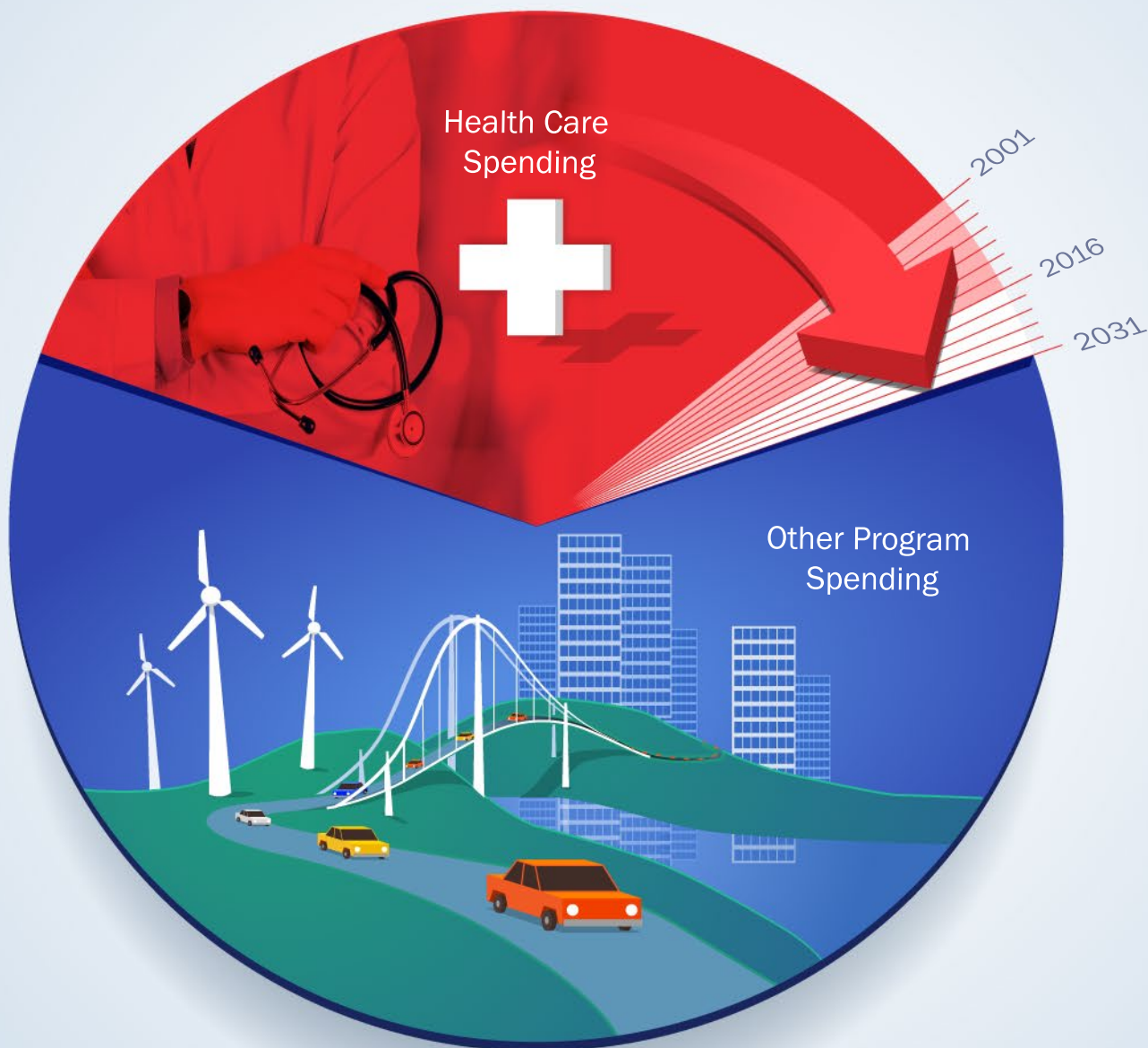


The Sustainability of Health Care Spending in Canada 2017

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Executive summary

Health care is the single largest budget item for every province in Canada, ranging from 34.3 percent of total program spending in Quebec to 43.2 percent in Ontario in 2016. 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 last 15 years (ie., between 2001 to 2016) saw provincial governments increase health care spending at an unsustainable pace. Indeed, during this period, health care spending grew by 116.4 percent, outpacing growth in other program spending (94.6 percent) and GDP (77.4 percent). It is therefore unsurprising that during the same period, the share of program spending represented by health care for the provinces in total grew from 37.6 percent to 40.1 percent. Further, while provincial health care spending (in total) represented only about 6.0 percent of Canada's GDP in 2001, it had grown to represent 7.3 percent by 2016. However, growth in spending has not followed a consistent trend over this 15-year period. Notably, the average annual growth in health spending (6.7 percent) during the first 10 years between 2001-2011 was much higher than the average annual growth during the past 5 years (2.6 percent) between 2011-2016.

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 (long-term trend model) 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 2001 and 2016. Under this scenario, health care spending is projected to grow at about 5.3 percent per annum on average between 2016 and 2031. As a result, health care spending is expected to consume a slightly larger portion of total program spending—growing from 40.1 percent in 2016 to 42.6 percent in 2031. The range of results for specific provinces is a low of 34.2 percent in Quebec to a high of 47.2 percent in British Columbia in 2031. As well, health spending in total is expected to grow from 7.3 percent of the economy in 2016 to 9.3 percent in 2031. Health care spending in four provinces (British Columbia, Prince Edward Island, Ontario and Nova Scotia) is projected to consume over 45 percent of total program spending—suggesting increases in spending along these lines may be unsustainable and carry some risk of crowding out other programs or requiring fiscal adjustments.

In the second scenario (short-term trend model), the assumptions regarding health-specific inflation and other factors are altered to reflect trends only between the shorter and more recent period between 2011 and 2016. Under this scenario, health care spending is projected to grow at about 2.9 percent per annum on average between 2016 and 2021. As a result, it is expected that health care spending will continue to represent about the same portion of total program spending—growing from 40.1 percent in 2016 to 40.5 percent in 2021. Relative to the size of the economy, health spending is again expected to remain roughly constant—decreasing marginally from 7.3 percent of the economy in 2016 to 7.0 percent of the economy in 2021. Under this scenario, there is less risk of crowding out other programs and requiring fiscal adjustments.

After years of increasing health care spending at an unsustainable pace, it seems as though provincial governments have started to reach their limits over the past 5 years—understanding that a continuation of such increases would result in either reductions in other spending, or higher taxation, higher deficits and debt, or some combination of these three.

Indeed, given expected inflationary and demographic pressures, if governments increase health care spending in the future in line with trends observed over the last 5 (rather than 15) years, the present ratio of health care spending to program spending and GDP may be preserved (at least in the near future). However, the continual presence of long wait times and low ratios of human and technological medical resources despite historically high levels of spending raise new questions about whether the public health care system will be able to deliver adequate services to patients without fundamentally altering its structure.

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 2017 and 2031.

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 2001 and 2016. 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 2017 and 2031 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 number¹ 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-

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, 2016) estimates that a total of \$228.1 billion was spent on health care in Canada in 2016.² This represents about 11.1 percent of Canada's economy, or roughly \$6,299 per Canadian.

The \$228.1 billion figure includes expenditures in both the private and public sectors. As figure 1 illustrates, the private sector's share (30.2 percent) totalled \$68.9 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 (65.1 percent) of all private health care expenditures.

