CAN WE AVOID A SICK FISCAL FUTURE? THE NON-SUSTAINABILITY OF HEALTH-CARE SPENDING WITH AN AGING POPULATION

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SUMMARY

Funding for Canadian public health care has long relied on a "pay-as-you-go" funding model: for the most part, government pays for health costs each year from taxes collected in that fiscal year with effectively nothing put aside for projected rising health-care costs in the future. But the future of Canadian public health care is going to get more expensive as the relatively large cohort of baby boomers reaches retirement age. As they exit the work force, and enter the ages at which Canadians use the health-care system more, a smaller population of younger workers is going to be left paying the growing health-care costs of older Canadians. If Canadians intend to preserve a publicly funded medicare system that offers a similar level of service in the future as it does today, under the pay-as-you-go model, eventually peak taxes for Canadians born after 1988 will end up twice as high as the peak taxes that the oldest baby boomers paid. The "pay-as-you-go" model has become like a Ponzi scheme, where those who got in early enough make out nicely, while those who arrive late stand to suffer a serious financial blow.

This should concern both Canadians who value a comprehensive public health system as well as Canadians who value competitive tax rates: There is no reason to be certain that future taxpayers will blithely accept having their taxes substantially increased to finance health care for another, older generation that did not pay for a significant portion of its own health care. If the burden proves too high for the taxpaying public to accept, that could well jeopardize Canada's health-care system as we know it. If Canadians intend to preserve their iconic public health system, and are unprepared to unjustly overburden future generations with the tax bill left by their parents and grandparents, provincial governments must make strong and rapid efforts to reform the health system. They must find more cost-efficient ways of managing medicine, including new approaches to eldercare, chronic disease prevention and better health promotion. If policymakers respond in time with a workable strategy and adequate effort, the substantial financial health-care liability currently faced by future generations may not be eliminated entirely, but it can still be reduced dramatically.

I.   INTRODUCTION

The Canadian population is aging. The proportion of Canadians aged 65 and over is forecast to increase from around 15 per cent today to 25 per cent by 2030. Health spending is much higher for Canadians over age 65, so considerable debate has occurred as to whether population aging will challenge the financial sustainability of Canada's single-payer medicare systems for doctors and hospital services. Remarkably, economists and health services researchers largely agree on the apparent modest impact that population aging will have on the growth of aggregate health spending. Most estimates suggest that per-capita health spending has risen, and will rise, at only one per cent per year. As this is a lower growth rate than the projected growth for the economy (GDP), it follows that population aging is a manageable cost driver for public payers that poses little threat to the sustainability of single-payer Canadian medicare.[1]

What the literature on population aging and health-care costs has neglected to appreciate is that, while the aggregate growth of health spending due to population aging is modest, how we finance that expenditure turns a modest fiscal challenge into a much bigger political economy issue.[2] Public spending on health care in Canada is largely financed out of general tax revenues collected by the provinces and the federal government. This "pay-as-you-go" structure, where current revenues fund current spending, is not a problem where populations are either stable or continuously growing through natural population increases. When fertility rates fall, however, pay-as-you-go financing for health care results in an unsustainable health-care system for the public payer because we know that we will not be collecting sufficient revenues on an annual basis to meet the required health-care costs of an older Canadian population if we maintain current tax structures and taxation levels. Even with only one per cent annual increases in per-capita health spending, Bill Robson[3] estimates that the present value of the "implicit liability" of promised public health-care spending under the pay-as-you-go funding model by 2040 (the value of the unfunded portion of future health-care costs) is between $531 billion, calculated at present value for 2001, and $1.4 trillion, net present value, in 2007.[4] That is, governments would need to have invested as much as $1.4 trillion, in 2007, to afford the health-care costs over and above the services general revenues will cover, up to 2040. To maintain budget balances, therefore, we must see tax levels eventually rise, health spending fall, or some combination of those two things.[5] In other words, the status quo of health spending promised to Canadians at the current tax price of that spending is not sustainable with an aging population.

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[1]   Robert G. Evans et al, "Apocalypse No: Population Aging and the Future of Health Care Systems." *Canadian Journal on Aging*, 20 (suppl. 1): 160-191 (2001) and Seamus Hogan and Sarah Hogan, "How an Aging Population Will Affect Health Care," Chapter 2 in Gregory P. Marchildon, Tom McIntosh, and Pierre-Gerlier Forest eds. *The Fiscal Sustainability of Health Care in Canada: Romanow Papers, Volume 1* (Toronto: University of Toronto Press, 2004). This normative assessment of the impact of population aging may be optimistic since it ignores the possibility that population aging itself will result in decreasing labour force and lower output per worker. To offset the negative economic consequences of population aging for economic growth and health care spending Canada will need to have productivity gains.

[2]   William B.P. Robson, "Will the Baby Boomers Bust the Health Budget? – Demographic Change and Health Care Financing Reform, " *C.D. Howe Institute Commentary*. Toronto. No. 148 (2001) and "Time and Money – The Challenge of Demographic Change and Government Finances in Canada, " *C.D. Howe Institute Backgrounder*. Toronto. No. 109 (2007).

[3]   Robson, "Will the Baby Boomers Bust the Health Budget?" and "Time and Money."

[4]   Following Robson (2007), implicit liabilities are to be distinguished from unfunded liabilities. A reviewer notes that all pay-as-you-go finance arrangements have an unfunded liability by definition. Here we refer to "implicit liabilities" as the insufficiency of revenues to be collected over time, at the existing level of taxation, to meet promised expenditures. We contrast this with a situation where the promised future spending can be met by current levels of taxes levied.

[5]   It should be obvious that borrowing, which would convert the unfunded liability to explicit debt, does not address the issue. Borrowing raises taxes of Canadians in the future to maintain spending levels in the near term.

