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E-BRIEF

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HEALTH POLICY

Managing the Cost of Healthcare for an Aging Population: British Columbia Confronts its Glacier

by
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"Before the worldwide economic crisis, health care funding in B.C. was rising by an average of about seven per cent per year. Since 2009, the rate of increase has declined to about five per cent. And now, going forward, we're looking at lifts closer to three per cent per year.

Even with this modest growth, health care is projected to account for more than 42 per cent of total government spending by 2014-15. We can't just keep pouring more and more dollars in. We have to find creative ways to minimize expenses…." (British Columbia Budget Speech 2012, p. 7.)

For years, a debate has raged over the fiscal impact of demographic change – in particular, whether providing publicly funded healthcare to an aging population will financially stress Canadian governments. One camp, developing a theme that the pressures are a glacier rather than an avalanche, 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.

This E-Brief is part of a series profiling the fiscal challenge of aging and publicly funded healthcare in each province. 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.

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, potentially compromising other major government programs, manageable tax rates, and debt control (Robson 2001, 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 key fiscal priorities requires fundamental changes to the financing and delivery of healthcare.

While the debate has raged, publicly funded healthcare in British Columbia has risen from 6.8 percent of provincial GDP in 1991 to about 8.0 percent in 2012. At the same time, it has risen from 35 percent of the provincial government's program spending in 1991 to about 43 percent in 2012, and its share of provincial own-source revenue – that is, revenues from provincial taxes and other sources the province controls rather than funds transferred from Ottawa – has risen from 41 percent to about 49 percent.

As we discuss in this E-Brief, British Columbia has been almost uniquely successful among Canadian provinces in mitigating the impact of aging on its healthcare budget – yet publicly funded healthcare's claim on provincial resources continues to rise. The above quotation from British Columbia's 2012 Budget highlights the importance of this challenge in the eyes of policymakers. How strong might these pressures be in the future?

Mapping Today's Spending onto Tomorrow's Population

We come at that question with a well-known, straightforward approach. We project British Columbia'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 in-migration from other provinces falling to zero over 10 years, and net international in-migration continuing at its 1997-to-2011 average.

We then multiply the potential workforce, which we define as the population aged 18 to 64, by an index of output per potential worker – which grows at the rate recorded by the equivalent national measure from 1997 to 2011: 1.2 percent annually. This provides our model with projections of real provincial gross domestic product (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. 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 the Canadian Institute of Health Information (CIHI) figures for 2010, pro-rated to match recent actual totals.[1] Looking forward, we assume that service intensity per person rises at the same rate as real output per potential

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 method yields a larger increase in spending for 2011 than the CIHI estimates, and a smaller one in 2012. We estimate total health spending in British Columbia, in 2012, to be $393 million smaller than the CIHI figure.

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.[2]

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.

British Columbia's Outlook: Trends and Implicit Liability

Our projections show the claim of British Columbia's public healthcare spending on provincial GDP rising from 8.0 percent this year to 12.2 percent in 2035 and to 16.0 percent in 2062. Taking account of other demographically sensitive programs does not change the prospect of fiscal stress. In British Columbia, spending on seniors' programs represents an implicit liability and spending on child/family benefits an implicit asset, because of a projected decline in the proportion of the population that is young. These programs are very small, however. In education, service intensity creates upward pressure even as the number of students plateaus. As a result, the share of all these programs in GDP rises from 14.0 to 22.7 percent over the period (see Figure 1). For British Columbia to meet these demands from its own revenue sources would require an increase of more than 50 percent in the tax bite taken from British Columbian 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. Most public discussion of healthcare and other programs emphasizes maintaining them – perhaps enhancing, but certainly not cutting. The opening quotation cited above from the British Columbia government, like other government communications, prefigures no rise in tax rates. These political understandings create 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.[3]

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 British Columbian. 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 $422 billion, nearly all of which

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.

3 The parallel with explicit liabilities is straightforward: if British Columbia 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.

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 British Columbia that this is not a serious problem. Our index of transfer intensity for child and family benefits does not change over time: we assume that the real value of transfers per person in the relevant age group is constant.