The public sector's share of total health care spending (69.8 percent) totalled \$159.1 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.³

Provincial and territorial government spending accounts for almost all (93.2 percent) public spending on health care.⁴ In 2016, their combined health care expenditures added up to approximately \$148.3 billion (about \$4,095 per person). By comparison, in 2001 (our first year of analysis⁵),

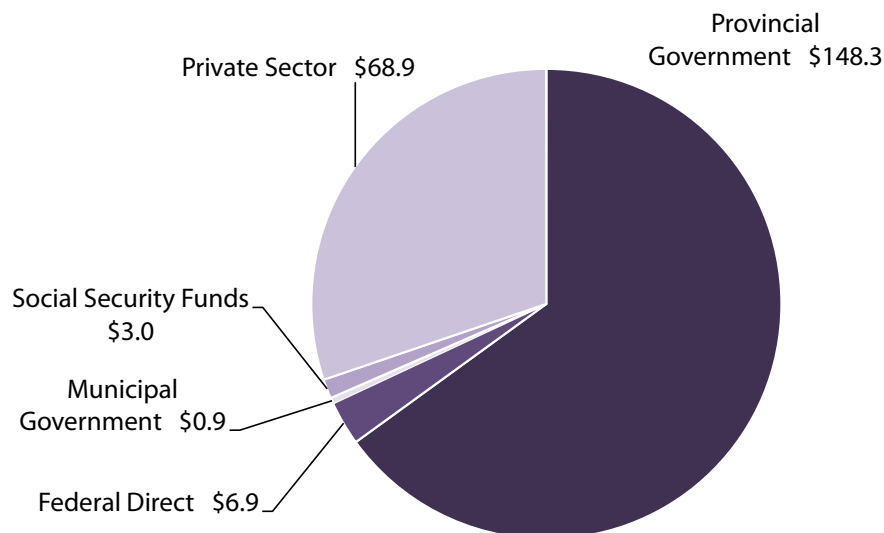
² The CIHI report (2016) presents forecasted estimates for health care expenditures in 2015 and 2016.

³ CIHI (2015) estimated that hospitals and physicians account for almost 60 percent of all public health care expenditures in 2015. CIHI (2016) did not include these estimates for 2016. For more details regarding health care expenditures by the public and private sectors, see CIHI (2015, 2016).

⁴ This is partly as a result of the fact that expenditures are reported by 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.

⁵ For historical analyses this publication examines the most recent 15 year period for which age-adjusted data is available.

Figure 1: Total Health Expenditures, by Source of Finance, 2016 (\$ billions)



Source: CIHI, 2016.

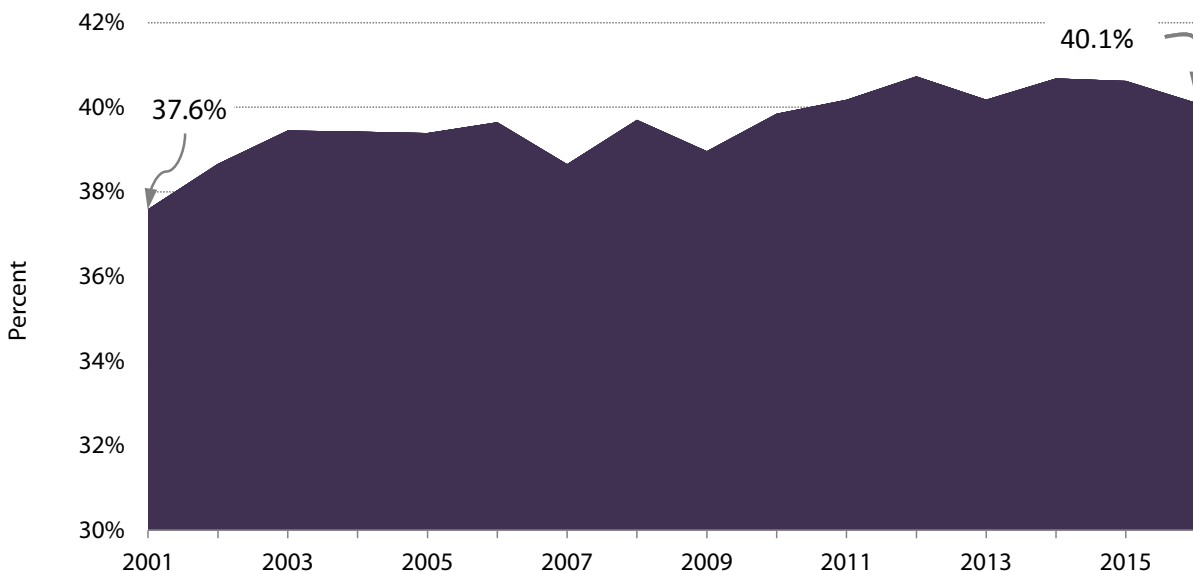
provincial governments spent a combined \$68.5 billion (about \$2,209 per person) on health care. This means that between 2001 and 2016, expenditures by provincial governments on health care increased by 116.4 percent (in nominal terms).

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 about 37.6 percent of provincial program spending in 2001, it ended up consuming 40.1 percent by 2016 (figure 2).

Nine of the ten provinces 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 British Columbia (from 36.4 to 42.0 percent), while Manitoba experienced a decrease (from 43.6 to

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 2001/02 to 2015/16 are from Public Accounts. Data for 2016/17 are from the most recent provincial budgets and latest quarterly updates.

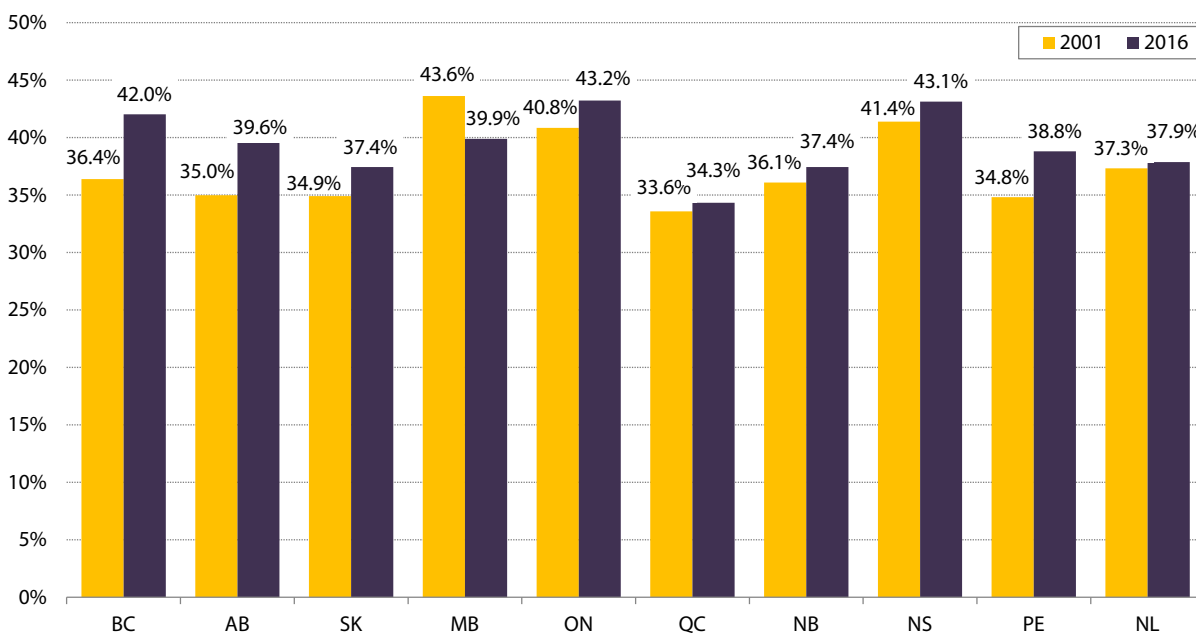
Figure 2: Provincial Health Spending as a Percentage of Program Spending, Canada, 2001-2016



Note: Program spending is defined as total spending minus debt servicing costs.

Sources: CIHI, 2016; Canada, Department of Finance, 2016; Provincial Budgets and updates, 2016; calculations by authors.

Figure 3: Provincial Health Spending as a Percentage of Program Spending, by Province, 2001-2016



Sources: CIHI, 2016; Canada, Department of Finance, 2016; Provincial Budgets and updates, 2016; calculations by authors.

39.9 percent). By 2016, health care spending as a share of total provincial program spending ranged from a low of 34.3 percent in Quebec,⁷ to 43.2 percent in Ontario.

Relative to the size of the economy, provincial health care spending represented about 6.0 percent of Canada's GDP in 2001.⁸ By 2016 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 7.1 to 9.8 percent). Every province saw an increase except British Columbia where spending on health care as a percentage of provincial GDP (7.4 percent) is the same in 2016 as it was in 2001. By 2016, health care spending as a share of provincial GDP ranged from a low of 6.6 percent in Alberta to a high of 10.3 percent in Prince Edward Island.

