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HEALTH POLICY

## Managing the Cost of Healthcare for an Aging Population: Nova Scotia's Healthcare Glacier

by

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"Health, as we all know, is by far the biggest part of the budget. And for years it has also been the fastest growing.... This government has reduced health-care administration costs to below the national average, and has cut the rate of growth of health spending. That is no small feat...." *2012 Nova Scotia Budget Speech* (Nova Scotia, p. 11).

Satisfaction with the Nova Scotia government's success in restraining the growth of healthcare costs is inevitably tempered by concern that this feat will need to be repeated, over and over, for years into the future. Nova Scotia is one of the Canadian provinces for which the threat looms that demographic change – in particular, providing publicly funded healthcare to an aging population – will create serious fiscal stress.

Whether this threat is truly serious has been a lively topic of Canadian debate for years. One camp has emphasized that aging itself adds no more than 1 percentage point to annual increases in health costs, and argued that it creates no urgency around reforms to treatment or financing (Barer et al. 1995; Evans et al. 2001). If taxes can rise and curbing provider compensation can restrain costs, the system is, in a familiar phrase, as sustainable as Canadians want it to be.

The other camp has emphasized that 1 percentage point annually is large when it compounds over many years – and, moreover, that aging will slow the growth of the tax base (Robson 2001,

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This E-Brief is part of a series profiling the fiscal challenge of aging and publicly funded healthcare in each of Canada's provinces. We gratefully acknowledge the support of Alexandre Laurin in calculating program costs, and thank Don Drummond, Herb Emery, Livio Di Matteo, Seamus Hogan, Al O'Brien, Paul Kershaw, Stuart Langdon, Mel McMillan, Kevin Milligan, John Richards, an anonymous reviewer, our colleagues at the C.D. Howe Institute, and the members of the C.D. Howe Institute's Fiscal and Tax Competitiveness Council and Health Policy Council for comments on earlier drafts. We are responsible for any errors and the conclusions.

2007, 2010; Drummond and Burleton 2010; Dodge and Dion 2011; and Emery et al. 2012). Glaciers may move slowly, but they transform a landscape: this view tends to see the current system as unsustainable, in the sense that avoiding a painful collision between healthcare and other priorities – other key programs, manageable tax rates, and debt control – will require major changes to healthcare financing and delivery.

While the debate has raged, publicly funded healthcare in Nova Scotia has risen from 7.6 percent of provincial GDP in 1991 to about 10.2 percent in 2012. At the same time, it has risen from 35 percent of the provincial government's program spending in 1991 to about 46 percent in 2012, and its share of provincial own-source revenue – that is, revenues from provincial taxes and other sources Nova Scotia controls rather than funds transferred from Ottawa – has gone from 54 percent to about 70 percent.

Whatever the precise impact of aging and its interactions with changes in treatment, publicly funded healthcare's claim on provincial resources has increased. The above quotation from Nova Scotia's 2012 Budget highlights the ongoing challenge of curbing healthcare spending. How bad might things get?

## Mapping Today's Spending onto Tomorrow's Population

We address Nova Scotia's challenge with a well-known, straightforward approach. We project the province's population using the following middle-of-the-road assumptions: a fertility rate stable at its 2010 level; longevity rising in line with Statistics Canada's "medium" improvement scenario; net out-migration to other provinces falling to zero over 10 years, and net international in-migration continuing at its 1997–2011 average.

We then multiply the potential workforce, which we define as the population of Nova Scotians aged 18 to 64, by an index of output per potential worker – which grows at the rate recorded the equivalent national measure did from 1997 to 2011: 1.2 percent annually. This provides our model with projections of Nova Scotia's real GDP. Nominal provincial GDP is real GDP times the same 2 percent inflation rate we assume will prevail nationally.

