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THE FISCAL SUSTAINABILITY OF ALBERTA'S PUBLIC HEALTH CARE SYSTEM

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Summary

The long-term fiscal sustainability of Canada's publicly funded provincial health care systems is under pressure from an aging population, expensive technological advances, and expanding coverage that is pushing up against constraints on provincial government revenues. Alberta, for example, enjoys the benefit of energy royalties, but the volatility of this bounty has been highlighted by the recent collapse in energy prices and the loss of upwards of $6 billion in resource royalties. Other provincial governments enjoy more stable sources of revenue but are constrained in their health care choices by heavier tax burdens and larger public debt loads. This paper examines the challenges faced by governments as they attempt to satisfy the needs of the public today, without compromising the needs of future generations.

EXECUTIVE SUMMARY

From 1975 to 2007, Alberta's real per capita government health expenditures grew from $1,679 to $3,696 (in 2007 dollars), at a median annual growth rate of 3.5%. Over the same period, Alberta's real per capita gross domestic product and real per capita total government revenues grew at median annual rates of 2.2% and 1.7%, respectively. This difference between the growth rates of health care spending on the one hand and government revenues and the economy on the other gives rise to concern about the fiscal sustainability of the province's public health care system.

This study presents projections of real per capita spending on public health care in Alberta over the medium term out to 2030. They suggest that, by then, real per capita spending could reach anywhere between $5,339 and $14,215, soaking up between 32% and 87% of total government revenues; more worrying, the high end of these ranges reflects a continuation of the policy settings that guide current provincial public health spending.

Alberta is fortunate to have a wealthy economy that can support a high level of public health spending. But that support is precarious given the cyclical nature of non-renewable natural resource revenues and Alberta's past tendency to experience periods of boom and bust. Basing the financing of key spending programs such as health care on a volatile revenue base is not advisable, for it puts them at risk should economic conditions turn unfavourable, as they have recently. Indeed, adjusting government revenues in our projections to match a more reasonable measure of what might be relied upon with a degree of certainty simply enhances the precariousness of the fiscal sustainability of the public health care system.

Not all categories of provincial government health care spending — in particular, the traditional core medicare areas of physician services and hospitals — are growing faster than either the revenue base or the economy. The growth of spending on non-medicare categories such as drugs, capital, and all other health expenditures, however, is a particular source of concern.

Options for sustaining provincial government health expenditures include choosing what other government programs could be allowed to grow more slowly over time, what tax rates could be increased to cause the revenue base to grow more quickly, and what health programs currently provided by the public sector instead could be provided privately. These approaches need not exist in watertight compartments, however, and a portfolio of policies that combines these solutions likely would be a pragmatic policy outcome. Such a strategy would help to ensure the fiscal sustainability of Alberta's public health care system and responsibly provide for the future welfare of its citizens.

INTRODUCTION

Despite a recent period of rising federal transfers and health expenditures in the wake of the report of the Romanow Commission,[1] the funding and sustainability of health care remains a chronic public policy issue in every province in Canada, and Alberta is no exception. The most recent estimate of the Canadian Institute for Health Information (CIHI) puts total nominal health spending in Canada in 2008 at $171.9 billion, reflecting an increase of 6.4% over the level of spending in 2007.[2] The same report suggests that Alberta's total health spending per capita (both public and private) in 2008 was the highest of all the provinces. A recent report by the Fraser Institute estimates that, between 1999 and 2007, total average provincial government heath spending grew at an annual average of 7.7%.[3]

In 2008, Alberta's incoming new health minister, Ron Liepert, promised a bold program of health reforms and cost control, stating that, with rising costs, "[t]he current system is not working and it's not sustainable."[4] In British Columbia, health minister George Abbot recently stated that he wanted to make fiscal sustainability a principle of health care delivery alongside the other five principles of the *Canada Health Act*.[5] In Ontario, with health spending accounting for 45% of provincial expenditures and numerous hospitals forecasting deficits, health minister George Smitherman stated that there would be no "blank cheque" to assist hospitals facing staffing and service cuts.[6]

Concerns over rising health care costs, however, are not new. Between 1996 and 2007, Alberta government nominal total health spending grew at an average annual rate of 10.2% while total provincial government program spending grew at an average annual rate of only 6.9%.[7] While increases in total government revenues were healthy enough to afford surpluses during this period, at an annual growth rate of 9.1% the growth rate of revenues was still below the growth rate of the provincial health care budget. Given the prospect that an aging population, technological changes, and rising consumer health expectations will all contribute to increases in the demand for health care expenditure, health care expenditures could continue to grow more quickly than revenues.

The possibility that provincial government health care spending will continue to outstrip revenue growth raises the prospect of enormous future fiscal obligations. It has been estimated that, in the United States, the looming bill for health care is equivalent to the present value of all of the federal government's projected future health expenditures.[8] In Canada, it has been suggested that the real value of the debt of the three levels of government is actually one-third higher than official figures, largely because of the enormous value of unfunded pension and health liabilities.[9] Moreover, the projected increase in the share of health expenditures in gross domestic product (GDP) over the coming half-century is estimated to create a discounted implicit liability ranging from $1.5 to $1.9 trillion.[10]

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[1] Commission on the Future of Health Care in Canada, ***Building on Values: The Future of Health Care in Canada***; R.J. Romanow, chair (Ottawa: The Commission, 2002).

[2] L. Priest, "Health spending to outpace inflation, CIHI says," ***Globe and Mail***, November 13, 2008.

[3] B.J. Skinner and M. Rovere, ***Paying More, Getting Less: Measuring the Sustainability of Government Health Spending in Canada — 2008 Report*** (Vancouver: Fraser Institute, 2008).

[4] M. Lang, "Liepert takes on ailing health-care system; $12B-a-year in expenses 'not sustainable'," ***Calgary Herald***, March 13, 2008.

[5] J. Hunter, "B.C. intent on tackling issue of funding in health care," ***Globe and Mail***, April 7, 2008, p. A6. The five principles in the *Canada Health Act* are that health care plans must be available to all eligible residents of Canada; comprehensive in coverage; accessible without financial and other barriers; portable within the country and during travel abroad; and publicly administered.

[6] R. Ferguson, "Hospital cuts spark storm," ***Toronto Star***, April 9, 2008.

[7] Calculated from Government of Alberta, ***Budget Papers***, various years.

[8] L.J. Kotlikoff, ***The Healthcare Fix: Universal Insurance for All Americans*** (Cambridge, MA: MIT Press, 2007).

[9] W. Robson, "How Big Is the Debt," in ***Is the Debt War Over? Dispatches from Canada's Fiscal Front Lines***, edited by C. Ragan and W. Watson (Montreal: Institute for Research on Public Policy, 2004).

[10] W. Robson, "Time and Money: The Challenge of Demographic Change and Government Finances in Canada," ***Backgrounder*** 109 (Toronto: C.D. Howe Institute, 2007); idem, "Boomer Bulge: Dealing with the Stress of Demographic Change on Government Budgets in Canada," ***e-brief*** 71 (Toronto: C.D. Howe Institute, January 13, 2009).

Any government facing the prospect that its spending is growing consistently faster than its revenues must make difficult decisions. In such circumstances, the government and its citizens must choose (i) what government-provided services they want to give up in order to fund services they deem to be of higher priority; or (ii) how much more tax they are willing to pay for government goods and services currently provided; or (iii) what goods and services should be financed out of public revenues rather than private incomes. Recognizing the inevitability of these choices comes from an awareness that sound public policy requires that we not obligate future generations to fund expenditure commitments that, based on the best information we have, we know to be unsustainable over the long term.

In this study, we examine the fiscal sustainability of Alberta's public health care system. First, we review the basic structure and recent expenditure trends of the Alberta health care system. Second, we define the concept of fiscal sustainability and explore its implications for public policy. We also look at the evolution of Alberta's government revenues and expenditures in an effort to understand the fiscal base that will support future health care and other public spending. Third, we construct projections of health care spending using two techniques — growth rate extrapolation and a determinants model — and use these projections to illustrate the potential sustainability of health care funding. Finally, we examine a number of strategies to deal with the expected rise in the health expenditure burden.

ALBERTA'S HEALTH CARE SYSTEM: RECENT HISTORY, STRUCTURE, AND TRENDS

Since the advent of medicare, provincial governments have had to deal with a number of challenges related to public funding. An early challenge arose in 1977 due to changes in the federal-provincial cost-sharing arrangement known as Established Programs Financing (EPF). These changes loosened the relationship between federal transfers and the costs of provincial and territorial programs in health, education, and social assistance.[11] The 1990s were a period of change in the Alberta health care system, partly driven once again by rising expenditures and changes in federal transfer schemes. In 1996, the federal contribution to health and social services was consolidated into the Canada Health and Social Transfer, a major change in federal-provincial cost-sharing arrangements, which was also accompanied by a significant reduction in federal cash transfers.

Cuts to federal transfers were accompanied in Alberta, and in most other provinces, by cuts in health care spending resulting from efforts at deficit reduction. Federal transfers and health care spending began to recover somewhat during the late 1990s, but concerns over accessibility and sustainability of the health care system, nationally and provincially, continued to generate debate, controversy, and policy initiatives. Concerns over the potential for health care costs to rise in the near future — which we examine in depth below — suggest that worries over rising costs will continue to fuel debate and prompt attempts at reform. Having said that, it is interesting to note that, despite the perennial concern with insufficient health care resources, the provincial Progressive Conservatives kicked off the 2008 election campaign with the announcement that Alberta health care premiums — of $44 per month for individuals and $88 per month for families — would be abolished, and in the throne speech, the newly elected government of Premier Ed Stelmach promised it would do so within four years.

It is also interesting to note that, despite over a decade of proposed reforms and changes, driven in part by the need to make health care spending more sustainable, health spending has continued to rise. Moreover, there has been no major change in the balance between public and private health care, despite the frequent announcement of initiatives portrayed as increasing the role of the private sector. Thus, in real per capita terms, provincial government health spending (in 2007 dollars) rose from $2,008 in 1995 to $3,696 by 2007 — an increase of 84%. What is more, the public share of total health spending in Alberta, 70% in 1975, remained at

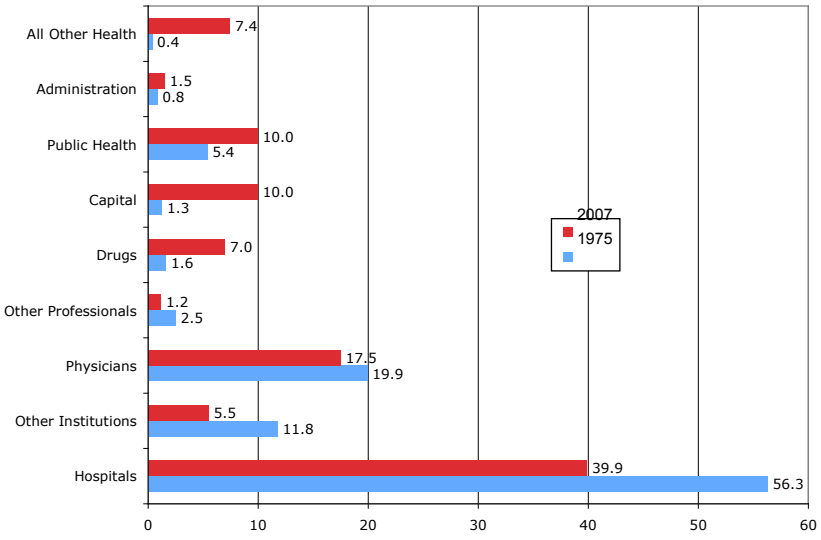
[11] Prior to the onset of EPF, the federal government provided transfer funding for 50% of provincial hospital and physician expenditures.

68% in 2007.[12] The most recently announced institutional reform measure is the creation of a "super board" that replaces the nine regional health authorities, effectively ending the regionalized health model by reverting to centralized administration but having no apparent impact on the prevalence of the public sector in the financing or provision of health care. Finally, Alberta's public health care system continues both to operate well within the requirements of the *Canada Health Act* and to grow in size.[13] Where changes *have* been made in the public provision of health care can be seen at the less aggregate level, in the composition of public health care spending, to which we turn next.

