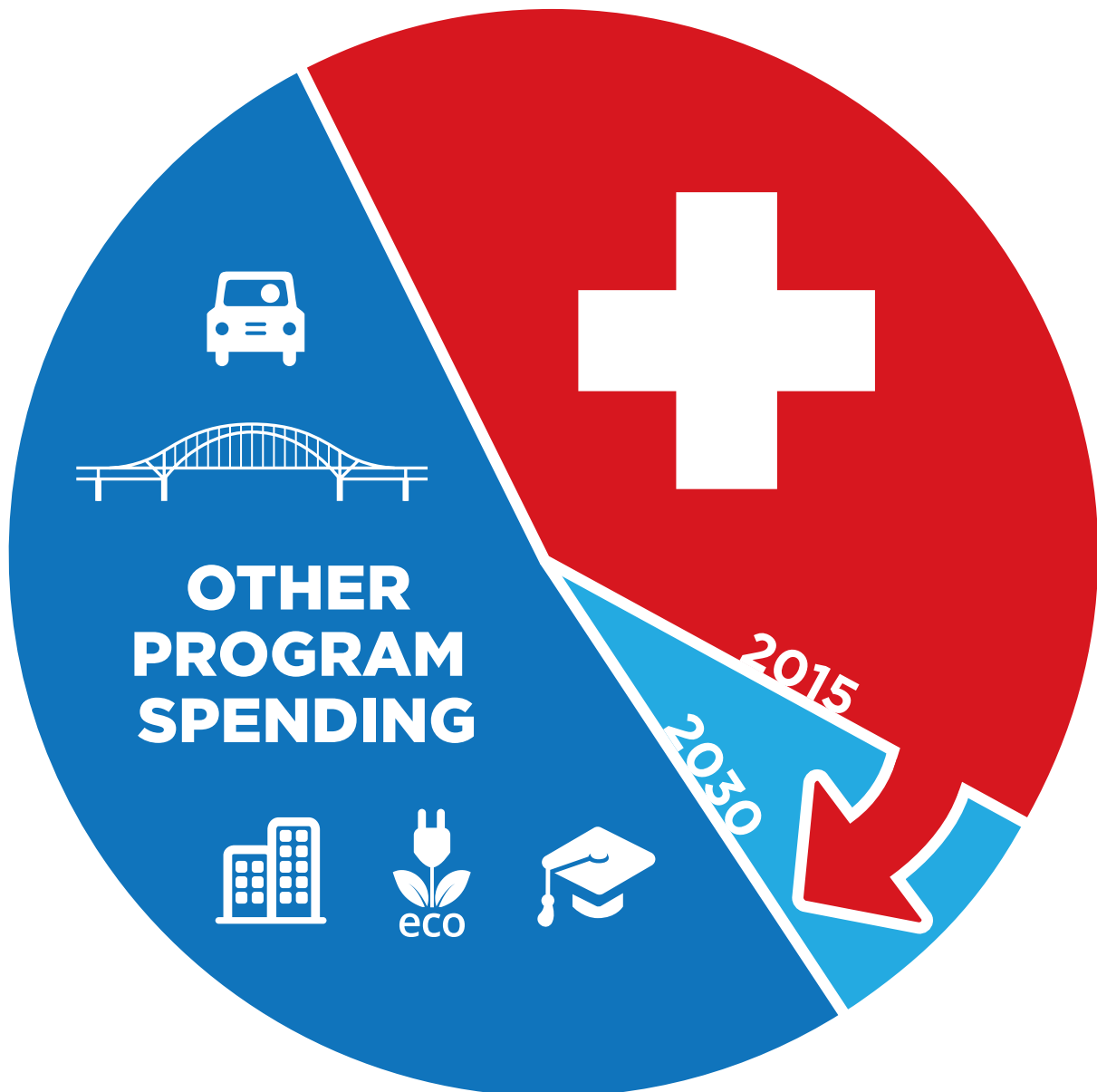# THE SUSTAINABILITY OF HEALTH CARE SPENDING IN CANADA

BY BACCHUS BARUA, MILAGROS PALACIOS, AND JOEL EMES

OTHER PROGRAM SPENDING

2015

2030

Contents

Executive summary

Health care is the single largest budget item for every province in Canada, ranging from 34.5 percent of total program spending in Quebec to 44.6 percent in Nova Scotia in 2015. Any changes in the amount spent on health care can have a significant impact on a government's fiscal balance (deficits or surpluses), the resources available for other programs such as education and social services, and/or tax competitiveness.

It is therefore vital that we routinely assess historical, current, and expected trends in health care spending in order to determine if such spending is sustainable.

While a number of indicators can help determine the sustainability of changes to health care spending, the most common and informative of these indicators are the share of program spending represented by health care and the ratio of health care spending relative to the size of the economy (GDP). An increase in the former may result in the crowding-out of other spending while an increase in the latter may require a change in the current tax system or deficits.

An examination of these two indicators of health care spending, that is health care spending as a share of program spending and health care spending as a share of the economy, shows clearly that the recent period of 1998 to 2015 saw provincial governments increase health care spending at an unsustainable pace. During this period, the share of program spending represented by health care for the provinces in total grew from 34.4 percent to 40.6 percent. Further, while provincial health care spending (in total) represented only about 5.8 percent of Canada's GDP in 1998, it had grown to represent 7.3 percent by 2015.

The pressing question today, however, is what can we reasonably expect to occur in the near future in the absence of any significant shift in government policy?

In order to answer this question, this paper presents the results of two scenarios based on a model for projecting health care spending in the future based on demographic factors (population growth and aging), inflation (general and health-specific inflation), and other factors (which may include factors related to government policy, income elasticity, developments in technology, etc.).

The first scenario is based on reasonable expectations of general inflation and demographic trends in the future, as well as assumptions regarding health-specific inflation, and other factors based on trends observed between 1998 and 2013. Under this scenario, health care spending is projected to grow at about 6.3 percent per annum on average between 2015 and 2030. As a result, health care spending is expected to consume an increasing portion of total program spending—growing from 40.6 percent in 2015 to 47.6 percent in 2030. The range of results for specific provinces is a low of 36.6 percent in Quebec to a high of 54.2 percent in Prince Edward Island in 2030. Indeed, the projections calculated indicate that five provinces (PEI, Nova Scotia, New Brunswick, Ontario, and British Columbia) will see health care spending grow close to (or exceed) 50 percent of total program spending by 2030. As well, health spending in total is expected to grow from 7.3 percent of the economy in 2015 to 10.7 percent in 2030.

In the second scenario, the assumptions regarding health-specific inflation and other factors are altered to reflect trends between the shorter and more recent period between 2008 and 2013. Under this scenario, health care spending is projected to grow at about 4.6 percent per annum on average between 2015 and 2030. As a result, it is expected consume a larger portion of total program spending—growing from 40.6 percent in 2015 to 45.3 percent in 2030. As well, health spending can be expected to grow from 7.3 percent of the economy in 2015 to 8.3 percent of the economy in 2030.

It is clear that under either scenario, the current ratio of health care spending to other program spending will be surpassed, as will be the current ratio of program spending to GDP. The rate of increase expected in health care expenditures will thus necessitate changes in other policies—either reductions in other spending to accommodate the increases in health care spending, or higher taxation, higher deficits and debt, or some combination of these three. Simply put, this paper shows that the current health care arrangements, which result in the level of spending observed and expected, do not seem sustainable over the next 15 years from today's vantage point.

Introduction

In Canada, provincial governments shoulder significant financial responsibility for funding health care services along with other public programs such as education and social services. Of these, health care is the single largest item in their budget. Therefore, changes in the amount spent on health care can have a significant impact on the government's fiscal balance (deficits or surpluses), the resources available for other programs, and/or tax competitiveness.

This paper presents a model to project and assess the sustainability of expected changes in health care spending between 2016 and 2030.

The paper's first section presents the definition of sustainability used throughout this paper. The second section provides an overview of current health care spending and examines how spending by provincial governments changed between 1998 and 2015. The third section presents the assumptions and methodology of our model for projecting future provincial health care spending. The fourth section projects health care spending between 2016 and 2030 under two scenarios. A conclusion follows.

Section I
Defining Sustainability

One way to think about sustainability is to consider whether the status quo can continue into the future without adversely affecting other considerations. In this paper, we are concerned about what the expected changes in health care spending are, and whether or not they will adversely affect other government program spending, the tax system, and the government's fiscal balance (surplus/deficit) and debt position.

A number[1] of measures help us determine whether or not the expected changes in health care spending are sustainable. Livio Di Matteo notes that "[a] variety of measures can assess sustainability, chief of which are the share of gross domestic product accounted for by health care spending as well as the share of total government spending accounted for by health care. If these are rising, then a larger share of resources is being devoted to health care and may be indicative of a sustainability problem" (2011; 7).

In this paper, we define sustainable changes in health care spending as those that meet the dual criteria of not resulting in an increase in a) the share of program spending represented by health care (which would result in crowding-out other programs) and b) the ratio of health care spending relative to the size of the economy (which may require a change in the tax system, or the incurring of deficits).

In isolation, these measures have their own individual drawbacks. For example, when we examine only the ratio of health care spending to program spending, growth in the former can seem sustainable if non-health program spending also grows at the same pace because this indica-

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[1] One measure that is sometimes used to assess the sustainability of changes in health care spending is to examine those changes against government revenues. There is an underlying understanding that such changes are sustainable if there are sufficient revenues to fund them. While this measure certainly does add to the discussion, viewed in isolation it can be problematic because it ignores deficits (deferred taxes) and accumulated debt. It has also been noted that measures of government spending themselves give us information about government revenues since the present value of expenditures must equal the present value of revenues in due course (Clemens et al., 2002).

tor will not change. While the ratio of health care spending to GDP also comes with its own drawbacks (volatility, predictability, etc.), it supports the first measure (the ratio of health care spending to program spending) by telling us about the ability of the economy to generate enough resources to fund such changes. More generally, the measure of government spending to the size of the economy (as measured by GDP) is "the best long-term measurement of the tax burden placed on citizens, since government spending ultimately drives taxation" (Clemens et al., 2002: 39).

Therefore, we define sustainable changes in health care spending as those that do not result in an increase in both the share of program spending represented by health care and the ratio of health care spending relative to the size of the economy.

Section II
Current Composition and Past Trends in Health Care Spending

The most recent report by the Canadian Institute for Health Information (CIHI, 2015) estimates that a total of $219.1 billion was spent on health care in Canada in 2015.[2] This represents about 10.9 percent of Canada's economy, or roughly $6,105 per Canadian.