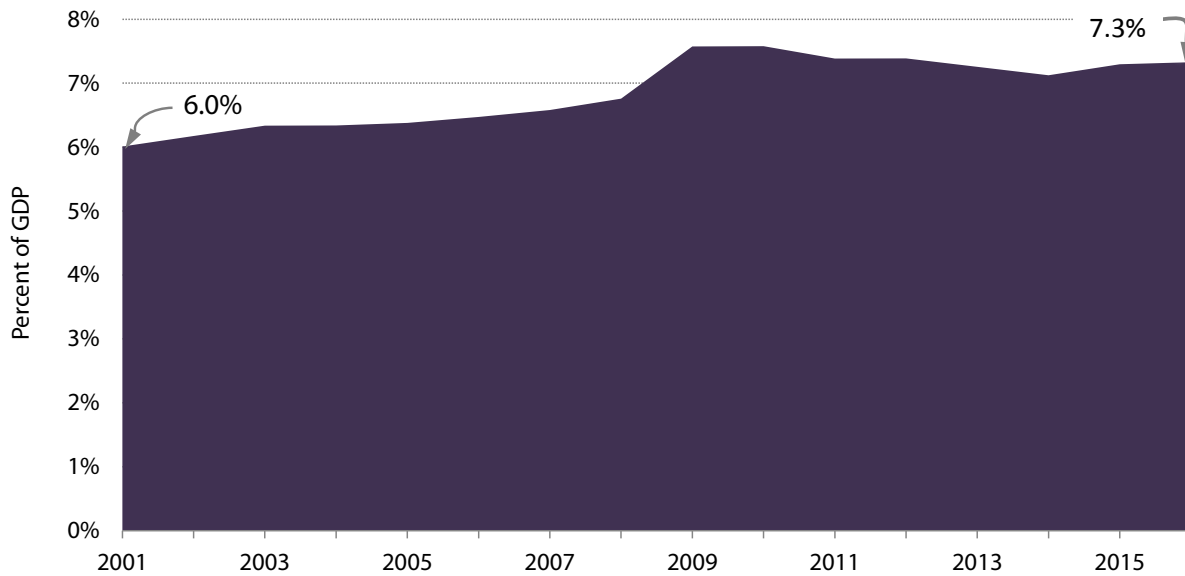
Figure 6 provides a more complete chronological picture of these trends by illustrating the growth of provincial government health care spending, non-health care program spending, and GDP between 2001 and 2016, indexed using 2001 as a base year. Provincial health spending rose by 116.4 percent between 2001 and 2016. In comparison, non-health related spending by provincial governments grew by 94.6 percent, while the Canadian economy (as measured by the sum of provincial GDPs) grew by 77.4 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 2001 to 2016. The province with the highest growth in health care spending was Alberta (191.4%), while the province with the lowest growth in such spending was British Columbia (90.0%). At 51.9 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 Manitoba (-37.0 percentage points). The greatest difference in growth between health care spending and GDP was in Alberta (89.6 percentage points), while the smallest was in British Columbia (-0.7 percentage points).

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.

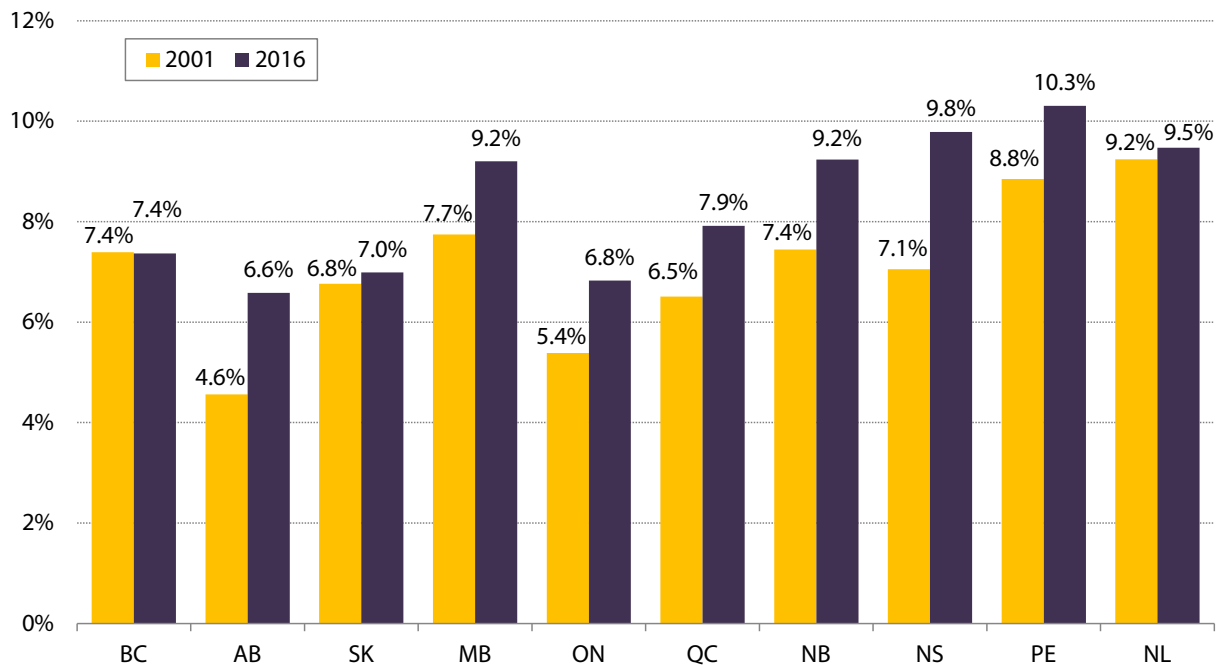
⁸ Provincial GDP figures 2001 to 2015 are from Statistics Canada (2016b & 2016c). For 2016, provincial GDP figures were estimated using private forecasters (TD Economics, 2016; RBC Economics, 2016; Grantham, 2016; Scotiabank, 2016).

Figure 4: Provincial Health Spending as a Percentage of the Economy (GDP), Canada, 2001-2016



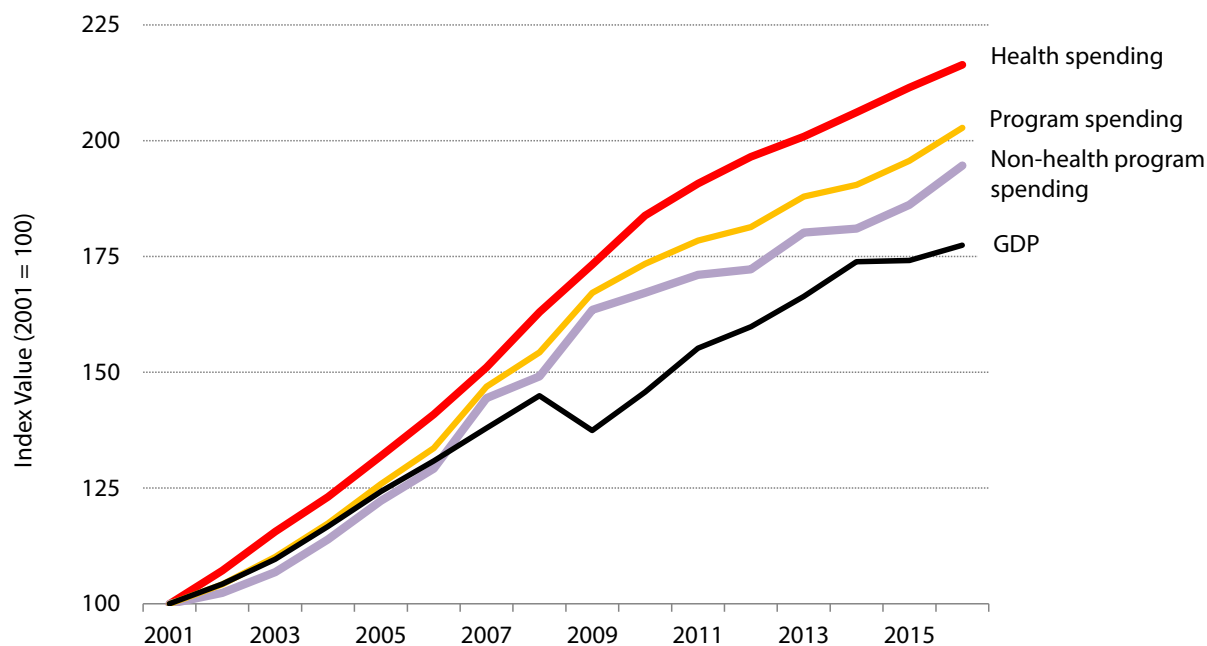
Sources: CIHI, 2016; Statistics Canada, 2016c; TD Economics, 2016; RBC Economics, 2016; Grantham, 2016; Scotiabank, 2016; calculations by authors.