The CIHI provides data on provincial government health expenditures in nine separate expenditure categories:

- *Hospital* expenditures are those for public acute and chronic care hospitals, as well as specialty hospitals such as for paediatrics and neurology.
- The *other institutions* category refers to residential care facilities such as homes for the aged and for the physically and mentally handicapped or facilities to treat drug and alcohol problems.
- *Physician* expenditures cover the professional health services provided by physicians, although the payment of physicians on the payrolls of hospitals or public agencies is included in the relevant category.
- *Other professional* expenditures include those for dentists, chiropractors, optometrists, private duty nurses, and physiotherapists.
- The *drugs* category includes expenditures on provincial government prescription drug plans.
- *Capital* expenditures are those on construction, machinery, and equipment for hospitals and other health institutions.
- *Public health* expenditures generally cover measures to prevent the spread of communicable diseases, as well as food, drug, and workplace safety.
- *Administration* expenditures refer to spending related to the cost of providing health insurance programs, as well as the costs of infrastructure to operate health departments; however, the administrative costs of running hospital and drug programs are included under the relevant category of service.
- Finally, the *all other health* expenditure category represents remaining spending on home care, medical transportation, hearing aids, and eyeglasses.

Figure 1: Percentage Distribution of Alberta Provincial Public Health Spending



[12] Data on provincial health spending and the share of public versus private health spending in Alberta are from the CIHI web site at www.cihi.ca. Population data and the Current Government Expenditure Implicit Price Index are from CIHI, ***National Health Expenditure Database, 2007*** (Ottawa: CIHI, 2007).

[13] G. Boychuk, "The Regulation of Private Health Funding and Insurance in Alberta under the ***Canada Health Act***: A Comparative Cross-Provincial Perspective," SPS Research Papers, The Health Series (Calgary: University of Calgary, School of Policy Studies, 2008).

In 1975, the Alberta government's nominal spending on health was $695 million; by 2007, this had risen to $12.6 billion. As Figure 1 shows, the largest component of health spending in 1975 was *hospitals*, which made up 56.3% of spending, followed by *physicians* at 19.9%, *other institutions* at 11.8%, and with each of the remaining categories at or below 5%. By 2007, along with the overall increase in spending, there were significant changes in the composition of spending. While *hospitals* was still the largest share, it was down to 39.9% of total government health care spending; the share of *physicians* had declined to 17.5%, and that of *other institutions* to 5.5%. Growing shares for *drugs*, *capital spending*, *public health*, *administration*, and *all other health* reflected the changing nature of health spending away from traditional physician and hospital care.

While Figure 1 shows a "snapshot" of health care spending for 1975 and 2007, the graphs in Figure 2 provide insight into the evolution of Alberta government health expenditures, both in the aggregate and by category, over that period. Rather than examine nominal aggregate figures, we converted the data into inflation-adjusted (2007) dollars and then divided by population to provide real per capita figures.[14] Figure 2a shows that, between 1975 and 2007, real per capita Alberta government total health expenditures grew from $1,679 to $3,696, an increase of 120%. The most rapid periods of growth were between 1976 and 1985, when annual growth rates averaged 3.7%, and since 1996, when the annual growth rate has averaged over 5%. The average annual growth rate during the 1985-1995 period was actually negative, coinciding with a period of fiscal restraint and cutbacks.[15]

Overall, real per capita provincial government health expenditures in Alberta over time resemble a roller coaster. This becomes even more apparent when separate expenditure categories are considered. For example, Figure 2a reveals that provincial government hospital spending grew rapidly after 1996, a change that might be interpreted as a recovery from the severe cuts to hospital spending in the early 1990s. By way of contrast, spending on other institutions (Figure 2b) was essentially flat over 30 years except for a large ratchet upward in 1996 and 1997. This occurred in the wake of a provincial deficit-fighting agenda, cuts to federal health transfers, and the implementation of provincial health system reform policies that sought to shift care from hospitals to other institutions in the community. *Hospital* and other *professional spending* (Figures 2a and 2c, respectively) bore a large brunt of the restraint imposed during the 1990s.[16]

Most notable is that, over the period from 1975 to 2007, provincial government real per capita *hospital* and *physician* spending — what one might consider core areas of health care spending — grew at annual rates below that for total real per capita government health expenditures. On the other hand, as Figures 2c-e reveal, long-term growth rates for *drugs*, *capital*, *public health*, and *all other health* expenditures were higher than those for the separate *hospital* and *physician* categories. As a result, as noted, over time there has also been a shift in the composition of health spending away from the traditional primary care areas of *hospital* and *physician* services to these other areas. In 1975, *hospital* and *physician* expenditures accounted for 76% of the Alberta government's health expenditures; by 2007 this had shrunk to 57%.

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[14] The data were deflated using the Government Current Expenditure Price Index in CIHI, ***National Health Expenditure Database, 2007***.

[15] By way of international comparison, total per capita health spending in the United States in 2006 stood at $6,714, while public sector per capita health spending was $3,075 (in purchasing power parity US dollars); see Organisation for Economic Co-operation and Development, Directorate for Employment, Labour and Social Affairs, ***OECD Health Data 2008: Statistics and Indicators for 30 Countries*** (Paris: OECD, 2008). From 1975 to 2006, per capita public sector health spending in the United States grew from $241 to $3,075, an increase of 1,176%. Between 1975 and 2006, Medicare and Medicaid accounted for a large and growing share of federal spending, and the Congressional Budget Office projects that total spending on health care will rise from 16% of GDP in 2007 to 25% by 2025, making sustainability a key issue.

[16] The early to mid-1990s saw a period of expenditure cuts to Alberta government health expenditures, the contracting out of some services, and other types of restructuring; see P. Bragg, "Time to run some tests on province's health system," ***Calgary Herald***, November 19, 1995, p. A.6.

Figure 2a: Total Health and Hospital Spending

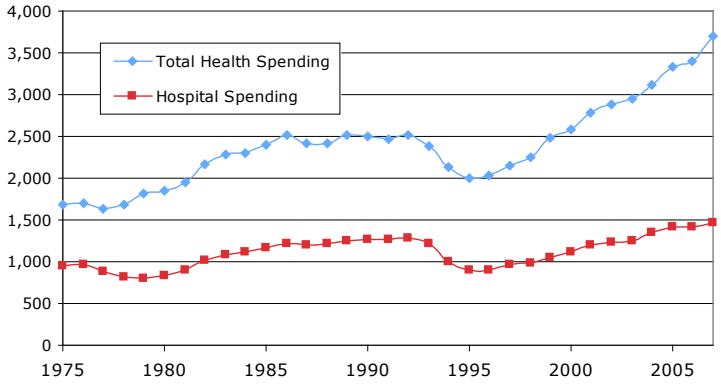


Figure 2b: Other Institution and Physician Spending

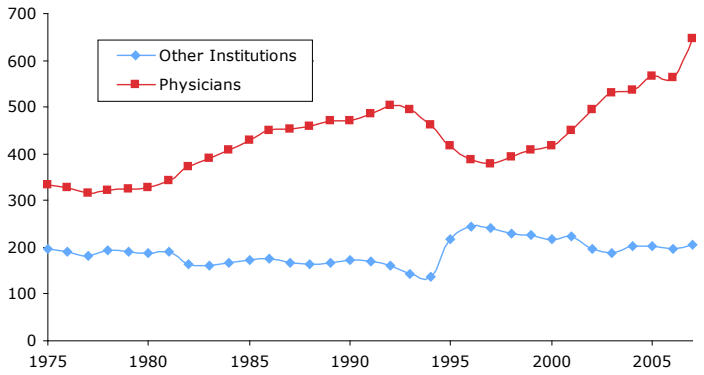


Figure 2c: Other Professional and Administration Spending

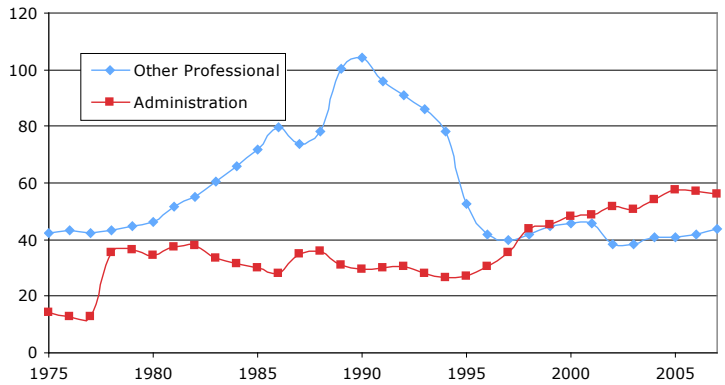


Figure 2d: Drugs and All Other Spending

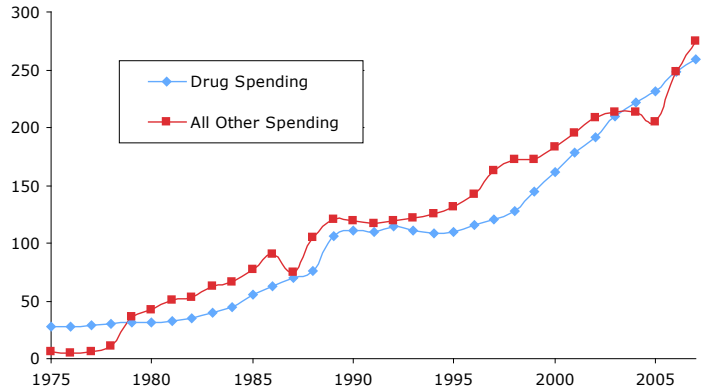
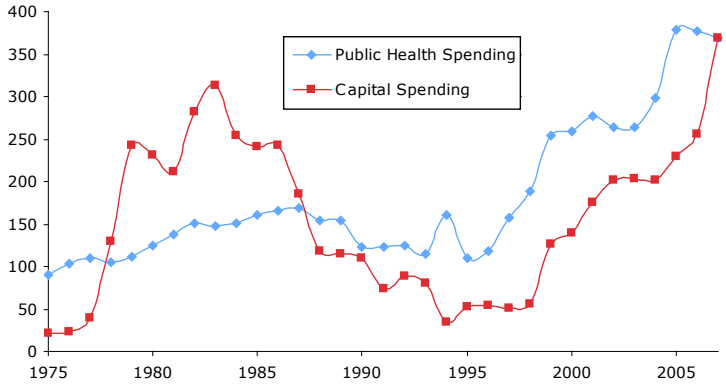


Figure 2e: Capital and Public Health Spending



FISCAL SUSTAINABILITY

Stated most broadly, the question of fiscal sustainability asks whether Canadians face uncertainty regarding the availability of public funds to provide universal, high-quality health care.[17] The question is debated on a number of levels, one of which is the actual definition of fiscal sustainability. The definition and measurement of sustainability is important because it defines whether there actually is a policy problem and what the eventual solution to the issue might be. Indeed, it has been argued that a significant barrier to health care reform is the continued misunderstanding of what fiscal sustainability is.[18] In addition, the debate over fiscal sustainability is closely linked with concepts of fairness and the debate on public-private finance in Canadian health care.

One view is that public health care, when measured as a share of Canada's collective income, GDP, is quite sustainable and that, despite some rising cost and expenditure drivers, the real issue is declining tax rates and

[17] See G. Guyatt, A. Yalnizyan, and P.J. Devereaux, "Solving the Public Health Care Sustainability Puzzle," ***Canadian Medical Association Journal*** 167 (1, 2002): 36.

[18] P. Boothe and M. Carson, "What Happened to Health-Care Reform?" ***C.D. Howe Institute Commentary*** 193 (Toronto: C.D. Howe Institute, 2003), p. 12.

social values that might be encouraging more private sector choices.[19] Adherents of this view suggest that the problem of fiscal sustainability arises because of the resistance of both federal and provincial governments to commit adequate funds to public health care in a planned and consistent fashion.[20] Proponents of this view emphasize that a commitment to maintain tax rates and efforts to increase the efficiency of administration in the public health care system will address sustainability concerns.

