Canadian Healthcare Industry- Operational Efficiency through IT Transformation - A Perspective

August 2013

Health care in Canada is delivered through a publicly funded health care system, which is mostly free at the point of use and has most services provided by private entities. The government assures the quality of care through federal standards. Health care spending in Canada has increased each year and stands at approximately 11% of GDP. As the population continues to grow and also age, there is a greater need to better understand their health care requirements to achieve better outcomes for the money spent and controlling the overall cost of delivery. A progressive, responsible and patient-focused healthcare system requires transformational change and disciplined budget management for long-term sustainability. Effective deployment of Information Technology (IT) services, catalyzes such transformation.

Canadian Healthcare System – an overview

The Canadian health care system was built around the principle that all citizens will receive all "medically necessary and hospital physician services." To that end, each of Canada's 10 provinces and 3 territories finance and run a statewide health insurance program. There is no cost sharing for the health care services guaranteed under federal law. The principles revolve around providing universally accessible, portable and comprehensive health care based on patients' needs and not their ability to pay.

Globally, most of the developed countries follow one of the three models for health care:

Model	Features	Countries Adopting
Bismarck Model	Employers and employees jointly finance private health insurance plans, through payroll deductions, to provide health care.	Germany, Japan, France & Belgium
Beveridge Model	Medical needs are treated as a public service to be financed by the government through tax payments	Italy, Spain and Scandinavian Countries
National Health Insurance Model	A hybrid model where the providers of health care are private not-for-profit organizations, but the payer is a government-run insurance program that every citizen pays into.	Canada

Canada's national health insurance program, Medicare, started in the 1960's, is a government-funded universal health insurance program. It is designed to ensure that all residents have access to hospital and physician services on a prepaid basis. Close to 70% of health care is publicly funded. Physicians are paid by the public sector on a fee-for-service basis. Hospitals are not-for-profit entities with independent boards of directors but are dependent on public funding for the majority of their working capital. The Canada Health Act provides administering principles at federal level, while the individual provinces are responsible for delivering care within their jurisdictions.

Structure of the Industry & Challenges

In the 1960's , the Hall commission recommended healthcare services to be a taxable benefit with a view to share the cost burden. The government resulting in the costs being borne completely by the central administration rejected this. This severely cramped the coverage of healthcare services, which had to be limited to simply access to physicians and hospitals. There is very little focus on preventive care, as citizens prefer to register at a hospital, being free, instead of resorting to preventive care. While Canadians are guaranteed access to hospital and physician services, it is up to each province to decide whether to cover "supplementary" benefits, like dental care and drug coverage. About two-thirds_of Canadians take out private, supplemental insurance policies (or have an employer-sponsored plan) to cover these services.

While Canada is traditionally thought of as a publicly financed system, spending on these supplemental benefits means that 30 percent of health spending comes from private sources. While Canada's health care system is publicly financed, many providers are not government employees. Instead, the government at a negotiated fee-for-service rate usually reimburses doctors. The average primary care doctor in Canada earns $125,000 (in the United States that number stands at $186,000).

How much does it cost?

Canada spends around 11.4 percent of its Gross Domestic Product on health care services, which puts it on the slightly higher end of OECD countries and compares favorably with the percentage spend of US, which is at 12%:

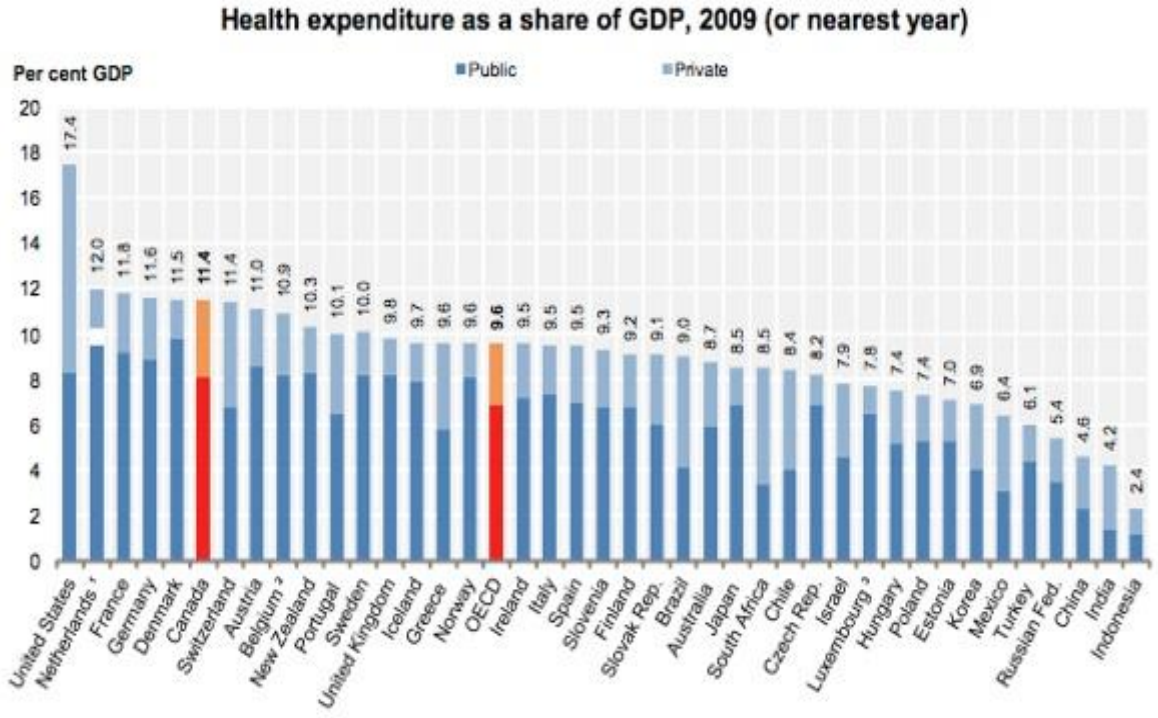

Figure 1: Healthcare expenditure as share of GDP

The unit cost of healthcare in Canada is estimated to be around 65% of costs prevalent in USA. Canada spent $207 billion for health services in 2012, which comprised of $145 billion in public spending and $62 billion in private spending. Spending fell predominantly into the following large categories:

Spend Categories	Amount ($ Bill)	Percentage
Hospitals	60.5	29.2%
Drugs	33.0	15.9%
Physician Service	30.0	14.4%
Other health professionals – Dentist, Physiotherapist etc.	22.0	10.6%
Other Institutions like Nursing Home & Long term care	21.6	10.4%

Hospitals are the single biggest cost accounting for more than one third of public spending on healthcare. On an average Canadians use $220,000 in public health care over a lifetime, factor in private spending and the figure works out to $320,000. Inspite of this pronounced degree of spending the key output metrics are disappointing. The median wait time to see a specialist or for surgery is 4 weeks. The median wait time for diagnostic services such as MRI and CAT scans is 2 weeks.

Access to timely health care services in the remote and sparsely populated Northern territories presents a unique challenge for the federal government. Ontario the largest province with population strength of 13 million as of 2010 spends 46 cents of every provincial dollar on health care and is projected to hit 70 cents by 2022 if spending is left unchecked.

The healthcare system in Canada is not well aligned to the needs of elderly patients. The current system has not adjusted to the very real differences in the population and its needs as they have changed from the 1960s through to the 21st century. The system needs to include social housing, mental and addiction health services, and childhood nutrition and development in the planning for "system," rather than myopically focusing mostly on acute care activities.

Canadian Healthcare Sector slow in IT adoption

Canada has been a slow adopter of innovative technologies that could enhance the quality of health care services and improve the health and quality of life of Canadians. Unfortunately the investment levels for health infrastructure in Canada are lagging. Despite its phenomenal boost to productivity, the amount spent by Canadian hospitals on information and communications technology constituted only about 2 per cent of their operating budgets. In stark contrast countries like Italy, Sweden and the UK allocate in excess of 5 per cent of hospital budgets to ICT.