Beyond the large implicit health-care liability identified by Robson, the distribution of the burden under the pay-as-you-go financing model is much higher for Canadians born after the baby-boom generation. The main issue is the difference in timing between when a person uses health-care services and when he or she pays the taxes that fund those services. The use of health-care services occurs primarily at the beginning of life and toward the end of it, but the majority of lifetime taxes are paid between the ages of 16 and 65. An annually balanced budget would not normally account for the future liabilities of a disproportionately large aging cohort. As that disproportionately large cohort ages, placing an increasingly large burden on the health-care system, they will have already paid the bulk of their lifetime's taxes — and governments will have already spent those revenues — requiring either later, younger cohorts to pay more in tax than previous cohorts did to maintain a similar health-care system, or significant reductions will have to occur in the future level of health-care services. Because financing Canadian medicare on a pay-as-you-go basis is increasingly expensive for successive birth cohorts of Canadians, even a modest increase in per-capita health-care spending (one per cent per year) creates the potential for a politically unsustainable health system. In short, Canadian taxpayers in the future may be less supportive of medicare since it will be much more expensive for them.[6]

In this paper, we illustrate the fiscal consequences of a sustainable single payer public health-care system financed on a pay-as-you-go basis as the Canadian population ages. Our model promises every Canadian at birth the same health-care spending profile by age. Based on this guaranteed lifetime health-care spending, and knowing the age distribution of the population, we can calculate total public health spending in a given year. We assume that the government will collect sufficient taxes to pay for total health spending in a given year, where annual taxes collected are proportional to individual income, which changes as individuals age.[7] Under these assumptions we allow the population age distribution to evolve over time. Then we calculate the lifetime health spending received and the total lifetime taxes paid for an average person born in a given year between 1948 and 2058. Comparing the net present values of lifetime taxes and lifetime transfers/spending for health care at the year of birth provides a measure of the "birth taxes" or "birth gifts" granted to Canadians born in a given year based on the status quo of Canadian medicare.[8]

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[6] Emery (2010) shows that in a median voter model, population aging should result in lower public health spending reflecting the higher "tax price" of health care when there is a larger proportion of the population that is lower income and less healthy.

[7] Our choice to model health care as completely financed by taxes on individuals, and not shared with taxes on capital (corporate taxes), could be challenged by readers who see the solution to health-care sustainability as higher taxes on corporations. We accept that some readers may hold this view, but we note that the work by Davies and Winer (2011) suggests that the long-run forces impacting labour mobility between Canada and the U.S. must be part of the reason that we have seen a shift from taxing mobile capital and toward taxing relatively immobile labour. Emery (2011) and Kneebone (2012) raise the issue that if voters see health-care funding from capital taxes as a "subsidy," then voters may choose to increase health spending rather than keep it constant as we have assumed. Finally, modeling the consequences of moving towards a greater reliance on corporate tax bases for financing health care is complicated by the potential reductions in productivity growth that could accompany such taxation.

[8] While our work is inspired by Laurence Kotlikoff's (1992) "Generational Accounting" approach to public finance, our calculations are different from generational accounts. Generational accounts consider the taxes and transfers for persons with a given birth year from the current date of a proposed policy change (and that person's age at that date) while we are considering taxes and transfers expected at birth. Our reason for doing this is that we wanted to consider the historical payment of taxes by older Canadians when making comparisons of the value of the health-care asset provided by medicare across birth cohorts. If we followed a true generational accounting perspective then we would always find older Canadians to be large net beneficiaries, even though they had previously paid taxes into the system under the expectation that the health-care services they used when older would be funded by taxes collected from later generations.

We show that the burden of addressing Robson's[9] estimated Canadian medicare implicit liabilities falls largely on Canadians born after 1990. This cohort will pay more through the tax system than they will receive in health spending; Canadians born prior to 1990 will *not* have paid the full resource cost of their health spending. Had we acted a decade ago on the advice of Robson[10] and Hogan and Hogan[11], we could have moved health-care financing away from pay-as-you-go to a "pre-funded" finance model, as was introduced for the Canada Pension Plan in 1997 to address the rise in spending associated with an aging Canadian population by ensuring that future pension costs were fairly borne by those who would later produce those costs. Similarly, taxes currently collected to pay for health care could have been set both to cover current health needs as well as expected future increases in health-care costs of the baby-boom generation. We believe it is too late to introduce pre-funding to address the situation because baby boomers are already reaching the age of retirement and are past their years of highest taxable earning. Furthermore, unlike the pre-funding of future pension benefits for the baby boomers, where pension benefits can be set by the public payer, public payers for health care have apparently much less control over spending levels and growth of spending. Higher taxes levied to pre-fund health spending expected to rise solely due to population aging would appear to have limited impact on reducing overall future tax burdens resulting from other drivers of health-care spending, such as technological and technical advances.

We discuss how the remaining option for sustaining pay-as-you-go, single payer medicare is to "bend the cost curve" by reducing the costs/prices of services for treating the health-care needs of Canadians over age 65. We show that health service delivery reforms, such as shifting care settings from acute-care hospitals to the home, promoting multi-disciplinary team-based care, and promoting better management of chronic diseases, if not reducing the prevalence of them, have the potential to fully address the implicit liabilities associated with population aging under the status quo of medicare. Pre-funding would be solely done to address intergenerational equity considerations, but intergenerational equity is just one of several reasons that governments need to push harder for health-care reform in Canada, to eliminate needlessly high health-care spending for elderly and chronically ill Canadians.

II.   A MODEL OF A SUSTAINABLE SINGLE-PAYER PUBLIC HEALTH-CARE SYSTEM

To examine the impact of population aging on public health-care spending, we consider a particular form of a sustainable single payer public health-care system that we believe is a reasonable representation of health-care funding in Canada. First, we assume that all Canadians at birth are promised the same average spending, by age, over their lifetime. In other words, all Canadians are endowed with the same lifetime health-care spending at birth. Second, knowing the age distribution of the population in a given year, we can calculate total health-care spending for the population. Third, we assume that Canadians will pay the taxes required

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[9]   Robson, "Will the Baby Boomers Bust the Health Budget?" and "Time and Money."

[10]   Robson, "Will the Baby Boomers Bust the Health Budget?"

[11]   Seamus Hogan and Sarah Hogan, "How an Aging Population Will Affect Health Care," Chapter 2 in Gregory P. Marchildon, Tom McIntosh, and Pierre-Gerlier Forest eds. *The Fiscal Sustainability of Health Care in Canada: Romanow Papers, Volume 1* (Toronto: University of Toronto Press, 2004).

to cover health-care spending in a given year. Fourth, we apportion the tax payments across the age distribution according to a relative age/tax profile that reflects the "hump shape" in the age/earnings profile for Canadians, reflecting the rise and fall of earning power over a lifetime. Fifth, we model the age distribution of the population according to assumptions that mortality rates continue to fall, and under a range of assumed fertility and immigration scenarios. Finally, we calculate the net present value of the difference between lifetime health spending and lifetime tax payments for health care for Canadians born in every year from 1948 to 2058.

a)   Health Spending by Age

In our hypothetical sustainable health-care system, we promise all Canadians the relative profile of health spending by age based on Health Canada's (2001) average public spending by provincial and territorial governments on health care by age and sex, and the 2008 level of per-capita health spending. In describing the age/health expenditure profile for Canada in 2009, the Canadian Institute for Health Information, CIHI,[12] shows that there is high spending per person in the first year of life — $8,527 per person — but from age one to age 49, health expenditures per person gradually rise from less than $1,000 to around $2,400. After age 50, there is a much more rapid rise in health expenditures per person, reaching $25,000 at ages 80 and over. CIHI reports that, while seniors accounted for only 14 per cent of the total population, they accounted for 44 per cent of total health-care expenditures.