Turning to the cost of demographically sensitive government programs, we project provincial spending on healthcare for 20 age groups of each sex across six types of spending. The per-person expenditures for each of these groups grow according to a measure of volume of services delivered and a cost index. The volume measure – an index of service intensity – represents spending on all services provided to a person by the publicly funded healthcare system, adjusted to remove the effects of inflation. Our base figures for these per-person numbers are from the Canadian Institute of Health Information (CIHI) figures for 2010, pro-rated to match recent actual totals.<sup>1</sup> Looking forward, we assume that service intensity per person rises at the same rate as real output per potential worker – 1.2 percent annually (see Box 1 for more detail). We also assume that costs rise at the pace recorded by the government consumption price index nationwide from 1997 to 2011 – 2.4 percent annually.<sup>2</sup>

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1 For our projections, we use the actual CIHI age and sex spending by health category for 2010, and prorate these amounts to correspond with the actual and projected health spending results using the most recent public accounts and budget documents, for 2011 and 2012. This estimation method yields a smaller increase in spending for 2011 than the CIHI estimates, and a larger increase in 2012, leaving total health spending in Nova Scotia \$33 million higher than the CIHI figure in 2012.

2 During this period, the Bank of Canada targeted 2 percent inflation, and achieved an annual average increase in the consumer price index of exactly 2 percent. The overall price index for government consumption rose 2.4 percent annually over the same period. We assume the same margin will prevail in the future.

## Box 1: Projecting Other Demographically Sensitive Program Costs

We use similar projection methods – multiplying relevant populations by program-specific indexes of service or transfer intensity – for all the programs we examine.\*

We assume that service intensity – the volume of services delivered per person in healthcare and education – rises at the same rate that output per working age person in the economy as a whole does. This assumption is not entirely arbitrary: absent good quantitative measures of quality of output, measures of activity in unpriced services such as health and education tend to be driven by inputs, and these are labour-intensive activities in which wages – which tend to rise with economy-wide productivity – are a key input. Historically, service intensity has grown at annual rates above the 1.2 percent we assume, and faster than productivity growth. We prefer to link them in our projections in order to ensure that trends upward or downward in the shares of health and education spending in GDP are not a function of different assumptions about service intensity on the one hand, and productivity growth on the other, but rather products of demographic change and the tendency for cost inflation in government consumption to outpace cost inflation elsewhere – an assumption that is explicit in our projections.

Our index of transfer intensity for seniors' benefits is derived from the Office of the Chief Actuary's projections of spending on Old Age Security, the Guaranteed Income Supplement, and Allowances per person age 65 and up. Because many of those programs are geared to income, and the Chief Actuary's model assumes that incomes rise over time, this index tends to fall somewhat in real terms. To the extent that provincial benefits for seniors differ from federal ones, this projection will not provide an accurate picture of the provincial outlook – but seniors' benefits are small enough in Nova Scotia that this is not a serious problem.

### Further notes on the projections for programs other than health:

*Education:* Base-year provincial/local spending on elementary and secondary education is calculated using data from Statistics Canada's Summary of Public School Indicators for the Provinces and Territories, 2005/06 to 2009/10. Base-year spending on postsecondary education comes from Statistics Canada (CANSIM, table 385-0001). Provincial populations aged 4 to 17 and 18 to 24 drive provincial spending on elementary and secondary students respectively. We multiply these populations by our indexes of service intensity. The population under 17 drives the Canada Education Saving Grant, while the population aged 18 to 24 and service intensity drive federal grants to postsecondary students. We multiply these by an unchanging index of transfer intensity.

*Elderly benefits:* Base-year federal spending is from the public accounts; base-year provincial is from Statistics Canada's Social Policy Simulation Database and Model (SPSD/M), Release 20.0 (responsibility for use and interpretation rests with the authors). As just noted, provincial payments assume the same time-path of transfer intensity for their elderly populations.

*Child/family benefits:* Spending on the federal Universal Child Care Benefit varies with the national population of children to age 5; spending on other child-related benefits varies with relevant populations up to age 17. We assume unchanging indexes of transfer intensity. Federal family benefits delivered through the tax system, while indexed to inflation, are income-tested, so real income growth erodes their real value.