Progress on applying information technology more widely within the health care system has been stifled by suboptimal strategies to engage health providers in the uptake of these technologies. Progress has also been restrained by endless debate focusing solely on privacy needs that could be accommodated through appropriate security. These obstacles are blocking the adoption of even rudimentary tools that would improve outcomes, speed process, ease work burdens, and improve the sharing of useful information and protocols

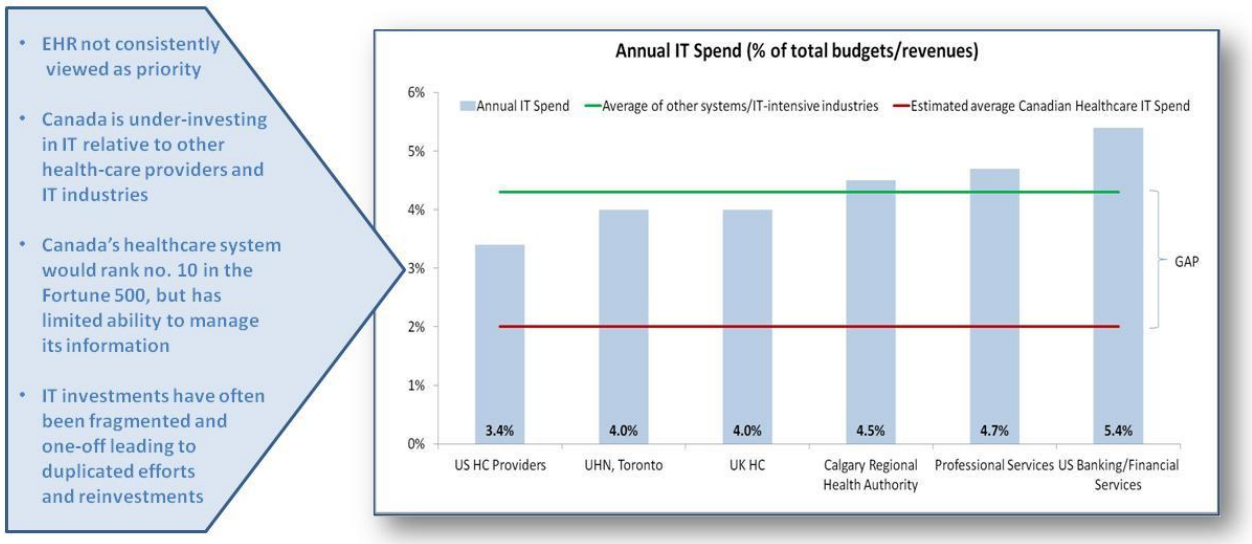

Figure 2: IT Investment Levels Comparison

Currently half of Canadians have some form of electronic health record, but the facilitation of timely introduction, adoption, and coordination of electronic records has been an issue. The need of the hour is

to improve healthcare by including the provision of better data to increase accountability, performance evaluations, and more transparency for citizens and more and better use of information and communication technologies.

Electronic Health Records (EHR's) along with E-prescribing (e-Rx) help in reducing patient wait times, bringing down costs by avoiding unnecessary or duplicate diagnostic tests, multiple prescriptions, risk of adverse drug reactions and timely transmission of prescription information from practitioner to pharmacist. As per the 2009 Fall Report of the Auditor General of Canada a rough cost of implementing EHR's Canada-wide would be close to $10 billion but would lead to extensive long term benefits.

Need for Transformation through IT

Clinicians today depend on healthcare information systems more than ever before to support patient care. These systems require modern, up-to-date infrastructure to deliver consistent, reliable service. As stakeholder expectations and the pace of change in healthcare continues to accelerate, health care organizations need to use technology to enhance patient care – emphasizing the outcomes, benefits to both patients and providers, and the overall efficiencies achieved as a result of implementing the Electronic Health Records. More than 120 Canadian ICT companies are actively involved in the health sector providing the talent and tools that can meet current and future expectations. Convinced that electronic connections between patients and clinicians will forge better, cheaper health care, the provincial and federal governments have started investing more on healthcare IT in pursuit of the sort of cost efficiencies and quality improvements that were captured long ago in banking, travel, and telecommunications sectors.