Figure 5: Provincial Health Spending as a Percentage of the Economy (GDP), by Province, 2001-2016



Sources: CIHI, 2016; Statistics Canada, 2016c; TD Economics, 2016; RBC Economics, 2016; Grantham, 2016; Scotiabank, 2016; calculations by authors.

Figure 6: Index of Comparative Growth, Selected Indicators, Canada (2001 = 100), 2001-2016



Sources: CIHI, 2016; Canada, Department of Finance, 2016; Statistics Canada, 2016c; TD Economics, 2016; RBC Economics, 2016; Grantham, 2016; Scotiabank, 2016; calculations by authors.

Table 1: Overall Growth Rates, Selected Indicators, 2001-2016

	Health spending	Non-health program spending	Program spending	GDP
Canada	116.4%	94.6%	102.8%	77.4%
NL	109.7%	105.1%	106.8%	104.6%
PEI	114.0%	80.3%	92.0%	83.7%
NS	114.1%	99.4%	105.5%	54.4%
NB	94.2%	83.3%	87.2%	56.5%
QC	99.4%	92.8%	95.0%	63.8%
ON	114.4%	94.4%	102.6%	69.0%
MB	123.2%	160.3%	144.1%	87.8%
SK	137.3%	112.6%	121.2%	129.6%
AB	191.4%	139.5%	157.6%	101.8%
BC	90.0%	49.9%	64.5%	90.7%

Sources: CIHI, 2016; Canada, Department of Finance, 2016; Statistics Canada, 2016c; TD Economics, 2016; RBC Economics, 2016; Grantham, 2016; Scotiabank, 2016; calculations by authors.

SECTION III

Building a Model to Project Health Care Expenditures

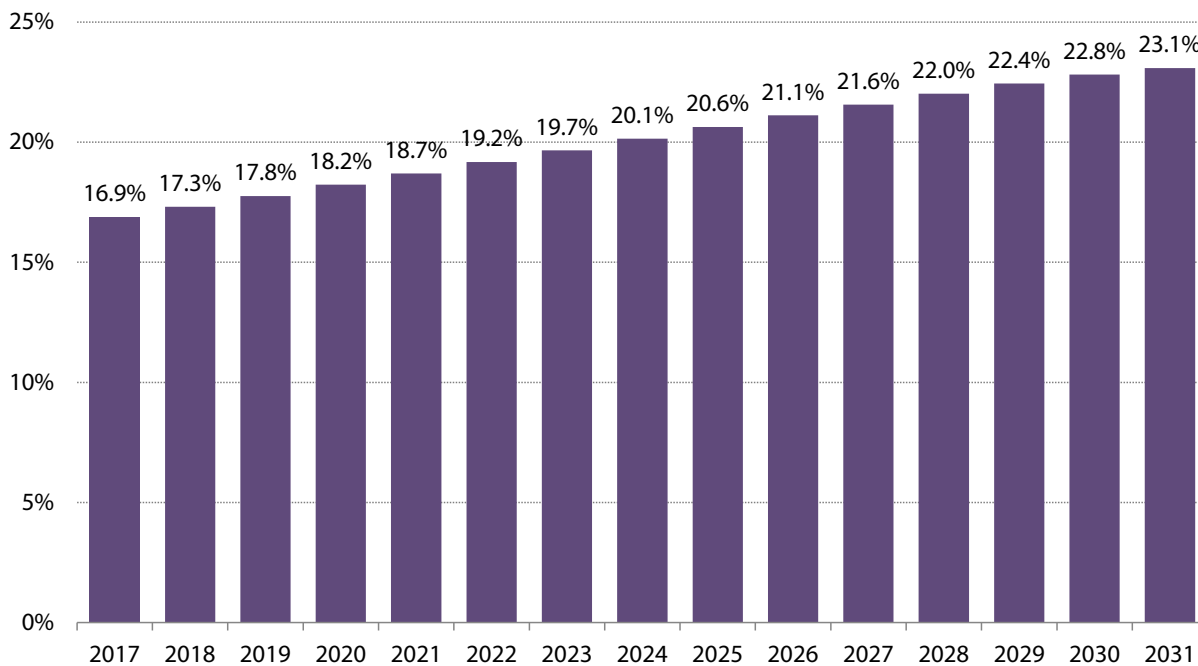
In order to assess whether health care spending is sustainable, it is necessary to make projections about the future. We make these projections for provincial government health care spending using detailed population projections and assumptions about key drivers of health care costs. Changes in health 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.⁹ 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 16.9 percent in 2017 to 23.1 percent by 2031 (figure 7). This is important because health expenditure data has consistently shown that, as a group, older Canadians consume more health care

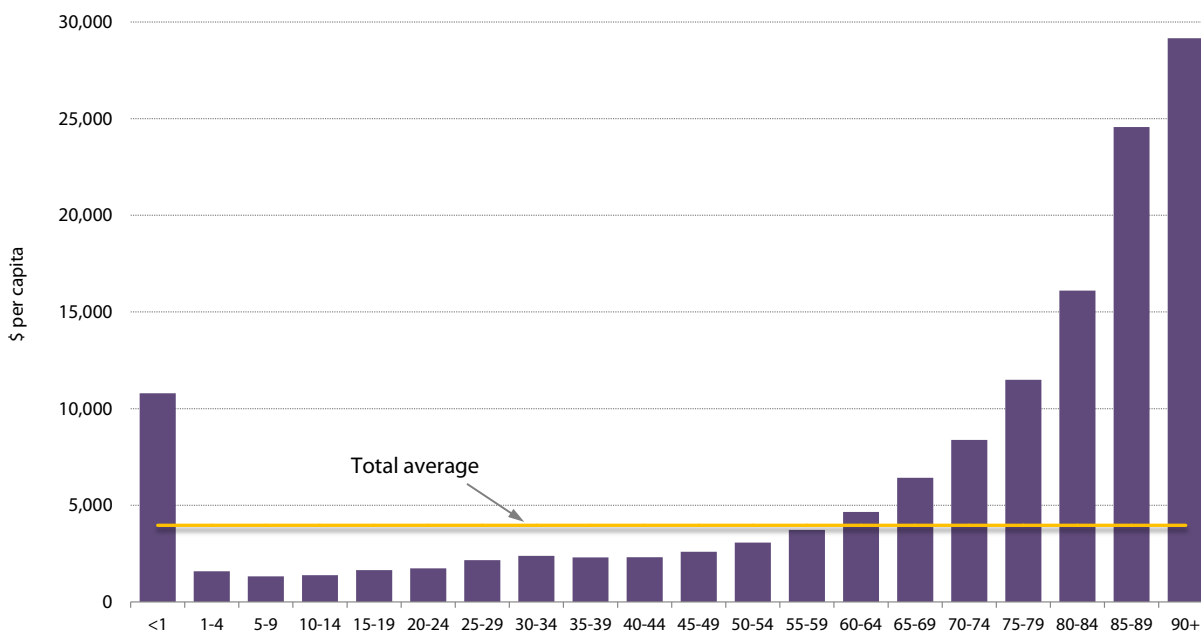
⁹ See CIHI (2011), Dodge et al. (2011), PBO (2015), Ragan (2012), Ramlo et al. (2010), and Busby et al. (2014), for example.

