

Trend 2 – SUSTAINABILITY, PRODUCTIVITY, AND INNOVATION IN THE HEALTH CARE SYSTEM

INTRODUCTION

Health system sustainability is critical in order to have a system that is able to meet current and future obligations and expected outcomes; adjust to meet new demands and unexpected system pressures; improve and be capable of sustaining improvement; and provide increasing values in both economic and health outcomes.¹ Four indicators can be used to measure characteristics of health system sustainability: health spending, productivity, health human resource supply, and investment in information management.² Productivity is estimated by comparing the fluctuations of inputs and outputs. Inputs are any resources invested in the system, and outputs refer to the services provided to patients.³ However, estimating productivity in health is complex,⁴ and health care quality (e.g., safety, efficiency and timeliness) and innovation are also important to sustainability.^{5, 6, 7}

SUMMARY OF KEY FINDINGS

Growing Challenges

- **Sustainability:** The key driver in escalating health care expenditure is increased utilization of services. Based on past trends, The Ontario Ministry of Finance estimates that utilization will grow at a rate of 1.5% per year.
- **Productivity:** Ensuring sufficient levels of health human resources (HHR) over time enables the system to provide care when it is needed. Labour productivity in Canadian Health and Social Assistance (CHSA) measured by real GDP dropped 0.69% per year from 1987 to 2006.

- **Innovation:** The Ministry of Health and Long-Term Care as well as other ministries such as the Ministry of Research and Innovation, invest millions in research and development annually. Despite Ontario's efforts to support innovations in such areas as biotechnology, new drugs and biotechnology products are often too expensive for the government to purchase for the public.

Emerging Responses

- **Sustainability:** Adopting a prospective fee-for-service (i.e. Diagnostic Related Group "DRG") or rationing of services.
- **Productivity:** Lean initiatives have been implemented in various organizations including the UK government and in one of Quebec's Health and Social Service Centres to improve quality and efficiency and reduce costs.
- **Innovation Focused on Sustainability:**
 - Involving patients in decision making as a way to reduce the use of discretionary surgery.
 - Self-management as a new approach to dealing with chronic care.

GROWING CHALLENGES

Sustainability in the Health Care System Canada

- In Canada, provincial-territorial government health expenditures have risen considerably over the past 35 years; total provincial-territorial health expenditures increased from 5% of GDP in 1975 to 6.8% in 2007.⁸

- Ontario public health care spending increased from 4.6% to 6.8% of Gross Domestic Product (GDP) from 1981 to 2007.⁹ The Ministry of Health and Long-Term Care health spending has grown from \$23.9 billion in 2001/02¹⁰ to \$46.1 billion in 2010/11, and is projected to increase by an additional \$6.0 billion by 2012/13.¹¹
- In 2005, the Ontario Ministry of Finance projected a 6.0% annual growth rate for provincial government health care expenditure from 2009/10 to 2024/25, accounting for 55% of Ontario's budget.¹² Health costs currently make up 42% of the Ontario government's total program spending and are expected to make up an even larger proportion of program spending in the future.¹³
- In 2005, the key driver in escalating health care expenditure was increased utilization of services. Based on past trends, The Ontario Ministry of Finance estimated that utilization would grow at a rate of 1.5% annually whereas costs attributed to the aging population were estimated to grow at a lower rate (1.1% annually).¹⁴
- Other contributing forces (besides utilization) to the escalating costs in health care spending are: increases in the population, aging in the population, inflation, and new, more expensive treatments, increased consumer expectations, new diseases and an increasing prevalence of chronic disease.¹⁵
- In Ontario, many health care programs and services are directed at seniors. Health care expenditures per person are approximately three times higher for seniors than for the average of the overall population. By 2030, seniors' share of Ontario's total population is projected to rise from 13.2 per cent in 2007 to 21.9 per cent.¹⁶
- According to an ICES study, for the time period 1996 to 2006, costs for cardiac medications increased by more than 200%, exceeding \$5 billion per year in 2006. Increasing age, risk factors (such as hypertension and diabetes) and inflation accounted for about two-thirds of the increase in costs while use of new, relatively

expensive medications accounted for one-third of the increase. If the use of cardiac medications continues to increase at the same rate, estimated costs could reach \$10.6 billion by 2020.¹⁷