A recent strategy report on the industry has stressed the need to invest in and use technology in the health care system, particularly information and communication technology. It stresses that more intensive and standardized use of information technology will allow patient information to be collected and shared seamlessly, making treatment more effective (better outcomes and fewer errors) as well as efficient—thereby boosting the productivity of the system overall. The report further states the following transformational needs:

- Accelerate the deployment of analytics solutions to support the creation of information and evidence for clinical and administrative decision making in the quest to create a high-performing health system across Canada. Technologies include: clinical analytics and evidence development and use for clinicians, analytics to support LEAN, population health, research, planning, operations and evaluation.

- Support new models of care by expanding the deployment and use of EHR, EMR and other point-of-care solutions into all care settings to enable person-centered care and continuity of care, including, but not limited to, chronic disease management. Technologies include: EMR, EHR, referral management, discharge summaries, chronic disease management, and telepathology.

The key goals Transformation of Healthcare IT tries to achieve are:

a) Improvement in patient care
b) Enhance consistency of access to healthcare services and quality of service
c) Enhance overall health system efficiency to deliver value for money
d) Promote healthcare innovation through research

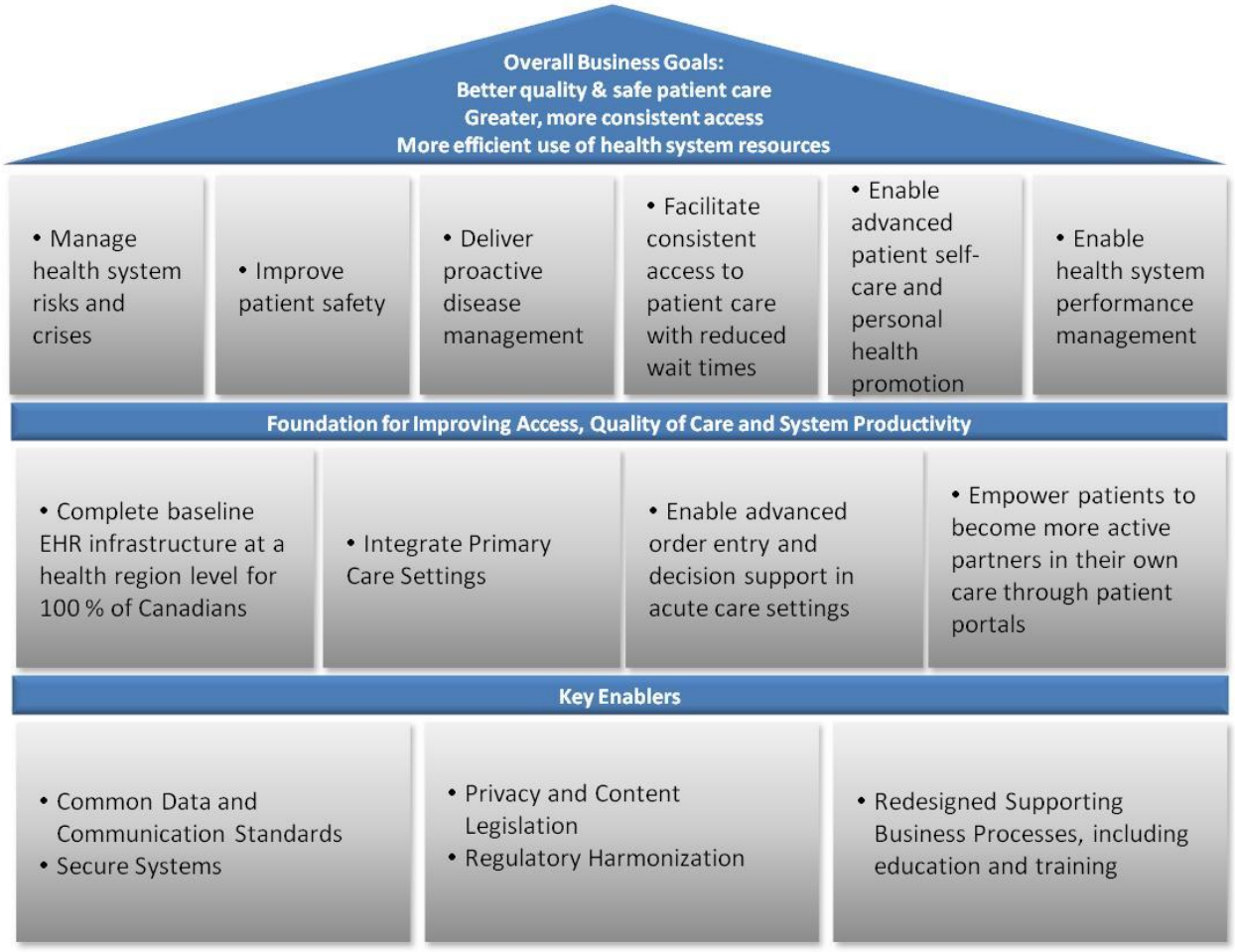

Figure 3: Health IT Vision in Canada

Some of the key IT transformation initiatives being implemented in the Canadian healthcare sector are:

- Integrated IT infrastructure at all levels of the healthcare system
- Redesign care processes and clinical documentation to deliver benefits in quality and productivity
- Linking silos of electronic information through progressive systems – implementation of EHRs, EMRs integration
- Strategic sourcing to secure access to Top Tier health care technology service providers
- Restructuring the IT service delivery model to ensure internal IT with focus on planning and strategy and work more collaboratively with business and providers in orchestrating IT delivery
- Adopting and maintaining IT Management Best Practices
- Implementing Common Clinical Platform across Provinces
- Developing products that empower patients, assist healthcare providers, and enable better population health monitoring

Success Stories