Figure 7: Proportion of the Population, 65 Years and Over, 2017-2031



Sources: Statistics Canada, 2014a and 2016a; calculation by authors.

Figure 8: Health Care Expenditure per Capita by Age Group, Canada, 2014



Source: CIHI, 2016.

dollars than middle-aged and younger Canadians (figure 8).¹⁰ In fact, in 2014, the latest year for which age-specific health spending data are available, seniors (aged 65 years and older) constituted about 16 percent of the population, but consumed “almost 46% of all public-sector health care dollars spent by provinces and territories” (CIHI, 2016). Therefore, we assume our population’s changing age structure will have a fairly predictable impact on future health care expenditures. By using the M1¹¹ population projection from Statistics Canada (2014a) and data from CIHI (2016) 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 2017 and 2018) 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.”¹² For this reason, we also assume that future health

¹⁰ 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.”

¹¹ 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.

¹² 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).

care expenditures will grow in excess of general inflation as a result of 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 (2016).

Other factors

The growth rate due to other factors is based on the historical average growth rate of health care that is unexplained¹³ by inflation (general¹⁴ and health specific¹⁵) and demographic factors (population growth¹⁶ and aging¹⁷). While we do not know precisely what these factors are, some explanations could include changes in government policy, technological change, and the income elasticity¹⁸ 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 2011 and 2016 suggests that growth in total health care spending by provinces during this particular period was 1.2 percentage points lower than growth predicted by just inflationary and demographic factors.¹⁹

¹³ For example, of the 5.3 percent average annual growth in provincial health care spending that we observed between 2001 to 2016 (the most recent 15 year period for which age-specific health spending data were available), 0.9 percentage points could not be explained by either inflationary or demographic factors, according to our calculations.

¹⁴ Calculated using data from Statistics Canada (2017).

¹⁵ Calculated using data from data from CIHI (2016).

¹⁶ Calculated using data from Statistics Canada (2016a).

¹⁷ Calculated using population data from Statistics Canada (2016a) and age-specific spending data from the CIHI (2016). 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.

¹⁸ The income elasticity of health care spending refers to the relationship between growth in per capita income and demand for health care services.

¹⁹ This finding is similar to the CIHI’s estimate of the contribution of “Other Factors” to health care spending growth between 2010-2014 (CIHI, 2016; 25-26)

Further, Kneebone (2012: 8-9) suggests that there is even greater uncertainty over the appropriate elasticity to use in a federation such as 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 equation²¹:

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

²⁰ Total health spending in 2015 and 2016 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 2015 and 2016. Health spending (annually from 2017 to 2031) 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):

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

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, 2016), CPI is the consumer price index (based on the Bank of Canada's CPI 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, 2017–2031

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 depends on the historical period chosen upon which to base our assumptions.

For this reason, we present the results of two scenarios. In Scenario 1 we project health care spending over the 15-year period spanning 2017-2031 by basing our assumptions for health-specific inflation and “other factors” on historical trends observed between 2001 and 2016 (the most recent 15-year period for which age-specific health spending data are available). In Scenario 2, we project health care spending over the 5-year period spanning 2017-2021 basing our assumptions for health-specific inflation and “other factors” on historical trends observed between 2011 and 2016 (the most recent 5-year period for which age-specific health spending data are available). The assumptions regarding the impact of demographic changes and general inflation are consistent across both models.

The results of these two scenarios are presented below, and are contrasted with data from 2016, the latest year for which health expenditure data are available from CIHI (2016).

Scenario 1: Long-term trend model

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

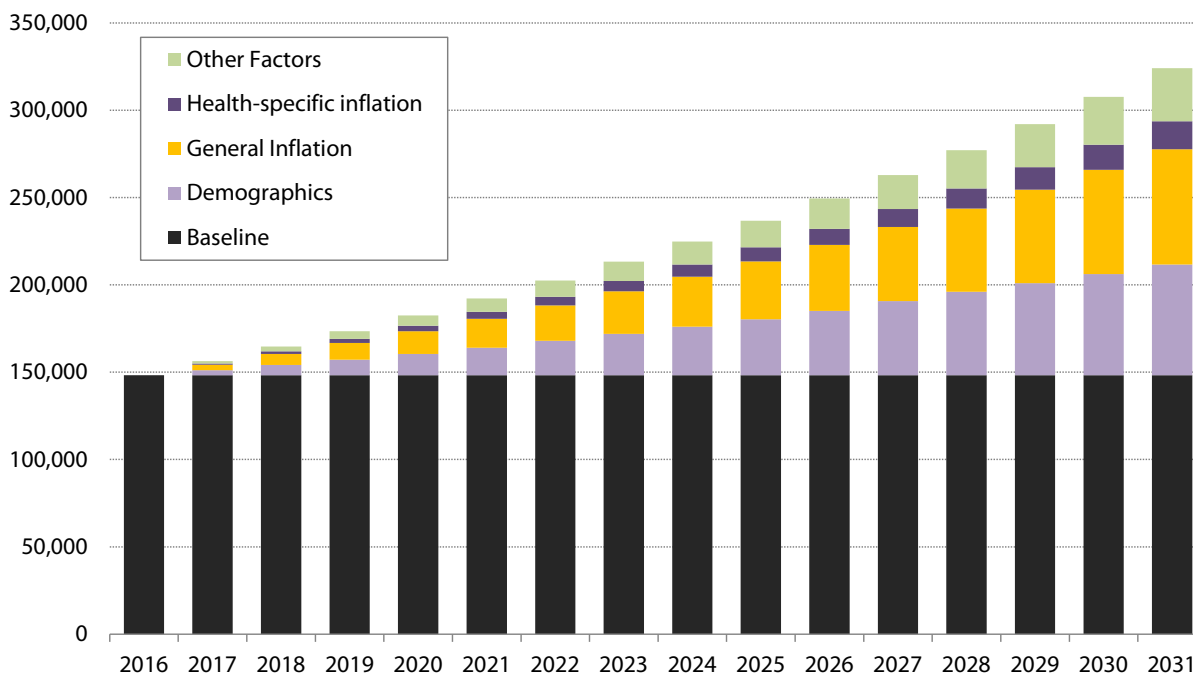
The combined effect of these factors suggest that health care spending by provincial governments will increase by approximately 5.3 percent per annum over the next 15 years—increasing 118.5 percent from \$148.3 billion in 2016 to \$324.0 billion by 2031 (figure 9).

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

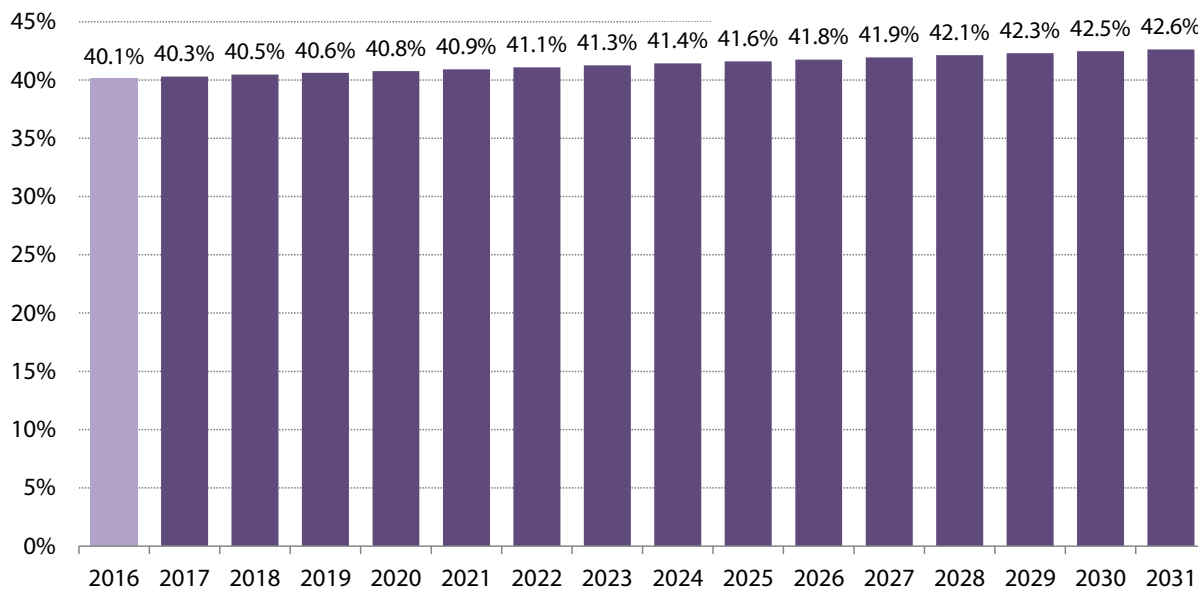
Growth Factor		Assumption		Average Annual Growth Rate (percent)
Inflation	General Inflation	Average private forecasters; Bank of Canada's Inflation target	Variable	2.0%
	Health-specific inflation	Historical Observation (2001-2016)	Constant	0.9%
Demographics	Population Growth	Statistics Canada (2016) Population Projections (M-1)	Variable	1.9%
	Population Ageing			
Other Factors		Historical Observation (2001-2016)	Constant	0.9%