The $219.1 billion figure includes expenditures in both the private and public sectors. As figure 1 illustrates, the private sector's share (29.3 percent) totalled $64.1 billion and includes health expenditures primarily made by households and private insurance firms. Spending on drugs (prescription and non-prescription) and other professionals (dentists, optometrists, physiotherapists, psychiatrists, etc.), account for approximately two-thirds (65.2 percent) of all private health care expenditures.

The public sector's share of total health care spending (70.7 percent) totalled $155 billion and includes payments made by government at the federal, provincial or territorial, and municipal levels as well as by workers' compensation boards and other social security schemes. Hospitals and physicians account for almost 60 percent of all public health care expenditures.[3]

Provincial and territorial government spending accounts for almost all (93.1 percent) public spending on health care.[4] In 2015, their combined health care expenditures added up to approximately $144.3 billion ($4,018
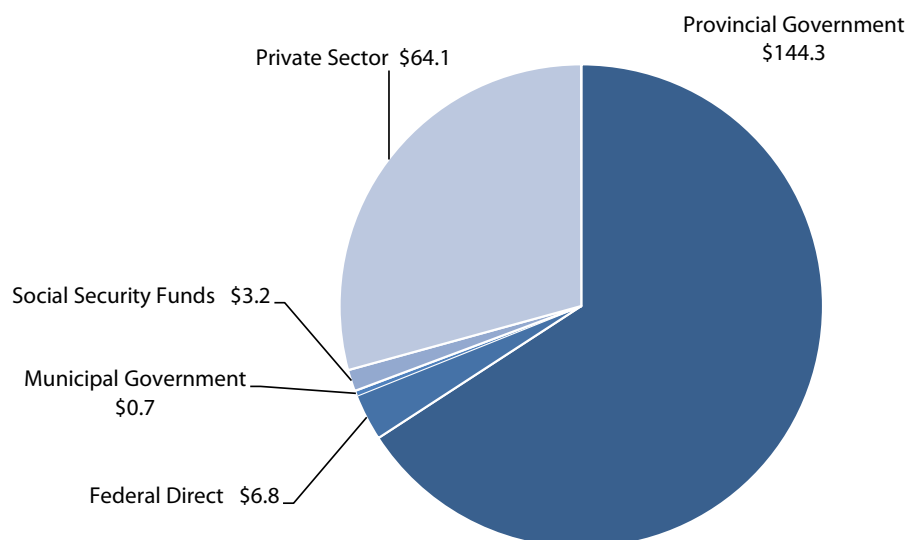
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[2] The CIHI report (2015) presents forecasted estimates for health care expenditures in 2014 and 2015.

[3] For more details regarding health care expenditures by the public and private sectors, see CIHI (2015).

[4] This is partly as a result of the fact that expenditures are reported by the CIHI on the basis of responsibility for payment. For example, federal health transfers to the provinces and territories are reported as part of the provincial government sector.

Figure 1: Total Health Expenditures, by Source of Finance, 2015 ($ billions)

Provincial Government
$144.3

Private Sector $64.1

Social Security Funds $3.2

Municipal Government
$0.7

Federal Direct $6.8

Source: CIHI, 2015.

per person). By comparison, in 1998 (our first year of analysis[5]), provincial governments spent a combined $54.3 billion ($1,803 per person) on health care. This means that between 1998 and 2015, expenditures by provincial governments on health care increased by 165.7 percent (in nominal terms).

This period of high growth in health care spending by provincial governments can perhaps be seen most clearly when compared to total spending on public programs (otherwise referred to "program spending").[6] While health care spending represented only about 34.4 percent of provincial program spending in 1998, it ended up consuming 40.6 percent by 2015 (figure 2).

[5] 1998 is chosen as our first year of analysis because it is the earliest year for which CIHI provides health care expenditures per capita by age group. Historical health spending was calculated as the sum of the products of health spending per capita by age group (provided by CIHI) times population estimates (from Statistics Canada). These totals slightly differ from those reported by CIHI for 1998 through 2005, likely due to the use of different population estimates.

[6] Program spending is total spending minus interest payments (debt servicing costs). Canada's program spending figure corresponds to the sum of program spending by the provinces. Program spending data from 1998 to 2014 are from Public Accounts. Data for 2015 are from the most recent provincial budgets and latest quarterly updates.
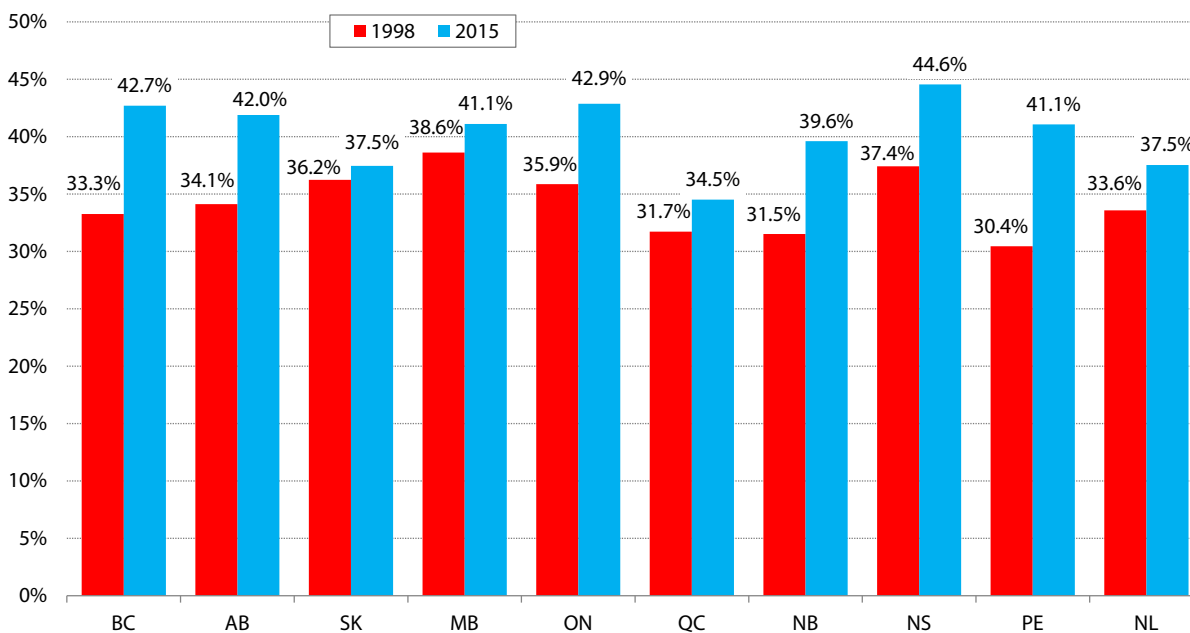
Figure 2: Provincial Health Spending as a Percentage of Program Spending, Canada, 1998-2015
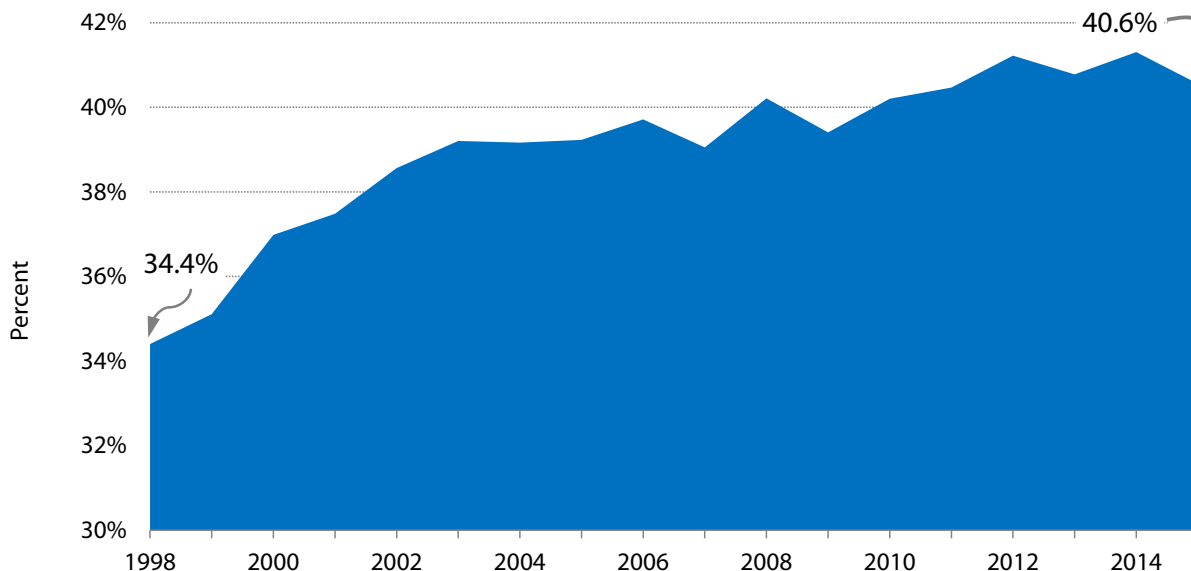
Note: Program spending is defined as total spending minus debt servicing costs.

Sources: CIHI, 2015; Canada, Department of Finance, 2015; calculations by authors.

Figure 3: Provincial Health Spending as a Percentage of Program Spending, by Province, 1998-2015

Sources: CIHI, 2015; Canada, Department of Finance, 2015; calculations by authors.

In fact, every province showed an increase in health care spending as a proportion of their total program spending during this period (figure 3). The largest increase in health care spending as a proportion of total program spending (in percentage points) was in Prince Edward Island (30.4 to 41.1 percent), while the smallest increase was in Saskatchewan (36.2 to 37.5 percent). By 2015, health care spending as a share of total provincial program spending ranged from a low of 34.5 percent in Quebec,[7] to 44.6 percent in Nova Scotia.

Relative to the size of the economy, provincial health care spending represented only about 5.8 percent of Canada's GDP in 1998.[8] By 2015 it had grown to represent 7.3 percent (figure 4).

Again, the magnitude of this trend varied across provinces (figure 5). For example, as a percentage of GDP, the largest increase was in Nova Scotia (up from 7.5 to 10.2 percent). Every province saw an increase except Newfoundland & Labrador, which actually experienced a decrease (down from 9.3 to 8.9 percent).[9] By 2015, health care spending as a share of provincial GDP ranged from a low of 5.9 percent in Alberta to a high of 10.3 percent in Prince Edward Island. However, these results should be interpreted with caution given the recent economic downturn in certain provinces.

Figure 6 provides a more complete chronological picture of these trends by illustrating the growth of provincial government health care spending, non-health care program spending, and GDP between 1998 and 2015, indexed using 1998 as a base year. Provincial health spending rose by 165.7 percent between 1998 and 2015. In comparison, non-health related spending by provincial governments grew by 104.2 percent, while the Canadian economy (as measured by the sum of provincial GDPs) grew by 111.8 percent over this period.

