

## HHRP ISSUES – A SERIES OF POLICY OPTIONS

### ENHANCING WORKFORCE PRODUCTIVITY AND INCREASING CAPACITY IN THE HEALTH SYSTEM THROUGH INFORMATION AND COMMUNICATIONS TECHNOLOGY

*In 2006, the World Health Organization estimated a worldwide shortage of almost 4.3 million doctors, nurses and other health-care workers.<sup>1</sup> Factors such as an aging population and the growing incidence of chronic diseases will continue to challenge the capacity of the health system in Canada and other countries across the globe in the coming years. Implementing effective strategies for retaining the existing workforce and recruiting new health-care professionals will not be enough to address workforce shortages: innovative approaches are also needed to enhance the productivity of the health workforce. New strategies using information and communications technology (ICT) can revolutionize Canada's health system. By adding efficiencies and reducing errors, the use of ICT will improve quality, productivity and financial performance. ICT must be implemented in the health system to increase the productivity of the health workforce and its capacity to provide quality care.*

#### **Information and Communications Technology and Labour Productivity**

Over the past few decades, information and communications technology (ICT) has transformed business activity in Canada and around the world, making transactions faster, cheaper and more efficient. The impact has been profound in the manufacturing and service sectors, among others. For example, in 2006, United Parcel Service (widely known as UPS) saved 12 million litres of fuel by using online networks to optimize delivery routes for approximately 100,000 trucks.<sup>2</sup> Airlines can now process 82 per cent more passengers per hour by providing self-serve check-in kiosks rather than traditional desk check-in.<sup>3</sup>

Evidence shows that investment in ICT is associated with innovation and increased productivity. Canadian researchers have found superior productivity growth among manufacturing plants that exploited the use of communications technologies.<sup>4</sup> Similarly, in a comparison of selected countries in the European Union, the Organization for Economic Co-operation and Development (OECD) found higher labour productivity in industries

where larger proportions of employees were linked by broadband (see Figure 1).<sup>5</sup> The large increase in productivity growth rate in the United States at the end of the 20th century, from 1.2 per cent in the 1980s to 1.9 per cent during the 1990s, was attributed to substantial investments in machinery and equipment, particularly ICT.<sup>6</sup> According to the OECD, information technology is “key to facilitating new organisational approaches,” and the greatest improvements in productivity occur from the synergy between ICT and changes in organizational processes.<sup>7</sup>

A recent report by the Conference Board of Canada highlighted the need for Canada to improve productivity. At the time of the report, Canada was in 8th place among 17 peer countries for labour productivity growth rates and in 15th place for overall productivity levels (dollar value of output per hour of work).<sup>8</sup> Although ICT is considered essential to organizational innovation and productivity, Canada's spending on machinery and equipment (including that related to ICT) as a percentage of gross domestic product (GDP) is lower than that of most peer countries.<sup>9,10</sup> The Conference Board of Canada has pointed out that making larger investments in ICT would be a way for Canada to boost labour productivity.<sup>11</sup>

**Figure 1: Labour productivity and broadband in selected European Union countries, 2001-2004**



Source: Organization for Economic Co-operation and Development. (2008). *The future of the Internet economy – a statistical profile*. OECD Ministerial Meeting, Seoul, Korea, June 17-18, 2008. Paris: OECD Publishing.

### **ICT in the Health-Care Industry**

Health-care systems both within Canada and abroad have implemented various information technologies to support clinical functions: medication administration, clinical decision-making, documentation, physician order entry, patient education, scheduling and communication among health-care providers. The benefits of applying ICT to the health sector are numerous. ICT can be used to give patients the information they need to navigate the health system and to make choices about their care. It can make communication with patients and their families faster and more accurate, resulting in shorter wait times and fewer errors. Finally, it gives health-care providers timely access to the results of tests and procedures so that assessments, examinations and treatments are not repeated. All of these outcomes mean enhanced productivity, improved service and lower costs.

