of disease outbreaks or bioterrorism.10 Adapting HIT systems to serve public health needs will require adaptation of local systems which are primarily clinical in focus.27 Our stakeholders believed that efforts to advance public health through HIT could be deferred. When drawing conclusions for the US, one must also consider the possibility that Canadian experts might consider public health issues as less important due to the higher accessibility to public health services in a single-payer healthcare system.
CONCLUSIONS

Canada has had a head start with respect to HIT and federal investment compared to the US. The Canadian approach of focusing on standards and interoperability has not yet resulted in widespread adoption, although important groundwork has been laid. Canadian stakeholders identified a number of areas that they believed to be important which have not received major emphasis in the US plan to date, and addressing these issues may be helpful to policymakers as they move forward. However, it is important to note that our Canadian informants based their insights and views on the Canadian experience and not necessarily on their knowledge of the US experience and recent policy initiatives. It is up to policy makers and opinion leaders in the US to consider how to best incorporate these insights into the national plan.

This study has several limitations. First, although we believe the number of informants we have interviewed allowed us to reach saturation in terms of identifying key policy issues, in accordance with qualitative research methodology, the small sample size is a potential limitation. Thus, it is possible that the choice of informants could have biased our conclusions and the groups of stakeholders might have been too small to provide adequate representation that would provide the complete picture. Second, when capturing the views and opinions of key opinion leaders, we did not include the end-users (ie, healthcare providers) or patients, and may have failed to include some of the views that could be expressed by them. These views could be valuable in informing and enriching the development of effective methods to enhance adoption and should be included in future studies. Nonetheless, by selecting a wide range of stakeholders dealing with HIT policy and by implementing qualitative research analysis methodology, we believe our conclusions capture the dominant opinions. Third, although we were unable to adequately represent that would provide the complete picture. Second, when capturing the views and opinions of key opinion leaders, we did not include the end-users (ie, healthcare providers) or patients, and may have failed to include some of the views that could be expressed by them. These views could be valuable in informing and enriching the development of effective methods to enhance adoption and should be included in future studies. Nonetheless, by selecting a wide range of stakeholders dealing with HIT policy and by implementing qualitative research analysis methodology, we believe our conclusions capture the dominant opinions. Third, although we were unable to assess if there was variation in the informants’ views across provinces and/or between the stakeholder groups, these differences may be relevant in understanding why some provinces may be more successful than others. Lastly, by pre-selecting domains to structure the interview instrument we may have directed the themes that emerged. However, we believe that since these domains were based on a comprehensive review of current literature, they provide a framework for discussion of the key issues regarding HIT policy.

Looking forward, from the perspective of our Canadian informants, in order to promote adoption of HIT the US needs to first put even more emphasis on direct engagement with consumers. Second, the US needs to define the business case for HIT in general and EMR in particular. This can be achieved by sponsoring large scale evaluations of the effects of adoption. Third, it is necessary to evaluate and revise standards as adoption proceeds. Fourth, experts felt the bar should be set high for EMR vendor certification in part to limit the number of players in the market. Finally, HIT successes should be recognized and leveraged as they emerge.

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None.

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