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\* For more background information on the methodology used and the terminology see Robson (2002) and Drummond and Burleton (2010).

Because demography affects other programs, we use similar methods – indexes of service intensity in the case of education, and indexes of transfers for elderly and child/family benefits – multiplied by relevant populations and price indexes to project spending on them also (Box 1 spells out our approaches for health and these other programs in more detail). We can thus see whether these programs offset, or exacerbate, any fiscal challenge presented by healthcare.

## Nova Scotia's Outlook: Trends and Implicit Liability

Our projections show the claim of Nova Scotia's public healthcare spending on provincial GDP rising from 10.2 percent this year to 18.0 percent in 2035 and to 23.5 percent in 2062. Taking account of other demographically sensitive programs does not change the prospect of fiscal stress. The provincial government's spending on seniors' programs is not large enough to affect the results materially. While smaller numbers of students will damp growth in education spending in the next decade, our projections prefigure a slight rebound later in the projection period. So the share of all these programs in GDP rises from 18.5 to 33.0 percent over the next half-century (see Figure 1). For Nova Scotia to meet these demands from its own revenue sources would require an increase of more than 70 percent in the province's tax bite from Nova Scotians' incomes.

Another perspective on the fiscal pressure of rising healthcare costs is intergenerational: the liability implicit in a "pay-as-you-go" approach when a program's costs are not stable. The Nova Scotia government may advertise its success in restraining the growth of health spending, but it is certainly not promising cuts. And it is not promising to increase its aggregate tax take. This political understanding creates an implicit liability on the government's balance sheet, because meeting the commitment will require the government to tax a higher share of provincial income in the future.<sup>3</sup>

One way to quantify this liability is to calculate the present value of changes in these programs' claims on GDP over the next half-century, which is roughly the average life expectancy of the average Nova Scotian. Discounting the cumulative increase in the province's average tax take from its current level at the yield on government long-term bonds, the province's implicit liability amounts to \$102 billion – essentially all of which, \$99 billion, is for healthcare (see Table 1).<sup>4</sup> In other words, to cover the additional cost of these programs the province would need more than \$100 billion in assets yielding what the long-term bonds of Canadian provincial governments do. This figure is more than double provincial GDP – amounting to some \$108,000 per Nova Scotian.<sup>5</sup>

