

Welcome to the new issue of *Seeing Beyond Risk*, the quarterly electronic publication from the Canadian Institute of Actuaries (CIA). Each issue presents the latest actuarial thinking from experts; below, Stéphane Levert looks at the viability of Canada's universal health care system in the face of spiralling costs and an aging demographic. We are sure you will find this article informative and thought-provoking, and we encourage you to distribute it among your friends and colleagues.

Salvaging the Canadian Health Care System

By Stéphane Levert, FCIA, FSA

The concept of medicare—a nationally organized, primarily province-funded health care system—is well established in the Canadian mindset, bordering on national pride. It is governed by the *Canada Health Act* of 1984, which imposes minimum standards on provinces for them to qualify for federal subsidy. It essentially covers hospital and physician services, which accounted for \$88.9 billion of expenditures in 2014 (63 percent of total expenditures). Costs have been increasing steadily, with provincial health care expenditures over the last ten years outpacing the annual rate of inflation by more than 2 percentage points.

The question of how to fund and even contain growing health care costs is the topic of significant discussion and debate in Canada. While provinces and territories are predominantly responsible for their own health care delivery, the federal government provides funding support through the Canada Health Transfer (currently funding 23 percent of provincial health care expenditures, reducing to 14.3 percent by 2037). Provinces are currently devoting 39 percent of their total available revenues to health care.

I authored a [research paper](#) in 2013 sponsored by the Society of Actuaries and the Canadian Institute of Actuaries¹. Unlike studies that have attempted to forecast and discuss the future costs of the Canadian

¹ LEVERT, Stéphane, [Sustainability of the Canadian Health Care System and Impact of the 2014 Revision to the Canada Health Transfer](#), September 2013, Canadian Institute of Actuaries and Society of Actuaries. Stéphane was awarded the [2014 John Hanson Memorial Prize](#) by The Actuarial Foundation for this paper.

health care system using a macroeconomic approach, I used a demographic approach and the application of actuarial techniques to directly capture the increase in health care costs associated with the aging of the population. Key findings of the research include the following:

- Assuming no change in the growth rate of health care expenditures, provincial spending on health care is estimated to increase, due to inflation and population growth, at its current 5.1 percent real growth per year, increasing from 39 percent today to more than 100 percent of total available provincial revenues by 2037.
- Total revenues available to provinces, including federal transfers, are projected to grow at an annual real rate of 1.9 percent.
- Even after assuming some governmental action to limit real growth rates to 3.5 percent—and thus to decrease 2037 health care expenditures by 30 percent—health care will still absorb close to 70 percent of total revenues available to provinces by 2037, up from 39 percent in 2014 (close to 90 percent of own-source revenues, i.e., not transferred by the federal government, 49 percent in 2014).

This means that resources available to provinces to fund other program expenditures or to pay debt charges will be further reduced in the future.

THREATS TO FUTURE VIABILITY

Several factors are converging that raise questions about the future viability of medicare as we know it today:

- *Demand for health care services.* An aging society means that demand for health care services will increase over time. The aged and neonatal are the two largest cohorts of health care consumption. In fact, the number of physicians will need to increase by nearly 50 percent over the next 25 years just to keep up with increased demand as a result of aging—assuming no change in the way medical care is supplied. Also, as life expectancy, especially at older ages, continues to marginally improve, it is reasonable to assume that someone who lives longer may create an additional risk of increased prolonged demand for health care services.
- *Supply of health care services.* Health care inflation

continues to outpace inflation in general, due in part to terms negotiated between health care practitioners and provincial governments as well as a reimbursement mode (mostly fee-for-service) that has not proven effective in limiting the number of services performed. This has led to real costs accelerating faster than revenues to provinces. A phenomenon that economists refer to as supply-induced demand applies to health care: society will consume as many units of medical services as are available (unlimited elasticity of demand). This dynamic would seem to support governments' attempts to control supply as a way to contain health care costs.



THE POTENTIAL OF NEW THERAPIES

The delivery of health care is changing with the introduction of new drug therapies, including specialty drugs that allow for less invasive treatments than surgery and, hence, shorter recovery periods. In addition, the rapid development and easier access to genomic technologies will help physicians prescribe therapies that are expected to be more effective. We may also envision a time when medical conditions will be treated before the emergence of symptoms.

This may be good news for patients. It may also mean that new therapies will potentially be less expensive than traditional surgeries. However, it will also result in a shift of financial burden from governments to private payers (insurance companies, employers, or patients) as outpatient prescription drugs are not covered by provincial medical plans. The very survival of private group benefit plans may be at risk, as employers may not be able to assume that financial burden while maintaining their competitiveness in a global economy. Some industry pools are in place to spread risks across

several payers; however, coverage is not universal and they have no influence on the increasing costs of drug therapies. Interest groups are advocating the introduction of a national universal pharmacare program, which may result in an increased financial burden to provinces.