Another view in Canadian health policy debates is that health care is marked by rising costs that threaten to overwhelm the public health care system, and therefore major structural reform of the system is needed. The reform might include better public management, but there should also be a greater reliance on incentives and even private markets. The use of market incentives is seen as a way to foster cost savings, but, more important, to provide greater efficiency in the form of faster service as well as greater choice of services. Proponents of this view often point to European health systems, which typically have private as well as public health care, as either parallel or integrated systems.[21]

Whichever view one holds on the question, useful measures and indicators of the fiscal sustainability of the health care system are necessary. It is important for any measure to deal with the time dimension, for the question is not just whether the public health care system is sustainable today but whether it will be sustainable over the longer term. As Marchildon, McIntosh, and Forest note, sustainability has to do with "the sufficiency of resources over the long term to provide timely access to quality services that address Canadians' evolving health needs."[22] Comley and McKissack refine this concept by defining public sector fiscal sustainability as being attained when all "obligations, current and future, can be met without changing current policy settings."[23] The view of health care spending as a flow of benefits over time is useful as it imposes discipline on current health care decisions. That is, all else being equal, increases in the current level of health spending produce a future "implicit liability" that demands higher tax rates or cuts to spending in other government services in order to deliver the same value of health care per recipient as now.[24] Recognizing that implicit future liability and calculating the increase in current tax rates that would be required to fund it is a way of presenting to voters the true long-term impact of choices made with respect to health care spending.

In this vein, a useful measure of the sustainability of current settings is the share of total government spending allocated to health care and whether it is growing at the expense of other government expenditures. Figure 3 presents data on the share of total government spending accounted for by provincial government health care spending in each province over the 1975-2007 period. As the figure shows, health care as a percentage of total spending grew over that period in all provinces, and particularly so since 1995. This growth has raised concerns over the potential for health care spending to absorb an ever larger share of public spending and so potentially

[19] For example, R.G. Evans argues that:

> Claims that Canada's Medicare is economically or fiscally unsustainable represent part of a broader propaganda campaign to advance those priorities, "softening up" a generally skeptical and unsympathetic public to accept that the current form of public health insurance…is simply impossible to maintain. The agenda is being advanced by right-wing governments in the larger provinces with sympathetic coverage from the country's dominant newspaper chain.

R.G. Evans, "Political Wolves and Economic Sheep: The Sustainability of Public Health Insurance in Canada," Working Papers 03:16W (Vancouver: University of British Columbia, Centre for Health Services and Policy Research, December 2003), p. 19.

[20] Guyatt, Yalnizyan, and Devereaux, "Solving the Public Health Care Sustainability Puzzle," 36-37.

[21] See also Boothe and Carson, "What Happened to Health-Care Reform?"

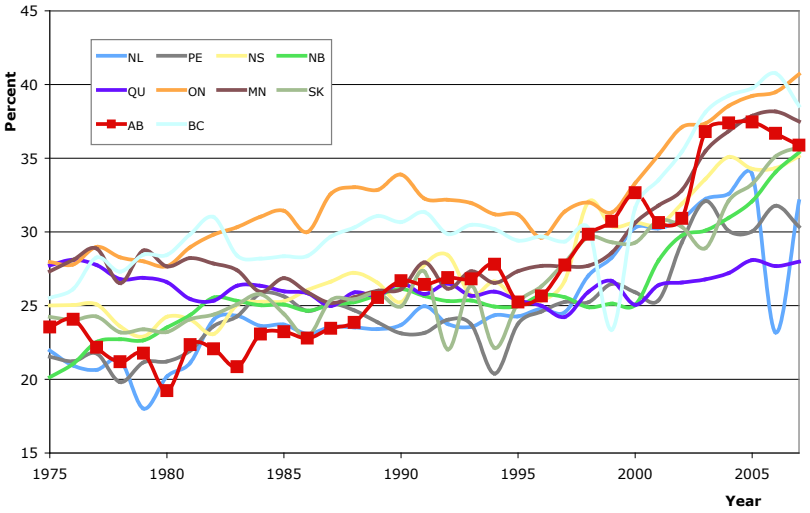
[22] G.P. Marchildon, T. McIntosh, and P.G. Forest, eds., ***The Fiscal Sustainability of Health Care in Canada, Romanow Papers, Volume 1*** (Toronto: University of Toronto Press, 2004), p. 3.

[23] B. Comley and A. McKissack, "Expenditure Growth, Fiscal Sustainability and Pre-Funding Strategies in OECD Countries" (paper prepared for the Banca d'Italia Workshop on Public Finance: Public Expenditure, Perugia, Italy, March 31-April 2, 2005), p. 5; accessed online at http://www.bancaditalia.it/studiricerche/convegni/atti/publ_expe/i/089-140_comley_mckissack.pdf.

[24] Robson, "Time and Money," p. 1.

crowd out other areas of public spending. However, a 2006 study using province-level data for the period of fiscal years 1988/89 to 2003/04 finds no evidence to support the claim that rising health care expenditures crowded out other categories of provincial government spending during that period. While the average share of provincial government spending accounted for by health rose from 30% to 36%, the level of spending on other government programs did not decrease. The study's results indicate that the fiscal dividend that accrued to the provinces as a result of lower interest rates and debt charges, increases in federal transfers, reduced demand for spending on certain programs, and increases in own-source revenues all contributed to financing the increase in health care spending over the period.[25]

Figure 3: Provincial Government Health Spending as a Percentage of Total Provincial Government Spending, 1975-2007



While interesting, indicators of relative rank across provinces say little, however, about any individual government's ability to sustain its health spending relative to its own resource base, and the study just referred to offers little help in understanding what issues of fiscal sustainability might arise in the future. Another useful measure of the sustainability of public health care spending, therefore, is to compare the growth rate of per capita public health care spending to the growth rate in per capita income (citizens' capacity to pay) or to total public sector revenues (government's capacity to pay at historical tax rates).[26] When such measures are used, growth rates of spending that are faster than growth rates of revenue are suggestive of a sustainability problem.[27]

As Table 1 shows, real per capita provincial government health expenditures per category, in general, grew faster over the 1976-2007 period (with a median growth rate of 3.5% annually) than either total government revenue growth (1.7%) or GDP growth (2.2%).[28] If the difference in these rates of growth can be expected to persist over the long term, then current and future obligations will be increasingly difficult to meet without a change in current policy settings. However, examining real per capita growth rates by category suggests that the issue of provincial government health expenditure sustainability is more complicated and depends on the type of expenditure. While total real per capita provincial government health spending is rising faster than the real per capita revenue base, the *hospitals*, *physician,* and *administration* categories all experienced real per

[25] See S. Landon et al., "Does Health-Care Spending Crowd Out other Provincial Government Expenditures?" ***Canadian Public Policy*** 32 (2, 2006): 121-141. The study does not break down the revenue increase from own-source revenues as originating from higher tax rates or an expanding tax base. However, given the income tax cuts of the 1990s and the economic boom that occurred, it is likely the tax revenue increases came largely from an expanding base.

[26] The connection between the faster growth of health care costs and that of general government revenue was noted by the Fykes Commission report; see Boothe and Carson, "What Happened to Health-Care Reform?" p. 12.

[27] Skinner and Rovere (***Paying More, Getting Less***, p. 3) argue that government spending on health care should be considered unsustainable when it grows on average faster than revenue.

[28] We report the median value of annual growth rates by category instead of annual averages because some category averages are heavily influenced by outliers and generate some extreme growth rates by category. This is especially true when, as we do later, we identify annual growth rates for sub-periods.

capita median long-term growth rates that were at or near the rate of growth in the revenue base measures. The categories that significantly exceeded the growth rates in revenue and GDP were *drugs*, *capital*, and *all other health*.

Table 1: Median Annual Growth Rates of Real per Capita Public Health Expenditures and Revenue Bases, Alberta, 1976-2007

Category	Median Annual Growth Rate
	(percentage change)
Total health	3.5
Hospitals	2.6
Other institutions	-1.1
Physicians	2.1
Other professionals	2.5
Drugs	5.7
Capital	6.0
Public health	2.8
Administration	1.7
All other health	6.5
GDP	2.2
Provincial government revenue	1.7

Sources: Canadian Institute for Health Information; authors' calculations.

The implication of these differences in growth rates is that sustainability of the Alberta public health care system is not necessarily as serious a long-term issue when the traditional core areas of physician services and hospital care are considered. These areas have experienced long-term growth rates that do not deviate substantially from the economy's long-term growth rate or the government's revenue growth rate. However, the non-core categories — which, over time, have taken a rising share of total health spending — have been growing at rates that perhaps cannot be sustained with current policy settings.[29]

It is important to note, however, that comparisons of expenditure growth rates, even by finely defined categories and whether measured by the growth rate in GDP or the growth rate of total government revenue, must be interpreted with care. This is so because the rate of growth in the government's total revenue base is arguably an optimistic measure of the government's ability to meet its expenditure obligations — an issue we turn to next.

SUSTAINABILITY AND ALBERTA'S REVENUES

An important part of the issue of the fiscal sustainability of public health care is the ability and willingness to pay for health care expenditures, so an examination of the revenue base is necessary. A unique aspect of Alberta's public finances is the large share of total revenue attributed to royalties earned on the sale of non-renewable resources. Historically, the share of non-renewable resource revenues in Alberta's revenues has always been quite high, and that remains true today. The fiscal year 2008/09 provincial budget, for example,

[29] The health policy community often expounds the view that the sustainability issue is a reflection of a broader government agenda sensitive to the needs of the wealthy that is geared towards privatization and tax cutting, thereby fuelling expenditure cuts; see Evans, "Political Wolves and Economic Sheep." Rising health expenditures, however, offer evidence that is contrary to this view. As well, contrary to the notion that tax cuts and health spending cuts have been designed to benefit wealthy Canadians and erode equity, the Canadian fiscal redistribution system during the 1990s remained progressive and even appears to have increased slightly in favour of low-income families; see D. Dyck, "Fiscal Redistribution in Canada, 1994-2000," Working Paper WP 2003-22 (Ottawa: Department of Finance, 2003).

estimates total government revenue at $38.6 billion, of which 30.4% is non-renewable resource revenue, 22.3% is from personal income taxes, 9.8% corporate income taxes, and the remainder comes from an assortment of other taxes, transfers, investment income, and various premiums, fees, and licences. What is more, non-renewable resource revenues are generally quite volatile. Over the 1983-2008 period, for example, while Alberta's resource royalties averaged 30% of program expenditures, they accounted for as little as 13% and as much as 53% of program expenditures.[30] The heavy reliance on a volatile revenue base, however, exposes important public expenditures, such as public health expenditures, to the risk of becoming volatile as well.[31] That is, since Alberta has legislation prohibiting annual budget deficits, if it risks a deficit because of a large fall in revenues, it must either increase tax rates or cut government spending.[32] With health spending currently at 36% of its budget, any decision by the government to react with a cut in spending requires either a cut in health care spending or a disproportionate cut in other government programs.

A way to minimize this risk is for the government to reduce its reliance on resource revenues. If, for example, Alberta chose to base the level of its expenditures on just that portion of resource and other revenues it could rely on with a high degree of certainty, it would reduce the volatility in resource revenues from being able to affect program spending. This is, in fact, what the government has tried to do. From fiscal years 2003/04 to 2007/08, the resource revenues Alberta allowed itself to use as a reliable source of revenue averaged just 42% of the amount it actually received.[33] Thus, over that time, an average of 58% of resource revenues was judged too unreliable a source of revenue on which to base spending plans. Rather than be allocated to spending, these revenues instead were allocated to saving and deposited into one or more of the government's various savings funds. Moreover, it has increased this amount more or less regularly, from $3.25 billion in 2003/04, to $5.3 billion in 2008/09, to a planned $6.6 billion in 2009/10.[34] What the dramatic fall in resource revenues realized since the summer of 2008 shows, however, is that the degree of certainty with which the government was counting on these revenues was not so high as it might have hoped.

If Alberta continues to dedicate a similar fraction of its resource revenues to saving as opposed to spending, judgments as to the sustainability of spending plans should properly be evaluated by comparing spending to an "adjusted" revenue base, one that has been adjusted by removing some fraction of resource revenues. The impact of judging fiscal sustainability on the basis of a lesser reliance on non-renewable resource revenues is

[30] Government of Alberta, ***Budget***, various years.