Table 1 presents a summary of overall growth rates of provincial government health care spending, non-health care program spending, and GDP by province from 1998 to 2015. The province with the highest

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[7] Data for Quebec should be interpreted with caution because unlike other provinces, Quebec's ministry of health and social services is also responsible for significant non-health care spending. Health-specific data are separated out by a ministry employee at the request of the Canadian Institute of Health Information (CIHI) and cannot be independently verified by the authors using provincial public accounts.

[8] Provincial GDP figures 1998-2014 are from Statistics Canada (2015d). For 2015, provincial GDP figures were estimated using private forecasters (TD Economics, 2015a; RBC Economics, 2015; Shenfeld, Exarhos, and Grantham, 2015; BMO Economics, 2015).

[9] This is because Newfoundland & Labrador's economy (GDP) grew by 171.9 percent while health spending in the province grew by 158.1 percent between 1998 and 2015.

**Figure 4: Provincial Health Spending as a Percentage of the Economy (GDP), Canada, 1998-2015**
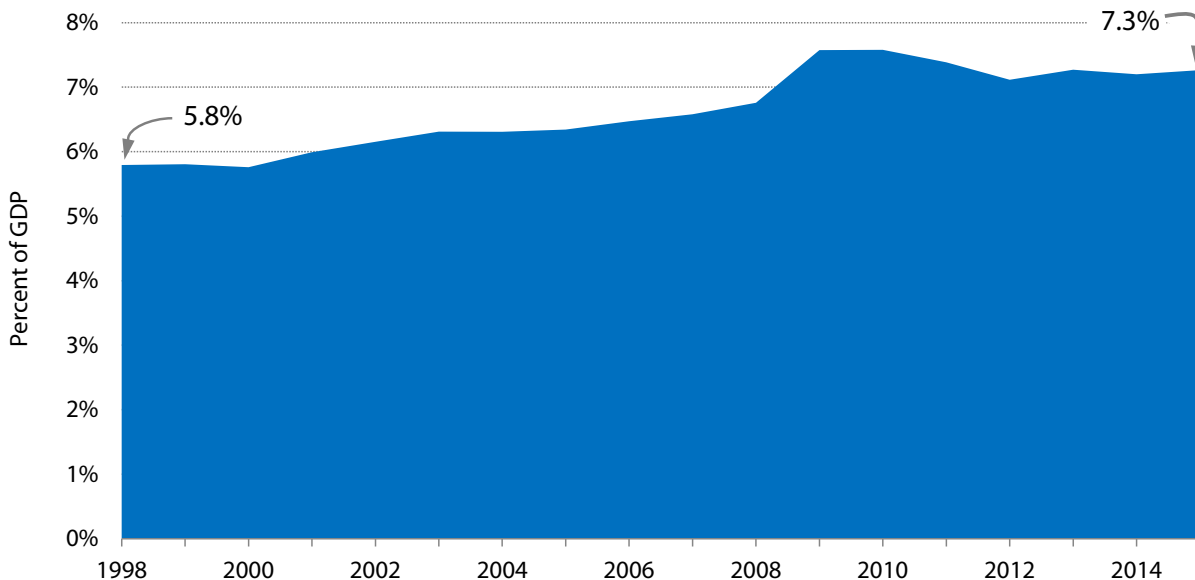
Sources: CIHI, 2015; Statistics Canada, 2015d; calculations by authors.

Figure 5: Provincial Health Spending as a Percentage of the Economy (GDP), by Province, 1998-2015
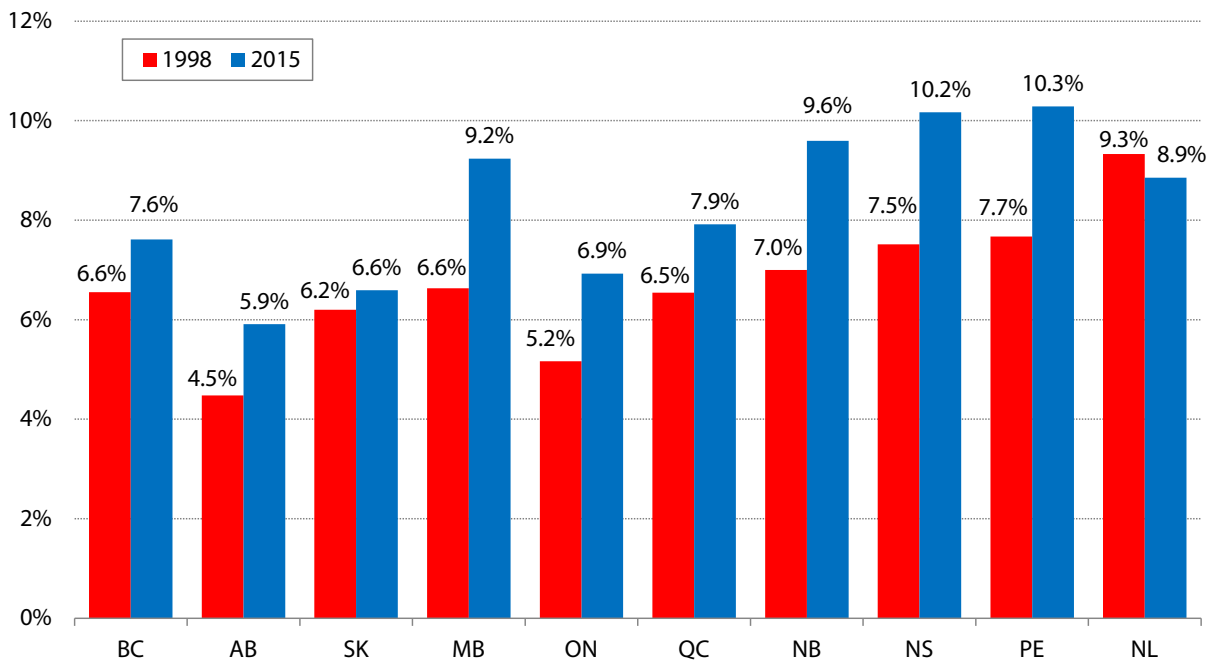
Sources: CIHI, 2015; Statistics Canada, 2015d; calculations by authors.

Figure 6: Index of Comparative Growth, Selected Indicators, Canada (1998 = 100), 1998-2015
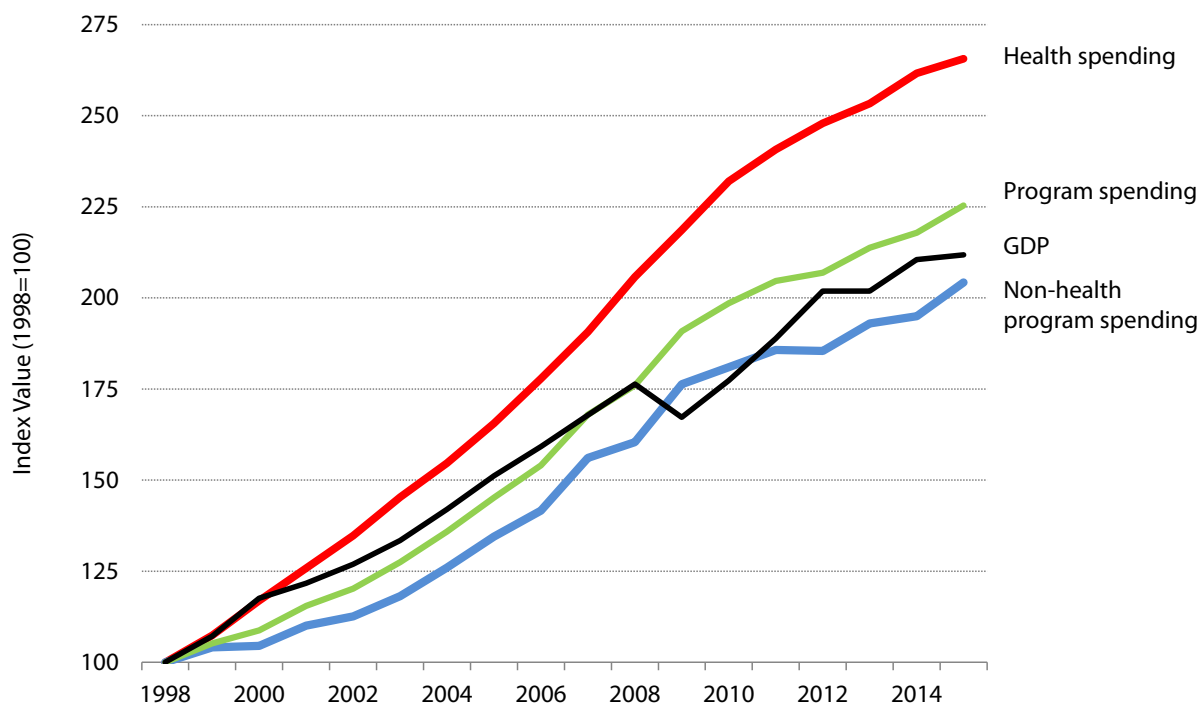
Sources: CIHI, 2015; Canada, Department of Finance, 2015; Statistics Canada, 2015d; calculations by authors.

Table 1: Overall Growth Rates, Selected Indicators, 1998-2015

	Health spending	Non-health program spending	Program spending	GDP
Canada	165.7%	104.2%	125.4%	111.8%
NL	158.1%	117.1%	130.9%	171.9%
PEI	177.2%	74.1%	105.5%	106.7%
NS	146.8%	83.6%	107.2%	82.4%
NB	148.1%	74.1%	97.4%	81.0%
QC	130.8%	103.5%	112.2%	90.7%
ON	157.9%	92.2%	115.7%	92.2%
MB	191.0%	162.1%	173.2%	108.9%
SK	182.9%	168.4%	173.7%	166.0%
AB	317.1%	198.9%	239.2%	216.2%
BC	141.4%	61.5%	88.1%	107.8%

Sources: CIHI, 2015; Canada, Department of Finance, 2015; Statistics Canada, 2015d; calculations by authors.

growth in health care spending was Alberta (317.1%), while the province with the lowest growth in such spending was British Columbia (141.4%). At 118.2 percentage points, the difference in growth between health care spending and non-health program spending was greatest in Alberta, while the smallest difference was in Saskatchewan (14.4 percentage points). The greatest difference in growth between health care spending and GDP was in Alberta (100.9 percentage points), while the smallest was in Newfoundland & Labrador (-13.9 percentage points). Again, these results should be interpreted with caution given the recent economic downturn in certain provinces.