Figure 9: Effect of Contributing Factor on Health Spending Growth, 2016-2031 (\$ millions)



Sources: CIHI, 2016; BMO Economics, 2016; RBC Economics, 2016; TD Economics, 2015 and 2016; Statistics Canada, 2014a and 2016a; calculations by authors.

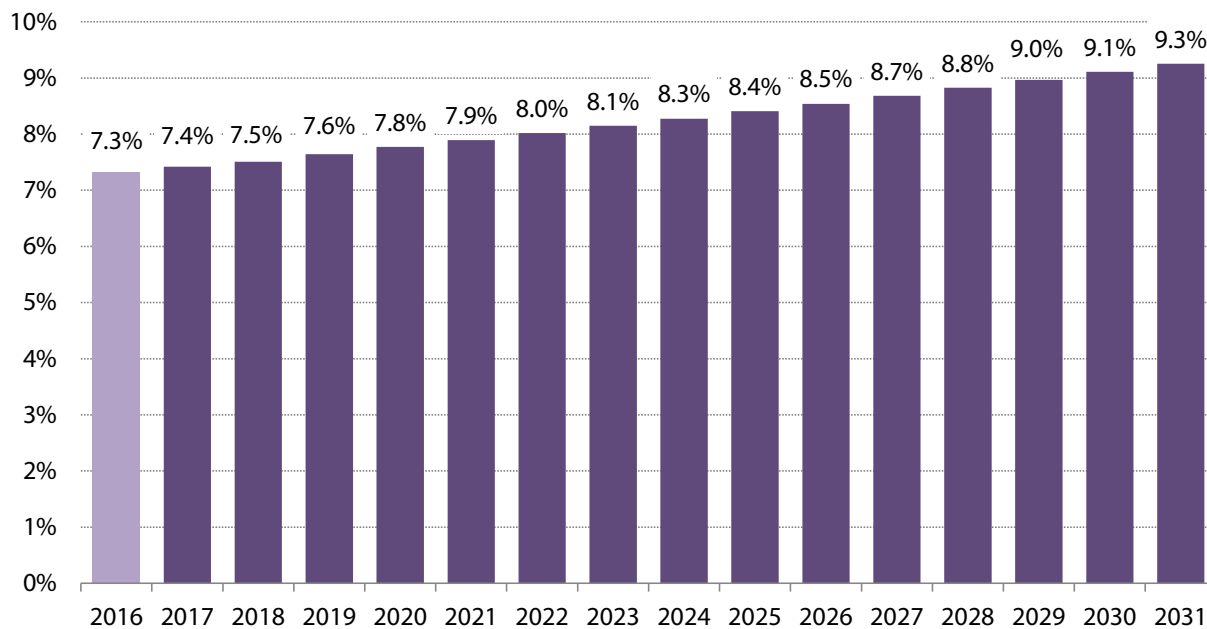
Figure 10: Provincial Health Spending as a Percentage of Program Spending, Canada, 2016-2031



Note: Program spending is defined as total spending minus debt servicing costs.

Sources: CIHI, 2016; Canada, Department of Finance, 2016; Provincial Budgets and updates, 2016; calculations by authors.

Figure 11: Provincial Health Spending Relative to the Economy (GDP), Canada, 2016-2031



Sources: CIHI, 2016; BMO Economics, 2016; RBC Economics, 2016; TD Economics, 2015 and 2016; Grantham, 2016; Scotiabank, 2016; 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%	2.0%	2.0%	2.0%	2.0%	1.9%	2.0%	2.0%	1.8%	2.0%
	Health-specific inflation	Historical Observation (2001-2016)	Constant	0.4%	0.8%	0.8%	0.7%	0.4%	0.5%	0.2%	0.2%	0.4%	0.2%
Demographics	Population Growth	Statistics Canada (2016) Population Projections (M-1)	Variable	1.9%	2.8%	1.4%	1.7%	1.9%	1.7%	1.6%	1.5%	2.3%	1.3%
	Population Ageing												
Other Factors		Historical Observation (2001-2016)	Constant	0.5%	1.6%	1.9%	1.7%	0.9%	0.3%	1.1%	1.7%	1.5%	1.4%

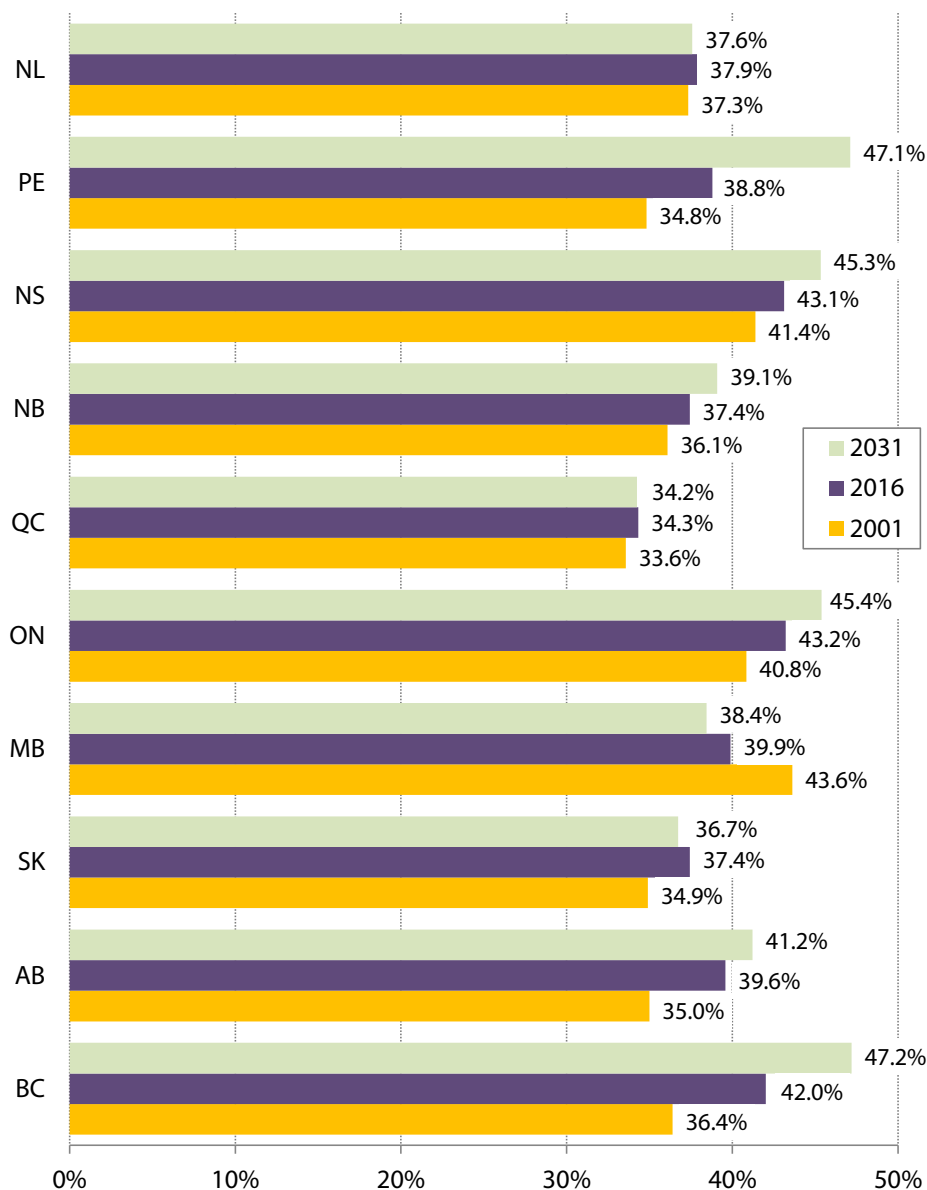
2001 and 2016 (the most recent year for which data are available), we project that health care spending will continue to represent an increasing portion of total program spending, going up from 40.1 percent in 2016 to 42.6 percent by 2031 (figure 10). This implies that other programs will represent a slightly 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 2016 to 9.3 percent in 2031 (figure 11).