[31] As an example of the precarious nature of non-renewable resource revenues, even prior to the dramatic fall in world oil prices beginning in the second half of 2008, Alberta's Financial Investment and Planning Advisory Commission forecast a 23% decline in resource revenues between 2010 and 2016 in the absence of an adjustment to royalty rates; see Alberta Royalty Review Panel, ***Our Fair Share: Final Report*** (Edmonton: Alberta Royalty Review Panel, 2007).
As noted in the report of Alberta's Financial Investment and Planning Advisory Committee, for reasons of intergenerational equity, expenditure control, and revenue stabilization, governments reliant upon the revenues realized from the sale of non-renewable resources are advised to impose a commitment to saving on their annual budgeting efforts; see Financial Investment and Planning Advisory Commission, ***Preserving Prosperity: Challenging Alberta to Save***; Jack Mintz, chair (Edmonton: Alberta Ministry of Finance and Enterprise, 2008). Another advantage of saving is that one could compensate for future resource revenue fluctuations by diverting a large portion of current resource revenues into government savings and in this way generate a stream of relatively stable investment income.

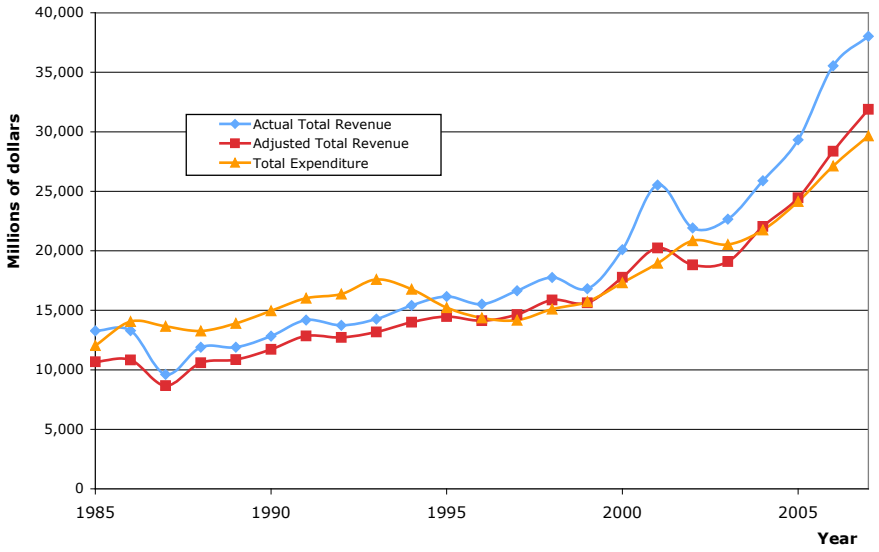
[32] Alberta currently maintains a Sustainability Fund, the purpose of which is to fund unexpected falls in revenue or increased demand for spending. Whether that fund is sufficiently large to mitigate the need to increase tax rates or cut spending in the face of a significant loss of revenue is about to be put to the test. In an update to its fiscal year 2008/09 budget, the Alberta government recently forecast a $6.7 billion revenue decrease — a 14% fall in total revenues — from the first quarter forecast, primarily as a result of the drop in energy prices. In the face of shocks like these, there is some question as to how long the Sustainability Fund can delay the need for adjustments to either spending or tax rates.

[33] Note that the government allowed itself to budget to spend 64% of the resource revenues it expected to receive. The discrepancy between the two percentages reflects the fact that the resource revenues realized were greater than the amounts forecast in budgets — Government of Alberta, ***Budget***, various years; and authors' calculations.

[34] The planned amount for 2009/10 was announced in the 2008 budget, which was released in April 2008. For a detailed discussion of this and other efforts by Alberta to minimize the impact of resource revenue volatility on its budget, see R.D. Kneebone, "From Famine to Feast: The Evolution of Budgeting Rules in Alberta," ***Canadian Tax Journal*** 54 (3, 2006): 657-673.

illustrated in Figure 4, where half of resource revenues have been removed from total revenues to provide an "adjusted total revenue" series. The figure shows that, although the period since 1995 officially has been one of large surpluses, the reality is that Alberta is closer to a barely balanced budget if one considers the implication of the government's relying upon just half of non-renewable resource revenues. Thus, in the face of rising health care spending, Alberta could be facing a more strained fiscal future.

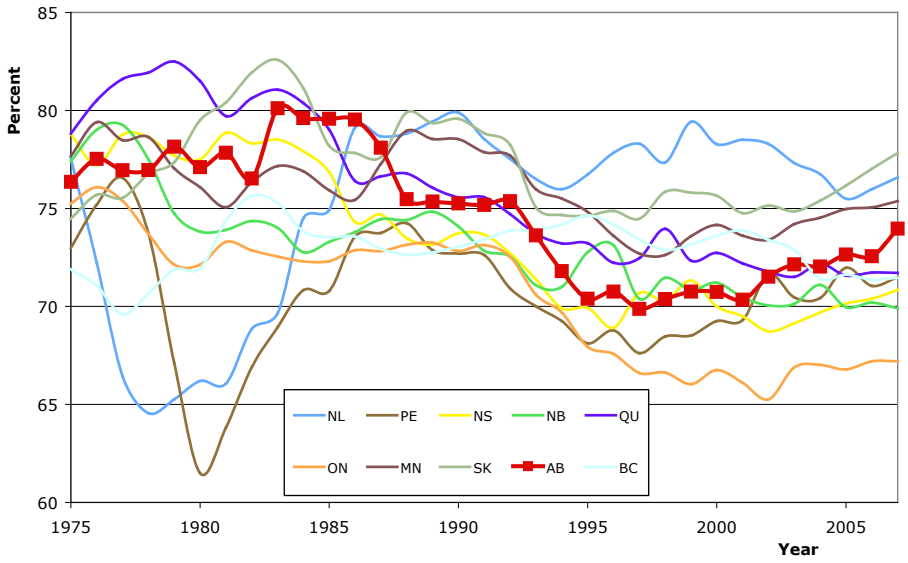
Figure 4: Provincial Government Actual and Resource Adjusted Revenues and Expenditures: Alberta, 1985-2007



SUSTAINABILITY AND THE PUBLIC-PRIVATE DIVIDE

An interesting perspective from which to judge the implications for public health spending of concerns over fiscal sustainability is to relate the size of the public share of total (public plus private) health spending to the general state of provincial government finances. Figure 5 shows that, since 1975, there has been considerable variation both across provinces and over time in public health spending as a percentage of total health spending. Especially noteworthy is the general decline in the public share over a period roughly defined as 1985 to 2000, during which provincial governments were forced to engage in a considerable amount of budget cutting and fiscal retrenchment due not only to poor economic conditions but also to cuts to federal transfers. After 2000, when generally strong economic growth significantly improved provincial balance sheets, the public share stopped falling and, indeed, is generally on a shallow incline. Certainly this pattern is clear in Alberta's case: the public share of health spending fell quite considerable during the 1987-1995 period of budget cutting but has

Figure 5: Public Share of Health Expenditure, by Province, 1975-2007



mounted a slow but steady recovery since 1995, when revenues have grown strongly.

Figure 5 also shows that provincial variation in the public share shrinks during periods of tight budgets and grows during periods of relative revenue abundance. These two observations suggest that it is during periods of fiscal restraint that provincial governments should pursue most strongly opportunities to increase reliance on the private sector to satisfy health care demands and that only during periods of improved finances can they afford to express their differences in judgments over the appropriate public-private division.

Given that, over the course of 30 years, the overall share of private funding of health care in Canada has declined only from approximately 76% to 70%, it appears the shift towards private care has been one of marginal increments rather than fundamental shifts. Moreover, it seems to have involved a rebalancing of public-private preferences across expenditure categories with a willingness to accept a greater private share in *hospitals* and *other professionals*, maintenance of the share for *physicians*, and a smaller private share for *drugs*. Canadians appear conflicted about their health care system, as they seem willing to tolerate only marginal accretions in the overall private share of health spending but much larger changes across individual health expenditure categories as well as provincial systems.[35]

In the case of Alberta, any current concerns over increased privatization seem misplaced given that the decline in the public share occurred during the 1990s and that since then the public share has been gradually rising. As Figure 5 reveals, Alberta's public share is currently near the average public share across the provinces, with only Saskatchewan, Manitoba, and Newfoundland and Labrador having a larger public share. Quebec, Prince Edward Island, British Columbia, Nova Scotia, New Brunswick, and Ontario all have lower public shares. Indeed, the lowest share belongs to Ontario, at approximately 67%.

LOOKING AHEAD: PROJECTING HEALTH EXPENDITURES INTO THE FUTURE

Whereas in the previous sections we examined issues related to the question of the fiscal sustainability of the public health care system by looking to the past, in this section we turn our attention to making predictions about fiscal sustainability in the future. We do so by using two alternative approaches, what we call the "extrapolation" and the "determinants" approaches.

The Extrapolation Approach

The extrapolation approach considers alternative scenarios for the growth of real per capita health expenditures based on different historical episodes and uses them to generate projections showing possible future expenditure growth paths. A very simple approach is to use alternative rates of growth in real per capita total public health care expenditures. However, as shown in Table 1 and as discussed earlier, the growth rate of health spending varies widely across expenditure categories. As a result, our preferred approach is to break the extrapolation into separate expenditure categories and then aggregate the categories for a projection of total health spending. Table 2 presents the median annual growth rate in real per capita expenditures for each of nine health expenditure categories for three periods: 1976 to 2007, 1976 to 1986, and 1996 to 2007. We apply these median growth rates to each category for the period after 2007 and aggregate the categories to generate three projections to 2030 of real per capita total provincial government health expenditures. We present the results in graphic form as Figure 6, where Projection 1 is the result of applying 1976-2007 median growth rates, Projection 2 is the result of applying 1976-1986 median growth rates, and Projection 3 is the result of applying 1996-2007 median growth rates. In 2007, real per capita provincial government total health expenditures in Alberta were $3,696 (in 2007 dollars). By 2030, this figure would grow to $8,218, based on Projection 1; to $5,709, based on Projection 2; and to $14,215, based on Projection 3.

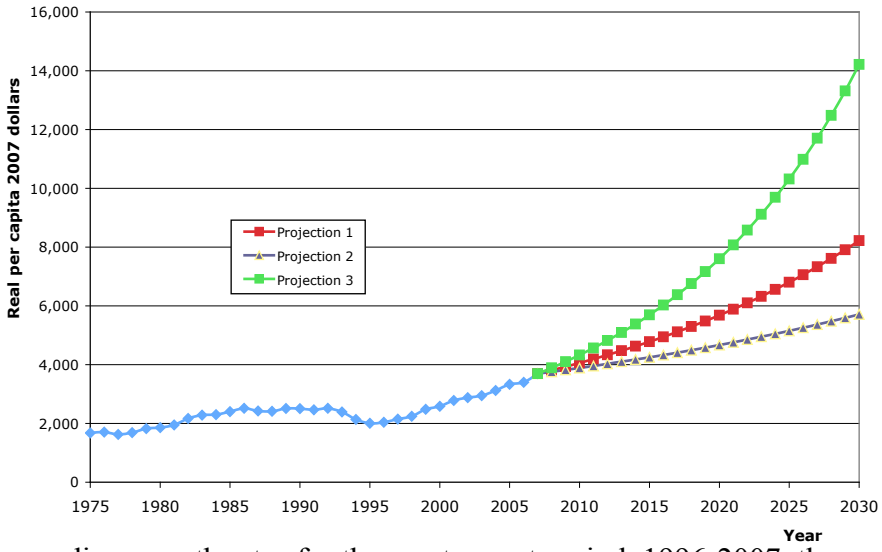
[35] For a more detailed discussion of the public-private split in health care, see L. Di Matteo, "Policy Choice or Economic Fundamentals: What Drives the Public-Private Health Expenditure Balance in Canada?" ***Health Economics, Policy and Law*** 4 (1, 2009): 29-53.

Table 2: Median Annual Growth Rates of Real per Capita Public Health Expenditures, Alberta, Selected Periods

Category	Median Annual Growth Rate		
	1976-2007	1976-1986	1996-2007
	(percentage change)		
Hospitals	2.6	1.6	4.6
Other institutions	-1.1	-1.3	-1.1
Physicians	2.1	0.4	4.2
Other professionals	2.5	-5.1	1.1
Drugs	5.7	4.4	6.8
Capital	6.0	3.2	10.7
Public health	2.8	2.3	7.3
Administration	1.7	2.6	5.8
All other health	6.5	2.9	6.5

Sources: Canadian Institute for Health Information; authors' calculations.