Section III
Building a Model to Project Health Care Expenditures

In order to assess whether health care spending is sustainable, it is necessary to make projections about the future. We make these projections for provincial government health care spending using detailed population projections and assumptions about key drivers of health care costs. Changes in health care expenditures can be generally broken down into several categories: demographic factors (population growth and aging), inflation (general and health-specific inflation), and other factors (including factors related to government policy, income elasticity, developments in technology, etc.). These are fairly well-recognized explanatory factors of health care spending and have been incorporated into a number of models already.[10] Below we present a brief discussion of each of these explanatory factors along with our underlying assumptions. A formal description of their mathematical interaction follows.

Demographic factors

Two primary demographic factors need to be taken into account when projecting health care expenditures. The first is simply population growth. As the total number of people increases or decreases, so will the expected demand for health care services (and thus health care expenditures). In addition, it is important to account for changes in the composition of the population. For example, the proportion of the population over age 65 is expected to increase from 16.5 percent in 2016 to 22.8 percent by 2030 (figure 7). This is important because health expenditure data has consistently shown that, as a group, older Canadians consume more health care
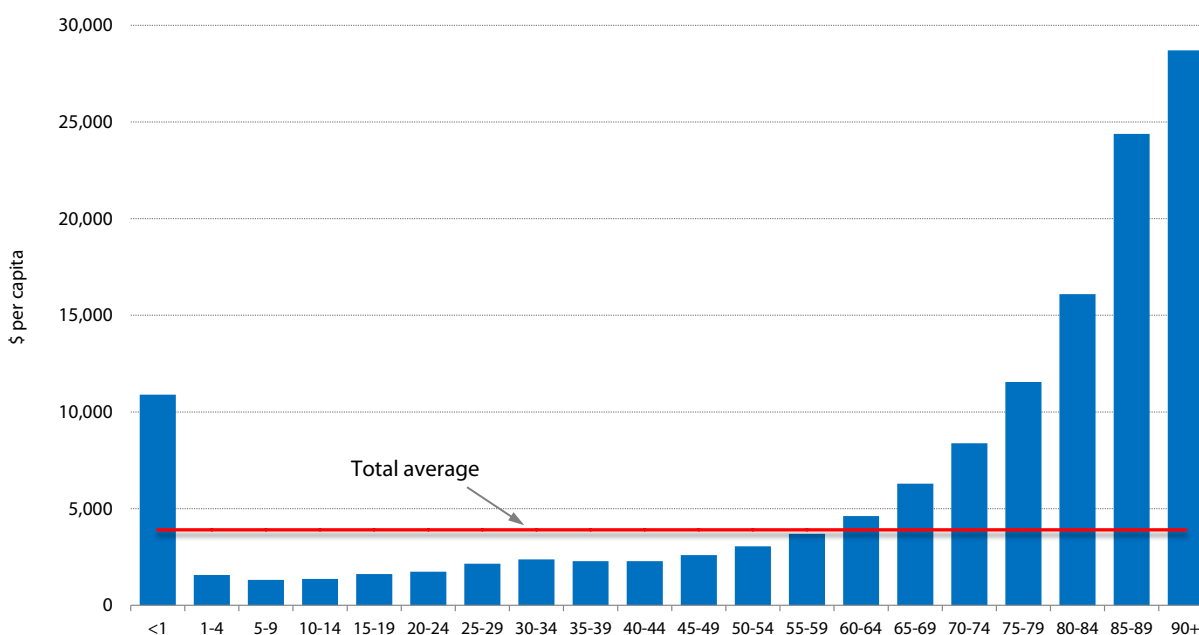
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[10] See CIHI (2011), Dodge et al. (2011), PBO (2015), Ragan (2012), Ramlo et al. (2010), and Busby et al. (2014), for example.

Figure 7: Proportion of the Population, 65 Years and Over, 2016-2030
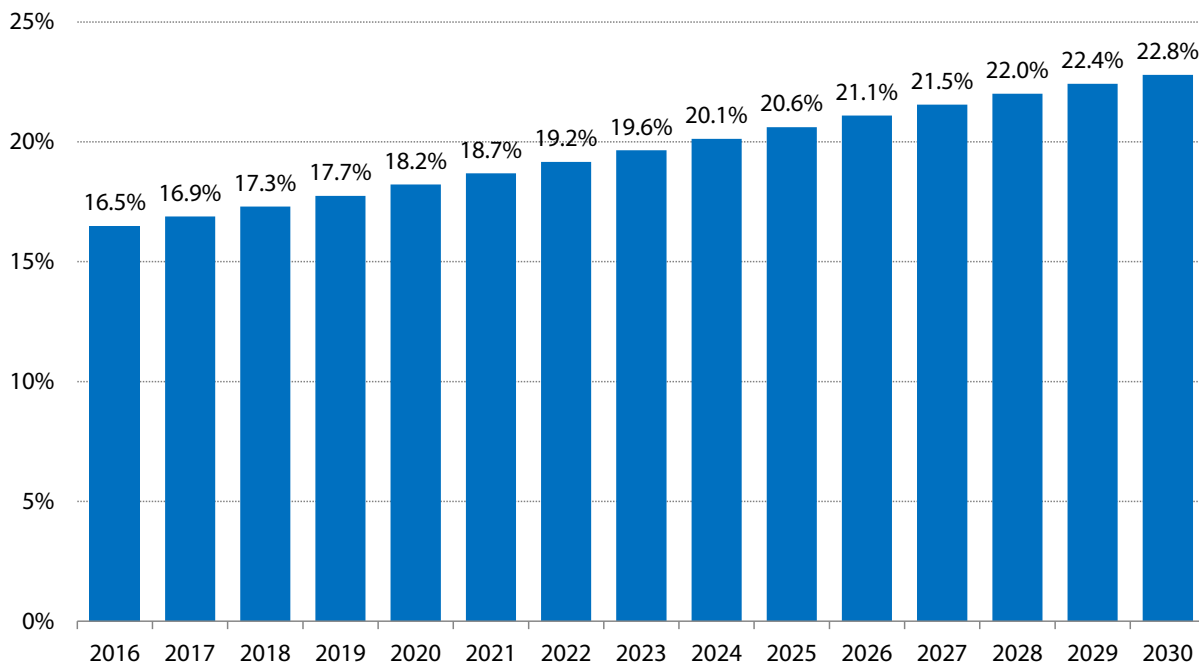
Sources: Statistics Canada, 2014; calculation by authors.

Figure 8: Health Care Expenditure per Capita by Age Group, Canada, 2013

Source: CIHI, 2015.

dollars than middle-aged and younger Canadians (figure 8).[11] In fact, in 2013, the latest year for which age-specific health spending data are available, seniors over 65 years of age consumed 45 percent of all health care expenditures (CIHI, 2015). Therefore, we assume our population's changing age structure will have a fairly predictable impact on future health care expenditures. By using the M1[12] population projection from Statistics Canada (2014b) and data from CIHI (2015) for average expenditures for different age groups (delineated by five-year age bands), it is possible to simulate the expected changes in health care expenditures as a result of demographic factors.

Inflation

We assume that general inflation will affect the health care sector in a manner similar to the rest of the economy. The projected impact of general inflation on the future changes in health care expenditures is therefore based on short-term projections from private forecasters (for 2016 and 2017) and the Bank of Canada's CPI inflation target of 2.0 percent per annum for the long-term projection (Bank of Canada, undated). We assume that this target of 2.0 percent will be achieved gradually by 2025.

However, CIHI also notes that "[h]ealth-sector price inflation has been well above the rate of general inflation for core medicare services such as physicians and hospitals" (2011: vii) primarily due to "increases in remuneration, as employers and governments compete for a limited pool of human resources."[13] For this reason, we also assume that future health care expenditures will grow in excess of general inflation as a result of

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[11] CIHI (2011: 16-17) suggests that "[o]lder seniors consume more health care dollars largely as a consequence of two factors: the cost of health care in the last few months of life, and the minority of the population with chronic illnesses that tend to require more intensive medical attention with age." However, they also note that "[t]here is some evidence that proximity to death rather than aging is the key factor in terms of health expenditure."

[12] Statistics Canada provides seven different scenarios based on fertility rate, life expectancy, immigration rate, and interprovincial migration. The medium-growth scenario, M1, was developed on the basis of assumptions reflecting the medium-growth trends observed from 1991/1992 to 2010/2011. For details on the underlying assumption for each of the seven scenarios, please see Statistics Canada, 2014b.

[13] It is debatable whether such inflation in the health sector should be viewed through the same lens as general inflation, or whether it should be viewed as a variable factor contributing to increased health expenditures. In this paper, we categorize it in a similar manner as inflation measured by the CPI, but view it as a factor that is possible to control (unlike population growth and aging, for example).

inflation in the health care sector. Our assumption regarding the magnitude of growth due to this factor, which we will refer to as "health-specific inflation" from here onwards, is based on previous trends recorded by CIHI (2015).

Other factors

The growth rate due to other factors is based on the historical average growth rate of health care that is unexplained[14] by inflation (general[15] and health specific[16]) and demographic factors (population growth[17] and aging[18]). While we do not know precisely what these factors are, some explanations could include changes in government policy, technological change, and the income elasticity[19] of health care spending. In particular, various studies have made assumptions regarding the income elasticity of health care spending in order to explain part of this growth. However, there is a great deal of controversy regarding the magnitude of this effect. For example, Canada's Parliamentary Budget Office (PBO) assumed an income elasticity of unity in their 2010 report while the work of Baltagi and Moscone (2010) and Xu, Saksena, and Holly (2011) suggest that an income elasticity of health care spending of 0.5 is appropriate for Canada. Another relevant factor is that our own analysis of health care spending between 2008 and 2013 suggests that all growth in total health care spending by provinces during this particular period can be attributed fully to inflation and demographic factors, which suggests the net impact of income elasticity (and the other potential factors noted above) was negligible for this period. Further, Kneebone (2012: 8-9) suggests that there is even greater uncertainty over the appropriate elasticity to use in a federation such as

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[14] For example, of the 6.4 percent average annual growth in provincial health care spending that we observed between 1998 to 2013 (the years for which age-specific health spending data were available), 1.9 percentage points could not be explained by either inflationary or demographic factors, according to our calculations.

[15] Calculated using data from Statistics Canada (2015a).

[16] Calculated using data from data from CIHI (2015).

[17] Calculated using data from Statistics Canada (2015b).

[18] Calculated using population data from Statistics Canada (2015b) and CIHI (2015). Specifically, we calculated the change in government health care spending when the age structure changes, while keeping constant both per capita age-specific health spending and the size of the population.

[19] The income elasticity of health care spending refers to the relationship between growth in per capita income and demand for health care services.