In a battle against rising healthcare and hospital costs across the country Canada Health Infoway invested $6 million in the ambulatory hospital Electronic Patient Record (EPR) in the Women's College Hospital in downtown Toronto. Tackling high cost in-patient care is an open ended problem which is being partially countered by installing an Epic Systems EPR in a large state-of-the-art ambulatory hospital. The ambulatory EPR (aEPR) demonstrates clinical value in a multitude of fundamental functions like registering patients, entering encounter notes, problem lists, allergies, vital signs or prescriptions, generating automated alerts or reminders, receiving lab results or diagnostic imaging reports, accessing clinical reports or encountering summaries, producing referrals or consultation reports, integration with their provincial health insurance scheme as well as access to a central laboratories information system. It furnishes timely health care services in the remote and sparsely populated territories and provinces by serving as a common hub for hospitals, pharmacies and family doctors.

Healthcare IT standards

The Standards Collaborative launched in 2006 within Canada Health Infoway maintains and publishes health information standards which can be utilized by vendors, IT staff, technologists and clinicians. They can be viewed as the building blocks of electronic health records and provide an insight into the best ways to hook up the multiple systems used in hospitals and healthcare regions. It is a platform ensuring most up-to-date access to national and international healthcare IT standards with technical supporting tools for clinical decision support and reporting. This initiative helped in creating better workflows by virtue of seamless data paths finally resulting in enhanced patient outcomes

MyChart, first launched in 2006, was Canada's first online health records system giving patients virtual access to their health records. It helped patients to schedule appointments, read educational materials, and give other physicians and family member's access to their files. SunnyCare provides streamlining of emergency patient care by integrating all patient related information under one roof. It provides a one-stop repository of all clinical information greatly helping in removing ambiguity by keeping all care providers and clinicians on the same page.

Pharmacy Automation

Princess Margaret Cancer Centre, Toronto is using RIVA, an automated compounding system, for making chemotherapy drugs. It outputs the dose with the patient name, date, drug information and administration information printed on the finished product. It monitors weight and volume of doses, reads barcodes, measures the length of syringes and diameters of vials being loaded. The RIVA robotic arm uses ultra-violet light to kill any bacterial presence on loaded vials and also ensures air quality by using particle monitors. Furthermore it reduces the risk of human exposure to harmful cytotoxins. Priced around $1.5 million it provides significant time savings, long term cost benefits by reallocating pharmacy staff and most importantly safety for patients and staff.