Figure 6: Alberta Provincial Government Heath Expenditures: Projections from the Extrapolation Approach



Since Projection 3 uses median growth rates for the most recent period, 1996-2007, these growth rates are of particular interest because a projection based on them defines the implications of continuing with current policy settings. Indeed, as Figure 6 shows, Projection 3 paints a most dire scenario. Assuming a continuation of spending growth rates observed from 1996 to 2007, real per capita provincial government health expenditures are projected to increase almost fourfold, from $3,696 to $14,215. In contrast, the actual increase in real per capita spending from 1975 to 2007 — from $1,679 to $3,696 — represented only a doubling of spending over a considerably longer period. This suggests that the most recent growth phase of Alberta government health spending is unlikely to be fiscally sustainable given the income and revenue trends of the past 30 years.

The Determinants Approach

The determinants approach to projecting future public health care expenditures is to estimate what are the determinants of health expenditures, make assumptions as to what future direction those determinants will take, and then use the estimated determinant equation to forecast expenditures. Relative to the extrapolation approach, then, the determinants approach allows one to consider the implications for future levels of health care spending of changes in growth rates of a wider range to variables. Having established a statistical relationship between population growth and public health care expenditures, for example, one may derive the

implication for health spending of alternative population-growth-rate scenarios. This is something we do in some of the simulations we generate using the determinants approach.

Many of the first wave of health expenditure determinant studies used single cross-sections and focused on the role of income and demographic variables.[36] Later studies used pooled time-series cross-sectional data.[37] In Canada, the literature on the determinants of health expenditures has been shaped by a number of policy reports produced as part of the debate on health care reform. A 2000 report by the provincial and territorial ministers of health forecast that real per capita health expenditures, under modest assumptions, would continue to grow at a rate of approximately 5% per year and practically triple real per capita provincial government health expenditures between 1999 and 2026.[38] The report also noted that certain cost accelerators have the potential to increase growth by even more. These include emerging and new technologies (such as major joint surgery, neonatal and fetal technologies, dialysis, organ transplantation, genetic testing, and therapy), increased incidence of chronic and new diseases (heart disease, diabetes, AIDS), technological change in pharmaceuticals, and increased expectations that might affect use rates. According to the report, over the period from 1999 to 2026, aging is anticipated to account for approximately 21% of total expenditure growth, population for 13% of growth, inflation 43%, and all other factors 21%.

Another report,[39] using a similar methodology and a sensitivity analysis to decompose past expenditure trends and applying them to the future, finds that, over the 1998-2030 period, population aging is likely to account for 31% of the growth in real per capita health expenditures. Aging is also expected to affect Alberta's health spending, as the share of the population ages 65 and over is projected to reach more than 20% by 2031.[40] Other

[36] The first generation of such studies often used international data. See R.E. Leu, "The Public-Private Mix and International Health Care Costs," in ***Public and Private Health Services***, edited by A.J. Culyer and B. Jonsson (Oxford: Basil Blackwell, 1986); D. Parkin, A. McGuire, and B. Yule, "Aggregate Health Care Expenditures and National Income: Is Health Care a Luxury Good?" ***Journal of Health Economics*** 6 (2, 1987): 109-127; M.C. Brown, ***Caring for Profit: Economic Dimensions of Canada's Health Industry*** (Vancouver: Fraser Institute, 1987); U.G. Gerdtham et al., "An Econometric Analysis of Health Care Expenditure: A Cross-Section Study of the OECD Countries," ***Journal of Health Economics*** 11 (1, 1982): 63-84; and K.P. Gbesemete and U.G. Gerdtham, "Determinants of Health Care Expenditure in Africa: A Cross-Sectional Study," ***World Development*** 20 (2, 1992): 303-308.

[37] Most of these rely on international comparisons; see T. Hitiris and J. Posnett, "The Determinants and Effects of Health Expenditure in Developed Countries," ***Journal of Health Economics*** 11 (2, 1992): 173-181; P.P. Barros, "The Black Box of Health Care Expenditure Determinants," ***Health Economics*** 7 (6, 1998): 553-544; and U.G. Gerdtham et al., "The Determinants of Health Expenditure in the OECD Countries: A Pooled Data Analysis," in ***Health, the Medical Profession and Regulation***, vol. 6, ***Developments in Health Economics and Public Policy***, edited by P. Zweifel (Boston: Kluwer Academic, 1998). For estimates of the determinants of Canadian provincial government health spending, see L. Di Matteo and R. Di Matteo, "Evidence on the Determinants of Canadian Provincial Government Health Expenditures: 1965-1991," ***Journal of Health Economics*** 17 (2, 1998): 211-228; and R. Ariste and J. Carr, "New Considerations on the Empirical Analysis of Health Expenditures in Canada: 1966-1998," Health Policy Research Working Paper 02-06 (Ottawa: Health Canada, 2003). Recent work on the determinants of health expenditures has criticized the time-series literature on the basis of the issue of stationarity and has applied a co-integration approach. For studies of health expenditure determinants using this approach, see N.R. Murthy and V. Ukpolo, "Aggregate Health Care Expenditure in the United States: Evidence from Cointegration Tests," ***Applied Economics*** 26 (8, 1994): 797-802; P. Hansen and A. King, "The Determinants of Health Care Expenditure: A Cointegration Approach," ***Journal of Health Economics*** 15 (1, 1996): 127-137; A.G. Blomqvist and R.A.L. Carter, "Is Health Care Really a Luxury?" ***Journal of Health Economics*** 16 (2, 1997): 207-229; and J. Roberts, "Spurious Regression Problems in the Determinants of Health Care Expenditures: Comment on Hitiris (1997)," ***Applied Economics Letters*** 7 (2000): 279-283. Recent research suggests that stationarity might not be as serious a problem in panel data when panel-level tests are employed; see S.K. McKoskey and T.M. Seldon, "Health Care Expenditure and GDP: Panel Data Unit Root Test Results," ***Journal of Health Economics*** 17 (3, 1998): 375.

[38] From a real per capita figure in fiscal year 1999/2000 of $1,759, the study projects real per capita public health care spending in Canada could reach $5,143 in 2026/27 — a near-tripling of real per capita spending over a 25-year period; see Provincial and Territorial Ministers of Health, *Understanding Canada's Health Care Costs*, Final Report (n.p., August 2000), pp. 31-32.

[39] S. Hogan and S. Hogan, "How Will the Ageing of the Population Affect Health Care Needs and Costs in the Foreseeable Future?" Discussion Paper 25 (Ottawa: Commission on the Future of Health Care in Canada, 2002).

[40] This estimate is based on a medium-growth, medium-migration scenario that assumes fertility until 2031 will be 1.5 children per

reports suggest, however, that aging will remain a secondary source of pressure on health expenditures relative to non-aging factors.[41]

The determinants model we estimate here for Alberta, which is typical of such models estimated in the literature to date, can be presented in the equation: h = f (Y, A, z), where real per capita provincial government health expenditure, h, is assumed to be a function of income, Y, age, A, and a vector, z, of social and economic variables that affect real per capita health expenditures.

The inclusion of a real per capita income variable is standard in studies of the determinants of health care expenditure, since higher income is expected to be associated with higher levels of demand for health care spending. For our purposes, we use a broad measure of income — real per capita GDP — because Alberta has access to a broad range of revenues not captured by a narrower measure such as personal income.[42] Another income-type variable used is intergovernmental transfers, since federal transfers represent an important revenue source for provincial governments, although they vary in importance across provinces and over time. Whereas income represents a measure of the potential availability of own-source tax revenue, intergovernmental transfers represent external financing resources available to a jurisdiction and therefore are conceptually distinct. Historically, about 20% of provincial government revenues was obtained from federal transfers, but by the late 1990s this had declined to approximately 15% as the result of the federal government's deficit fighting agenda and consequent reductions in provincial transfers.[43] According to the fiscal year 2008/09 Alberta budget, the province is expected to receive $3.8 billion from the federal government, or about 9.8% of total provincial government revenue.

Today, federal transfers are largely unconditional, but in the past, some were conditional and came with requirements on how they had to be spent. Since our analysis includes periods when at least some transfers were conditional, we constructed a cash transfer variable that attempts to include all cash resources transferred from the federal government to Alberta that potentially could be used for health expenditures. The transfer components used were equalization cash transfers, the cash component of EPF, the cash component of the Canada Health and Social Transfer (CHST) entitlement (which becomes the Canada Health Transfer and the Canada Social Transfer after 2005), and the value of health grants for the two years prior to the onset of EPF in 1977.[44] As well, we constructed dummy variables to capture the impact of transfer regime changes to EPF and the CHST.

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woman, male life expectancy will be 81.9 years, female life expectancy will be 86 years, and immigration will be 7 per 1,000 of the population, while emigration will be 1.5 per 1,000 of the population; see Statistics Canada, ***Population Projections for Canada, Provinces and Territories***, Cat. 91-520 (Ottawa: Statistics Canada, 2005), Table 10-10.

[41] Recent testimony before a US Senate committee suggests the key contributors to the growth of US health care spending are population aging, changes in third-party payment, income growth, health care prices, administrative costs, and technology-related changes, with the latter estimated to account for between 38% and 65% or more of growth; see P. Orszag, "Growth in Health Care Costs" (testimony before the United States Senate, Committee on the Budget, Washington, DC, January 31, 2008), p. 6.

[42] Sources of data employed in the determinants model are provided in an online appendix; see http://www.iapr.ca/files/iapr/On-line-Data-Appendix.pdf.

[43] In fiscal year 2008/09, estimated federal cash transfers to the provinces and territories are expected to total approximately $53.6 billion, of which 30 percent was general-purpose transfers and the remainder was specific-purpose transfers mainly under the rubric of the Canada Health and Social Transfer (CHST). The 1990s saw a shift in federal transfer funding, not only in dollar amounts, but also in the institutional arrangements governing those transfers. These have evolved considerably since the mid-1970s. The arrival of the CHST has made it much more difficult to obtain specific data on federal health transfers, as they are now incorporated into a much more general transfer payment. As well, even before the arrival of the CHST, there was some discretion over the use of transfer income, particularly for those provinces that received equalization cash transfers. For estimates of the federal share of health spending and the federal health share of cash transfers, see K. Banting and R. Boadway, "Defining the Sharing Community: The Federal Role in Health Care," in ***Money, Politics and Health Care: Reconstructing the Federal-Provincial Relationship***, edited by Harvey Lazar and France St-Hilaire (Montreal: Institute for Research on Public Policy, 2004).

[44] For further discussion, see L. Di Matteo and P. Grootendorst, "Federal Patent Extension, Provincial Policies, and Drug Expenditures, 1975-2000," ***Canadian Tax Journal*** 50 (6, 2002): 1913-1948.

Two other fiscal variables used in the model are a tax revenue share variable and real per capita provincial debt-service costs. Increases in the values of these variables are expected to have a negative influence on the demand for provincial health care spending. The tax revenue share is the proportion of total provincial government revenues that is financed by direct personal, direct corporate and business taxes, and indirect taxes — that is, revenue net of sales of goods and services, investment income, and transfers. In many respects, this represents a "tax price," as the higher its value, the greater the share of expenditures that ultimately is financed via taxes.[45] The use of real per capita provincial debt-service costs is an attempt to take the servicing of the provincial debt into account, particularly as it was the rapid accumulation of debt in the late 1980s and early 1990s that prompted the Klein government to reduce expenditures by more than 25% in real per capita terms. Conversely, recent surpluses and debt paydown have generated declines in debt-service costs and so freed up government revenues for other uses.

Another variable included in the regression is due to consideration of the so-called Baumol model of unbalanced growth between a "productive" and an "unproductive" sector of the economy.[46] The Baumol model hypothesizes that relatively labour-intensive sectors of the economy are characterized by relatively low levels of productivity growth and ever-increasing relative costs. Thus, wage rises are not matched by productivity gains in the "unproductive" sector, leading to the potential for an ever-widening gap between costs and revenues in those sectors; the relatively unproductive sector is said to suffer from so-called cost disease. To test whether this hypothesis has any relevance to public health care expenditures, we created a variable measuring the relative price of health care defined as the ratio of the government's current expenditure implicit price index to the all-items consumer price index (CPI).[47] Increases in the value of this variable are expected to increase costs and hence raise health care spending.