Canada because "most provincial governments receive transfers intended to equalize their spending capacities," which "means that the sensitivity of provincial health-care expenditures may have a smaller relationship to provincial income than otherwise." For these reasons, when projecting health care expenditures into the future, our assumption regarding growth due to unexplained factors is based on observed historical data without separating out the possible contribution of income elasticity of health care spending. While this is conceptually equivalent to assuming an income elasticity of zero, it neither means that we do not think that such an effect may exist, nor that our model excludes this effect, but rather simply acknowledges the difficulty separating out its effect from other factors. Notably, a sensitivity analysis using income elasticities of 0, 0.5, and 1 suggest only small differences in our results at the national level.

Total projected health spending in our model can be therefore understood as the sum of the products of projected health care spending by age group (delineated by five-year age bands) and population counts (in each age band).[20] Projected health spending by age group is determined as spending in the previous year multiplied by a growth factor to reflect general inflation, health-specific inflation, and other unexplained factors. This number is then multiplied by the projected population count (in each age-band) to reflect the impact of expected demographic changes.

Formally, projected total provincial health care spending in year t can be described by the following equation[21]:

$$HS_t = \sum_{\substack{k=0 \\ t=1}}^{n} \left[hc_{k,t-1} \left(\frac{CPI_t}{CPI_{t-1}} \right) \left(\frac{HSI_t}{HSI_{t-1}} \right) (1 + X_t) \right] Pop_{k,t}$$

where t is the year, k is the five-year age band, HS is total provincial health spending, hc is health spending per capita (based on data from CIHI 2015), CPI is the consumer price index (based on the Bank of Canada's CPI

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[20] Total health spending in 2014 and 2015 is determined as the sum of the average proportional contribution of each age group in the preceding three years multiplied by total health spending as reported by CIHI for 2014 and 2015. Health spending (annually from 2015 to 2030) is the sum of the products of projected health spending by age group (as explained in the equation) times population in each age group.

[21] This equation can easily be altered to incorporate the income elasticity of health care spending separately in the following way (where GDP is the real gross domestic product per capita and ε is the assumed income elasticity):

$$HS_t = \sum_{\substack{k=0 \\ t=1}}^{n} \left[hc_{k,t-1} \left(\frac{CPI_t}{CPI_{t-1}} \right) \left(\frac{HSI_t}{HSI_{t-1}} \right) \left(1 + \varepsilon \frac{GDP_t}{GDP_{t-1}} \right) (1 + X_t) \right] Pop_{k,t}$$

inflation target), HSI is health specific inflation (based on historical data), X represents other unexplained factors including a possible income effect (based on historical data), and Pop is the population (based on population projections from Statistics Canada's M1 scenario).

Section IV
Projections of Health Care Spending, 2016–2030

Of the factors affecting health care expenditures discussed in the previous section, the impact of general inflation and demographic factors are fairly predictable from a conceptual standpoint. However, the magnitude of projected growth due to health specific inflation and other factors depend largely on the historical period chosen upon which to base our assumptions.

For this reason, we present the results of two scenarios. In our standard model (scenario 1) the assumptions for health-specific inflation and "other factors" are based on historical trends observed between 1998 and 2013 (the years for which age-specific health spending data are available). In our alternative model (scenario 2) we present an estimation using the shorter (and more recent) 5-year period between 2008 and 2013 for these factors. During this period, increases in health care spending by provincial governments were smaller than increases between 1998 and 2008. Notably, the average annual increase in health spending between 2008 and 2013 can be almost fully attributed to general inflation and demographic factors in addition to health-specific inflation.

The results of these two scenarios are presented below, and are contrasted with data from 2015, the latest year for which health expenditure data are available from CIHI (2015).

Scenario 1: Standard model

Table 2 presents a summary of the assumptions for scenario 1.

The combined effect of these factors suggest that health care spending by provincial governments will increase by approximately 6.3 percent per annum over the next 15 years – increasing 151.4 percent from $144.3 billion in 2015 to $362.6 billion by 2030 (figure 9).

If we assume that provinces continue to increase spending on other, non-health care related programs at the same rate as they did between

Table 2: Assumptions for Scenario 1, Canada

Growth Factor		Assumption		Average Annual Growth Rate (percent)
Inflation	General Inflation	Average private forecasters; Bank of Canada's Inflation target	Variable	1.9%
	Health-specific inflation	Historical Observation (1998-2013)	Constant	0.6%
Demographics	Population Growth	Statistics Canada (2014) Population Projections (M-1)	Variable	2.0%
	Population Ageing			
Other Factors		Historical Observation (1998-2013)	Constant	1.8%

Figure 9: Effect of Contributing Factor on Health Spending Growth, 2015-2030 ($ millions)
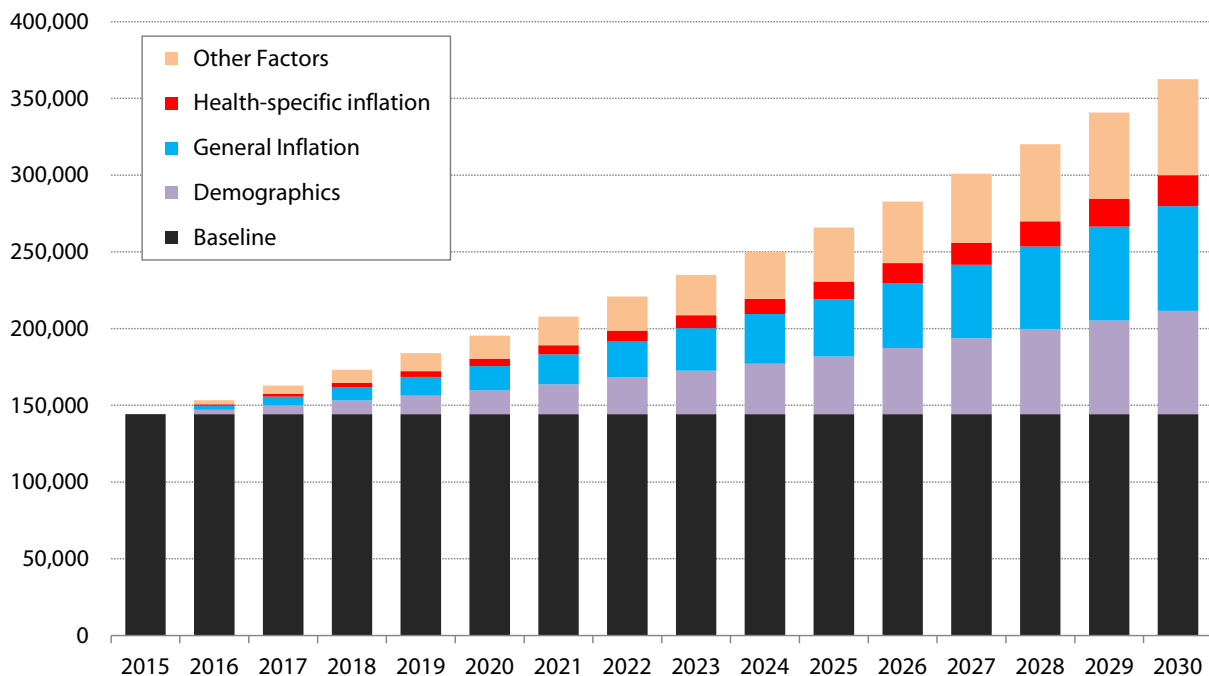
Sources: CIHI, 2015; BMO Economics, 2015; RBC Economics, 2015; TD Economics, 2015a and 2015b; Statistics Canada, 2014a; calculations by authors.
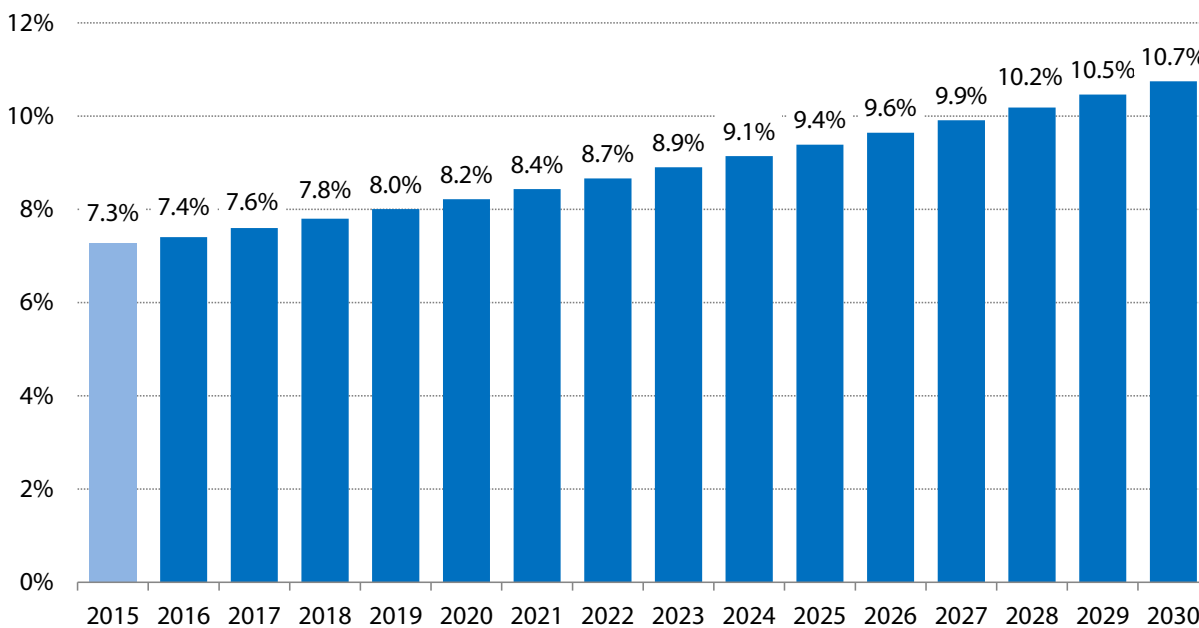
Figure 10: Provincial Health Spending as a Percentage of Program Spending, Canada, 2015-2030
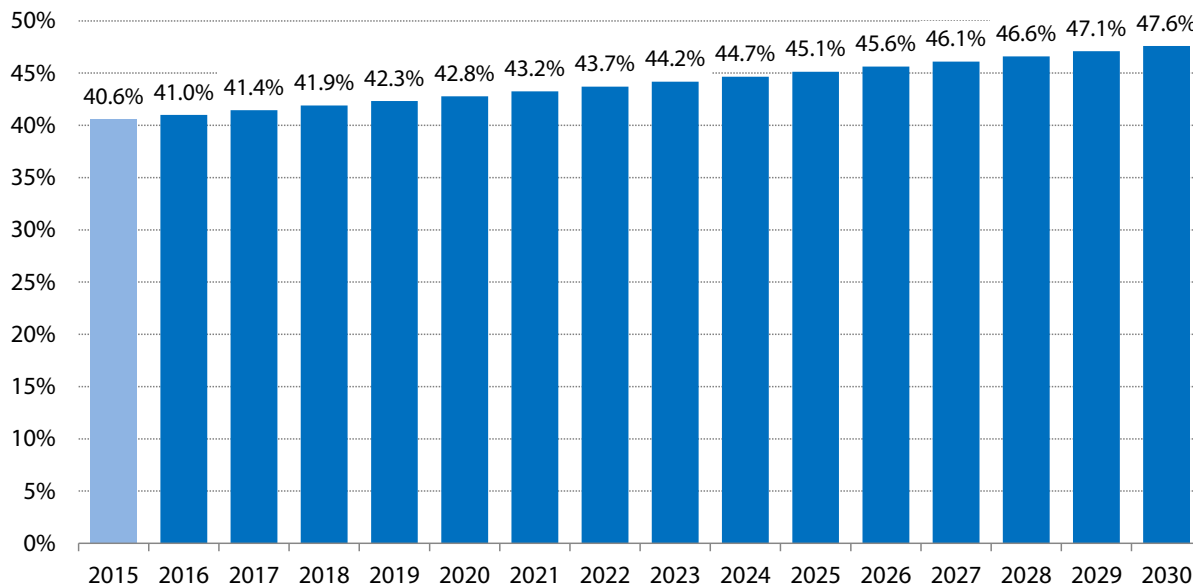
Note: Program spending is defined as total spending minus debt servicing costs.
Sources: CIHI, 2015; Canada, Department of Finance, 2015; calculations by authors.