Further notes on the projections for programs other than health:

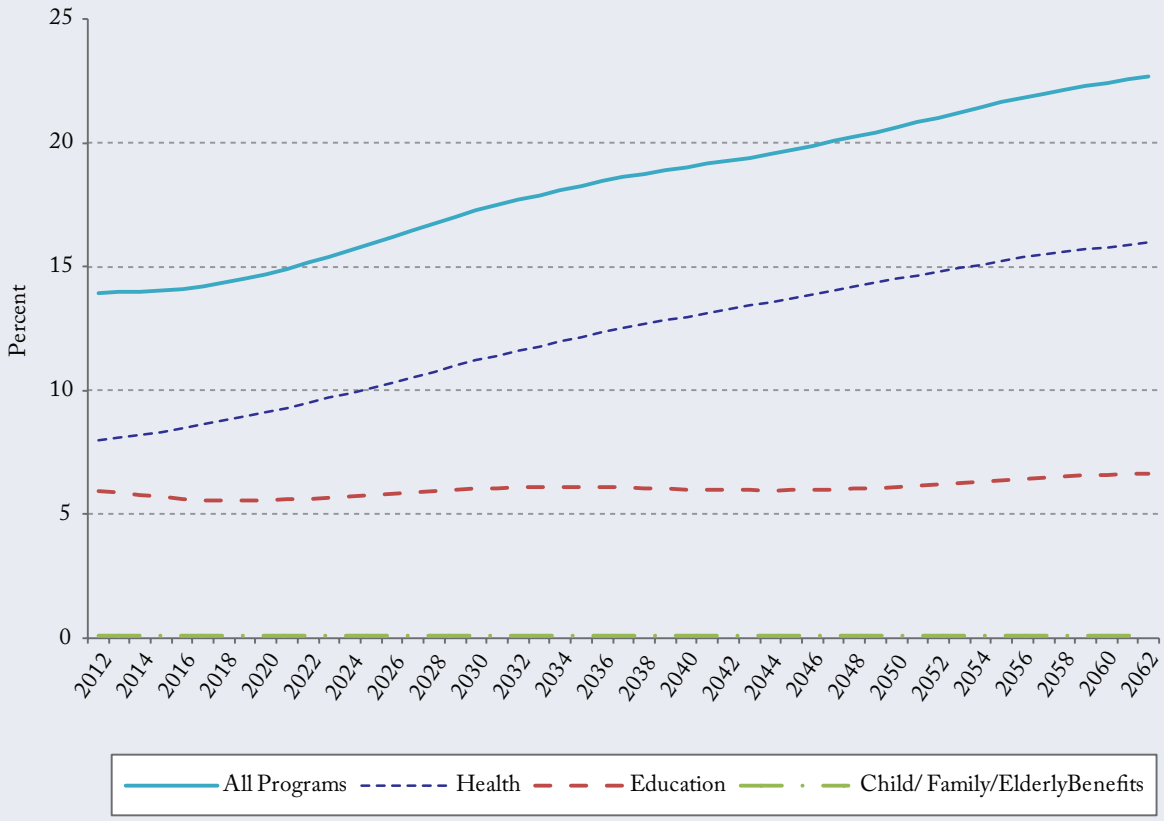
Education: Base-year provincial/local spending on elementary and secondary education is calculated using data from Statistics Canada's Summary of Public School Indicators for the Provinces and Territories, 2005/06 to 2009/10. Base-year spending on postsecondary education comes from Statistics Canada (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 federal 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 spending 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. SPSD/M simulations suggest that in the scenarios modeled here, these offsetting characteristics leave average nominal spending per child unchanged – an assumption that has also been made for (generally much smaller) provincial programs.

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

Figure 1: British Columbia's Demographically Sensitive Programs as a Share of GDP, 2012-2062



Source: Authors' calculations as described in text.

($415 billion) relates to healthcare (see Table 1).[4,5] In other words, to cover the additional cost of these programs, the province would need about $400 billion in assets yielding what its long-term bonds do. This figure is more than double provincial GDP, and about $90,000 per British Columbian.

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 the province manage to constrain growth in service intensity to 0.5 percentage points less than growth in productivity – 0.7 percent annually, rather than the 1.2 percent we assume in our projections – demographically sensitive spending would be 17.4 percent of GDP in 2062 and the unfunded liability would be $191 billion. Historically, service intensity has tended to outpace productivity: if it grew 0.5 percentage points faster – 1.7 percent annually – demographically sensitive spending would be 28.6 percent of GDP in 2062 and the unfunded liability would be $664 billion.

5 This exceeds the $360 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. At the time of writing, British Columbia's long bonds are yielding almost exactly the same as Ontario's, so that choice makes little difference to the discounted totals.