Another determinant of health expenditure we consider is the age distribution. It is a popular notion that an aging population is a major cost driver of health care costs, but many analyses suggest that its importance has been overstated.[48] Complicating its impact is the potential effect of changing health expectations and demands across population cohorts, and the effects of new techniques and technologies, demographic uncertainty, and even age-related changes on the overall cost of health services.[49] In fact, the effects of an aging population

[45] A plot of real per capita provincial government health spending versus the tax revenue share generates a hump-shaped curve, with health spending per capita peaking at about the 0.5-0.6 range. This suggests that, beyond a certain point, a higher "tax price" serves as a disincentive for more health spending and implies a quadratic specification for the tax price variable. The technique used was LOWESS, short for locally weighted scatter plot smoothing, a non-parametric regression technique useful for visualizing trends; see W.S. Cleveland, "Robust Locally Weighted Regression and Smoothing Scatterplots," ***Journal of the American Statistical Association*** 74 (368, 1979): 829-836; idem, ***The Elements of Graphing*** (Monterey, CA: Wadsworth Advanced Books and Software, 1985); and idem, ***Visualizing Data*** (Summit, NJ: Hobart Press, 1993). For another use of a "tax price" variable in regression estimates, see P. Boothe, ***The Growth of Government Spending in Alberta***, Canadian Tax Paper 100 (Toronto: Canadian Tax Foundation, 1995).

[46] See W.J. Baumol, "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis," ***American Economic Review*** 57 (3, 1967): 415-426; and idem, "Health Care, Education and the Cost Disease: A Looming Crisis for Public Choice," ***Public Choice*** 77 (1, 1993): 17-28. For a recent application of the Baumol hypothesis to OECD health expenditure data, see J. Hartwig, "What Drives Health Care Expenditure? Baumol's Model of 'Unbalanced Growth' Revisited," Working Papers 103 (Zurich: Swiss Federal Institute of Technology, 2006).

[47] A similar specification for the relative price of health care is also employed by C. Bac and Y. Le Pen, "An International Comparison of Health Care Expenditure Determinants" (paper prepared for the 10th International Conference on Panel Data, Berlin, July 5-6, 2002).

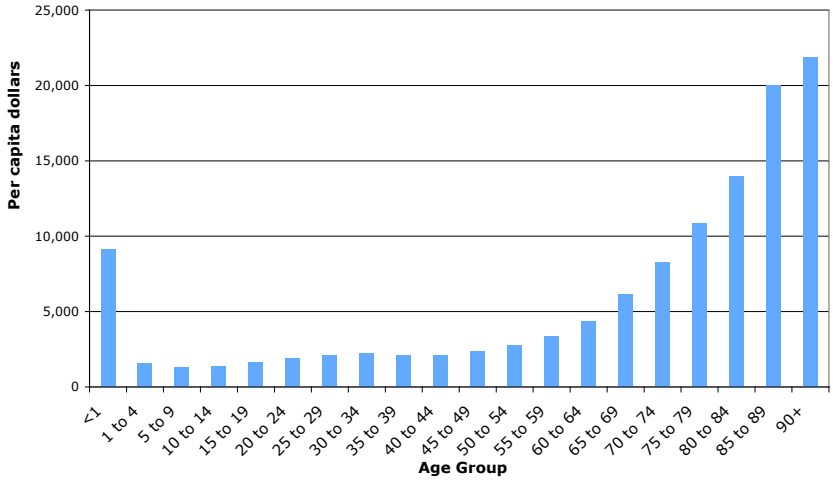
[48] See, for example, R.G. Evans et. al., "Apocalypse No: Population Aging and the Future of Health Care Systems," ***Canadian Journal on Aging*** 20 (suppl.1, 2001): 160-191; and W. Robson, "Will the Baby Boomers Bust the Health Budget? Demographic Change and Health Care Financing Reform," ***C.D. Howe Institute Commentary*** 148 (Toronto: C.D. Howe Institute, 2001).

[49] See Hogan and Hogan, "How Will the Ageing of the Population Affect Health Care Needs and Costs in the Foreseeable Future?" p. v.

and demographic factors in general — can be complex. The bulk of the projected increase in health care expenditures in the United States, for example, is expected to be due, not to demographic changes *per se*, but to increases in costs per beneficiary fuelled by new technologies and services for the aging.[5050] Similarly, a 2004 study finds that it is the approach of death, rather than aging, that is a key cost driver.[51] This is consistent with a US study of trends in US Medicare payments in the last year of life that finds that, in 1990, the 6.6% of Medicare recipients who died accounted for 22% of program expenditures in that year.[52] Another US study finds that Medicare expenditures rise at a rate of 9.4% per year for people three to ten years away from death and then accelerate sharply to 45% per year in the final two years before death.[53]

Canadian studies show that the per capita costs of health care for a 60-year-old are nearly double, and those for a 70-year-old nearly triple, those for a 40-year-old.[54] A study of the effects of demographic composition on physician expenditures in British Columbia estimates that the average annual per capita cost increase for people age 75 and over was 5.5%, with the fastest growth in the use of specialist care.[55] Given that the proportion of the Canadian population over age 65 was 7.6% in 1961 and is expected to reach 18% by 2025, the growing number

Figure 7: Alberta Provincial Government Health Expenditures by Age Group, 2005



of elderly would seem to be an important factor in increases in future health care expenditures.[56]

[50] Orszag, "Growth in Health Care Costs," pp. 1-2.

[51] M. Seshamani and A.M. Gray, "A Longitudinal Study of the Effects of Age and Time to Death on Hospital Costs," ***Journal of Health Economics*** 23 (2004): 217-235. The authors find a tenfold increase in costs in the five years prior to the last year of life that overshadows the 30 percent increase in costs from ages 65 to 85.

[52] J. Lubitz and G. Riley, "Trends in Medicare Payments in the Last Year of Life," ***New England Journal of Medicine*** 328 (15, 1993): 1092-1096.

[53] C.I. Jones, "Why Have Health Expenditures as a Share of GDP Risen So Much?" Working Paper Berkeley, CA: University of California, Berkeley, Department of Economics, 2003); see also T. Miller, "Increasing Longevity and Medicare Expenditures," ***Demography*** 38 (2, 2001): 215-226.

[54] F.T. Denton and B.G. Spencer, "Health-Care Costs When the Population Changes," ***Canadian Journal of Economics*** 8 (1, 1975): 38). For additional discussion of the impact of aging on Canada's health care costs, see idem, "Population Aging and Future Health Costs in Canada," ***Canadian Public Policy*** 9 (2, 1983): 155-163; idem, "Demographic Change and the Cost of Publicly Funded Health Care," ***Canadian Journal on Aging*** 14 (2, 1995); 174-192; F.T. Denton, S. Neno Li, and B.G. Spencer, "How Will Population Aging Affect the Future Costs of Maintaining Health Care Standards?" in ***Aging in Canada***, 2nd ed., edited by V.W. Marshall (Markham, ON: Fitzhenry and Whiteside, 1987); and F.T. Denton, A. Gafni, and B.G. Spencer, "Exploring the Effects of Population Change on the Costs of Physician Services," ***Journal of Health Economics*** 21 (5, 2002): 781-803.

[55] M.L. Barer et al., "Trends in Use of Medical Services by the Elderly in British Columbia," ***Canadian Medical Association Journal*** 141 (1, 1989): 39-45.

[56] M.S. Marzouk, "Aging, Age-Specific Health Care Costs and the Future Health Care Burden in Canada," ***Canadian Public Policy*** 17 (4, 1991): 490-506. This assumes, however, that age-specific health care utilization rates remain constant.

Despite the complexity of trying to capture the influence of aging on health care expenditures, most studies use fairly simple linear age specifications consisting of the proportion of the population age 65 and over or that age 15 and under. The reason is clear from Figure 7: public health care expenditures are highly age-sensitive, with young and old age groups accounting for the majority of expenditures. Indeed, those age 15 and under (11%) and 65 and over (68%) together account for 79% of all public health care expenditures. Since a substantial increase occurs after age 65, modelling the age distribution variable simply as the proportion of the population over age 65 represents a reasonable tradeoff between the potential benefit of a more complicated age distribution specification and the benefit of avoiding a significant reduction in degrees of freedom.

Modelling the impact of technological change on health care spending is also a complicated issue. If new techniques generate a cheaper way of treating health outcomes, there could very well be expenditure reductions associated with technological change — for example, one study finds that, between 1983 and 1994, the real quality-adjusted price of heart attack treatments actually declined at an annual rate of 1.1%.[57] At the same time, if expensive new treatments are devised, then technological change can also be associated with rising health expenditures. In the aggregate, however, technological change is difficult to measure. One way is simply to ascribe it to the residual after all other factors have been controlled for.[58] A US study, using aggregate data for the 1969-1997 period, finds that changes in research and development spending, which the authors use as a proxy for changes in technology, is a statistically significant long-run driver of rising health care expenditures.[59] Other approaches have used a time index or measures of the diffusion of new medical equipment and procedures.[60] Given that technological change occurs over time, a time index is another logical way to control for the effect of technological change on health expenditures, although that effect is not always captured well by a simple time trend that assumes a constant effect over time. Despite this concern, given its prevalence in the literature and its convenience, we use a time trend in some of the estimates in this study. When we do not include a time trend in regression runs, then we are ascribing technology to the residual.

Results from the Determinants Approach

As a preliminary to estimating regressions of Alberta's health expenditures, we estimated a simple model using provincial panel data with real per capita income, the proportion of the population age 65 and over, and real per capita federal cash transfers as the determinants of the log of real per capita provincial government health expenditures for the period 1975-2005. We did not include a time trend because of co-linearity with the income,

[57] D.M. Cutler et al., "Are Medical Prices Declining? Evidence from Heart Attack Treatments," ***Quarterly Journal of Economics*** 113 (4, 1998): 991-1024.

[58] For a discussion of technological change in health see S. Folland, A.C. Goodman, and M. Stano, ***The Economics of Health and Health Care***, 5th ed. (Upper Saddle River, NJ: Pearson-Prentice Hall, 2007), pp. 132-134, 234-236.

[59] A.A. Okunade and V.N.R. Murthy, "Technology as a 'Major Driver' of Health Care Costs: A Cointegration Analysis of the Newhouse Conjecture," ***Journal of Health Economics*** 21 (1, 2002): 147-159.

[60] See, for example, T.P. Weil, "Comparisons of Medical Technology in Canadian, German, and U.S. Hospitals," ***Hospital and Health Services Administration*** 40 (4, 1995): 524-533; L.C. Baker and S.K. Wheeler, "Managed Care and Technology Diffusion: The Case of MRI," ***Health Affairs*** 17 (5, 2000): 195-207; U.G. Gerdtham and B. Jonsson, "International Comparisons of Health Expenditure: Theory, Data and Econometric Analysis," in ***Handbook of Health Economics***, vol. 1, edited by A.J. Culyer and J.P. Newhouse (New York: Elsevier Science, 2000); and U.G. Gerdtham and M. Lothgran, "On Stationarity and Cointegration of International Health Expenditure and GDP," ***Journal of Health Economics*** 19 (4, 2000): 461-475. Selecting a measure of technological progress is complicated by the fact that there is some debate over what is the best indicator of technological progress. One study finds that two of the most common innovation indicators — R&D and patent applications — have numerous weaknesses; see A. Kleinknecht, K. Van Montfort, and E. Brouwer, "The Non-Trivial Choice between Innovation Indicators," ***Economics of Innovation and New Technology*** 11 (2, 2002): 109-121.

age, and transfer variables.[61]

The purpose of this preliminary regression is to compare the relative response of Alberta's health spending to key variables to that of the other provinces. The results show that real per capita provincial government health expenditures are positively and significantly related to real per capita provincial GDP, the proportion of the population age 65 and over, and real per capita federal cash transfers. As well, the constant differs across the provinces: Alberta has the fifth-highest intercept, after Quebec, New Brunswick, Ontario, and Saskatchewan. This implies that, after controlling for income, age, and federal transfers, Alberta was the fifth-highest spender on real per capita provincial government health expenditures over the period 1975-2005.