- There is also concern that the current budgeting system for Canada's hospitals (block grants or global budget) is not providing enough incentives for efficient and high quality hospital care, particularly in Canada's uncompetitive health care environment.¹⁸

Global

- In the US, health care providers consumed approximately \$1.9 trillion (USD) or 16% of the GDP in 2008. Currently, the US per capita health spending is \$7538 (USD); approximately 161% of Canada's spending and roughly double that of Spain, Italy and the UK.¹⁹ The US Congressional Budget Office estimates spending on programs such as Medicare and Medicaid will grow from roughly 5% of the GDP today to about 10% in 2035, and will continue to increase thereafter.²⁰
- In the US in 2006, expenditures on outpatient imaging were estimated to be about US \$100 billion. Between 1995 and 2005, there was a fourfold increase in advanced imaging reimbursed under the Medicare Physician Fee Schedule.²¹
- In the UK, age-related health spending is projected to increase from 7.4% of GDP in 2007/08 to 9.9% in 2057/58.²² The NHS has a finite budget, and, according to James Gubb, "will not be able to afford all the medical care that people want or need."²³ It has been suggested that, "efficiencies can only account for small savings; society will have to decide whether to fund this increase by paying higher taxes. If it does not wish to pay higher taxes, it must accept that it will be necessary to prioritise services."²⁴
- In Australia, health spending is projected to grow from 4.0% of GDP in 2009/10 to 7.1% in 2049/50. An aging population, increased demand for health services and the funding of new technologies are all expected to contribute to spending growth. From 2009/10 to 2049/50, real health spending on those

aged over 65 years is expected to increase approximately seven-fold. Over the same period, real health spending on those over 85 years old is expected to increase around twelve-fold.²⁵

Productivity and Quality in the Health Care System:

Canada

- Ensuring sufficient levels of health human resources (HHR) over time enables the system to provide care when it is needed. The Ontario government is accelerating growth in certain areas and is taking steps to increase HHR.²⁶ For example, the current Ministry of Health and Long-Term Care HealthForceOntario strategy aims to provide the right number and mix of qualified health care providers through such goals as introducing new and expanded provider roles to increase the number of providers working in health care and build on the skills of those already in the system.²⁷ Continued growth in HHR supply should enable the system to meet expectations and improve future productivity.²⁸
- During the 1990s, health care delivery focused on cost containment. Cutbacks in HHR and the restructuring of the hospital sector forced the system to meet obligations under duress. Between 2000 and 2004, significant investments were made to enhance quality of health care; however, evidence suggests that overall the system's outputs have not kept pace with inputs in terms of productivity.²⁹
- Labour productivity in Canadian Health and Social Assistance (CHSA), measured by real GDP, and dropped 0.69% per year from 1987 to 2006.³⁰
- A report by the Ontario Health Quality Council concluded that though wait times have decreased for many surgeries, people in Ontario still wait too long for urgent cancer surgery, MRI scans, specialists, and a space in a nursing home. As well,
 - In 2009, 43% of family physicians in Ontario had electronic records, compared to 49% in Alberta and British Columbia and 95-99% in

Australia, New Zealand, the UK, Norway and the Netherlands.

- Ontario doctors with EMRs are not fully utilizing available tools to improve quality, such as electronic reminders for guideline based interventions of screening tests (16%) or checks for drug errors. (28%). In Australia, nearly all doctors use these tools.³¹

Global

- In the US, quality improvement rates are lower than increases in health spending. Health care expenditure increased 6.7% over 1994 to 2005.³² The quality of health care improved by an average of 2.3% between 1994 to 2005, showing important advances but an overall slowing in quality gains.³³
- Efficiency is a global issue, as numerous studies have documented that rates of inappropriate hospital days in paediatric hospitals around the world range from 20% to 60%.³⁴

Innovation as a Driver of Cost in the Health Care System:

Canada

- Despite Canada's efforts to innovate, no leading companies have emerged, salaries are lower than the US, patent output is lower and R&D per capita is lower.³⁵ A lack of venture capital investments needed to turn R&D ideas into successful business initiatives has also been blamed for limiting Canada's ability to fund innovative companies in their early stages.³⁶
- A comparative analysis of Toronto's biopharmaceutical cluster concluded that the extent of the provincial and federal governments' impact on buyers of biopharmaceuticals and their focus on price leads to reduced opportunities for innovation in the cluster and indirectly prevents the development of a healthy supplier infrastructure that can provide the specialized support.³⁷
- A large investment in biotechnology may create a paradox where new

biopharmaceuticals are developed but Canada will not be able to afford them.³⁸

Global

- The OECD New and Emerging Health Related Technologies (NEHRT) project concluded that more work must be done to align health system objectives with policy decisions in new technology sectors. They stress the importance of government communication in order to coordinate with and between multiple departments.³⁹
- Since governments are a main pharmaceutical purchaser, the rising costs of pharmaceuticals are important for future budgeting. From 2001 to 2005 biopharmaceutical sales have increased in the US (127%), Canada (213%), France (227%), Germany (235%), Italy (189%), Spain (190%), UK (158%), Australia (230%), Japan (82%).⁴⁰

EMERGING RESPONSES

Sustainability in the Health Care System

- If Canada's tax revenue rose to 36% of the GDP (average for OECD countries) there would be much more revenue available to fund health care spending. This new funding would make the argument for unsustainable health care spending less viable.⁴¹
- Moving towards a prospective fee-for-service (i.e., Diagnostic Related Group "DRG") requires the government to pay a fee to the service provider (hospital) for each individual cared for, based on the average expected costs of treating the patient's condition. Swedish councils that adopted a DRG system achieved 13% cost savings. In Denmark the DRG system led to increases in productivity. In Italy the DRG system resulted in a 32% cost reduction in the cost per discharge. Prospective fee for service programs have also been successful in Australia, where Victoria hospitals achieved a 25% reduction in costs per patient.⁴²
- The Oregon Health Plan (OHP) in the US was the first public insurance program to ration medical care explicitly, systematically, and openly by denying coverage of some health care services. During its first five years of operation, the OHP saved the state 2% of total expenditures. Lessons from the Oregon experience include: Explicit service delisting is unlikely to produce substantial savings and the process of rationing services makes it harder to control costs due to public pressure during the delisting process.⁴³
- The British Medical Association recommends a fair and open approach to priority setting and the rationing of services, while at the same time, providing a mechanism to review and change priorities according to public views. This can enable the creation of core services and define a process for patients to access additional services.⁴⁴
- As part of the 2009 US economic stimulus package, \$1.1 billion is designated for comparative-effectiveness research. Comparative-effectiveness research compares clinical outcomes, effectiveness, and appropriateness of items, services, and procedures that are used to prevent, diagnose, or treat diseases, disorders, and other health conditions.⁴⁵ The funding was allocated to the Agency for Healthcare Research and Quality (\$300 million), the National Institutes of Health (\$400 million), and the Office of the Secretary of Health and Human Services (\$400 million).⁴⁶
- Sustainability can be addressed through assuring appropriateness of medical treatments. The Ministry of Health and Long-Term Care and the University Health Network, in partnership with St. Joseph's Healthcare Hamilton, have developed an MRI and CT online decision support tool for use by physicians to determine appropriateness of testing.⁴⁷
- In the UK, the government has recently announced plans to make structural changes to the National Health Service (NHS). Stating that layers of national and regional organisations have resulted in excessive bureaucracy, inefficiency and duplication, the government intends to delayer and simplify the number of NHS bodies, and expects to reduce the management costs by more than 45% over the next four years as a result.⁴⁸ The nation's 152 primary care trusts (PCTs) will be gradually phased out,

and replaced by several hundred general practice consortia, a transition which would pass control from health service managers to general practitioners.⁴⁹