Figure 1 shows our assumed relative age/health care spending profile, combined for males and females and normalized by (or, relative to) average health-care spending across all ages in 2001. As we have assumed Canadians born in 2008 and after will receive the average public spending on health care for each age from 2008 onwards, we have also assumed away all other drivers of cost increase unrelated to the aging population.[13] Consequently, our calculated total health-care spending for 2008 and after will only increase because of population aging (the population aging mass moving to higher ages). In other words, we are showing the impact of population after assuming that governments have successfully contained all other sources of health-care cost increases. We also consider the fiscal implications of pay-as-you-go funding when the population is aging and per-capita health-care costs are rising at 2.5 per cent per year due to technical and technological advances in health care.

For years prior to 2008, we make a key adjustment to the promised age/health spending profile. As health spending has increased due to technical and technological progress in health care, it would be inappropriate to assume that a Canadian born in 1960 had the same health-care spending from the public payer at a given age as a Canadian born in a later year at that same age. Consequently, we scale the age/health spending profile by the ratio of constant dollar per-capita health spending in a given year to the constant dollar per-capita health spending in 2008. Thus, prior to 2008, the normalized profile of health spending by age is fixed, but the dollar levels of spending do change.

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[12] Canadian Institute for Health Information. 2011. *National Health Expenditure Trends, 1975 to 2011*. (November 2011), Figure 32, page 49.

[13] See Kneebone (2012) for a discussion of the importance of these other sources of increase in health spending. Technical change leads to higher health-care expenditures because it makes new treatments feasible. Often these new treatments are costly to do and/or increase the volumes of procedures performed, but do not reduce the cost per service. It has proven politically challenging to restrain the demands of patients and providers to continually expand treatment options.

We calculate total public health-care spending in a given year by multiplying health-care costs by age and sex for that year by the number of Canadians of a given sex and age, while accounting for the age-specific mortality rate. We then sum across the sexes and across ages zero to 100. Expected lifetime health-care spending on an individual born in a given year is the sum of all his or her age-specific health spending in every calendar year from age zero to 100. For the proportion of the population that survives to 100, we arbitrarily terminate all remaining lives at that age.

FIGURE 1: RELATIVE HEALTH-CARE COSTS AND HEALTH-CARE TAXES BY AGE
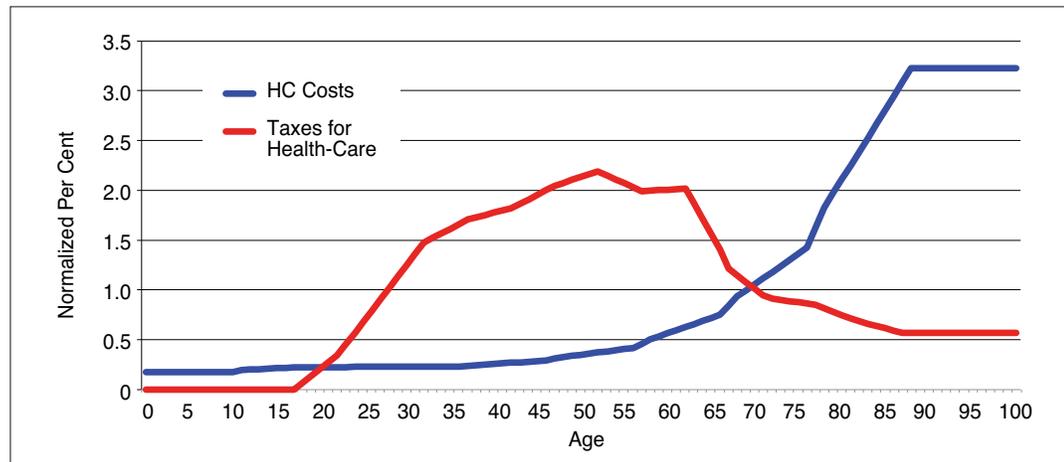
b)   **Tax Payments by Age**

Jackson and Matier[14] point out that, because age/income and age/consumption patterns tend to be "hump-shaped," with a person's income and consumption peaking between the ages of 45 and 55, lifetime patterns of income and consumption, as well as income taxes and consumption taxes paid, will follow roughly the same age profile. We assume that the relative incidence of taxes collected over the age distribution in a given year is stable. For convenience we use Oreopoulos and Vaillancourt's Age Profile of Taxes[15] for 1995 to generate the distribution for taxes across ages zero to 100 shown in Figure 1.[16] In each year, we assume that taxes are collected to meet total health-care spending. Tax collections are apportioned across the population according to the numbers of Canadians at each age and based on the age/tax profile depicted in Figure 1.

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[14] Harriet Jackson and Chris Matier. "Public Finance Implications of Population Ageing: An Update." *Department of Finance Working Paper 2003-03*. (2003), 9.

[15] Philip Oreopoulos and François Vaillancourt, "Taxes, Transfers, and Generations in Canada: Who Gains and Who Loses from the Demographic Transition, " C.D. Howe Institute. Toronto. (1998), Figure 2, page 5.

[16] Our reliance on the 1995 age/tax profile is a limitation for our analysis as there have been major tax changes in Canada that may have altered the relative incidence of taxes collected by age. For example, personal income tax was re-indexed and a fourth tax bracket was introduced at the federal level in 2001; provinces have adopted their own PIT rates and brackets under new tax-sharing agreements with the federal government; GST rates have changed from seven per cent to five per cent; income splitting has been introduced for those over age 65; corporate income tax rates have been greatly reduced; and so on. Despite these changes since 1995, Jackson and Matier (2003, Figure 2D) show a relative age/tax incidence profile similar to the 1995 profile, suggesting that the myriad of tax changes may have had less influence on the average taxes paid by age than they may have had on marginal tax rates of particular groups of taxpayers.

c)   The Age Distribution of the Population over Time

Having described the static, or per-year, calculations of health-care spending and taxes collected, we now turn to a description of the changing age distribution over time.[17] Since men and women have different life expectancies, and only women give birth to children, we needed to separate the age distributions for the sexes. Since it was only possible to obtain demographic data back to 1971, a frequency matrix of year and age was constructed for both men and women starting in 1971 and ending in 2008.

