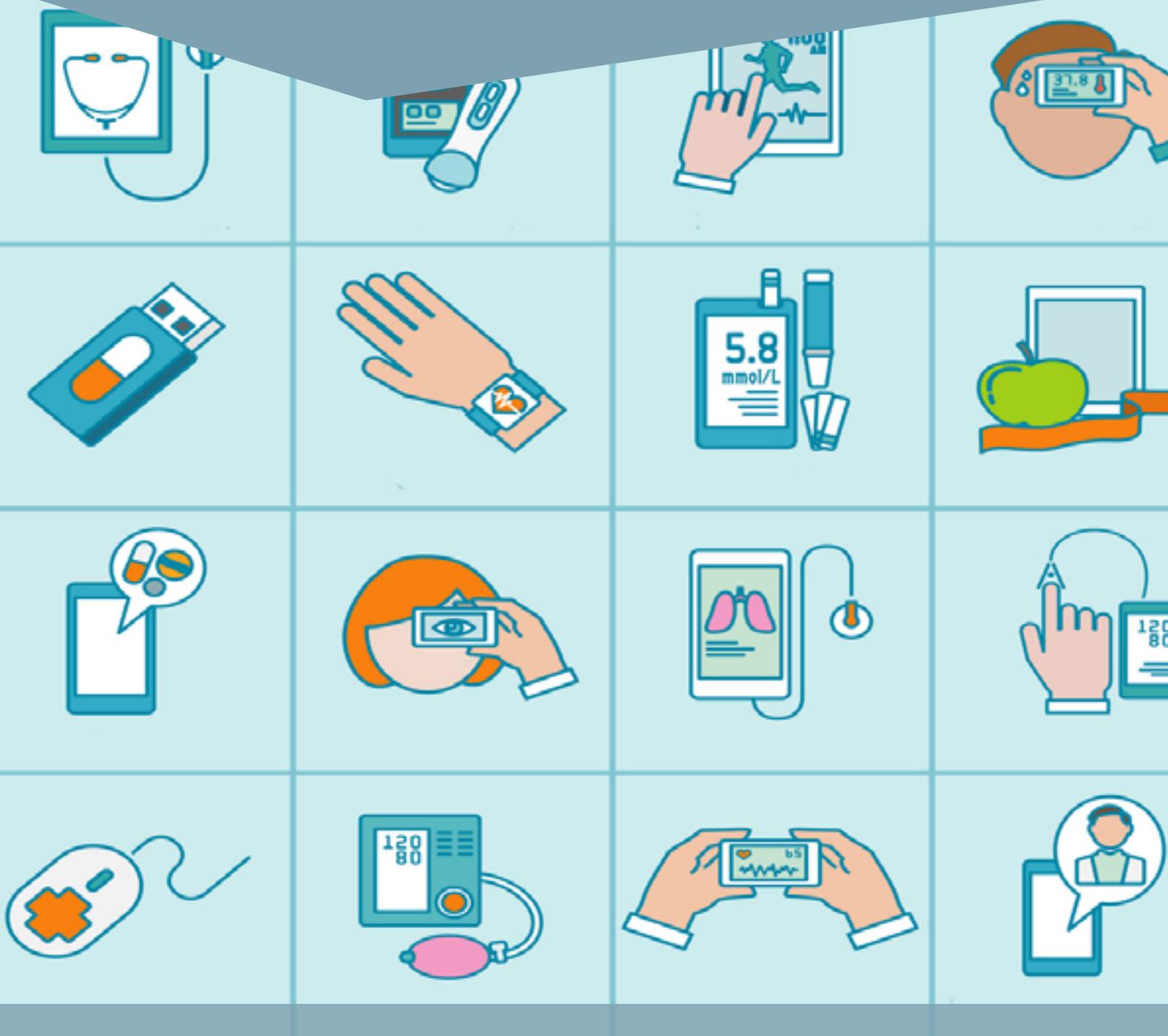


Technologies Transforming the Healthcare Landscape



Trend Focus: Issue 2

THE PREVALENCE OF TECHNOLOGY

Innovations in ICTs have become drivers of economic productivity and growth in all spheres of life. Not only have these enabling digital technologies changed the way we live our daily lives, but also the way we experience healthcare. The continued adoption of ICTs in healthcare has also led to economic opportunities, creating new and redefining existing occupations, increasing productivity, reducing costs, generating revenues, as well as improving collaboration and innovation. There is a growing body of evidence highlighting that the benefits from adoption of technologies are [substantial](#), often even revolutionary. Investing in technological adoption gives the highest return on investment when complementary investments in upskilling the workforce to keep pace with the changing technologies is ensured. [Strategies](#) and measures to circumvent talent shortage and skills mismatch are crucial in this regard.