- Similarly, private insurers in the US are increasingly contracting with radiology benefit management programs (RBMs) to reduce overall use and expenditures for radiology services. In most RBMs, referring physicians are required to submit requests for advanced imaging and obtain approval before such procedures are performed. The RBM uses algorithms and clinical decision-support criteria, based on evidence from published clinical literature, to determine the medical necessity of the diagnostic exam or to suggest whether an alternative treatment is clinically indicated.⁵⁰
 - One recent study in the US found that the result of using a three-tiered RBM was that 4% of the total requests for CT or MRI scans submitted to the RBM company in 2008 were either cancelled or changed to more appropriate scans.⁵¹
 - A study comparing the records of 459 CT and MRI examinations to the guidelines used by a RBM found that 26% of the examinations were considered inappropriate by the RBM's standards.⁵²

Productivity and Quality in the Health Care System:

- On June 3rd, 2010, the Ontario Legislature passed the Excellent Care for All Act, which will make health care providers and executives accountable for improving patient care. The legislation requires health care organizations, starting with hospitals, to:⁵³
 - publish annual quality improvement plans
 - create quality committees to report on quality related issues
 - link executive compensation to quality plan performance improvements
 - implement patient and employee satisfaction surveys and a patient complaints process.⁵⁴
- The Agency for Healthcare Research and Quality's (AHRQ) annual companion Quality

and Disparities reports measure quality in four areas – effectiveness of care, patient safety, timeliness of care and patient centeredness.⁵⁵ This is a starting point for defining what quality is in health care.

- Furthermore, the AHRQ has developed specific quality indicators in prevention (PQI), inpatient (IQI), patient safety (PSI) and paediatric sectors (PDI).⁵⁶ There is also a growing consensus and collaboration among diverse stakeholder groups involved in the measurement, development and implementation of quality standards and specific measures.⁵⁷
- In 2008, Medicare was offering bonuses to hospitals that excelled in the use of best-practice guidelines and was phasing out payments for treatments that were caused by improper hospital care.⁵⁸
- In the UK, government Lean techniques achieved double digit productivity gains in documents processed per hour and improved customer service by decreasing lead times and eliminating back logs. The use of Lean techniques in other government organizations may prove to be a future solution to improve quality/efficiency and reduce costs.⁵⁹
- The Ontario Health Quality Council reports that the province has made significant improvements in the use of information technology, particularly in the use of electronic medical records (EMRs). The proportion of family doctors who have an EMR system has risen from 26% in 2007 to 43% in 2009 due to the OntarioMD program,⁶⁰ which funds and assists physicians to acquire, implement and adopt IT, helps them transition from paper records to EMRs and providing them with easy access to information and resources to improve the quality of patient care and practice efficiency.⁶¹
- In the province of Quebec, the Health and Social Service Centre (CSSS) of the Valée-de-l'Or successfully implemented a Lean initiative in the CSSS' Surgical Ward at Val-d'Or hospital. Specifically, the reorganization of the patient journey for day surgery (including physical space usage, reorganization of medical equipment, and

waiting lists) was targeted. Implementation of Lean Healthcare in the Surgical Ward led to a 20% improvement in productivity and capacity; 50% reduction in waiting times, 40% reduction in waiting room waits, 30% reduction in usage of medical equipment, and a potential reduction of costs (\$500,000).⁶² More recently under the same initiative, the hospital met and surpassed its goal to drop wait times for ambulatory patients in the emergency department to between two and three hours.⁶³

- Lean initiatives are also being rolled out in many Ontario hospitals. The University Health Network,⁶⁴ North York General⁶⁵ and St. Joseph's⁶⁶ hospitals in Toronto have all implemented Lean techniques to increase productivity and quality (patient safety). North York General hospital won a national patient safety award in 2008 due to its implementation of Lean methodology to improve patient flow.⁶⁷
- Surgical checklists are a tool being studied around the world to determine if they can improve team communication and consistency of care to reduce complications and deaths associated with surgery.
 - The World Health Organization funded an eight country study (including one site in Canada) which found implementation of the checklist program was associated with concomitant reductions in the rates of death and complications among adult patients.⁶⁸
 - A recent cost analysis, based on the WHO study took into account implementation and per-use costs associated with the checklist. The study found that, for a US hospital with a baseline major complication rate after surgery of at least 3%, the checklist would generate cost savings once it prevented at least five major complications per year.⁶⁹
 - A 2010 study of a medical team training program in Veterans Health Administration (VHA) facilities, which included the use of checklists in the operating room, found that facilities in the training program had an 18%

reduction in annual mortality rate, compare with a 7% reduction at facilities that had not yet undergone training.⁷⁰