Advent of IT in the mental health space has been limited, leading to most patient information being siloed. RelayHealth's Ambulatory Electronic Mental Health Record (EMHR) project is a new solution, which was awarded a $1 million grant from Canada Health Infoway to connect the various departments in different hospitals to share patient records. This clinical documentation software has the added benefit of automatically pulling together synoptic reports from various physicians and clinics, thus quickening the tedious task of producing discharge summary reports. The onerous job of dictating many pages followed by transcribing those reports is greatly reduced through synoptic reporting. This process could save hospital annual cost of around $900,000. Efficient patient handling due to dissemination of data amongst all concerned people has led to a decrease in re-hospitalization, which was a notable cost escalator in the past.

Integrated Electronic Patient Record

Implementation of Microdea Inc's Synergize software is being funded by eHealth Ontario on a region wide scale to improve document management. Its delivery of diagnostic imaging reports and discharge summaries has accelerated the movement of patient information to family MD's. It is a scalable and cost effective solution to integrate clinical systems and consolidate patient information, thus making it a key component for in-hospital or cross-hospital EPR strategy. The annual savings just in administration and paper costs at Brockville General, where it was first implemented in May 2011, is projected to be around $75,000.

Alberta Health Services (AHS) with an urgent need to improve IT service capability to better support AHS current and future needs, it has evaluated its current IT capabilities and determined the following actions which need to be undertaken:

- The implementation of a province-wide common clinical platform – The platform will enable cross continuum standards, 'one patient, one record', facilitate collaborative practice, eliminate practice variability and greatly increase patient safety and enable better cost management.

- The adoption and implementation of Enterprise IT Management Best Practices - re-engineer IT governance, IT financial management, business engagement model, service management capabilities, program management and architecture to ensure IT meets the strategic, tactical and operational needs of the business while containing the overall increasing annual cost growth.

- The transformation of an Enterprise IT Service Delivery Model leveraging third party service providers

Quantifying potential benefits

The Commonwealth Fund Survey 2012 came out with results of multiple questionnaires posed on use of electronic patient medical records in practice. The prime monetary benefits were derived from reduced chart pulls (health record), improved management of diagnostic tests, reduced number of duplicate tests, reduced number of adverse drug events and improved preventative care.

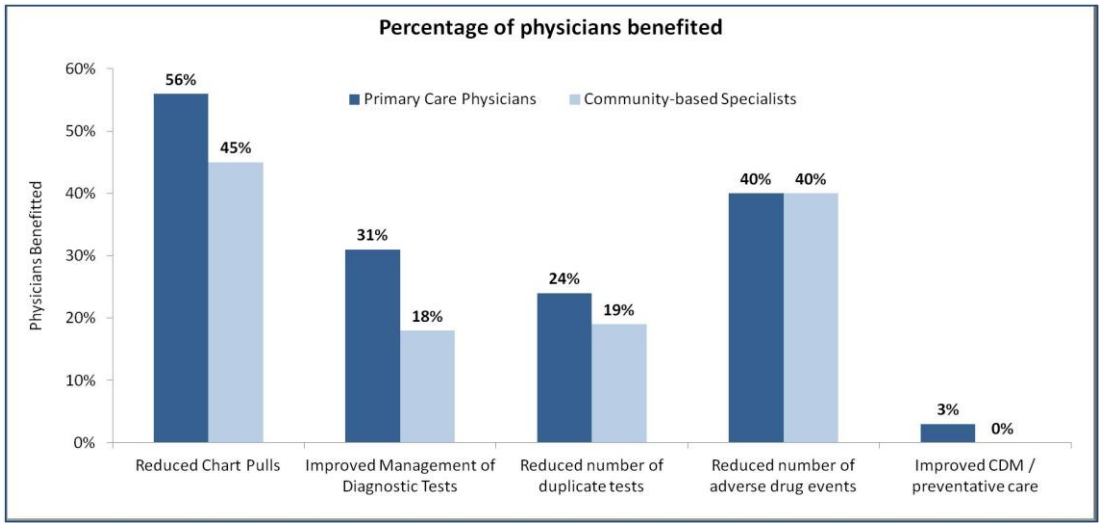

Figure 4: Percentage of physicians benefited

Canadian Health Infoway came up with a model to put a figure on the benefits accrued from all the above factors. The model for putting a figure on the gains from reduced chart pulls went on to quantify the advantages of reduced staff time spent on paper based administrative tasks at the primary care physician and the community based specialist.