To project the population beyond 2008, we assume that age- and sex-specific mortality rates decline from what we observe for 2008. Mortality rates for 2008 are linearly decreased until they reach the level of a 30-year-old, at minimum, for the ages over 50 — that is, where a 50 year old of the future is subject to the same mortality rate as a 30-year-old in 2008 — until the implied life expectancy equals that of the Statistics Canada's long-term projection.[18]

Although it would have been simplest to assume a constant birthrate, this would not be an accurate assumption due to rate distortions in the age demographic (i.e. baby boomers, and the baby boom echo). Consequently, we look at fertility rates by age for women, and we project the future birthrate using the male and female age distributions; assuming that fertility changes very slowly over time, one can ignore changes within its distribution. We also accounted for the probabilities that a birth produces a male or female, since it is not a perfectly equal probability.

Immigration is another influence on the age distribution, so we consider several scenarios where immigration rates continue after 2008 at the rates observed over the past 10, 20 and 30 years. We present the calculations using the average rate of immigration observed for Canada over the past 30 years.

Using observed age distributions of the Canadian population for 1971 to 2008, and projected age distributions for 1948 to 1971(where demographic data is not available) and for 2009 to 2158, we produce a matrix that describes the population sizes of birth cohorts, starting with 1948 and ending with Canadians born in 2158, to encompass the full effects of the baby-boom generation on the Canadian population and health-care spending. Since we are interested in the baby boomers, we must go back as far as 1948, and as far forward as 2158, since to encompass the generation born in 2058 we must go at least 100 years beyond 2058, the last year (in our model) for all members of that generation. That leaves us with a model spanning 210 years of demographic calculations. While our calculations include other generations at the beginning and end, we do not calculate their lifetime health spending and tax payments.

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[17] Statistics Canada does produce population age projections. We chose to do our own population modeling so that we would be able to model health-care taxes and health-care spending under a variety of assumptions about population growth. In addition, as 1971 was the earliest year of data that we could obtain, we needed to do our own population modeling to extend back to 1948.

[18] Life expectancy 82.3 - 85.4 years for men, 86 - 88.4 years for women.

III. GENERATIONAL BALANCES FOR HEALTH-CARE SPENDING UNDER PAY-AS-YOU-GO FINANCE

Given our assumptions about health-care spending by age and sex, and the relative size of tax payments by age, we can describe tax payments and health-care spending by age (in 2008 purchasing power) for Canadians born in given years for eleven 10-year birth cohorts. We start with the oldest generation born in 1948, which would be 60 years of age in 2008, and end with the youngest generation that would be born in 2058. The results we present, unless stated otherwise, are based on the assumptions that age-specific fertility rates are constant from 2008 and that the average annual rate of immigration over 30 years prior to 2008 continues indefinitely.

Column 3 in Table 1 shows the expected net present value at birth of health-care spending promised to men and women from birth to age 100, grouped into 10-year birth cohorts. The differences in the value of lifetime health-care spending across birth cohorts reflects the increasing life expectancy of Canadians over time as well as associated changes in the sex composition of the cohorts at each year of age (as women, on average, outlive men). For Canadians born in 2008 or after, we "endow" each Canadian with a health-care asset worth around $35,000. The value of lifetime health-care spending is lower for Canadians born prior to 2008 since we have accounted for the fact that average health-care spending levels were lower prior to 2008.

TABLE 1: NET PRESENT VALUE OF EXPECTED LIFETIME TAXES FOR HEALTH CARE AND HEALTH-CARE SPENDING FOR 10 YEAR BIRTH COHORTS AT BIRTH, MALES AND FEMALES COMBINED (FIVE PER CENT DISCOUNT RATE)

Birth Year of Oldest in Cohort	Birth Year of Youngest in Cohort	Health-Care Spending ($)	Taxes Paid for Health Care ($)	Net Balance ($)
1948	1957	21,123	20,188	935
1958	1967	26,302	22,155	4,147
1968	1977	29,527	25,467	4,060
1978	1987	30,699	29,141	1,558
1988	1997	32,576	32,344	232
1998	2007	34,693	35,202	-510
2008	2017	35,364	37,117	-1,752
2018	2027	35,367	37,946	-2,578
2028	2037	35,376	38,229	-2,853
2038	2047	35,381	38,332	-2,951
2048	2057	35,381	38,289	-2,908

Column 4 of Table 1 shows, for each 10-year birth cohort, the net present value at birth of taxes collected for health care over an individual's lifetime. One interpretation of these "birth taxes" is that they are the price that each birth cohort pays for the public health-care asset that they are endowed with at birth. Clearly, the health-care asset is getting more expensive for each successive birth cohort because of pay-as-you-go financing. Column 5 of Table 1 presents the difference in the net present values at birth between lifetime health spending and health-care tax payments for each birth cohort, with males and females combined.

In Figure 2, we show how the burden of the taxes paid for health care is distributed over the lifetime of an individual in each cohort. It shows that under the pay-as-you-go finance model, the annual taxes required to pay for promised health-care spending will rise for each successive birth cohort and that the peak taxes paid by each cohort will almost double between the oldest baby boomers and those Canadians born after 1988. What this suggests is that rising health-care spending due to aging baby boomers, combined with the fall in the proportion of working-age Canadians, will mean that the main surge in taxes required to balance the health-care budget can be expected over the next 20 years. Notice that the growth in the taxes required by age profile for Canadians born between 1988 and 2048 is relatively small as the age/tax profiles are tightly clustered for these younger and future birth cohorts. Most of the surge in taxes falls on cohorts born after 1988.

FIGURE 2:   ANNUAL TAXES REQUIRED BY AGE FOR 10-YEAR BIRTH COHORTS TO BALANCE ANNUAL HEALTH-CARE BUDGET (2008 $)
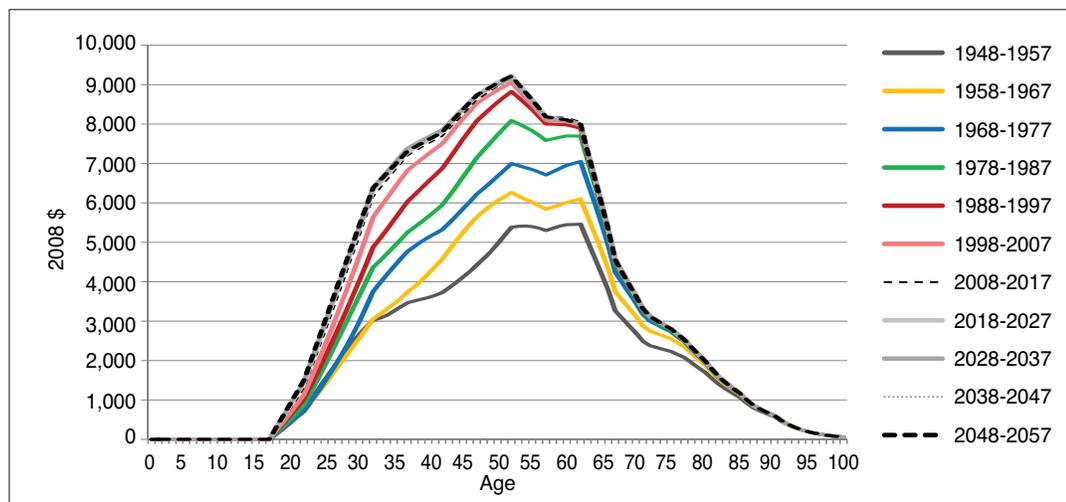