Under this scenario, we also project that total program spending by provincial governments will increase from 18.3 percent of GDP in 2016 to 21.7 percent in 2031. This implies an expected increase in the size of government as a share of the economy.

²² GDP estimates are the average of private forecasters (TD Economics, 2015 and 2016; Scotiabank, 2016, RBC Economics, 2016 and Grantham, 2016).

Figure 12: Provincial Health Spending to Program Spending, by Province, 2001, 2016, 2031

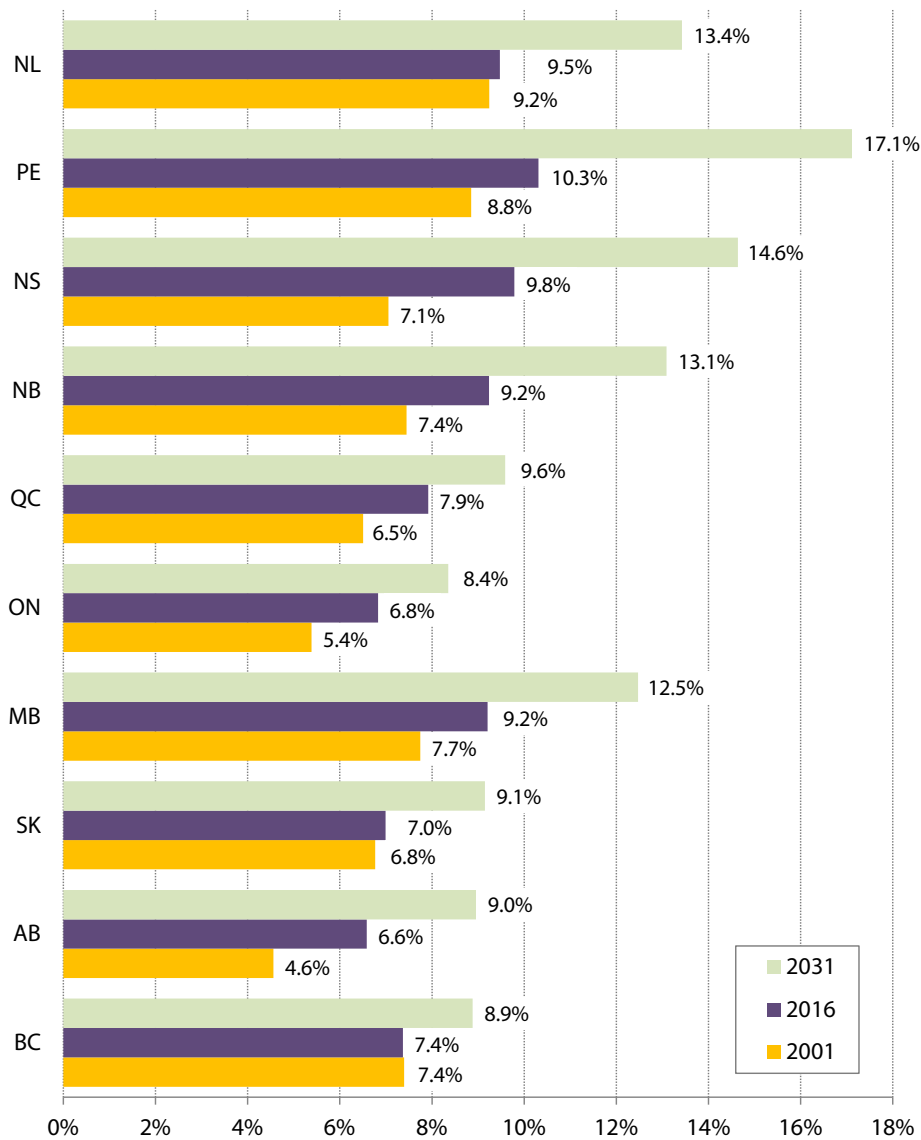


Sources: CIHI, 2016; Canada, Department of Finance, 2016; Provincial Budgets and updates, 2016; calculations by authors.

Provincial projections

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

Figure 13: Provincial Health Spending to GDP, by Province, 2001, 2016, 2031



Sources: CIHI, 2016; Statistics Canada, 2016c; calculations by authors.

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 nine of the ten provinces, projected health care expenditures in 2031 represent a higher proportion of projected program spending than in 2001. Only Manitoba is projected to have lower health care expenditures as a percentage of program spending

in 2031 (38.4 percent) compared to 2001 (43.6 percent). In six of the 10 provinces, projected health care expenditures in 2031 represent a higher proportion of program spending than in 2016. In three provinces, Saskatchewan, Manitoba, and Newfoundland & Labrador, health care expenditures are projected to represent a smaller percentage of their entire program spending by 2031 in comparison to 2016 (the projected change in Quebec is negligible).

Figure 13 summarizes historical and projected health care expenditures relative to GDP. In all 10 provinces, projected health care expenditures in 2031 represent a higher proportion of projected provincial GDP than in 2001. Further, in every province, projected health care expenditures in 2031 also represent a higher proportion of GDP than they did in 2016.

Scenario 2: Short-term trend 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 accordance with expected trends for general inflation (measured by the Consumer Price Index) and demographics, as well as in line with historical trends for health-specific inflation and “other factors” observed between 2001 and 2016.

In this short-term trend model, we project a scenario in which future increases in health care spending again grow according to expected trends for general inflation (measured by the Consumer Price Index) and demographics, but this time in line with historical trends for health-specific inflation and “other factors” observed over the shorter, and more recent five-year period between 2011 and 2016. The time-frame for projections in this model reflect the fact that the historical observation is limited to a short five year period, and hence are only estimated till 2021.

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 2.9 percent per annum (compared to 5.3 percent in scenario 1) over the next 5 years, increasing by 15.7 percent from \$148.3 billion in 2016 to \$171.5 billion by 2021.

If we assume that provinces continue to increase spending on other programs at the same rate as they did between 2011 and 2016, we project that health care spending will continue to represent about the same portion of total program spending—going up from 40.1 percent in 2016 to 40.5 percent by 2021 (see figure 14).

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	2.0%
	Health-specific inflation	Historical Observation (2011-2016)	Constant	0.3%
Demographics	Population Growth	Statistics Canada (2014) Population Projections (M-1)	Variable	1.9%
	Population Ageing			
Other Factors		N/A		

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 stay roughly constant—decreasing marginally from 7.3 percent in 2016 to 7.0 percent in 2021 (see figure 15). We also project that total program spending by provincial governments will decrease from 18.3 percent of GDP in 2016 to 17.4 percent in 2021. This implies an expected decrease in the size of government.