With respect to real per capita GDP, Alberta ranks sixth in the size of its income coefficient, followed by Quebec, Newfoundland and Labrador, Ontario, and Saskatchewan. The implication is that Alberta's health expenditures are among the least sensitive to income. On the other hand, its health spending is the second-most sensitive to federal transfers among the provinces, exceeded only by that of Newfoundland and Labrador. Nonetheless, the elasticity of health expenditures with respect to transfers is still quite low for Alberta, at 0.14. Finally, Alberta ranks ninth among the provinces in terms of the size of its coefficient on the proportion of the population age 65 and over. The most age-sensitive health expenditures are those of Saskatchewan, Ontario, and New Brunswick, while the least sensitive are those of Newfoundland and Labrador, Alberta, and Quebec.

These results demonstrate that there is substantial variation among the provinces in the sensitivity of health care spending to determinants such as age, income, and federal transfers. As such, any "one-size-fits-all" approach to health care spending — or to health care policy in general, for that matter — is inappropriate for Canada's federation.

We turn now to a more detailed examination of the determinants of public health care spending in Alberta. Experimentation with alternative specifications suggested a parsimonious specification wherein real per capita public health care expenditures are a function of a constant, the fraction of the population age 65 and over, real per capita debt-service costs, the real per capita value of federal transfers, the relative price of health care (defined as the ratio of the government current expenditure implicit price index to the CPI), and the lagged value of real per capita GDP.[62] All the variables in the preferred regression are significant at the 5% level, the coefficients are the expected sign, and the regression explains more than 90% of the variation in real per capita provincial government health spending. The remaining 10% of the variation in health spending can be explained by other factors that are explicitly unaccounted for, which can include technological change. The regression results show that real per capita health spending in Alberta is positively related to the lagged value of real per capita GDP, real per capita federal transfers, the proportion of the population age 65 and over, and the relative price of health care. It is negatively related to real per capita debt-service costs.

The sensitivity of health spending to these variables is reflected in the following ways:

- a one dollar increase in the lagged value of real per capita GDP raises real per capita provincial government health spending by about 2 cents;

[61] This regression is a pooled time-series cross-section regression and was estimated using STATA 10 and the techniques of Ordinary Least Squares (OLS) and Generalized Least Squares (GLS). For the GLS estimates — which we discuss in the text — the pooling technique used is for data that is cross-sectionally heteroskedastic with cross-sectional independence, no autocorrelation, and an assumption of variable slope coefficients. The interactive province-variable specification allows for variation across provinces not only in the constants but also in the coefficients. Regression results are reported in the online appendix; see http://www.iapr.ca/files/iapr/On-line-Data-Appendix.pdf.

[62] For alternative specifications and results, see the online appendix at http://www.iapr.ca/files/iapr/On-line-Data-Appendix.pdf. We estimated all regression equations using a linear specification and OLS as the estimation technique. We used a linear specification to facilitate construction of projections in real per capita figures. We ran regressions using 1997 dollar values, but the coefficient estimates presented in the text have been adjusted to reflect their value in 2007 dollars. All coefficients are statistically significant at the 5% level or better unless otherwise stated.

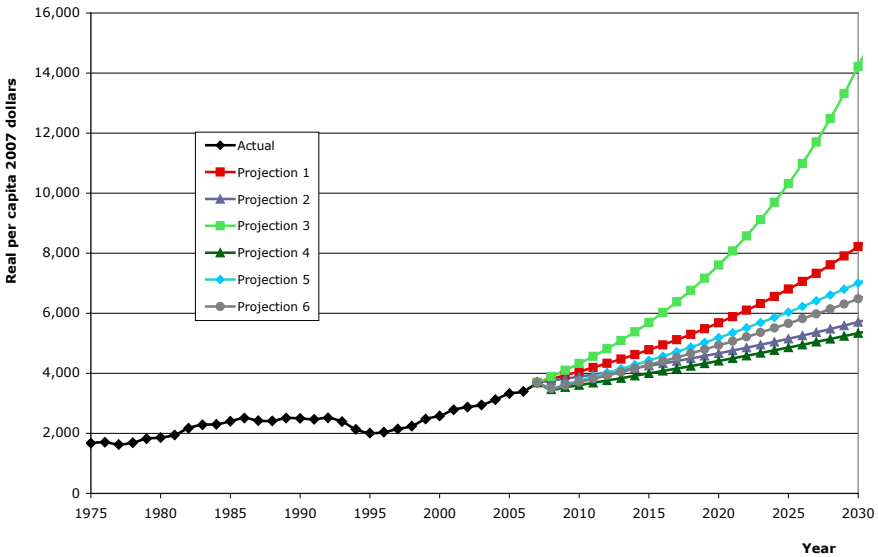
- a one percentage point increase in the proportion of the population age 65 and over raises spending by $254 per capita;
- a one dollar increase in real per capita debt-service costs is associated with a 34 cent decline in real per capita health spending;
- a one dollar increase in real per capita federal transfers is associated with an 83 cent increase in real per capita health spending; and
- a one percent increase in the ratio of the government expenditure price index to the CPI results in a $32 per capita increase in health expenditures.

These results indicate several important things. First, there is a fiscal dividend from the decline in debt-service costs, which means tax revenue that was once used to service the debt can be used for health spending. Second, health spending in Alberta is quite sensitive to federal cash transfers, and increased federal transfers to Alberta have gone mainly into health spending. Indeed, it is possible to quantify the impact of these variables as well as the others on recent spending increases and demonstrate their contribution. Between 1995 and 2007, real per capita provincial government health expenditures rose from $2,008 to $3,696, an increase of $1,687. The regression coefficients allow us to determine that $363 (22%) of the increase came from falling debt- service costs, $352 (21%) from rising federal transfers, $206 (12%) from the aging population, $589 (35%) as a result of rising per capita GDP, and zero dollars from the price ratio variable, which remained constant over this period; the final $177 (10%) can be accounted for by residual factors.

We used the same model to estimate the determinants of real per capita Alberta government health spending by separate expenditure categories, and found that an aging population has the largest per capita effect for *drugs*, *hospitals*, *physicians*, *public health*, and the *all other* health spending categories. Federal transfers have their biggest dollar effect on *hospital* and *physician* spending, a result that is perhaps not a surprise given that the *Canada Health Act* deals primarily with these services. The effect of the relative price variable is greatest in the *hospital*, *physician*, *public health*, *capital,* and *all other health* categories, which suggests that these are the areas most characterized by Baumol's "cost disease."

We then used the results of our regressions to make three further projections of the future direction of health care spending based on assumptions about rates of growth in the determinants of health spending; see Figure 8, which presents the three new projections derived from the "determinants" approach along with the three

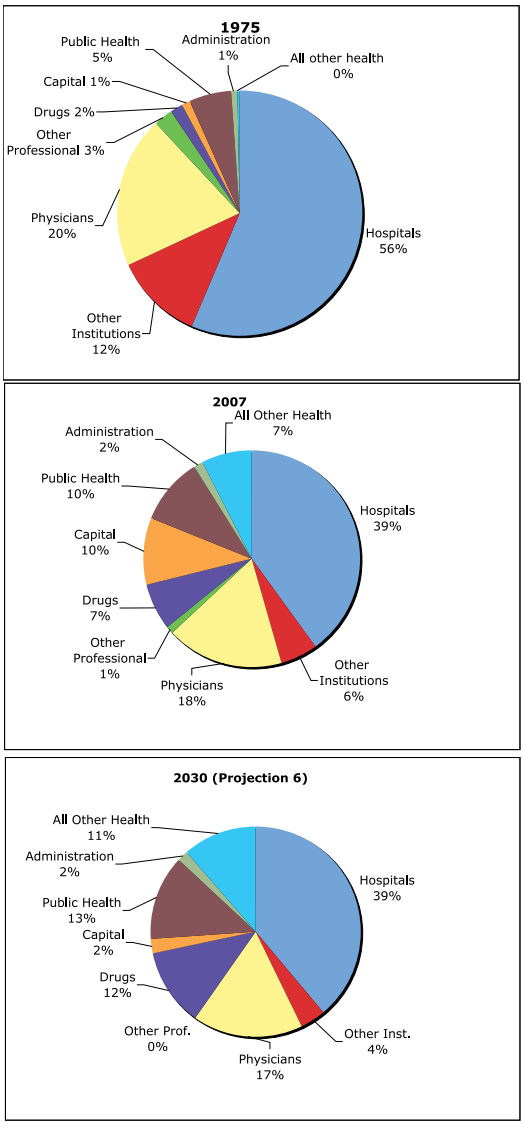
Figure 8: Alberta Provincial Government Health Expenditure Projections



projections derived earlier from the "extrapolation" approach.[63]

Projection 4 broadly parallels the historical experience from 1976 to 2007 and assumes that real per capita GDP from 2007 onward grows at a constant 2% per year, the proportion of the population age 65 and over grows at 1% per year, real per capita federal transfers and real per capita debt-service costs stay constant, and the ratio of the government current expenditure price index to the CPI grows at only 0.33% per year. Projection 5 uses the same assumptions except for population aging, where it changes the growth of the proportion of the population age 65 and over to 2.85% per year after 2007. This demographic assumption is based on Statistics Canada's medium growth population projection for Alberta over the period 2006-2031, arguably the appropriate assumption for understanding future health care expenditures.[64]

Figure 9: Compostion of Government of Alberta Health Care Expenditure, Selected



Finally, we used the determinants of each of the nine separate categories of public health spending to produce Projection 6, which, like Projection 5, assumes the proportion of the population age 65 and over grows at 2.85% per year after 2007.

In Projection 4, real per capita provincial government health expenditures rise to $5,339 by 2030. The assumptions in Projections 5 and 6 of a more rapidly growing elderly population share result in expenditures also growing more quickly, reaching $7,005 in Projection 5 and $6,485 in Projection 6 by 2030. In Projection 4, real per capita provincial government health expenditures rise by 44% between 2007 and 2030; in Projections 5 and 6, the increases are 90% and 75%, respectively.

Before summarizing the results of our exercise, it is worthwhile to point out that these projections have implications not only for the growth of total public health care spending, but also for the composition of that spending over time. Figure 9 shows the composition of actual real per capita provincial government health expenditures for 1975 and 2007, and the composition for 2030 implied by Projection 6. The projection suggests that, by 2030, the share of total spending on *hospitals* will remain as it was in 2007, at 39% of the total public health care budget, but down from 56% in 1975; the share of total spending on *physicians* will fall to 17%, from 18% in 2007 and 20% in 1975; spending on *drugs* will increase to 12% of the total budget, from 7% in 2007 and 2% in 1975; and spending on *public health* will grow to 13% in 2030, from 5% in 1975 and 10% in 2007.

[63] Not shown in Figure 8 are the within-sample simulations of real per capita provincial health expenditures generated by the two sets of regression approaches. These closely track actual expenditures, and are available in the online appendix at http://www.iapr.ca/files/iapr/On-line-Data-Appendix.pdf.

[64] Statistics Canada, ***Population Projections for Canada, Provinces and Territories***. Under this projection, the proportion of the population age 65 and over grows from 10.8 percent in 2007 to 20 percent by 2031 and to 35 percent by 2050.

THE IMPLICATIONS OF OUR PROJECTIONS

A summary of some key results from each of our alternative scenarios for future levels of real per capita health spending by the Alberta government is presented in Table 3. The estimates suggest that, by 2030, real per capita expenditures might range from a low of $5,339 to a high of $14,215.

Table 3: Projections of Total Public Health Care Expenditures, Alberta, 2030

	Projected Total Expenditures, 2030	Median Annual Growth Rate, 2007-2030
	(real per capita 2007 dollars)	*(%)*
Projection 1	8,210	3.5
Projection 2	5,709	1.9
Projection 3	14,215	6.1
Projection 4	5,339	2.0
Projection 5	7,005	3.2
Projection 6	6,485	2.8

Perhaps most disconcerting is Projection 3, which is based on median rates of growth in health care expenditure categories observed from 1996 to 2007, and suggests that the rate at which Alberta has allowed public health spending to grow is not at all likely to be sustainable. Indeed, that rate of growth far outstrips the median rates of growth over the period in either government revenues (1.7%) or the ultimate source of that revenue — GDP (2.2%). Assuming these rates of growth in revenue and GDP continue to 2030, the continuation of Alberta's current health policy settings is simply not a sustainable policy option. Indeed, only the rates of growth in Projection 2, based on spending realized from 1976 to 1986, come close to being able to finance public health care spending without the need for increased tax rates or a reduction in other spending commitments.