Figure 11: Provincial Health Spending Relative to the Economy (GDP), Canada, 2015-2030

Sources: CIHI, 2015; BMO Economics, 2015; RBC Economics, 2015; TD Economics, 2015a and 2015b; calculations by authors.

Table 3: Assumptions for Scenario 1, Provinces

Growth Factor		Assumption		Average Annual Growth Rate (percent)									
				BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL
Inflation	General Inflation	Average private forecasters; Bank of Canada's Inflation target	Variable	1.9	1.8	2.0	2.0	1.9	1.9	1.9	1.9	1.9	2.0
	Health-specific inflation	Historical Observation (1998-2013)	Constant	0.7	0.9	0.6	0.8	0.4	0.5	0.6	0.3	0.2	0.7
Demo-graphics	Population Growth	Statistics Canada (2014) Population Projections (M-1)	Variable	1.7	2.7	1.2	1.6	1.8	1.6	1.4	1.4	2.1	1.2
	Population Ageing												
Other Factors		Historical Observation (1998-2013)	Constant	1.3	3.1	3.0	3.1	1.8	0.9	2.2	2.2	3.0	2.3

1998 and 2015 (the most recent year for which data are available), we project that health care spending will continue to represent an increasing portion of total program spending, going up from 40.6 percent in 2015 to 47.6 percent by 2030 (figure 10). This implies that other programs will represent a smaller portion of total program spending unless total program spending is increased.

Relative to the size of the economy,[22] we project that health care spending by provincial governments will increase from 7.3 percent in 2015 to 10.7 percent in 2030 (figure 11).

Under this scenario, we also project that total program spending by provincial governments will increase from 17.9 percent of GDP in 2015 to 22.6 percent in 2030. This implies an expected increase in the size of government as a share of the economy.

Provincial projections

Of course, the assumptions about demographic factors (population growth, and aging), inflation (general, and health-specific inflation), and

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[22] GDP estimates are from TD Economics (2015).

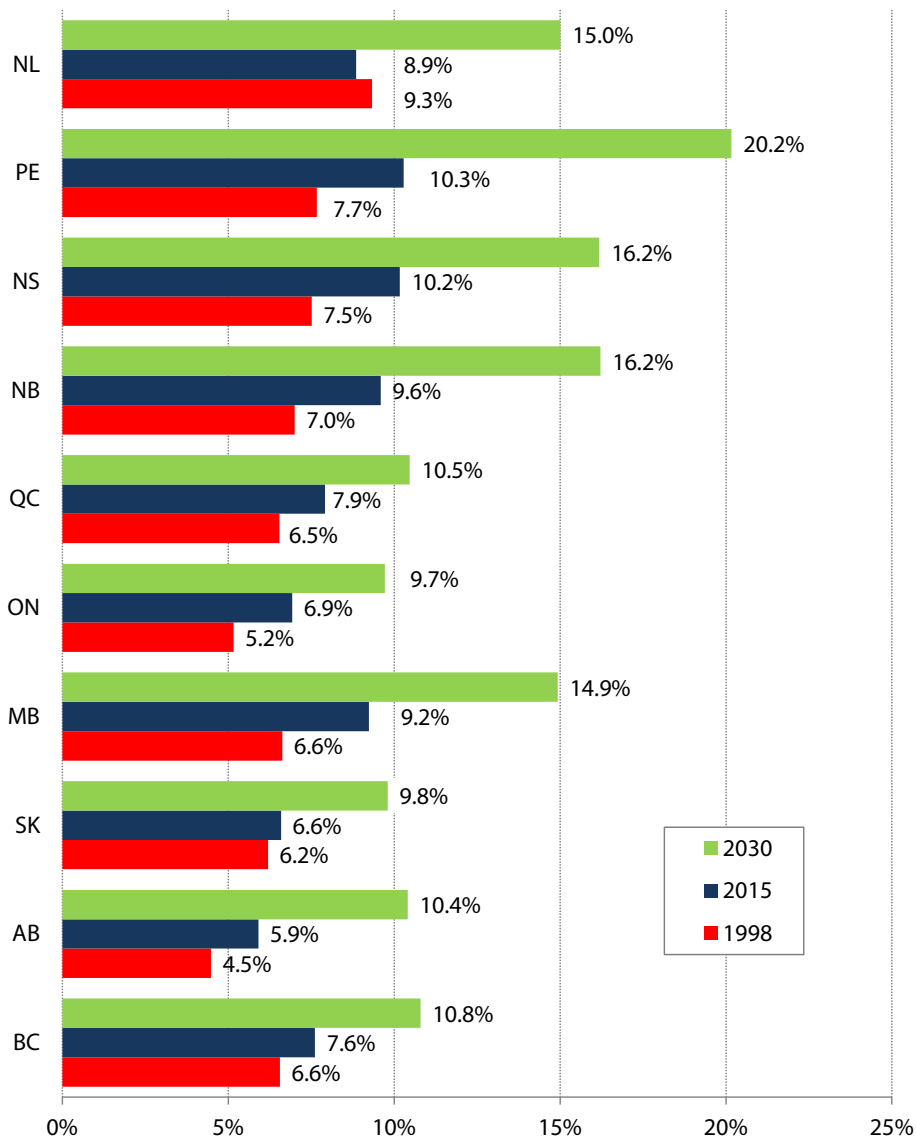**Figure 12: Provincial Health Spending to Program Spending, by Province, 1998, 2015, 2030**
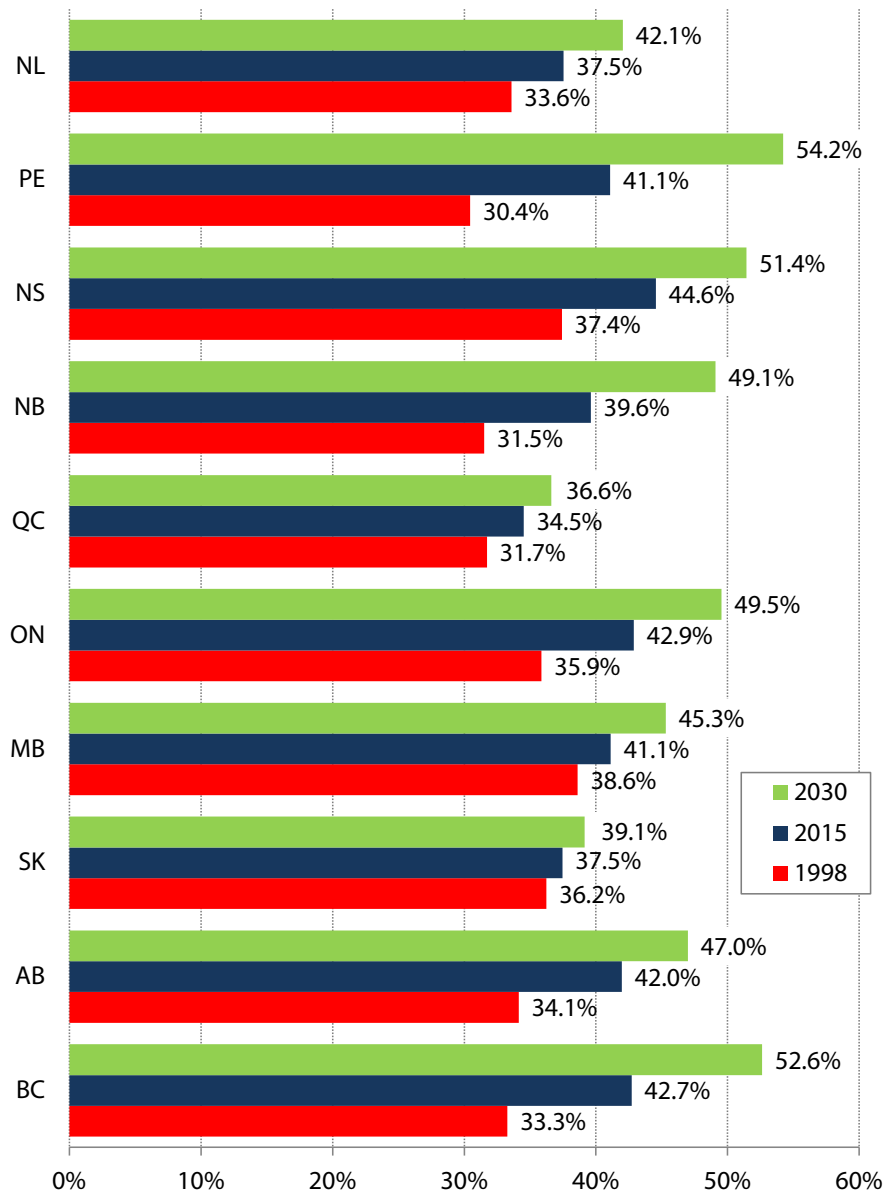
Sources: CIHI, 2015; Canada, Department of Finance, 2015; calculations by authors.

other factors vary by province. However, the method of analyzing historical trends and projecting future changes in health care expenditures for specific provinces is the same.