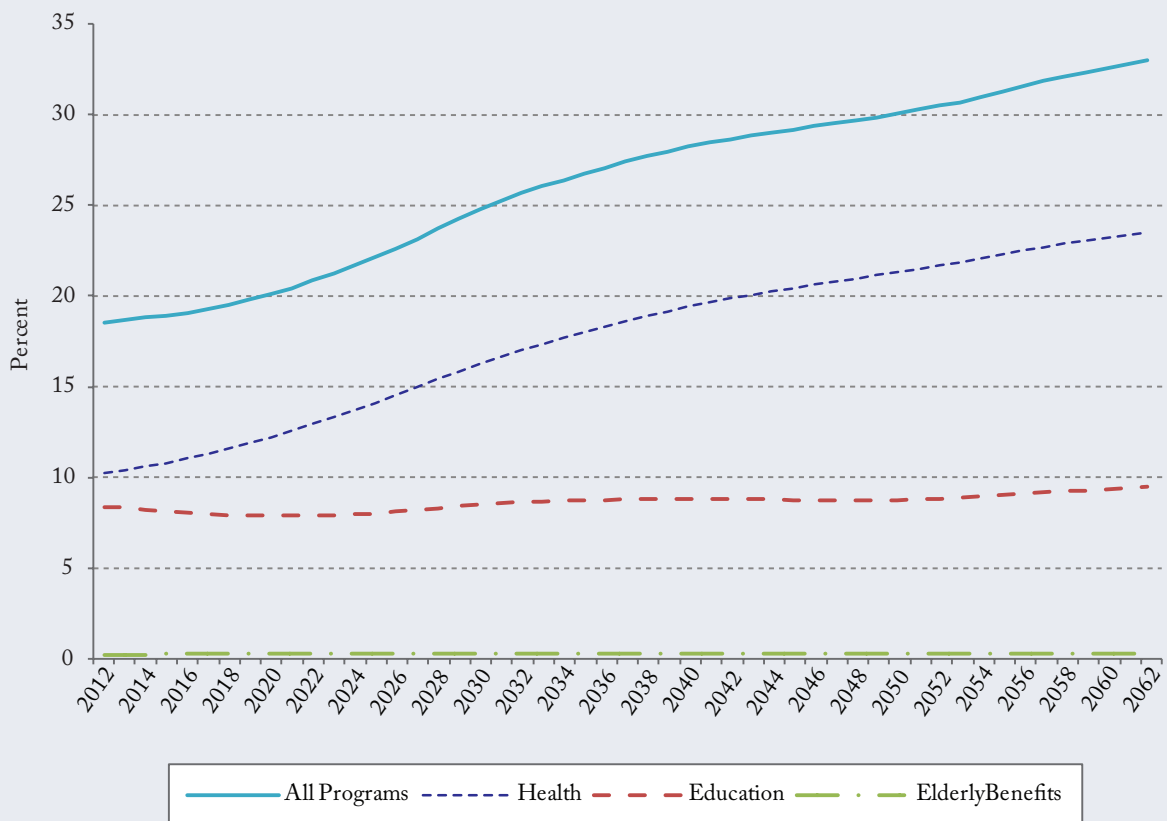
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3 The parallel with explicit liabilities is straightforward: if Nova Scotia decided to cover the higher program costs by borrowing rather than raising its aggregate tax rate, the implicit liability would, over time, become higher public debt.

4 As we explain in Box 1, the labour-intensiveness of healthcare (and education) services provides some justification for linking service intensity to economy-wide productivity. The assumption that both grow together is clearly critical to our results. Should Nova Scotia manage to constrain growth in service intensity to 0.7 percent annually, instead of 1.2 percent as assumed, demographically sensitive spending would be 25.4 percent of GDP in 2062 and the unfunded liability would be \$57 billion. Historically, service intensity has tended to outpace productivity: if Nova Scotia let it grow 0.5 percentage points faster than productivity – 1.7 percent annually – demographically sensitive spending would be 41.6 percent of GDP in 2062 and the unfunded liability would be \$149 billion.

5 This exceeds the \$82 billion calculated in Robson (2010) mainly because of the lower discount rate used in this study. We use the long-term Ontario bond for these calculations because a deep, liquid market makes yields readily available, and for the sake of using the same discount rate for all Canada's governments.

Figure 1: Nova Scotia's Demographically Sensitive Programs as a Share of GDP, 2012–2062



Source: Authors' calculations as described in text.

## Policy Pressures and Responses

We see a funding gap this big, and the prospect of such a massive increase in provincial taxation, as strengthening the case for continuing changes to Nova Scotia's healthcare system. Because federal-provincial transfers have historically been important in Canada, some people might expect more money from Ottawa to alleviate this pressure. Scanning our results across the country in Table 1, however, shows that while the pressure will be particularly intense in Nova Scotia – where the ratio of implicit liability to GDP is relatively high – it will exist everywhere. So larger net transfers from the federal government are unlikely. Nova Scotia will have to deal with these pressures with tools it controls itself. What kinds of moves make sense?