Table 1 demonstrates that pay-as-you-go financing, combined with population aging, leads to substantial fiscal redistribution across generations. If nothing changes, birth "gifts" granted to the baby-boom generation will be financed by birth "taxes" on their grandchildren. Table 1 also shows that the largest beneficiaries of this system have been Canadians born between 1958 and 1977. In our model, Canadians in these birth cohorts benefit because they are part of a large generation that followed a smaller generation; they benefited from being part of a large cohort of workers sharing the relatively smaller burden of paying for fewer Canadians over 65 from previous generations. These cohorts also benefited from the same technical and technological change in health care that led to increased health-care spending up until 2008.[19] The earliest birth cohort we consider, those born between 1948 and 1957, has a relatively small positive balance compared to later baby-boom birth cohorts. This reflects the fact that their low lifetime tax payments for health care were accompanied by lower health spending by age due to the more limited scope of medical treatment, and lower prices of health services, that they experienced. The later cohorts in our simulation receive no gain from additional health-care spending, since we assume fixed spending rates, but they face higher lifetime tax payments because of their smaller numbers relative to the size of the aging baby-boom generation they will have to support.

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[19]   The deficits of the federal and provincial governments in the 1980s and 1990s also suggest that the baby boomers were not paying even the full amount of these relatively low tax requirements, although they may have eventually paid them as deficits and debts were eliminated.

One response to the health-care balances that we have calculated is: "So what?" Productivity growth, and increased incomes, while not changing our calculations, would relieve the relative intergenerational burdens, as the higher lifetime taxes we project would represent a smaller share of lifetime income for future, potentially higher-earning generations.[20] In addition, younger Canadians and future Canadians may benefit from bequests of wealth from deceased baby-boomer parents and grandparents. Consequently, the higher incomes and wealth of Canadians in the future makes the rising taxes for health care nothing more that a form of progressive taxation across generations.[21]

While productivity growth can keep the relative tax burden from rising for future generations, voters today cannot obligate voters in future to pay the taxes required to sustain current health spending levels. Can we be certain that future taxpayers will agree to pay higher tax levels over reducing promised health-care spending? In the case of the Canada Pension Plan reforms in the late 1990s, arguments in favour of ignoring generational equity and maintaining pure pay-as-you-go financing were not considered compelling, and it would be necessary to determine if Canadians find the arguments any more compelling in the context of health care.

We believe that while the dismissive response to our calculations could be defended if population aging was the only driver of rising health-care spending, our calculations in Table 1 have ignored the other two per cent per year or more that health-care spending is increasing for reasons other than population aging. Table 2 shows the implications of 2.5 per cent annual growth in per-capita expenditures on health, which is much lower than that observed annual rates of growth of government expenditures on health care over the past decade.[22] Where population aging alone resulted in what appear to be modest birth gifts and birth taxes through health-care finance in Canada, Table 2 shows the extremely troubling sizes of intergenerational redistribution based on current health-care spending growth rates. As Table 2 shows, the rising "price" of medicare for future generations may be enormous because the compounding rate of increase in health-care spending gives a pay-as-you-go financing arrangement a "Ponzi scheme" quality.

It is not clear that this rate of increase can be sustained indefinitely. It is hard to believe that future taxpayers will agree to pay the high taxes required to pay for health-care promises, particularly given the large intergenerational transfers associated with pay-as-you-go financed health care in Canada. Can we count on productivity growth to average three per cent per year or more so that incomes keep up with health spending?[23]

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[20] Consider that the near doubling of tax payments shown in Figure 2 represents taxes to be paid in 20 to 30 years time. If real incomes rise by one per cent per year, roughly the same magnitude of increase in health-care spending due to population aging, then incomes will also double over the same period, leaving unchanged the relative share of income paid for health care.

[21] This perspective was discussed in the late 1990s when population aging was raised as a reason for reforming the Canada Pension Plan. The federal government, and presumably voters, did not find this perspective compelling as it was considered to have been a logic that had resulted in the debt crisis of the 1980s and 1990s (Emery 1996).

[22] See Di Matteo and Di Matteo (2009) for a discussion of these growth rates and forecasts of future growth rates.

[23] Lee (2007, 15) shows that to maintain health spending as a constant share of GDP, Canada will need to have sustained annual real growth rates of three per cent or more.

TABLE 2:   HEALTH SPENDING GROWS 2.5 PER CENT PER ANNUM

Birth Year of Oldest in Cohort	Birth Year of Youngest in Cohort	Net Present Value at Birth		
		Health-Care Spending ($)	Taxes Paid for Health Care ($)	Net Balance ($)
1948	1957	21,397	24,521	3,123
1958	1967	25,880	32,525	6,645
1968	1977	34,765	39,997	5,232
1978	1987	48,877	47,521	-1,356
1988	1997	68,404	58,986	-9,418
1998	2007	93,749	75,449	-18,300
2008	2017	124,826	96,854	-27,971
2018	2027	162,299	123,992	-38,307
2028	2037	208,794	158,739	-50,054
2038	2047	267,691	203,212	-64,478
2048	2057	342,375	260,126	-82,249

IV.   IS "PRE-FUNDING" A SOLUTION?

Policy analysts since at least the late 1990s proposed solving the financial challenges to Canada's single payer health-care systems both by eliminating the pure "pay-as-you-go" structure of financing health-care spending and by accounting for the estimated future health-care spending liabilities. In the 1990s, concerns over the sustainability of the Canada Pension Plan, in the face of an aging population, resulted in the government of Canada moving away from pay-as-you-go financing and introducing "pre-funding" of future pension benefits. Payroll taxes were increased from 5.6 per cent of insurable earnings to a "steady state" tax rate of 9.9 per cent. The excess of tax revenues over current pension benefit expenditures were saved and invested in the CPP Reserve fund. The success of the Canada Pension Plan finance reforms, particularly for addressing issues of intergenerational equity, resulted in calls from policy analysts, such as Bill Robson[24], for provincial governments to take a similar approach to reforming health-care finance.[25] Pre-funding future health-care costs of aging baby boomers through higher taxes in the near term would seem to have political feasibility. Polls of Canadians and Albertans support both health-care premiums and higher taxes to maintain health spending[26] and it was possible to convince Canadians to accept higher taxes to pre-fund the Canada Pension Plan. Nevertheless, introducing new taxes to fund spending is not always politically popular. Voters worry that governments might not be trusted to carefully save and prudently invest funds collected for future spending obligations.[27]

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[24] Robson, "Will the Baby Boomers Bust the Health Budget?"