BALANCING THE COSTS AND QUALITY OF CARE

To move the Canadian health care system into the twenty-first century, it is obvious that changes will have to be made to ensure its sustainability. There are several options, including the following:

- *Reduce costs and/or pare benefits.* Several measures may be considered. Among them, health care services may be rationed, especially when the patient is not observant of physicians' advice (e.g., adherence to drug therapy, smoking cessation, exercising). The

idea of gratuity of services may be challenged with the introduction of copay structures or deductibles with or without out-of-pocket limits and, possibly, with financial assistance for the poor. Access to some services may be means-tested. Provinces may also decide to rely more on private provision of certain health care services, or to rely more on lower-cost alternatives to expensive inpatient care (e.g., home care, hospice care, etc.). The overall goal is to make the cost of care more transparent to patients and to reduce moral hazard.

- *Educate and reward.* Partial subsidies for private coverage may be effective in relieving the public health care program. This has proven to be effective for the educational system, and it works for health care in other countries: patients receiving care from the private sector, even with subsidy from the public

Specialty Drugs: Increasing Effectiveness and Cost

Certain diseases historically have held pessimistic prognoses for those who had contracted them. Perhaps the most notable in recent history has been the HIV virus, which until the mid-1990's was associated with very high mortality rates.

Impairments such as HIV have led to the development of specialty drugs. This class of pharmaceuticals generally is highly effective in combating the diseases for which they are prescribed. However, they tend to lack scope in treatment: they are virtually ineffective in any other intervention. As such, the high fixed costs associated with development, testing, and eventual roll-out must be spread among a relatively small subset of the population, resulting in a very high cost for the intervention.

For example, a currently popular set of specialty drugs targets hepatitis-C virus (HCV), with remarkable, potentially curative results. The table below illustrates the evolution of HCV intervention.

Drug (Class)	Treatment Duration	Side Effects	Success Rate	Average Cost
Peginterferon alfa-2b; Ribavirin (Pegatron) (Interferon)	Up to 48 weeks	Chronic and severe (body pain, lack of concentration, chills, depression, etc.)	6%	\$6350
Boceprevir (Victrelis) (Protease inhibitors)	3–11 months	Short-term moderate (headache, nausea, confusion, easy bruising and bleeding, etc.)	~70%	\$20,000
Ledipasvir and sofosbuvir (Harvoni) (Antiviral)	3–6 months	Short-term, mild (fatigue, headache, nausea, etc.)	90%+	\$99,000

Each of these regimens is prescribed on an outpatient basis, which passes the cost from medicare to patients or their private health insurer. Currently, no generics exist for the more effective protease inhibitors or antivirals, as they remain under patent protection. Therefore, alternatives to these highly effective interventions are limited.

sector, allows the poor to have easier access to free care. In addition, the public health care plan may develop ways to reward healthy habits (regular physician visits, adherence to prescriptions, etc.) and to promote wellness programs (diet, exercise, etc.). Alternatively, programs to encourage Canadians to save for their future health care expenditures may be introduced.

OTHER ECONOMIC TOOLS

Apart from containing the costs of the health care system, other options are available to provincial governments. Some that may be unpopular with Canadians may prove to be necessary. These include increases in taxes and tariffs, or reductions to social programs such as education, social welfare, and infrastructure. Ethical and societal questions also need to be addressed: a significant portion of one's lifetime health care expenditures are incurred during the last six months of life, leading to questions about the effectiveness of such social investments using taxpayers' money.


A way out may be to stimulate the economy to a level capable of supporting the increased costs of the health care system. One way to reduce the impact of increasing health care costs on provincial budgets would be to improve GDP growth. A 2.7 percent annual real GDP growth is needed to sustain current benefit levels. However, this target is extremely unlikely, because the growth of the working population (0.4 percent in the future), combined with historic economic productivity gains of 1.3 percent per year leads to an expected economic growth of only 1.7 percent per year. Canadian workers would need to produce one additional economic unit for each 100 units they now produce, at no economical cost, to keep 2037 health care budgets closer to their current situation.

CONCLUSION

Prospects for the future of the Canadian health care system are less than promising, at least in its current state. The challenge is that the concept of medicare, or socialized medicine in general, is so woven into the Canadian fabric that change will not be easy. This change



will become even more difficult as the public learns about the actions that would be required to maintain the system as we know it.

The high growth rates in health care expenditures will make it almost impossible for provinces to service their debts and to fund other services, such as education, social welfare, and infrastructure. In the absence of significant changes—improved GDP growth, increased taxes, significant controls on health care cost increases, or cutbacks in other government programs—the Canadian health care system will collapse. My research demonstrates that government action is necessary to sustain the system. Federal and provincial government initiatives should be aimed at limiting future increases in health care costs, improving economic productivity, and finding new or additional sources of funds to support the principles of the *Canada Health Act* of 1984. 



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