Table 1: British Columbia'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
	$ Billions					*Percent*	*$*
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
NS	99.1	2.4	0.2	-	101.7	263	107,713
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
CANADA	3,681.3	273.8	443.0	(49.6)	4,348.5	244	125,040

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 British Columbia's healthcare system, as prefigured in the 2012 budget address.

Scanning our results for British Columbia and other provinces in Table 1 shows that pressure for change will occur everywhere in Canada. Moreover, other provinces face relatively worse fiscal stresses – indicated by their higher ratios of implicit liability to GDP – that make unlikely larger net transfers to British Columbia through the federal government. Simple compression of compensation to providers will not counteract pressures this big. 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 drug programs, and potentially long-term care for the elderly 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.

Like other provinces, British Columbia 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 (Robson 2002; Stabile and Greenblatt 2010). Prefunding does not make sense for all the programs that threaten cost increases, but can spread more fairly over time the tax increases necessary for some health services that, like pensions, are geared to age.[6]

Reducing Healthcare Spending's Sensitivity to Aging

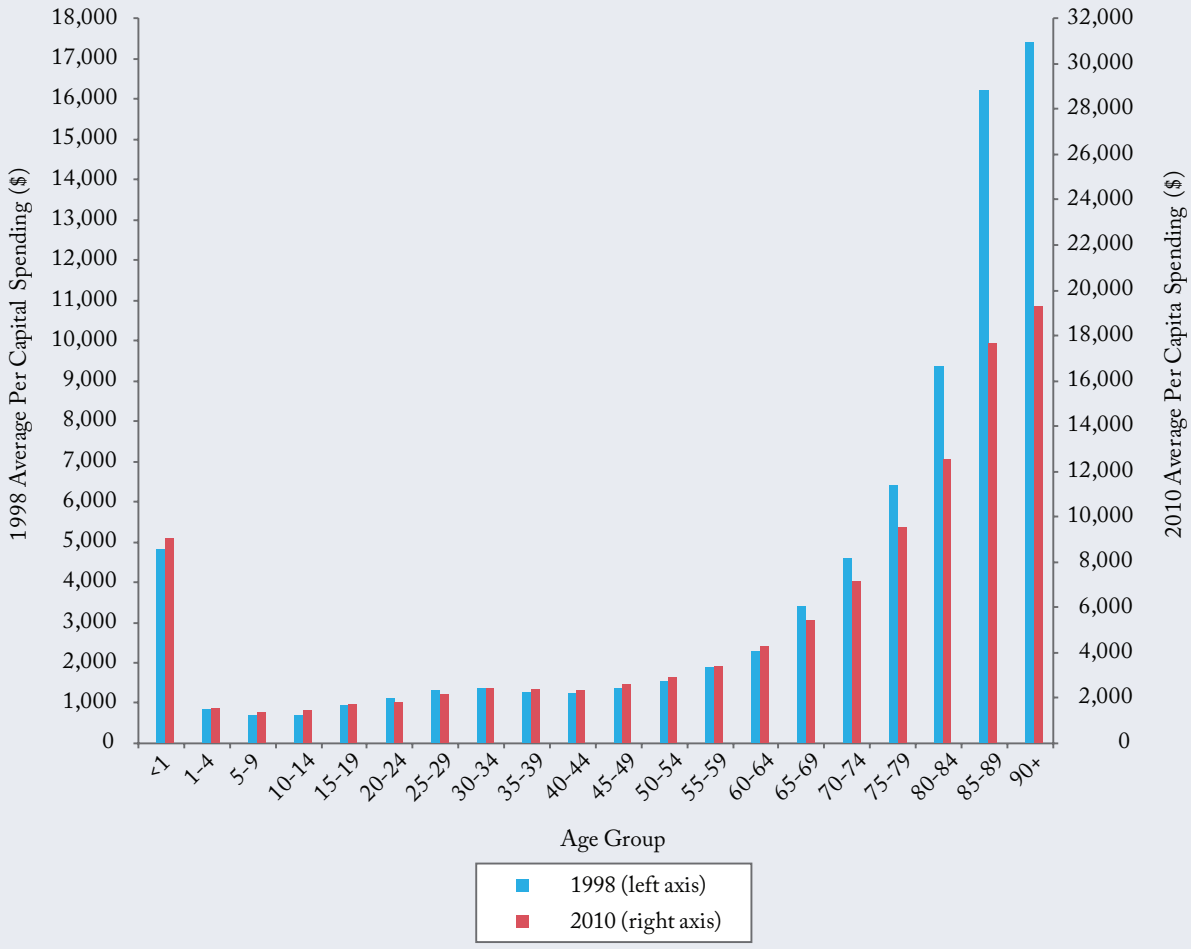
Unlike pensions, which are promises to pay dollars, healthcare promises services, the cost and quality of which are not fixed. The camp that says aging by itself is not a major problem has tended to emphasize that some factors that make per capita healthcare spending so strongly associated with age, 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.