As for the projections that include alternative assumptions about the key health cost driver of the future the rate of growth of the elderly population, Projection 4 assumes, perhaps optimistically, that this segment of the population will grow at the same rate as it did from 1976 to 2007. Even so, at a median growth rate of 2.0% per year, public health care spending would outstrip the historical rate of growth in government revenues, while the rates of growth in Projections 5 and 6 would produce still larger annual increases in health care spending of 3.2% and 2.8%, respectively.

We should not lose sight of the fact that these projections are based on assumptions about the future — an inherently difficult and imprecise exercise. Still, projections do tell us something about the implications of carrying on with current policies. What is more, a government would be ill advised to base its actions on either a best-case or a worst-case scenario. It is worth emphasizing that, with respect to our assumption about the rate of growth of government revenues, we have not considered the implications of either "nightmare" or "dream" scenarios; rather, we think it is appropriate to use the median rate of growth measured over a long period of time. Thus, we compare rates of spending growth against the rate of real per capita revenue growth realized during a rather long period of growth in Alberta's finances, 1975 to 2007. In doing so, we capture the effect both of periods of revenue booms (1996-2007, for example, when the median annual growth rate in real per capita revenue was 2.6%) and periods of revenue busts (1987-1996, for example, when the median annual growth rate in real per capita revenue was -0.9%). Given the recent collapse of energy prices in Alberta, our decision to evaluate sustainability on a long-term average for revenue growth seems particularly appropriate.

Another way of looking at the question of fiscal sustainability is to understand what our projections mean for the share of provincial revenue absorbed by spending on health. In 2007, real per capita total government revenues in Alberta were $11,134, while real per capita health spending was $3,696, or 33% of the total. Assuming real per capita government revenues continue to grow at the median annual rate of 1.7% that prevailed from 1975 to

2007, one could expect them to reach $16,407 by 2030. Thus, in Projection 1, public health care spending grows to $8,219 per capita, eating up 50% of revenues; the calculation is 35% for Projection 2, 87% for Projection 3, 33% for Projection 4, 43% for Projection 5, and 40% for Projection 6. That is to say, health care takes up an even larger share of provincial revenues than at present in all of our projections.[65]

Sustainability Issues

Alberta faces rising demand for government health expenditures in a manner akin to other jurisdictions around the world. As our simulations show, real per capita provincial government health spending could rise from $3,696 in 2007 to anywhere between $5,339 and $14,215 in 2030. At the same time, Alberta's public health care system currently seems to be on more solid financial footing than that of other provinces: although Alberta spends one of the higher amounts per capita on health among the provinces, a relatively low share of its GDP is accounted for by such spending. This ratio, however, mask the seriousness of the problem Alberta faces in financing it public health care system. Our analysis suggests that a number of issues are looming with regard to the fiscal sustainability of Alberta's health spending.

First, approximately one-third of Alberta's government revenues currently are rooted in non-renewable resource revenues, which are tied to energy prices that are beyond the control of the provincial government. These revenues are a generous bounty, but, as history has shown repeatedly — most recently in 2008 — they are also subject to wide fluctuations. Moreover, these revenues ultimately are limited by the size of the resource base and the cost of the technology required to access it. The development of the oil sands and future development of other types of non-conventional energy require high and stable energy prices. Recent developments raise questions about both of those conditions and so about the degree to which the provincial government should depend on those revenues both now and into the future.[66] This issue seems particularly important when making commitments about future spending obligations in as crucial an area as public spending on health care.

Second, the trend rate of growth in real per capita provincial government health expenditures is significantly greater than the trend rate of growth in the government's revenue base, and while the revenue base is at present large enough to accommodate these rising expenditures, our projections question whether this will be true in the future. Responding to our projections requires political choices of health over other expenditures, tax increases over tax cuts, and/or increasing the share of private health care provision or maintaining the status quo.

Third, although health spending is rising generally, it is not rising in all categories at the same rate. As Figure 9 shows, *hospital* and *physician* spending rose at rates below the average for total health care spending over the period 1976-2007, while spending on *drugs*, *capital*, and *all other health* grew at much faster rates. Indeed, when one compares the growth of spending in these separate categories with the growth of the provincial government's revenue base over time, *hospital* and *physician* expenditures are not the major source of the sustainability problem.

Possible Solutions to Sustainability

While a detailed exposition of how to address the sustainability problem is beyond the scope of this report, we should note that one simple, though controversial, solution would simply be to privatize the entire public health expenditure sector, in which case sustainability would no longer be a public issue. Any disparities in health care access and provision then would be the outcome of market forces and more akin to issues of inequity in income

[65] Our estimate of resource-adjusted per capita revenue for 2007 is $9,339. Assuming the same 1.7% annual growth rate in revenue, public health care expenditures under Projections 1 through 6 would account for between 39% (Projection 4) and 103% (Projection 3) of total resource-adjusted revenues.

[66] See Financial Investment and Planning Advisory Commission, ***Preserving Prosperity***. It should be noted that recent world financial developments have further eroded the value of these funds. For example, in March 2008, the Alberta Heritage fund stood at about $17 billion, but, by September, it had declined to $15.8 billion; See Alberta, Finance and Enterprise, Alberta Heritage Savings Trust Fund, 2008-09, ***Second Quarter Update*** (Edmonton, 2008).

distribution.[67] Such a solution, however, would not appear to be in accord with the desire of Albertans to have a public health care system.[68] While there might be scope for some additional private sector role in the health care system that would shift some of the expenditure burden more directly onto individuals, the continued existence of a public health care system means that sustainability will remain an issue. Assuming, then, that the provincial government continues to fund the public health system and that the public-private spending balance remains as it currently is, one could consider three potential approaches to public health care sustainability.

One option would be to put in place policies to control expenditures and restructure health care delivery to ensure that spending does not grow faster than either the revenue base or GDP or some combination thereof. Given that the average rate of growth of health spending over the past decade has been well in excess of this level, however, the political will to implement such a disciplined long-term policy might be difficult to find. A variant of this solution would be to recognize that, since expenditure growth has been the least pronounced in the medicare areas of *hospital* and *physician* spending and most pronounced in non-medicare categories such as *drugs*, *capital*, and *all other health*, it is more important to contain expenditure growth in the latter areas. Such an approach to expenditure restraint might prove more palatable.

A second option would be to raise tax rates as expenditures rise and so cover rising costs. Given that Alberta has no provincial sales tax and the lowest income tax rates in the country and that it has promised to abolish health premiums, the province clearly has room for tax increases that might not be available to other jurisdiction. Our projections suggest, however, that such an approach could entail sizable increases in the per capita tax burden by 2030. Moreover, it would require that the natural resources share of provincial government revenues stay at current levels. Since energy revenues have not been stable historically, one could envision personal taxes having to rise by more than would be required simply to fund rising health expenditures in order to make up for declining resource revenues and to maintain other program spending. It is important to note as well that health care is not the only government program expenditure that is facing rising costs and large unfunded liabilities. Demographic change and stable patterns of age-specific spending are expected to put added pressure on government budgets across Canada not only for health care but also to fund other elderly benefits.[69] Finally, raising tax rates would have serious efficiency and equity impacts that could affect the long-term performance of the economy both absolutely and relative to Canada's trading partners.

A third option would be to create — by increasing tax rates or reducing expenditures now — what might be called a Health Opportunities Endowment Fund that eventually would generate the income needed to pay for future health care expenditures. This approach is attractive because the aging of the baby boom generation will create a "bubble" in health care spending that eventually will subside as that generation passes from the scene. Funding that bubble now would minimize the need to impose fluctuating tax rates on the economy and so protect Alberta's reputation as a low and stable tax regime. Alberta is in a position to pursue such a strategy given the provincial economy's recent robust growth and the favourable fiscal situation created by the provincial government's debt-elimination program. Moreover, the existence of the Heritage Fund and other public savings funds has established a precedent and a mechanism for creating a health spending endowment.[70]

The creation of such a health endowment would be a forward-looking strategy that, by directing a larger portion of current surpluses as well as resource revenues into saving, would shift the focus on the use of resource rents from

[67] For a more detailed discussion, see J. Ruggeri, "Health Care Spending, Fiscal Sustainability, and Public Investment," Public Policy Paper 42 (Regina: Saskatchewan Institute of Public Policy, 2006).
[68] For a presentation of polling results on this question, see Boychuk, "The Regulation of Private Health Funding and Insurance."
[69] See Robson, "Time and Money."
[70] Indeed, the Financial Investment and Planning Advisory Commission (***Preserving Prosperity***) suggests expanding the assets of the Heritage fund to $100 billion by 2030; in 2007, Alberta's total savings and endowments amounted to approximately $40 billion, of which the Heritage Fund consisted of about $16 billion

current consumption to building a stream of future benefits. Still, the challenge would be large: funding Alberta's 2007 government health expenditures of $12.6 billion completely at an interest rate of, say, 4% would require an endowment of $315 billion. [1] Such a goal might seem overly ambitious, but keep in mind that, since 1990, Norway has used its oil revenues to build a fund that now approaches $400 billion in size — although Norway saves 96% of its resource revenues, as opposed to about 30% for Alberta, [2] and levies much higher tax rates to provide current services. Building such a fund in Alberta would also require a higher tax burden, although the actual weight of the burden would depend on how aggressively the fund was built up. From a public policy perspective, however, the use of the bulk of natural resource revenues for saving and personal tax revenues for current consumption is sound public policy in that it retains a share of the benefits of the natural resource endowment for future generations.[3]

The pre-funding of future health spending requirements could also be done on a more targeted basis, with separate funds for categories such as *drugs*, *capital*, and *public health*, which have seen the greatest spending increases, thus helping to defray long-term costs in those areas and freeing up resources for other categories. A health capital infrastructure fund would be a particularly apt use of savings from natural resource revenues because it would directly channel savings into productive investment.

CONCLUSIONS

Alberta is experiencing rising demand for government health expenditures in a manner akin to other jurisdictions in Canada and around the world. From 1975 to 2007, real per capita government health spending grew from $1,679 to $3,696 (in 2007 dollars). According to our projections, by 2030, those expenditures could reach anywhere between $5,339 and $14,215 — that is, between 45% and 285% higher than the 2007 level. Policy makers thus ought to be concerned about the medium-term fiscal sustainability of Alberta's public health care system, particularly if spending requirements continue to grow at the pace of recent years. If that proves to be the case, we project that the public health care budget could absorb as much as 87% of total provincial government revenues by 2030. Projections based on growth assumptions from earlier periods in Alberta's fiscal history or on optimistic assumptions about the growth rate of Alberta's elderly population are less catastrophic, but all raise concerns about the growing share of total government revenues that will need to be devoted to financing public health expenditures. Clearly, the set of policies that guided health care spending over the period 1997-2007 is not sustainable.

If there is some good news in our projections, it is that not all categories of public health care spending are growing at the same rate. Significantly, over the period 1996-2007, real per capita spending on the traditional core medicare areas of physician services and hospitals grew at annual rates below that of total health spending; however, growth rates were much higher for spending on drugs, capital, and all other health expenditures.

In summary, our projections suggest that, to maintain high rates of growth in government health expenditures, Albertans will have to devote a rising share of their government program expenditures to public health care, be willing to accept a rising tax burden to pay for the increases and to maintain current program shares, or consider altering the mix of private versus public health care provision. None of these approaches need exist in a watertight compartment, however, and a portfolio of policies that combines these solutions likely would be a pragmatic policy outcome. Such a strategy would help to ensure the fiscal sustainability of Alberta's public health care system and responsibly provide for the future welfare of its citizens.

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[71] A conservative investment strategy with an anticipated return of about 4% is recommended in light of recent volatility in world investment markets

[72] Financial Investment and Planning Advisory Commission, ***Preserving Prosperity***.

[73] For a discussion of principles that can be applied to the management of natural resource wealth, see R.D. Kneebone, K.J. Mckenzie, and M.S. Taylor, "Living on Borrowed Time: Alberta at the Crossroads," IAPR Policy Brief 0401 (Calgary: University of Calgary, Institute for Advanced Policy Research, 2004).

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