## The Case for Prefunding

One way to mitigate the impact of rising costs in some healthcare services would be to follow the lead of the late-1990s reforms to the Canada and Quebec Pension Plans that converted them from pay-as-you-go to plans in which a portion of premiums collected today prefunds the benefits of those same participants in the future. Some

**Table 1: Nova Scotia's Demographically Sensitive Programs, Implicit Liabilities in a National Context**

	Health	Education	Elderly Benefits	Child/ Family Benefits	All Programs	All Programs Relative to GDP (2012)	All Programs Per Person
	<i>\$ Billions</i>					<i>Percent</i>	<i>\$</i>
BC	415.2	6.4	0.4	(0.1)	421.9	192	91,474
AB	615.4	65.0	13.6	(0.8)	693.2	227	180,332
SK	82.0	15.3	0.3	-	97.6	131	91,897
MB	100.8	15.4	0.1	(0.1)	116.3	197	92,493
ON	1,398.3	89.8	2.4	(6.3)	1,484.2	223	109,920
QC	767.7	79.0	-	(17.3)	829.4	242	103,344
NB	78.2	5.5	0.4	(0.1)	84.0	266	111,745
<b>NS</b>	<b>99.1</b>	<b>2.4</b>	<b>0.2</b>	-	<b>101.7</b>	<b>263</b>	<b>107,713</b>
PE	14.0	0.6	-	-	14.5	269	99,244
NL	75.3	4.5	0.9	(0.1)	80.6	240	158,905
YK	9.0	0.6	-	-	9.5	369	263,744
NT	12.5	1.4	-	-	13.9	278	321,187
NU	13.8	1.6	-	-	15.4	801	457,690
All Provinces and Territories	3,681.3	287.3	18.3	(24.6)	3,962.3	222	113,935
Federal		(13.5)	424.7	(25.0)	386.2	22	11,105
<b>CANADA</b>	<b>3,681.3</b>	<b>273.8</b>	<b>443.0</b>	<b>(49.6)</b>	<b>4,348.5</b>	<b>244</b>	<b>125,040</b>

Source: Authors' calculations as described in text.



drug programs, and potentially long-term care as well, are like social security programs that many people will need, and can prepare for by building a provident fund during their younger years.

Nova Scotia could selectively convert pay-as-you-go programs so that the babyboomers, rather than their inadequately numerous children and grandchildren, pay some of the higher costs that loom. Prefunding does not make sense for all the programs that threaten cost increases, but can spread the tax increases necessary for some health services that, like pensions, are geared to age.<sup>6</sup>

### **Reducing Healthcare Spending's Sensitivity to Aging**

One key difference between pensions and healthcare is that pensions are promises to pay money, whereas the implicit promise in healthcare relates to services, the cost and quality of which change over time. The camp that says aging by itself is not a major problem has tended to emphasize that some factors that make per-capita healthcare spending so strongly associated with age, such as high rates of hospitalization or use of certain drugs, may change over time (Evans et al. 2001), which could mitigate the demographic effects in our model.

While such changes are possible in the future, they do not appear to have had much impact on the age-profile of provincial healthcare spending in Nova Scotia in the past. A comparison of CIHI's 1998 to 2010 data shows some variations by age-group, but little change in the overall spending profile (see Figure 2). So a 1998 projection similar to ours of the impact of demography on Nova Scotia's healthcare spending by 2010 would have been almost spot on.

### **Benchmarking Best Practices**

Where might Nova Scotia look in its search for yet more bang per healthcare buck? As in other provinces, areas that commentators have identified as promising include:

- the establishment and expanded use of electronic health records;
- more coordinated team-based primary care, giving patients comprehensive non-acute services from practitioners such as doctors, nurses, dieticians, and physiotherapists;
- scope-of-practice changes to substitute services from such specialties as pharmacists and nurse practitioners for similar services provided by more expensive physicians;
- integration of follow-up care for patients once they are discharged from hospital; and,
- improvements in, and more use of, non-institutional care for seniors with chronic conditions.