Innovation Focused on Sustainability in the Health Care System

- The Ministry of Health and Long-Term Care invests over \$80 million in health services research annually.⁷¹ This figure does not include health-related investments made by other parts of the Ontario government. Since 2001, the Ministry's research spending has increased by 38% cumulatively.⁷²
- In November 2010 the Ontario Ministry of Health and Long-Term Care and Health Achieve will host the fifth annual Celebrating Innovations in Health Care Expo. The event is centered around six innovation themes that relate to the province's Excellent Care for All Strategy,⁷³ and provides an opportunity to discuss current achievements and approaches underway as they relate to improving integration, patient-centeredness, evidence-based practice, access, safety, and efficiency.⁷⁴
- The US Patient Protection and Affordable Care Act, signed into law in 2010, mandates the creation of a Center for Medicare and Medicaid Innovation (CMI) by January 2011. The purpose of the of the CMI is to test innovative payment and service delivery models to reduce program expenditures under Medicare and Medicaid, while preserving or enhancing the quality of care furnished to individuals under the programs.⁷⁵ The \$10 billion worth of grants distributed by the CMI in 2011-2019 will be used to test promising models and expand successful pilot programs.⁷⁶
- In 2003 the Canadian government supported the biotechnology industry by giving \$1.7 billion in new funds for R&D and innovation.⁷⁷
- The National Research Council's (NRC) aims include concentrating R&D on developing solutions to national challenges in health and wellness, helping key sectors of Canadian industry to increase their innovation capacity and compete more

- effectively in world markets, and strengthening Canada's innovation system.⁷⁸
- In 2009, the Canada Foundation for Innovation, an independent corporation created by the Government of Canada to fund research infrastructure, granted over \$665 million for new grants and infrastructure at dozens of Canadian research institutes including \$262.8 million for Ontario-based institutes. The funding supports a wide range of research, including biomedical and biotechnology studies involving genomics, molecular imaging, proteomics, and other areas.⁷⁹
 - In 2010, the Government of Canada announced the first group of Canada Excellence Research Chairs (CERC). The CERC program aims to attract and retain the world's most accomplished and promising researchers in four priority areas, including health and related life sciences and technologies. The chair holders, each of whom will be awarded up to \$10 million over seven years, are considered to be world-class leaders in research and innovation.⁸⁰
 - Patient decision aids are being used in various clinical situations in several countries to prepare individuals to participate in making specific and informed values-based choices about disease management and treatment options, prevention, or screening.^{81, 82} Patient decision aids supplement (rather than replace) clinician's counselling about options. According to one systematic review, patient decision aids can reduce the use of discretionary surgery without apparent adverse effects on health outcomes or satisfaction.⁸³
 - Self-management is a new idea being proposed to reduce costs and improve the quality of care. It is defined as (1) engaging in activities that protect and promote health; (2) monitoring and managing signs and symptoms of illness; (3) managing impacts of illness on function, emotions, and interpersonal relationships; and (4) adhering to treatment regimens. User innovation toolkits could be shifted to medical toolkits devised for patient self-management of chronic medical conditions (i.e. self-management tools for type-1 diabetes).⁸⁴
 - The growing market penetration and the communication properties of mobile phones create opportunities for innovation in promoting cardiovascular disease self-management in developing countries through support of lifestyle and behaviour modification. Mobile phones support various modes of communication and interaction, have fewer adoption barriers, and are more prevalent than other available technologies in developing countries.⁸⁵
 - The Health Care Innovations Exchange is an AHRQ program designed to support health care professionals in sharing and adopting innovations that improve the delivery of care to patients.⁸⁶
 - The X PRIZE Foundation encourages radical breakthroughs by creating and managing prizes that drive innovators to solve some of the greatest challenges facing the world today.⁸⁷ There are plans to launch ten new prizes, in four prize groups, within the next five years.⁸⁸ The focus of the life sciences prize group is to identify and address the obstacles between cutting-edge scientific, technological and distributive understanding and the capture of those benefits by societies worldwide to improve health and ameliorate suffering.⁸⁹

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