ICTS CHANGING HEALTHCARE

Continued progress in critical elements of our healthcare services – including areas such as patient safety, treatment quality, better record keeping resulting in better overall health, and cost efficiency – is crucially dependent on our use of ICT in healthcare. Though the precise nature of the impact is unique to each technology and can often be quite challenging to estimate, modern healthcare services undeniably benefit from advances in connectivity and technologies.

For instance:

- Healthcare providers work together with patients, families, and care providers to ensure accurate and comprehensive medication information is communicated consistently across transitions of care to ensure that medications being added, changed, or discontinued are carefully evaluated
- Patients routinely seek advice from off-site doctors via telemedicine or telehealth
- The elderly can receive support in their daily life at home by means of eHealth
- Chronic heart patients can receive treatment via video consultation
- Many state-of-the-art healthcare facilities provide internet-based consultancy service for overseas patients
- Data transfer via cell phones and personal data assistants allow tracking the use and dosage of drugs
- Medical professionals update their skills through internet-based advice and training initiatives

ICTs are also transforming healthcare-related knowledge and processes by facilitating the creation of discussion groups and networks beyond family, community, and even national boundaries. As a result, people are gaining the required knowledge to make more informed healthcare choices. Online forums and networks are allowing those facing healthcare-related issues to share information, identify trustworthy service providers, seek advice, and raise awareness for improved treatment.

INTERSECTION OF HEALTH AND ICTS CREATING A NEW VALUE CHAIN

The prevalence of ICTs is not only benefitting society and allowing people to connect and share, but also creating a whole new value chain known as health ICT – companies that provide technology solutions for healthcare providers. This unexplored economic sector needs a thorough understanding to unleash its full potential – both economic and with respect to contribution to improved healthcare – and to this end, ICTC just released a [study](#) with funding from Canada Health [Infoway](#). This study focused on Canadian for-profit companies conducting business in the health ICT sector, excluding multinational companies operating in Canada but headquartered elsewhere. Despite the challenges encountered in defining this relatively new sector, the key findings of this study illustrate that the Canadian health ICT sector is strong and growing in all critical measures of economic stimulus:

- Approximately 700 companies currently make up the health ICT sector in Canada (excluding the multinational companies headquartered elsewhere). This is arrived through consultations with multiple sources including Export Development Canada (EDC), Information Technology Association of Canada (ITAC), Industry Canada, Key stakeholders, and subject matter experts.
- Canada's health ICT sector generates an estimated \$3.4 billion in revenues annually, and makes an estimated \$1.5 billion contribution to Canada's GDP. Average annual growth over the last five years in Canada's health ICT sector is estimated at 19 percent, outgrowing most economic sectors in Canada. In this period, the overall Canadian economy grew by less than three percent.
- The adoption of ICTs in healthcare in Canada and internationally has resulted in a significant number of jobs being created in the health ICT sector. An estimated 47,400 professionals are currently employed in and by the health ICT sector, with more than 32,000 new jobs expected to be created by 2020. In the near term, over four out of five health ICT employers expect employment to increase in their companies in 2015.
- The health ICT sector has a domestic focus with global reach, as more than half of the companies export their health ICT products and services. At present, nearly two-thirds of the revenue generated by the health ICT sector is sourced domestically, while a quarter of the revenue is generated from the United States and a tenth from the rest of the world.
- The health ICT sector is innovative, as two in five companies hold their own patents. Investments in health ICT research and development (R&D) is expected to grow from the current level of \$210 million annually. Nearly half the companies in the health ICT sector are projecting their R&D expenditure to increase over the next three years. Three-quarters of the health ICT companies that invest in R&D do so in Canada, while nearly a tenth do so in USA in collaboration with American partners and counterparts.