[25] See Oreopoulos (1998, 1999) and Oreopoulos and Vaillancourt (1998) for generational account estimates for public pensions in Canada and the alternative financial reforms to address population aging. Pre-funding future health-care spending is discussed in Robson (2001) and Hogan and Hogan (2004).

[26] http://www.cbc.ca/news/canada/edmonton/story/2009/10/07/edmonton-cbc-poll-health-premiums-alberta.html. See also Gerard Boychuk, "The Regulation of Private Health Funding and Insurance in Alberta Under the Canada Health Act: A Comparative Cross-Provincial Perspective." University of Calgary, The School of Public Policy SPS Research Papers, The Health Series, (2008) Vol. 1 (1), 25-26.

[27] This is why it was important for the reserve funds accumulated for the Canada Pension Plan to be managed at "arm's length" from the federal government.

How much more tax would we need to collect from Canadians to fully pre-fund the implicit health-care liabilities, ensuring a sufficient level of taxes collected to recoup their "birth gifts" in Table 1? In this exercise, the additional taxes collected would leave all birth cohorts paying the full cost of their own lifetime health spending, with the result that there are no intergenerational transfers arising from population aging. Suppose we consider an unlikely tax structure where taxes are set according to one's year of birth and levied on all persons, and not just on working individuals (e.g. a poll tax, differentiated by age). While such a tax could be implemented, it would likely be a tough sell politically given the large differences in annual taxes currently collected from across the different age groups of Canadians. Ironically, Canadians seem to have no issues with the analogous inequity across age groups with respect to the size of the implicit liabilities for health spending.

We calculate the annual health tax as similar to a payment into a sinking fund that would retire a liability over the life of a loan. The formula is the same annuity calculation used to determine a mortgage payment for a fixed term at a stated rate of interest. It can also be thought of as the amount an investor would need to invest in the current year in exchange for an equal annual sum over a specified horizon, given a designated rate of re-investment. In our case, the sum in the current year, similar to the amount of a mortgage, is the implicit at-birth liability, and the annual tax is the annuity that would retire that liability.

The algebraic formula is $L = A \dfrac{1-(1+i)^{-t}}{i}$,

where L is the unfunded liability, A is the annual tax payment, i is the interest rate, and t is the "term" of the payments. The implicit liability is the value today of investing the excess benefit at birth: $L = b_c (1 + i)^t$, where in this case t represents the cohort age, and b_c represents at-birth benefit to cohort c. We show the application of the equations below in Table 3.

The challenge for pre-funding implicit health-care liabilities is readily apparent in the last column of Table 3. If we consider the aggregate implicit liabilities in public health care for Canadians aged 24 to 65 in 2012, then we need to collect sufficient taxes over the next 20 or 30 years, invested at a five per cent rate of interest, to cover $469,056 million — that is, just over $469 billion — which is roughly equal to the total net debt today of all provincial and territorial governments.[28] In other words, pre-funding the implicit liabilities of pay-as-you-go health-care spending in Canada would effectively double the recognized indebtedness of provincial and territorial governments.

[28]   Source for provincial/territorial net debt is Fiscal Reference Tables, Department of Finance, Ottawa, October 2011. This calculated implicit liability differs from that that calculated by Robson (2001, 2007) as we are not considering the tax payments of Canadians under age 24 or unborn, and we are considering the health care balances from the birth of all Canadians, and not just the liabilities dating from 2012.

TABLE 3:   HEALTH-CARE BALANCES FOR SINGLE YEAR BIRTH COHORTS, CANADIANS AGED 24 TO 64 AT BIRTH AND AT CURRENT AGE IN 2012 (R=5 PER CENT, 2008 PURCHASING POWER)

Age in 2012	Present value of balance at birth ($)	Present value of balance at age in 2012 ($)	Population (both sexes) 2011	Balance for population of given age in 2012 (millions $)
24	232	713	473,262	337
25	1,558	5,025	481,282	2,418
26	1,558	5,276	487,191	2,570
27	1,558	5,540	485,481	2,689
28	1,558	5,817	483,096	2,810
29	1,558	6,108	482,230	2,945
30	1,558	6,413	484,083	3,104
31	1,558	6,734	477,535	3,216
32	1,558	7,070	466,713	3,300
33	1,558	7,424	459,560	3,412
34	1,558	7,795	460,195	3,587
35	4,060	21,329	460,585	9,824
36	4,060	22,395	461,025	10,325
37	4,060	23,515	451,659	10,621
38	4,060	24,691	454,825	11,230
39	4,060	25,925	462,302	11,985
40	4,060	27,221	479,646	13,057
41	4,060	28,582	481,048	13,749
42	4,060	30,011	477,218	14,322
43	4,060	31,512	475,634	14,988
44	4,060	33,088	483,180	15,987
45	4,147	35,487	510,752	18,125
46	4,147	37,261	548,836	20,450
47	4,147	39,124	566,918	22,180
48	4,147	41,080	570,328	23,429
49	4,147	43,134	553,851	23,890
50	4,147	45,291	553,991	25,091
51	4,147	47,555	543,987	25,869
52	4,147	49,933	530,543	26,492
53	4,147	52,430	524,665	27,508
54	4,147	55,051	514,983	28,350
55	935	13,033	499,138	6,505
56	935	13,684	494,168	6,762
57	935	14,369	475,160	6,827
58	935	15,087	452,641	6,829
59	935	15,841	433,084	6,861
60	935	16,633	423,922	7,051
61	935	17,465	413,281	7,218
62	935	18,338	402,858	7,388
63	935	19,255	399,945	7,701
64	935	20,218	398,284	8,052

NOTES: 10-year cohort balances at birth from Table 1. Present value (2008 purchasing power) at current age is the balance at birth compounded at five per cent annual interest from birth to current age in 2012. Population numbers from CANSIM II.