Table 3 presents a summary of province-specific assumptions for scenario 1.

Figure 12 summarizes historical and projected health care expenditures relative to program spending. In all 10 provinces, projected health

Figure 13: Provincial Health Spending to GDP, by Province, 1998, 2015, 2030

NL — 2030: 15.0% / 2015: 8.9% / 1998: 9.3%

PE — 2030: 20.2% / 2015: 10.3% / 1998: 7.7%

NS — 2030: 16.2% / 2015: 10.2% / 1998: 7.5%

NB — 2030: 16.2% / 2015: 9.6% / 1998: 7.0%

QC — 2030: 10.5% / 2015: 7.9% / 1998: 6.5%

ON — 2030: 9.7% / 2015: 6.9% / 1998: 5.2%

MB — 2030: 14.9% / 2015: 9.2% / 1998: 6.6%

SK — 2030: 9.8% / 2015: 6.6% / 1998: 6.2%

AB — 2030: 10.4% / 2015: 5.9% / 1998: 4.5%

BC — 2030: 10.8% / 2015: 7.6% / 1998: 6.6%

Legend: 2030, 2015, 1998

Sources: CIHI, 2015; Statistics Canada, 2015c; calculations by authors.

care expenditures in 2030 represent a higher proportion of projected program spending than in 1998. Similarly, in all 10 provinces, projected health care expenditures in 2030 represent a higher proportion of program spending than in 2015. In three provinces, British Columbia, Nova Scotia, and Prince Edward Island, health care expenditures are projected to represent over 50 percent of their entire program spending by 2030.

Figure 13 summarizes historical and projected health care expenditures relative to GDP. In all 10 provinces, projected health care expenditures

in 2030 represent a higher proportion of projected provincial GDP than in 1998. Further, in every province, projected health care expenditures in 2030 also represent a higher proportion of GDP than they did in 2015.

Scenario 2: Alternative Model

As mentioned previously, the magnitude of projected growth due to health-specific inflation and other factors depends largely on the historical period chosen to base our assumptions on. The former projection (scenario 1) is based on the assumption that provinces will continue to increase health care expenditures in excess of what is required to keep pace with inflation and demographic factors as they did, on average, between 1998 and 2013.

In this alternative model, we project a scenario in which future increases in health care spending in excess of expected changes in general inflation (measured by the Consumer Price Index) and demographics grow according to the historical trend over the shorter, and more recent five-year period between 2008 and 2013.

Table 4 presents the assumptions for scenario 2.

The combined effect of these factors suggests that health care spending by provincial governments will increase by approximately 4.6 percent per annum (compared to 6.3 percent in scenario 1) over the next 15 years, increasing 95.5 percent from $144.3 billion in 2015 to $282.0 billion by 2030.

If we assume that provinces continue to increase spending on other programs at the same rate as they did between 2008 and 2015, we project that health care spending will continue to represent an increasing portion of total program spending—going up from 40.6 percent in 2015 to 45.3 percent by 2030 (see figure 14). This implies that other programs will represent a smaller portion of total program spending unless total program spending is increased.

Relative to the size of the economy (measured in gross domestic product), we project that, under scenario 2, health care spending by provincial governments will increase from 7.3 percent in 2015 to 8.3 percent in 2030 (see figure 15). We also project that total program spending by provincial governments will increase from 17.9 percent of GDP in 2015 to 18.4 percent in 2030. This implies an expected increase in the size of government, albeit a smaller increase than under Scenario 1.

Table 4: Assumptions for Scenario 2, Canada

| Growth Factor		Assumption		Average Annual Growth Rate (percent)
Inflation	General Inflation	Average private forecasters; Bank of Canada's Inflation target	Variable	1.9%
	Health-specific inflation	Historical Observation (2008-2013)	Constant	0.7%
Demographics	Population Growth	Statistics Canada (2014) Population Projections (M-1)	Variable	1.9%
	Population Ageing			
Other Factors		N/A		

Note: The difference in the average annual growth of health care spending due to demographics between scenario 1 (table2) and scenario 2 (presented in this table) is less than 0.03 percentage points.

Conclusion

Under the two scenarios presented in this paper, health care spending will continue to grow and will consume a larger portion of provincial government program spending (figure 14), as well as the country's economy (figure 15).

Under our standard assumptions (scenario 1) based on reasonable expectations of future general inflation and demographic trends, as well as assumptions regarding health-specific inflation, and other factors based on trends observed between 1998-2013, we project that health care spending will grow at about 6.3 percent per annum on average between 2015-2030. As a result, it will consume an increasing portion of total program spending—growing from 40.6 percent of total program spending in 2015 to 47.6 percent in 2030. As well, health spending will grow from 7.3 percent of the economy in 2015, to 10.7 percent in 2030. Under this scenario, the

Figure 14: Provincial Health Spending Relative to Program Spending, Canada, 1998-2030
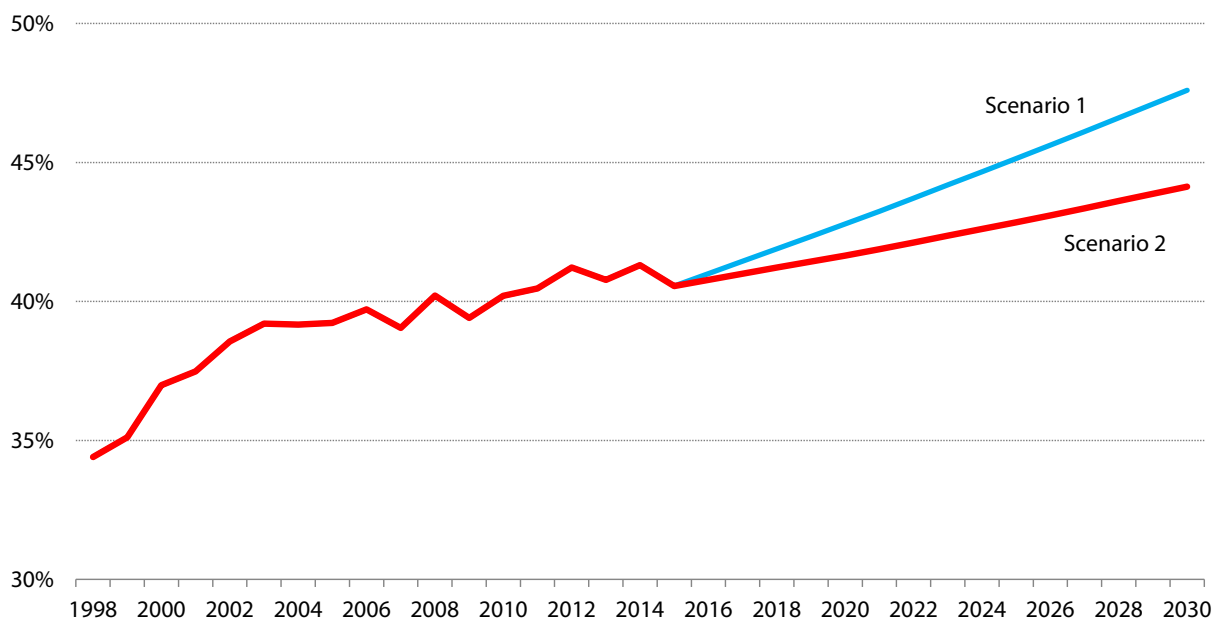
Figure 15: Provincial Health Spending Relative to the Economy (GDP), Canada, 1998-2030
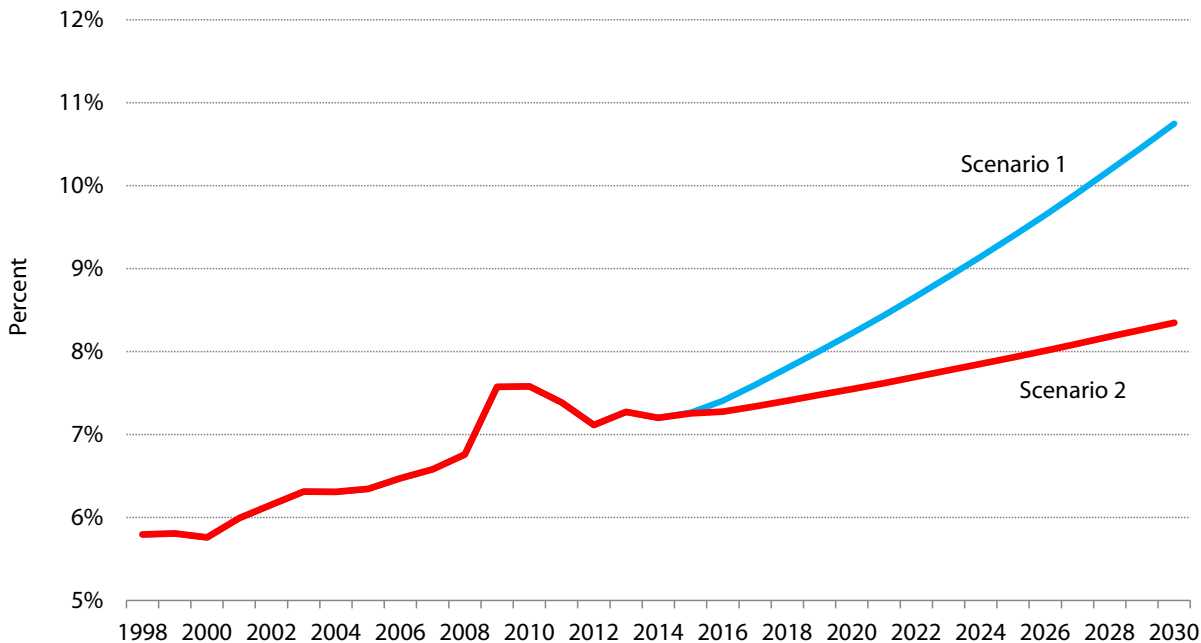
projected increases in health care spending by provincial governments are not sustainable and carry a high risk of crowding out other programs or requiring fiscal adjustments.

If we alter our assumptions regarding health-specific inflation and other factors to reflect trends between the shorter and more recent period between 2008 and 2013, we project that health care spending will grow at about 4.6 percent per annum on average between 2015 and 2030. As a result, it will consume a larger portion of total program spending—growing from 40.6 percent of total program spending in 2015 to 45.3 percent in 2030. As well, health spending will grow from 7.3 percent of the economy in 2015, to 8.3 percent of the economy in 2030. Under scenario 2, expected increases in health care spending may be more manageable (compared to scenario 1) but still carry significant risk of crowding out other programs and requiring fiscal adjustments.