International and domestic experiences have shown that there are efficiencies to be gained by using information technology in health care:

- In Denmark, “e-prescribing” has cut the medication error rate from 33 per cent to 14 per cent.<sup>12</sup>
- Also in Denmark, information systems have saved physicians 50 minutes per day and have reduced telephone contact between doctors and hospitals by 66 per cent.<sup>13</sup>
- Telehealth home care and chronic disease management programs have reduced emergency department visits by up to 40 per cent, hospital admissions by at least 32 per cent and the number of admissions to long-term care by 47 per cent among those using these services.<sup>14</sup>

- The use of electronic records in intensive care has reduced mortality rates by up to 68 per cent.<sup>15</sup>
- Diagnostic imaging technology has improved the efficiency of clinical decision-making and has created a capacity increase equivalent to as many as 500 additional specialists across Canada.<sup>16</sup>

Although the benefits are immense, Canada’s spending on ICT in the health system is much lower than that of other developed countries. On average, Canadian hospitals allocate 1.5 per cent of their budgets to information technology, whereas OECD comparator countries spend approximately 4.4 per cent.<sup>17</sup>

### **Advancing ICT in Health Care**

Canada’s health system has realized some clear benefits by using ICT, but progress in adopting this technology has lagged behind that achieved by the banking industry and other sectors by as much as 25-30 years.<sup>18</sup> The full impact of ICT in the health system cannot be achieved without a comprehensive and integrated approach to the development and implementation of the necessary infrastructure. Canada Health Infoway’s effort to develop the electronic health record (EHR) system will result in integrated access to information within a jurisdiction. EHRs will establish the foundation for more efficient delivery of health care.

Canada must accelerate the implementation of ICT to support innovation, increased productivity and the long-term sustainability of the health system. Governments

and health-care professionals have a key role in advancing ICT in the health system to achieve these goals.

## 1. Investing in ICT

Canada Health Infoway estimates that a robust pan-Canadian electronic system for health records will require an incremental \$10 billion capital investment and an additional \$1.5 billion to \$1.7 billion annually in operating expenses.<sup>19</sup> However, it has also been estimated that these costs could be recovered within 10 years.<sup>20</sup> Savings of at least \$6 billion per year are expected through better utilization of resources, a reduction in duplication of tests and a reduction in errors. Such a transformational investment would reshape the future of health care.

The business case for investing in technological innovation extends beyond the health system. The Conference Board of Canada has identified a number of potential benefits of the EHR to the Canadian economy:

- 37,000 new jobs and \$2 billion in new labour income by 2010;
- \$1 billion in corporate pre-tax profits generated from investments in the EHR; and
- \$1.34 added to Canada's GDP for every \$1.00 invested by Canada Health Infoway and its jurisdictional partners.<sup>21</sup>

Canada's initial investment in electronic health information systems was strong, but the infrastructure is not complete. There is a large gap between what has been allocated to Canada Health Infoway and what is needed to support full ICT implementation. Further investments will be needed to ensure all Canadians have access. Federal, provincial and territorial governments must continue to support the implementation of EHRs.

## 2. Creating incentives for adopting ICT

Canada Health Infoway's focus for the implementation of the electronic health record has been on acute care settings. However, it is imperative that community care providers are also connected. The current trend toward increased provision of community-based care; the need to proactively manage chronic diseases, reduce admissions and shorten hospital stays; and the need for sharing real-time informa-

*Canada currently spends 1.5 to 2.5 per cent of its \$100 billion health budget on information technology (IT). With the proposed incremental \$10 billion investment in capital and \$1.5 billion in annual operating expenses for the electronic health information system, Canada's IT expenditures in 10 years will represent approximately 4.5 per cent of the annual health budget. In comparison, banks currently spend 5 per cent of annual revenues on IT.*

Source: Canada Health Infoway. (n.d.). 2015: *Advancing Canada's next generation of healthcare*. Toronto: Author.

tion during outbreaks of communicable diseases are all important reasons for the community sector to be equipped with information technology.

Through the tax system, the federal government can create a business environment that encourages investment in ICT. Incentives such as a 100 per cent rebate of the goods and services tax charged on ICT purchases for the health system would support investment in ICT by a broader range of health organizations.

## 3. Involving nurses in ICT decisions

Nurses use ICT for all kinds of clinical, education, administrative, research and health system initiatives. ICT has become an integral part of nursing practice, bringing both challenges and opportunities to optimize client health outcomes.

Registered nurses have been leaders in telehealth services and nurse-led patient advice lines, which are now improving access to primary care in many parts of the country. As well, nurses have been nominated to participate in all committees and working groups of Canada Health Infoway while it stimulates the development of EHRs.

The continued involvement of nurses is critical to the successful implementation of ICT in health care. Nurses must participate in the decisions about technology that will affect nursing care and bring about efficiencies in the health system.

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