Conclusion

The first scenario presented in this paper is 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 2001 and 2016. In this scenario, health care spending is projected to grow at about 5.3 percent per annum on average between 2016 and 2031. As a result, health care spending is expected to consume a slightly larger portion of total program spending—growing from 40.1 percent in 2016 to 42.6 percent in 2031 (figure 14). As well, health spending in total is expected to grow from 7.3 percent of the economy in 2016 to 9.3 percent in 2031 (figure 15). Health care spending in 4

Figure 14: Provincial Health Spending Relative to Program Spending, Canada, 2001-2031

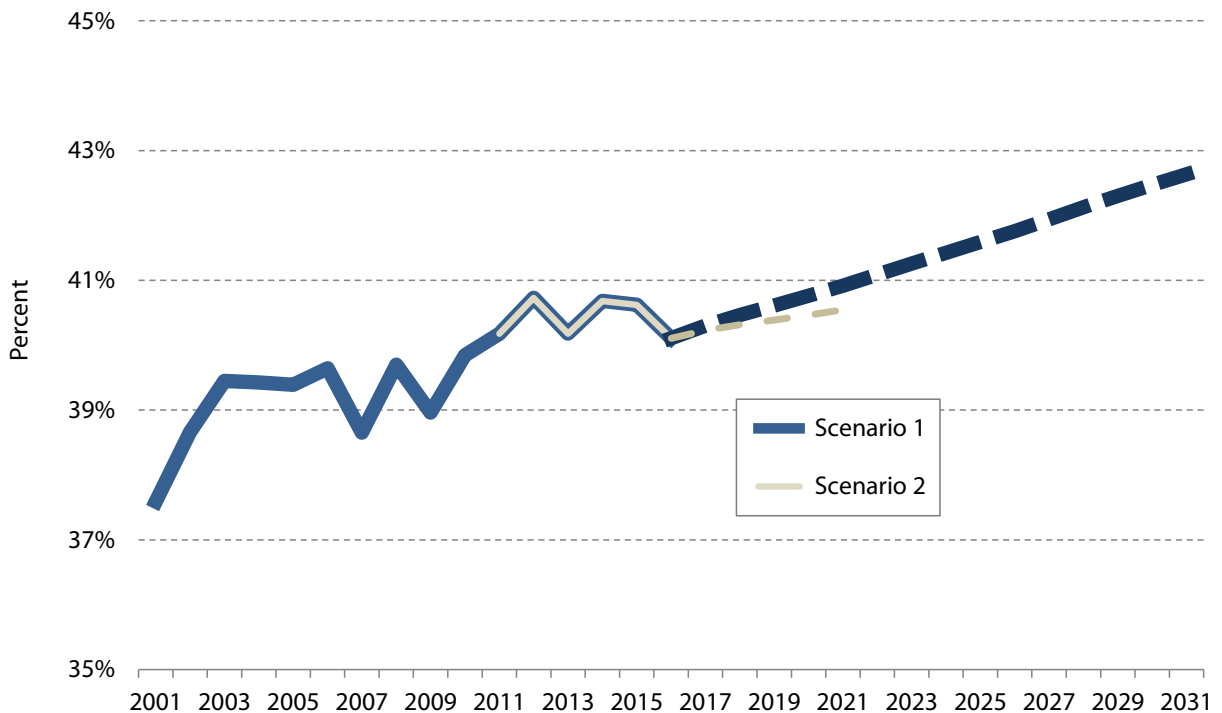
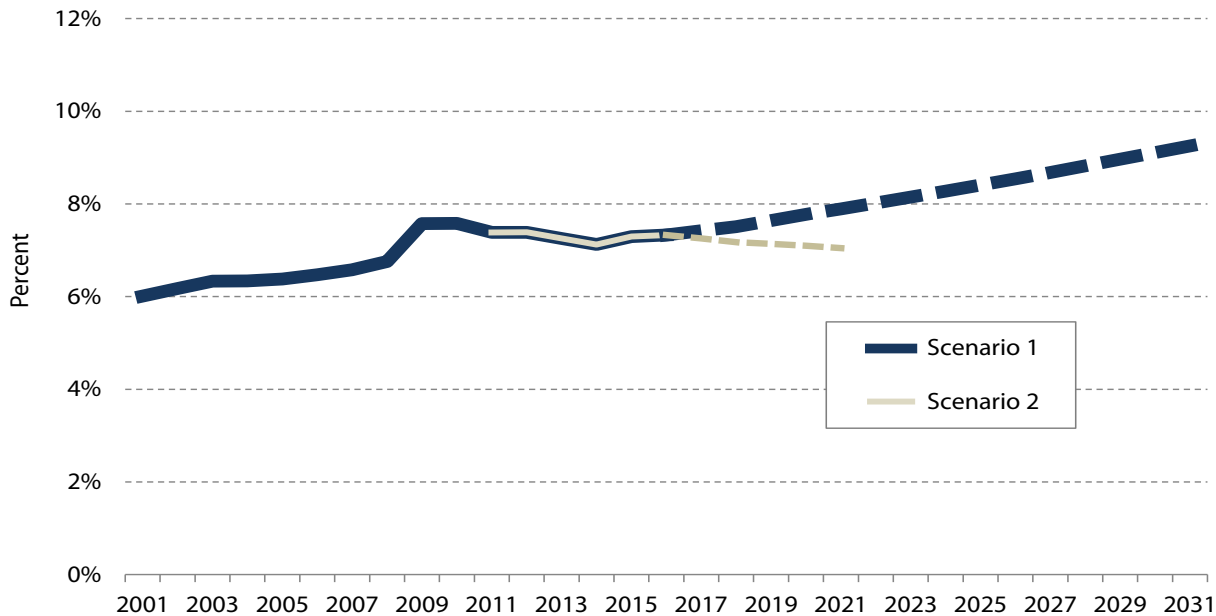


Figure 15: Provincial Health Spending Relative to the Economy (GDP), Canada, 2001-2031



provinces (British Columbia, Prince Edward Island, Ontario, and Nova Scotia) is projected to consume over 45 percent of program spending, suggesting that increases in spending along these lines may be unsustainable and carry some 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 2011 and 2016, health care spending is projected to grow at a more reasonable pace of about 2.9 percent per annum on average between 2016 and 2021 (the shorter projection reflects the shorter historical analysis). As a result, it is expected that health care spending will continue to represent about the same portion of total program spending—growing from 40.1 percent in 2016 to 40.5 percent in 2021 (figure 14). Relative to the size of the economy, health spending is again expected to remain roughly constant, decreasingly marginally from 7.3 percent of the economy in 2016 to 7.0 percent of the economy in 2031 (figure 15). Under this scenario, there is less risk of crowding out other programs and requiring fiscal adjustments.

After years of increasing health care spending at an unsustainable pace (most notably between 2001-2011), it seems as though provincial governments have started to reach their limits over the past 5 years, understanding that a continuation of such increases would result in either reductions in other spending, or higher taxation, higher deficits and debt, or some combination of these three.

Indeed, given expected inflationary and demographic pressures, if governments increase health care spending in the future in line with trends observed over the last 5 (rather than 15) years, the present ratio of health care spending to program spending and GDP may be preserved in the near future. However, the continual presence of long wait times (Barua and Ren, 2016) and low ratios of human and technological medical resources despite historically high levels of spending (Barua et al., 2016) raise new questions regarding whether the public health care system will be able to deliver adequate services to patients without fundamentally altering its structure.

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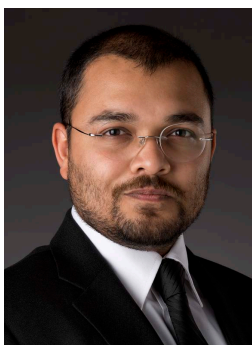
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Acknowledgments

The authors would like to thank the Lotte and John Hecht Memorial Foundation for funding this project. They would also like to thank Sazid Hasan for his assistance conducting research for this project and the unidentified reviewers for their comments and insights, which improved the paper substantially. Any remaining errors or oversights are the sole responsibility of the authors. As the researchers have worked independently, the views and conclusions expressed in this paper do not necessarily reflect those of the Board of Directors of the Fraser Institute, the staff, or supporters.

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Date of issue

March 2017

ISBN

978-0-88975-446-1

Citation

Bacchus Barua, Milagros Palacios, and Joel Emes (2017). *The Sustainability of Health Care Spending in Canada 2017*. Fraser Institute. <<http://www.fraserinstitute.org>>.

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