INNOVATION KEY TO BOTH THE QUALITY AND SUSTAINABILITY OF CANADIAN HEALTHCARE

A high level Advisory Panel on Healthcare Innovation identified [five](#) broad areas where federal action is important to promote innovation and enhance both the quality and sustainability of Canadian healthcare. Each of these five areas will have to rely on the health ICT sector heavily to innovate in:

1. patient engagement and empowerment
2. health systems integration with workforce modernization
3. technological transformation via digital health and precision medicine
4. better value from procurement, reimbursement, and regulation
5. industry as an economic driver and innovation catalyst

ICTS DRIVING A PARADIGM CHANGE IN THE HEALTHCARE ECOSYSTEM

Some ICT-enabled innovations that are not too far from being commonplace is set to change the existing service provider-care seeker paradigm. There are software that scan databases of clinical protocols best practices to guide diagnosis, recommend treatment, and monitor implementation. When widely adopted, such processes has the potential to limit the discretion of healthcare professionals and transform existing relationship paradigm within healthcare service providers. New healthcare models where service providers demonstrate ICT-based self-regulatory mechanisms to deliver quality care at reasonable cost will be attractive propositions.

For emerging ICTs to be adopted, the innovations have to take into account user needs and address societal and ethical concerns. In ICT innovations related to healthcare domain, patient safety and security, trust and privacy are of utmost importance. To ensure the adoption of new healthcare services, innovative technologies need to be complemented with new methods that can establish trust among patients in healthcare service providers with respect to quality, reliability, and privacy.

IMPACT OF GREATER ICT ADOPTION ON THE CANADIAN ECONOMY

Greater adoption of technologies is good for healthcare providers as their productivity level increases, costs decrease, and thus helps sustain their operations. How does it benefit us as individuals? Notwithstanding the precise nature of the impact is unique to each technology, some of the potential benefits can be projected. Let's take remote patient monitoring and diagnostics, for instance. Enhanced capability in this area using mobile technologies and devices will reduce both in- and out-patient care burden on hospitals, as monitoring and diagnostics will be done remotely. This will tremendously help our predominantly publicly funded healthcare system. It is estimated that annual healthcare spending in Canada is approximately \$220 billion and growing, the biggest share (30%) of which goes to hospitals. Even a 1% reduction in patient care costs of hospitals due to wide adoption of remote patient monitoring and diagnostics would translate to over \$700 million in cost savings annually, not to mention the health benefits associated with reduced risk of contracting germs and other illnesses from hospital visits, fuel cost savings for the patients and their families, and the longevity of infrastructure as well as the environment, to name a few of the benefits.

Looking at it in a different way, healthcare expenditures are not uniform across Canada. On average, provinces spend nearly 40% of their total annual budgets on healthcare. Per capita healthcare expenditure in Canada is \$5,988, ranging from \$5,775 in British Columbia to a \$7,132 in Newfoundland and Labrador ([Canadian Institute for Health Information](#)). If, for instance, the wide adoption of remote patient monitoring and diagnostics as well as other emerging technologies can level the fields and all provinces can provide healthcare at the same per capita cost as British Columbia does at present, annual healthcare spending in Canada would decrease by \$8 billion, alleviating some of the pressure on a healthcare system under tremendous stress with exploding demand due to a rapidly aging population.

EXPLORING THE ALL-INCLUSIVE HEALTH ICT SECTOR

THE NEXT FRONTIER

Many of the large international firms with a substantial presence in Canada's healthcare landscape, such as IBM, Cerner, and Meditech, have been excluded from our exploratory study highlighted above. This was mainly due to the difficulty of obtaining accurate information that applied specifically to Canada. It is important to note that the contributions of these multinationals – along with public sector organizations and healthcare providers who were also excluded – would lead to much higher projections of the employment and economic contributions of the health ICT sector. Nevertheless, the initial findings illustrate that further research and effort are needed – and ICTC aims to do so in the near future – to better define and continue to understand the impact of the all-inclusive health ICT sector has on the overall economy.



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OUR MAILING ADDRESS IS:
INFORMATION AND COMMUNICATIONS TECHNOLOGY COUNCIL - ICTC
116 LISGAR STREET
SUITE 300
OTTAWA, ON K2P 0C2
CANADA