Where the sizes of the balances at birth seem "manageable," the problem with the baby-boom generation is that these balances have been compounding in value for 40 years or more. For example, the youngest of the baby-boom generation, which turned 45 in 2012, had a net present value of their implicit liability in health care of $4,147 at birth. But after 45 years at a five per cent interest rate, the value of that balance today is $35,487.[29] Beginning now to retire this liability would require a sizeable annual tax. If we were to collect a tax from this person for 20 years until they reach age 65, we would need to collect almost $2,850[30] more per year over and above what is currently collected in annual taxes from that person. Those additional taxes would then have to be invested to earn a five per cent real annual rate of return in order to retire the unfunded liability. For younger working Canadians in 2012, the individualized tax to retire the unfunded liability is not as onerous. For someone 30 years old in 2012, with 35 years remaining to pay before retirement, the additional annualized health tax collected would be about $390 per year. For Canadians closer to retirement, such as a 54-year-old, with only a decade of tax collection years left before retirement and a $55,000 unfunded health-care liability in 2012, the tax to retire the liability would be over $6,600 per year, for a decade. Would Canadians currently in the workforce accept paying these taxes for health-care services they will receive in 20 to 30 years time, rather than on services, or consumption, today?

An alternative approach would be to tax Canadians for 20 years at an amount that would be sufficient to cover the average unfunded liability of Canadians aged 24 to 65. The government would need to collect $1,900 from each person for 20 years to cover the per-capita value of the implicit liability of $23,763 in 2012. These revenues would then need to be invested at a five per cent real rate of return to completely retire the implicit liability. Further, collecting a tax for 20 years only from Canadians aged 24 to 65 would require taxing Canadians who, in 2012, are under age 24, as they age, to replace the tax payments that cease to be collected from Canadians who move past age 65 during that 20-year period. This would be a large amount of tax to collect for future health-care services and it does not solve the intergenerational imbalance in a satisfying way. Focusing the tax collection on Canadians in the tax-paying ages for the next 20 years would cover the aggregate unfunded liability largely by moving the burden from our grandchildren to our children. The generation owing the most for health-care is still spared the burden of payment as they move beyond age 65.

Some will lament that pre-funding should have started a decade ago or more, when we implemented pre-funding for the Canada Pension Plan. Clearly this longer time horizon to collect taxes would have reduced the annual amount of tax that needed to be collected. However, it still would have entailed substantial tax levels. From the example above, a 45-year-old in 2012 would have to pay $2,850 per year until age 65 to retire his or her implicit health-care liability. If we had started collecting in 2002 when this person was 35, there would be both a lower implicit liability ($21,329 vs. $35,487) and longer time horizon to collect (30 vs. 20 years). The annual tax required to retire the implicit liability would have been $1,400, roughly half of the taxes required per year in a scenario where pre-funding starts 10 years later, at age 45.

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[29] $L = b_c (1 + i)^t + 4147(1 + 0.05)^{45} = 37,261.$ For current (2008) dollars, 37,261 x 0.9524 = 35,487

[30] Algebraically, we solve for A in the equation: $L = A \frac{1-(1 + i)^{-t}}{i}$, $35,487 = A \frac{1-(1 + 0.05)^{-20}}{0.05} = A \times 12.4622 \rightarrow$

$A = 2847.59.$

Some will argue that full pre-funding is not realistic, but at least partial pre-funding would be appropriate. Clearly, partial pre-funding reduces the political tensions arising from pay-as-you-go, but it does not eliminate the problem. Pre-funding may look like an effective tactic if the only source of increasing health-care expenditures is an aging population. But if health-care expenditures grow at 2.5 per cent per year due to drivers beyond the effects of population aging, pre-funding to any degree will look like a costly yet ineffective tax policy given the sizes of the generational balances in Table 2.

An important difference between health-care spending and government spending on public pension benefits, as in the Canada Pension Plan, is that governments have greater control over benefit levels and total spending for public pensions than they do for health care. With health care, technical and technological progress in medical treatment, inflation of input prices for the sector and a myriad of other cost drivers have resulted in sustained, high spending growth for health care. Thus while health-care spending increases that are expected strictly from population aging can be predictable, the amount of pre-funding still necessary to address the intergenerational transfers under pay-as-you-go funding, and overall health spending growth, is harder to determine, and as Table 2 shows, is likely very large. At a minimum, any pre-funding tax policy should be accompanied by government efforts to contain the size of annual expenditure increases.

V.   WHAT ELSE CAN BE DONE?

Population Policies

Pro-natalist policies to encourage more births offer one avenue for reducing the tax burden. As Figure 3 shows, if Canadian fertility rates returned to an average rate of two births per woman, the negative health-care balances for Canadians born after 1998 would be reduced and would be positive for Canadians born between 2028 and 2048.

How likely is that we would see Canadian fertility at this level? Beaujot's[31] discussion of population projections for Canada highlights that a fertility rate of two would be a large change to expect, as even high fertility rate projections have peaked around 1.8 children per woman. Beaujot[32] and Gauthier[33] both suggest that policy levers for influencing fertility may prove impotent for the task. Gauthier[34] finds that policies directly targeted at families with children — such as direct and indirect cash transfers for families with children; means-tested child-welfare benefits; maternity and parental leave benefits; and childcare facilities and related subsidy programs — lead to, at most, small increases in fertility. Beaujot[35] highlights that more effective policies are found in the realm of social policy, rather than tax and transfer policies

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[31] Roderic Beaujot, "Projecting the Future of Canada's Population: Assumptions, Implications and Policy." *Canadian Studies in Population* 30(1), 1-28. (2003)

[32] Ibid., 20

[33] Anne H. Gauthier,"The Impact of Family Policies on Fertility in Industrialized Countries: A Review of the Literature." *Population Research and Policy Review* 26(3), (2007), 323–346.

[34] Ibid.

[35] Beaujot, "Projecting the Future of Canada's Population," 20.

targeted to children, where fertility can be encouraged through: greater support for families, regardless of their type; reduced gender dependencies in families; and a more equitable distribution of earning and caring activities between men and women. Finally, growing the population size with higher birth rates comes with other costs that would need to be balanced against the health-care tax relief it might bring future Canadians.