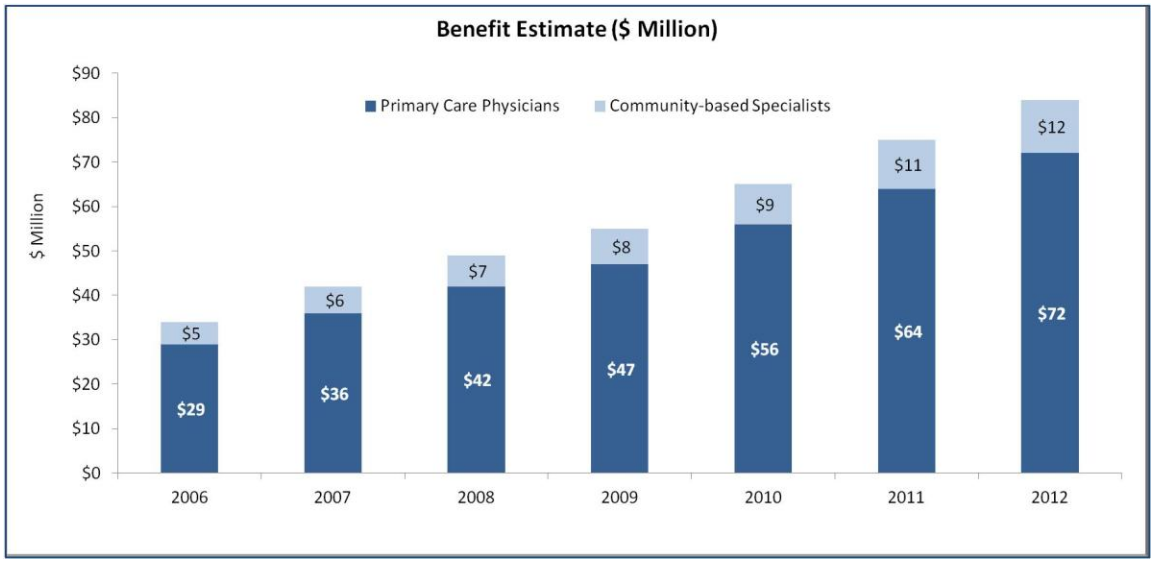

Figure 5: Annual savings accrued from reduced chart pulls

Close to a 3 fold increase in savings was observed in the last six years from reduced chart pulls for primary care physicians, while savings more than doubled for specialists for the same duration. The use of reduced chart pulls was 19% lower in case of specialists than primary care physicians. The future widespread adoption of EMR's in the specialist's community would greatly add to the gains.

Similar or even better results in terms of cost efficiency were observed from the other advantages associated in using EMR's. The figures assume greater relevance when compared to health spending in Canada which increased by 4.6% per year on average from 2000 to 2009 but slowed down to 3% in 2010.

Conclusion

The slowing Canadian economy has put a great burden on a fully government supported health care system and in such a scenario every avenue for saving needs to be explored. In Ontario, government spending on healthcare is estimated to touch 80 percent of the budget by 2030.

The ICT companies plan to deliver value to the healthcare sector by leveraging the following strategies:

Integrated Service Delivery: Coordinating healthcare services centered on the needs of patients/clients and specific population groups

Shared Back-Office Services: Integrating human resources/payroll, supply chain and information management and IT across health organizations and regions to improve efficiencies

Digital Backbone: Utilizing technology to better integrate, standardize and transfer knowledge of administrative and clinical information

Innovation: Improving treatment, efficiency and outcomes through technology, innovation and process changes

Infrastructure and Service Delivery: Balancing public and private interests in health care infrastructure investments as well as health care delivery

Healthcare IT provides a myriad of solutions and more than 120 Canadian ICT companies including major multinationals like Cognizant, TCS, CGI, IBM and Accenture are actively involved in the health sector to reduce time and cost while enhancing patient benefits. The solutions bring on board physicians, specialists and health care staff by creating a unified database for all patient's medical history. The fast countrywide adoption of these IT standards would lead to long-term benefits by removing impediments to universal healthcare.

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