British Columbia provides perhaps the most striking example of a province that has changed the age-profile of healthcare spending in recent years. A comparison of provincial expenditures per person by age in 1998 (the first year of CIHI's data) to 2010 (see Figure 2) shows a decline in the relative costs of older age groups. This change appears, in part, to be a consequence of per capita reductions in the public costs for nursing homes and residential facilities,[7] as well as the 2001 to 2003 change from age-based to income-based eligibility for the BC Fair Pharmacare provincial drug benefit program. So, unlike the case for most other provinces, a

6 Busby and Robson (2010) explore some prefunding possibilities, and their mechanics, in more detail.

7 The Canadian Institute for Health Information (CIHI) classifies this group of spending as "other institutions," which is primarily composed of residential care facilities and homes for the aged (including nursing homes), but also includes facilities for persons with physical disabilities, developmental delays, psychiatric disabilities and alcohol and drug problems, and facilities for emotionally disturbed children.

Figure 2: Average Per Capita Health Spending By Age Group, British Columbia, 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.

1998 projection of the impact of demography on British Columbia's healthcare spending by 2010 would have overestimated the impact of aging. Our projections use the current age profile of spending, effectively assuming the reductions in the relative spending on the elderly evident in 2010 can be maintained.[8]

8 One objection to projecting healthcare costs on the basis of current age-specific service use is that the higher costs associated with older people reflect higher mortality among older people, which means that these projections overstate cost increases in a future where people are living longer before they incur those mortality-related costs. As Brown and Suresh (2004) demonstrate, however, projections that distinguish spending on people who survive from spending on people who die at various ages produce cost estimates that are only marginally lower than estimates that make no such distinction.

Benchmarking Best Practices

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

- scope-of-practice changes to get more services from such specialties as pharmacists and nurse practitioners instead of the more expensive services of physicians;
- more coordinated team-based primary care models where patients can get comprehensive non-acute services from an organized group of practitioners such as doctors, nurses, dieticians, and physiotherapists;
- improvements in, and more use of, non-institutional care for seniors with chronic conditions; and,
- the establishment and expanded use of electronic health records.

Turning to different delivery vehicles, Canada's provinces exhibit large differences in spending in major categories that may yield insights. British Columbia spends less than any other province on hospitals and drugs, for example (see Table 2). It spends relatively more on "Public Health," which includes expenditures for items such as food and drug safety, health inspections, health promotion activities, community mental health programs, etc. Perhaps British Columbia's generally low health costs per person reflect value from its investments in public health that other provinces can emulate. Conversely, British Columbia could emulate other provinces in its continuing efforts to make sure 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. British Columbia has been relatively successful in making its healthcare spending less age sensitive over time, but even the current configuration threatens glacier-sized increases in the province's aggregate tax take over time, and its implicit liability related to demographically sensitive programs 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 get better bang for their bucks in some areas can help British Columbia deliver high-quality healthcare in a sustainable fiscal framework for years to come.

Table 2: Real Per Person Health Spending, By Use of Funds, British Columbia vs. Provinces, 2010										
	Hospitals	Other Institutions	Physicians	Other Professionals	Drugs	Capital	Public Health	Admin	Other Health Spending	Total
	Per Capita (in 2012 $)									
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	1,789	624	767	13	344	157	143	98	170	4,105
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
	Real Per Capita Growth Rate 1991 to 2010 (percent)									
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	1.5	6.8	4.1	-4.6	4.6	3.0	3.5	7.1	7.3	3.0
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
Blue (with underline): among lowest third; Red (with double underline): among highest third										
Ranking Among Provinces (10 being the lowest; 1 being the highest)										
Per Capita Spending	8	10	4	2	10	4	2	9	2	9
Growth Rate	8	10	10	5	10	6	2	10	5	10

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 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).

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