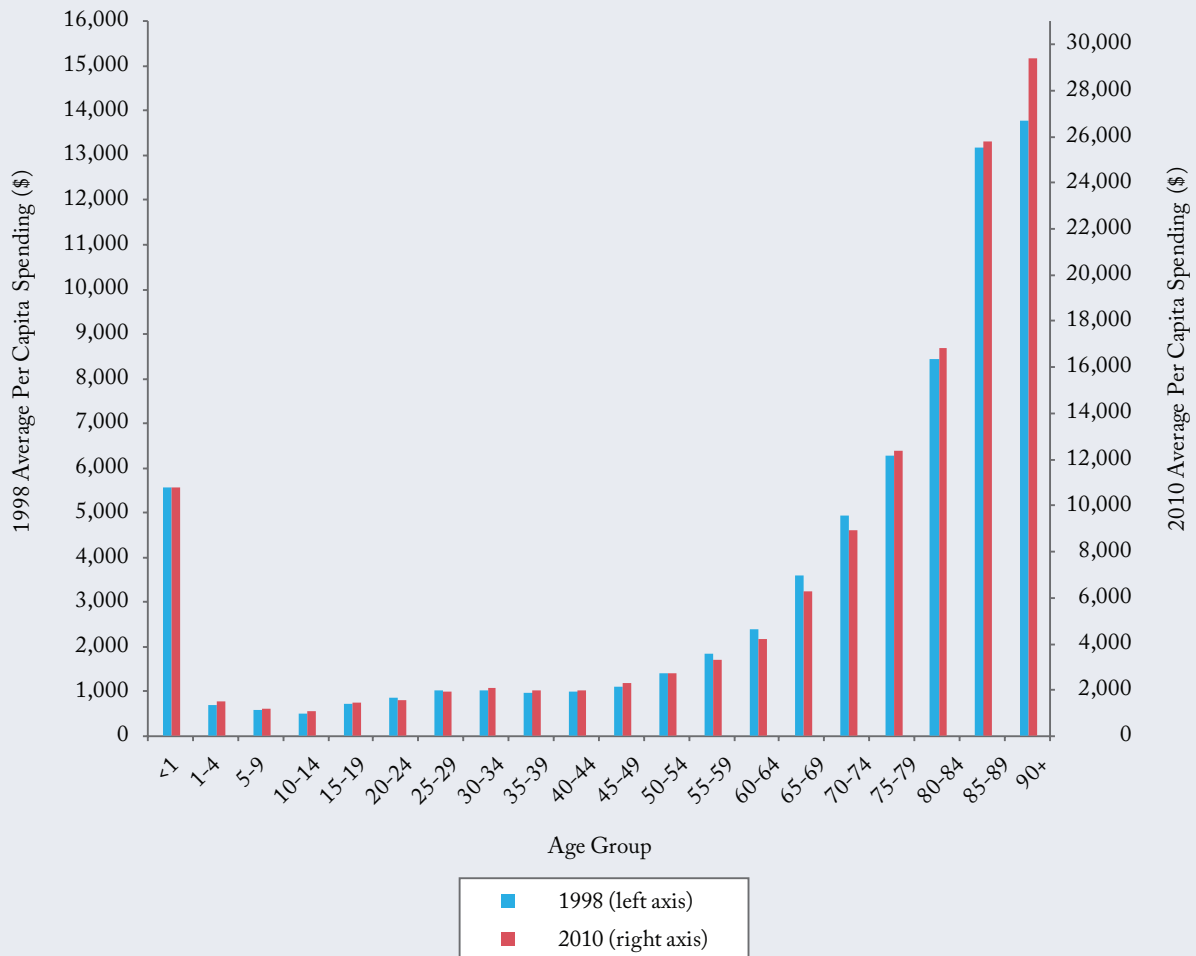
Turning to different delivery vehicles, Canada's provinces exhibit large differences in spending in major categories that may yield insights (see Table 2).

At one end of the cost scale, Nova Scotia spends less than most provinces on capital and "public health," which includes health promotion activities. At the other, Nova Scotia spends more on drugs than other provinces. It also has a relatively high budget for "other institutions," such as nursing and residential care homes.

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6 Robson (2002) and Stabile and Greenblatt (2010) elaborate on this idea; Busby and Robson (2011) explore the mechanics of prefunding in more detail.