A remaining question is, if we assume that provinces continue to increase spending on other (non-health care related) programs at the same rate as they did between 1998 and 2015, and given our current expecta-

tions of GDP growth, what is the health care spending growth rate that would be considered sustainable given the definition used in this paper? To estimate this we use our dual criteria of requiring growth in health care spending to not lead to both an increase in the share of program spending represented by health care and the ratio of health care spending relative to the size of the economy. We estimate that, averaged across 2015-2030, the growth in health care spending by provincial governments should not exceed 3.5 percent per annum (at maximum) in order to be considered sustainable.[23]

However, it is clear that under the two scenarios presented in this paper that both the current ratio of health care spending to other program spending and the current ratio of program spending to GDP are expected to be surpassed. The rate of increase expected in health care will thus necessitate changes in other policies, either reductions in other spending to accommodate the increases in health care spending, or higher taxation, higher deficits and debt, or some combination of these three. Simply put, the current health care arrangements, which result in the level of spending observed and expected, do not seem sustainable over the next 15 years from today's vantage point.

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[23] It should be noted that this does not take into account other considerations such as, for example, the eventual repayment of debt.

References

Alberta, Ministry of Finance (1999 to 2015a). *Public Accounts,* 1998-99 to 2013-14. Government of Alberta.

Alberta, Ministry of Finance (2015b). *Budget 2015*. Government of Alberta.

Alberta, Ministry of Finance (2016). 2015-16 *Third Quarter Fiscal Update and Economic Statement.* Government of Alberta. <http://finance.alberta.ca/publications/budget/quarterly/2015/2015-16-3rd-Quarter-Fiscal-Update.pdf>, as of April 20, 2016.

Baltagi, Badi H., and Francesco Moscone (2010). *Health Care Expenditure and Income in the OECD Reconsidered: Evidence form Panel Data.* IZA Discussion Paper No. 4851. Institute for the Study of Labor. <http://ftp.iza.org/dp4851.pdf>, as of April 20, 2016.

Bank of Canada (undated). *Inflation.* Web page. Bank of Canada. <http://www.bankofcanada.ca/core-functions/monetary-policy/inflation/>, as of April 18, 2016.

BMO Economics (2015). *Provincial Economic Outlook, as of October 30.* BMO Economics.

British Columbia, Ministry of Finance (1999 – 2015). *Public Accounts,* 1998-99 to 2014–15. Government of British Columbia.

British Columbia, Ministry of Finance (2016). *Budget and Fiscal Plan 2015/16–2016/17*. Government of British Columbia.

Busby, Colin, William B.P. Robson, and Aaron Jacobs (2014). *Managing Healthcare for an Aging Population: Ontario's Troubling Collision Course.* E-Brief (December). CD Howe Institute. <https://www.cdhowe.org/managing-healthcare-aging-population-ontario%E2%80%99s-troubling-collision-course>, as of December 1, 2015>, as of April 18, 2016.

Canada, Department of Finance (2015). *Fiscal Reference Tables: September 2015*. Government of Canada. <http://www.fin.gc.ca/frt-trf/2015/frt-trf15-eng.pdf>, as of December 1, 2015.

Canadian Institute for Health Information [CIHI] (2011). *Health Care Cost Drivers: The Facts.* Canadian Institute for Health Information.

Canadian Institute for Health Information [CIHI] (2015). *National Health Expenditure Trends, 1975 to 2015*. Canadian Institute for Health Information.

Clemens, Jason, Joel Emes, and Nadeem Esmail (2002). *Saskatchewan Prosperity: Taking the Next Step.* Public Policy Sources, no. 57. Fraser Institute. <https://www.fraserinstitute.org/sites/default/files/Saskatchewan-Prosperity.pdf>, as of April 20, 2016.

Di Matteo, Livio (2011). *The Sustainability of Canadian Provincial Government Health Spending: An Expenditure Category Approach*. Paper prepared for the Meetings of Canadian Economics Association, Ottawa (June 2-5). <https://www.lakeheadu.ca/sites/default/files/uploads/44/dimatteo/work_in_progress/DIMATTEO-CEACDHOWEHealthPaper.pdf>, as of April 20, 2016.

Dodge, David, and Richard Dion (2011). *Chronic Healthcare Spending Disease: A Macro Diagnosis and Prognosis*. Commentary 327 (April). CD Howe Institute. <https://www.cdhowe.org/pdf/Commentary_327.pdf>, as of April 20, 2016.

Kneebone, Ronald (2012). *How you Pay Determines What you Get: Alternative Financing Options as a Determinant of Publically Funded Health Care in Canada*. SPP Research Papers 5, 21. School of Public Policy, University of Calgary. <http://policyschool.ucalgary.ca/sites/default/files/research/r-kneebone-althealthpayfinal.pdf>, as of April 20, 2016.

Manitoba, Ministry of Finance (1999–2015a). *Public Accounts of Manitoba*, 1998-99 to 2014–15. Government of Manitoba.

Manitoba, Ministry of Finance (2015b). *Budget 2015*. Government of Manitoba.

Manitoba, Ministry of Finance (2016). *Economic and Fiscal Outlook* (March). Government of Manitoba.

New Brunswick, Department of Finance (1999–2015a). *Public Accounts*, 1998-99 to 2014–15. Government of New Brunswick.

New Brunswick, Department of Finance (2015b). *Economic and Fiscal Update: Second Quarter Projections 2015-2016*. Government of New Brunswick. <http://www2.gnb.ca/content/dam/gnb/Departments/fin/pdf/Publications/2015-2016SecondQuarterReport.pdf>, as of April 20, 2016.

Newfoundland & Labrador, Department of Finance (1999–2015a). *Public Accounts*, 1998-99 to 2014–15. Government of Newfoundland & Labrador.

Newfoundland & Labrador, Department of Finance (2015b). *2015 Economic and Fiscal Update*. Government of Newfoundland & Labrador. <http://www.fin.gov.nl.ca/fin/publications/2015_mid_year_update.pdf>, as of April 20, 2016.

Nova Scotia, Department of Finance (1999–2015a). *Public Accounts of the Province of Nova Scotia*, 1998–99 to 2014–2015. Government of Nova Scotia.

Nova Scotia, Department of Finance (2015b). *Forecast Update* (December). <http://www.novascotia.ca/finance/site-finance/media/finance/Forecast_Update_Dec_2015.pdf>, as of April 20, 2016.

Office of the Parliamentary Budget Officer [PBO] (2010). *Fiscal Sustainability Report* (February). Office of the Parliamentary Budget Officer <http://www.parl.gc.ca/PBO-DPB/documents/FSR_2010.pdf>, as of April 20, 2016.

Office of the Parliamentary Budget Officer [PBO] (2015). *Fiscal Sustainability Report 2015*. Office of the Parliamentary Budget Officer <http://www.pbo-dpb.gc.ca/web/default/files/files/files/FSR_2015_EN.pdf>, as of April 20, 2016.

Ontario, Ministry of Finance (1999–2015). *Public Accounts of Ontario*, 1998–99 to 2014–15. Government of Ontario.

Ontario, Ministry of Finance (2016). *Budget 2016*. Government of Ontario.

Prince Edward Island, Department of Finance and Municipal Affairs (1999–2015). *Public Accounts*, 1998–99 to 2014–2015. Government of Prince Edward Island.

Prince Edward Island, Department of Finance and Municipal Affairs (2015). *Budget 2015*. Government of Government of Prince Edward Island.

Quebec, Ministère des Finances (2015). *Public Accounts 2014–15*. Government of Quebec.

Quebec, Ministère des Finances (2016). *Quebec Economic Plan 2016*. Government of Quebec.

Ragan, Christopher (2012). *Canada's Looming Fiscal Squeeze*. Revised version (March). Macdonald-Laurier Institute. <http://www.macdonaldlaurier.ca/files/pdf/Canadas-Looming-Fiscal-Squeeze-November-2011.pdf>, as of April 20, 2016.

Ramlo, Andrew, and Ryan Berlin (2010). *Sustainable: British Columbia's Health Care System and Our Aging Population.* Report 78 (June). The Urban Futures Institute. <http://www.urbanfutures.com/sustainable-health/>, as of April 20, 2016.

RBC Economics (2015). *Provincial Outlook* (September). RBC Economics.

Saskatchewan, Ministry of Finance (1999–2015a). *Public Accounts,* 1998-99 to 2014-15. Volume 1. Government of Saskatchewan.

Saskatchewan, Ministry of Finance (2015b). *2015–16 Saskatchewan Provincial Budget*. Government of Saskatchewan.

Saskatchewan, Ministry of Finance (2015c). *Keeping Saskatchewan Strong: 2015– 16 Budget Update, Mid-Year Report*. <http://www.finance.gov.sk.ca/budget2015-16/Q2-REPORT-2015-16.pdf>, as of April 20, 2016.

Shenfeld, Avery, Nick Exarhos, and Andrew Grantham (2015). *Provincial Outlook: The Changing of the Guard*. Economic Insights (November 23). CIBC World Markets. http://research.cibcwm.com/economic_public/download/pfnov15.pdf.

Statistics Canada (2014a). *CANSIM Table 052-0005: Projected population, by projection scenario, age and sex, as of July 1, Canada, provinces and territories, annual (in thousands).* Government of Canada.

Statistics Canada (2014b). *Table 1.1: Summary of long-term Projection Scenario Assumptions*. Web table. Government of Canada. <http://www.

statcan.gc.ca/pub/91-520-x/2014001/tbl/tbl1.1-eng.htm>, as of April 18, 2016.

Statistics Canada (2015a). *CANSIM Table 326-0021 – Consumer Price Index, annual (2002=100).* Government of Canada.

Statistics Canada (2015b). *CANSIM 051-0001 – Estimates of population, by age group and sex for July 1, Canada, provinces and territories.* Government of Canada.

Statistics Canada (2015c). *CANSIM 380-0063 – Gross domestic product, income-based, quarterly.* Government of Canada.

Statistics Canada (2015d). *CANSIM 384-0038 – Gross domestic product, expenditure-based, provincial and territorial, annual.* Government of Canada.

TD Economics (2015a). *Group of Seven Paint Moderate Growth Picture: Provincial Economic Forecast, as of October 8.* TD Economics.

TD Economics (2015b). *From a Longer-term Growth Perspective, West is still Best.* Special Report (April 10). TD Economics. <https://www.td.com/document/PDF/economics/special/LongtermGrowthPerspective.pdf>, as of April 18, 2016.

Xu, Ke, Priyanka Saksena, and Alberto Holly (2011). *The Determinants of Health Expenditure: A Country-level Panel Data Analysis.* Working Paper (December). World Health Organization. <http://www.who.int/health_financing/documents/cov-report_e_11-deter-he/en/>, as of April 18, 2016.

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