Figure 2: Average Per Person Health Spending By Age Group, Nova Scotia, 1998 and 2010



Note: The vertical axes show nominal dollars for transparency's sake: these are the actual dollar figures from CIHI. We could have used constant dollars from either – or, indeed, any – year, or index numbers, because the focus of this figure is the *relative* distribution of health spending by age in the two years. To facilitate comparison of the age-profiles of spending: we have set the vertical scales so roughly half the bars in each year are taller (or shorter) than their counterparts in the other.

Source: CIHI (2012) and authors' calculations.

These differences in spending are large. Having nursing and residential home costs in line with the national average, for example, would lower Nova Scotia's spending by some \$180 million annually. Perhaps Nova Scotians get appropriately greater value from their nursing and residential services than other provinces do – but without knowing, it is hard to ensure that dollars devoted to each area of healthcare are effectively deployed.

## Closing Comments

A casual attitude toward the impact of demographic change on government budgets is unwarranted. Statements about rising healthcare spending such as those in the 2012 budget address will be a staple of fiscal commentary



in Nova Scotia for years to come. The current configuration of demographically sensitive spending threatens large increases in the province's aggregate tax take over time, and Nova Scotia's implicit future liability related to future costs is much larger than the provincial debt that receives much more attention. In the face of this challenge, selective prefunding and benchmarking against other provinces that allocate their healthcare budgets differently are two steps that could help Nova Scotia deliver high-quality healthcare in a sustainable fiscal framework.

Table 2: Real Per Person Health Spending, By Use of Funds, Nova Scotia vs. Other Provinces, 2010

	Hospitals	Other Institutions	Physicians	Other Professionals	Drugs	Capital	Public Health	Admin	Other Health Spending	Total
<i>Per Capita (in 2012 \$)</i>										
BC	1,466	245	796	34	213	245	310	33	310	3,652
AB	2,109	403	905	57	323	311	285	60	202	4,655
SK	1,657	638	793	24	301	146	379	27	274	4,239
MB	1,799	595	783	24	250	167	271	45	329	4,264
ON	1,380	389	901	28	344	236	292	34	161	3,765
QC	1,392	531	653	24	316	220	122	59	150	3,468
NB	1,987	515	763	9	266	118	154	53	266	4,130
NS	<b>1,789</b>	<b><u>624</u></b>	<b>767</b>	<b><u>13</u></b>	<b><u>344</u></b>	<b><u>157</u></b>	<b><u>143</u></b>	<b><u>98</u></b>	<b><u>170</u></b>	<b>4,105</b>
PE	1,787	514	733	20	260	271	230	141	193	4,148
NL	2,352	763	810	16	276	296	171	63	202	4,948
CAN	1,545	436	815	30	310	233	248	47	198	3,861
<i>Real Per Capita Growth Rate 1991 to 2010 (percent)</i>										
BC	1.1	-1.5	1.2	-3.2	2.5	4.4	6.2	-2.4	4.8	1.5
AB	1.2	2.7	2.1	-3.6	4.4	6.3	5.1	3.2	2.2	2.2
SK	1.4	2.0	3.0	-4.2	3.7	-1.4	5.9	-1.1	5.1	2.1
MB	1.5	2.3	3.6	-1.0	6.3	1.6	5.3	0.9	4.7	2.5
ON	0.7	2.6	1.4	-1.3	4.7	6.9	6.9	0.8	1.0	1.9
QC	0.2	5.5	2.0	-3.5	5.2	5.3	3.0	-0.5	4.5	1.9
NB	2.0	3.3	3.1	-3.3	3.4	-0.7	4.6	1.8	6.5	2.6
NS	<b>1.5</b>	<b><u>6.8</u></b>	<b><u>4.1</u></b>	<b><u>-4.6</u></b>	<b>4.6</b>	<b>3.0</b>	<b><u>3.5</u></b>	<b><u>7.1</u></b>	<b><u>7.3</u></b>	<b><u>3.0</u></b>
PE	1.5	2.1	3.5	-1.5	5.6	7.2	3.7	7.6	5.0	2.7
NL	3.0	5.2	4.4	-2.4	5.4	10.2	5.8	4.1	3.7	4.0
CAN	0.8	2.9	1.9	-2.5	4.5	5.2	5.8	0.4	3.2	2.0
<b>Blue</b> (with underline): among lowest third; <b>Red</b> (with double underline): among highest third										
NS Ranking Among Provinces (10 being the lowest; 1 being the highest)										
Per Capita Spending	5	3	7	9	2	8	9	2	8	7
Growth Rate	5	1	2	10	6	7	9	2	1	2

Notes: 2010 data are converted into 2012 dollars using the government current expenditure implicit price index. And because growth calculations are sensitive to the base year chosen, we took an average of the three years around 1991 and the two years prior to, and including, 2010 to smooth out the swings in the economy. "Other professionals" includes care primarily provided by dental and vision care professionals; "Other institutions" includes nursing homes and residential care facilities; "Public Health" includes expenditures for items such as food and drug safety, health inspections, health promotion activities, community mental health programs, public health nursing, the prevention of spreading disease and health promotion.

Source: CIHI (2012).

## References

- Barer, M.L., R.G. Evans and C. Hertzman. 1995. "Avalanche or glacier? Health care and the demographic rhetoric." *Canadian Journal on Aging* 14(2): 193-224.
- Brown, Robert, and Uma Suresh. 2004. "Further Analysis of Future Canadian Healthcare Costs." *North American Actuarial Journal* 8(2). April.
- Busby, Colin, and William B.P. Robson. 2011. *A Social Insurance Model for Pharmacare: Ontario's Options for a More Sustainable, Cost Effective Drug Program*. Commentary 326. Toronto: C.D. Howe Institute. April.
- Canadian Institute for Health Information (CIHI). 2012. *National Health Expenditure Trends, 1975-2012*. Ottawa.
- Drummond, Don, and Derek Burleton. 2010. "Charting a Path for Sustainable Healthcare In Ontario: 10 Proposals to Restrain Costs Without Compromising Quality of Care." TD Economics Special Report. Toronto: TD Bank Financial Group. May.
- Emery, J.C. Herbert, David Still and Tom Cottrell. 2012. "Can We Avoid a Sick Fiscal Future? The Non-Sustainability of Health-Care Spending with an Aging Population." SPP Research Papers, Vol. 5, No. 31. October.
- Evans, Robert G., Kimberlyn M. McGrail, Steven G. Morgan, Morris L. Barer, and Clyde Hertzman. 2001. "Apocalypse No: Population Aging and the Future of Health Care Systems." *Canadian Journal on Aging*, 20 (suppl. 1).
- Nova Scotia. 2012. "Budget Address for the Fiscal Year 2012/13."
- Office of the Chief Actuary. 2012. *Actuarial Report (11th) on the Old Age Security Program, as at 31 December 2009*. Ottawa: Office of the Superintendent of Financial Institutions.
- Robson, William. 2002. *Saving for Health: Pre-Funding Health Care for an Older Canada*. Commentary 170. Toronto: C.D. Howe Institute. October.
- . 2007. "Time and Money: The Challenge of Demographic Change and Government Finances in Canada." Backgrounder 109. Toronto: C.D. Howe Institute. December.
- . 2010. "The Glacier Grinds Closer: How Demographics Will Change Canada's Fiscal Landscape." E-Brief. Toronto: C.D. Howe Institute. January.
- Stabile, Mark, and Jacqueline Greenblatt. 2010. "Providing Pharmacare for an Aging Population: Is Prefunding the Solution?" IRPP Study 2. Montreal: February.
- Statistics Canada. 2011. *Summary of Public School Indicators for the Provinces and Territories, 2005/06 to 2009/10*. Culture, Tourism and the Centre for Education Statistics: Research Papers. Cat no. 81-595-MWE2011095. Ottawa: Statistics Canada. November.

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