FIGURE 3:   NET PRESENT VALUE AT BIRTH OF LIFETIME HEALTH SPENDING LESS LIFETIME TAXES PAID FOR HEALTH CARE, 10-YEAR BIRTH COHORTS, FERTILITY FIXED AT 2008 RATES AND HIGH FERTILITY AFTER 2008
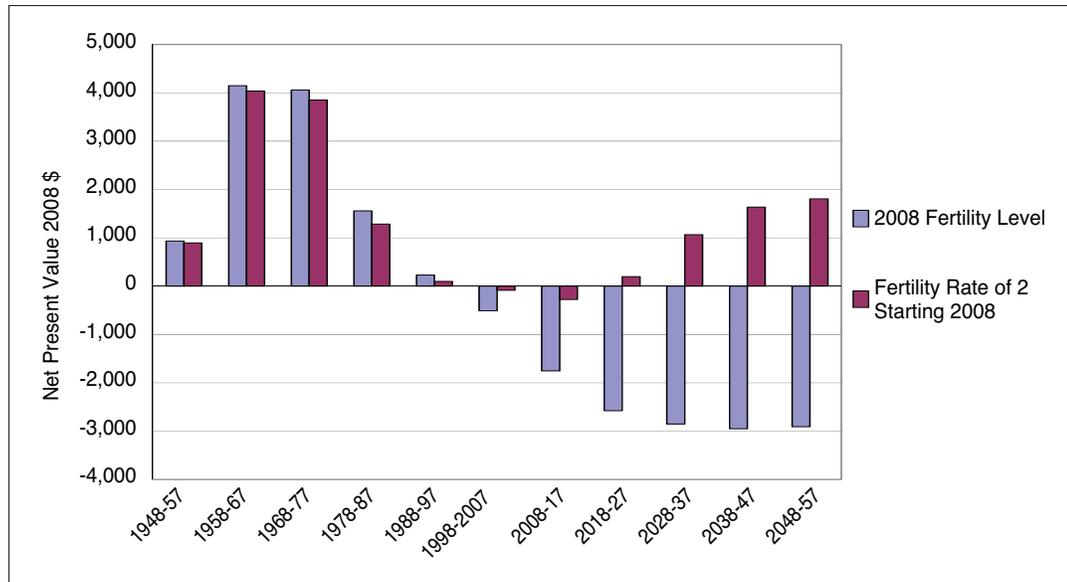
Higher immigration levels could also help offset the extent of population aging in Canada, but the benefit would depend on a sufficiently young age distribution of immigrants, and, if fertility remains at its existing levels, significantly higher numbers of immigrants. Beaujot[36] and Denton et al.[37] argue that immigration cannot be expected to "correct" the age structure and slow population aging in Canada.

Do what should be done regardless of population aging: Reform health service delivery

Evans et al.[38] assess that the "Apocalyptic Demography" type of calculations and projections that we present, based on no changes in age-specific use rates for health care, are "somewhat illogical," if not "intellectually dead," because we have not historically seen age-specific health-care use remain constant. Evans et al. highlight that evidence from British Columbia shows that (in the past) one would have made very poor forecasts of hospital usage if, as we have, one was to assume only changing demographics, yet constant rates of health-care use.

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[36] Beaujot, "Projecting the Future of Canada's Population," 20.

[37] Frank T. Denton, Christine H. Feaver and Byron G. Spencer, "Alternative Pasts, Possible Futures: A 'What If' Study of the Effects of Fertility on the Canadian Population and Labour Force." *Canadian Public Policy* – Analyse de politiques XXVIII(3) (2002), 456.

[38] Evans et al, "Apocalypse No."

While our projections of lifetime health-care spending and tax balances are useful for showing what will happen if we are at "the end of history," and health-care utilization rates do not change, it is interesting to investigate whether changes in utilization rates by age, as proxied by reductions in health-care spending by age, could be expected to address the generational imbalances of health care.

Governments in Canada have been looking at how to reform the delivery of care to reduce health-care costs for some time, but it has been slow to happen. Their interest in this direction for health-care reform has not been driven by concerns over population aging as much as it has been by maintaining their fiscal positions. But it is possible that, if governments can deliver on these reforms, some of the generational imbalances that currently exist through medicare would be addressed. Promising avenues for reducing health-care spending include: encouraging home care for the elderly and for palliative care; reducing the prevalence and severity of chronic disease in the population; changing how chronic diseases are managed so as to reduce reliance on doctors and hospitals for treatment purposes.

We argue that policymakers should consider ways to maintain the level of services provided, but lower the price of doing so. As an example, consider the use of acute-care hospital beds and doctors and specialists. The most expensive inputs in the health-care system are the acute-care hospitals and physicians. It has long been identified that these care providers and that care setting are not necessary, nor ideal, for caring for the elderly. Consequently, policy efforts that shift care settings to the home, particularly in palliative care situations, and that shift service provision to non-physician providers, may offer considerable potential for reducing the levels of spending for meeting the medical and health needs of the older population. Because this reduction in "price" of providing services, which may prove effective in reducing health expenditures without reducing services provided, would target the birth cohorts (such as the baby boomers) that have "underpaid" for their lifetime health care, such a policy direction would seem ideal for addressing intergenerational equity issues in Canadian medicare.

The potential reductions in spending from health promotion and reforming the delivery of health services for chronic conditions and the elderly are large. Health-care spending, particularly for the elderly and persons with chronic conditions, who account for the majority of health-care spending each year in Canada, seems to be needlessly high. As we noted earlier (page 6), while seniors accounted for 14 per cent of the total population, they accounted for 44 per cent of total health-care expenditures by provincial and territorial governments. The same report from CIHI[39] shows that the majority of these per-person costs are for services provided by a physician and/or in an acute-care hospital, and that the majority of provincial and territorial government expenditures on hospitals are for hospital services provided to Canadians over age 65. In many cases, these elderly patients occupying acute-care beds and under treatment by physicians, do not require such an intensive level of care and could be treated in the home with nursing care, complemented by less intensive physician care. In addition, Lee[40] summarizes that the literature finds that one-third to one-half of these costs of seniors are "end of life costs": health-care costs in what, *ex post*, is identified as the "last year of life." Lee reports the contrast in costs when persons of a given age who were in their last year of life are separated from persons who were not in their last year of life. For persons age 65 not in their

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[39] Canadian Institute for Health Information, *National Health Expenditure Trends, 1975 to 2011*, 44-46.

[40] Marc Lee, "How Sustainable is Medicare? A Closer Look at Aging, Technology and Other Cost Drivers in Canada's Health Care System." *Canadian Centre for Policy Alternatives* (2007), 11.

final year of life, annual health costs were around $600 per person; for those persons age 65 in their last year of life, costs were $30,000 per person. As much as half of this end-of-life per-patient cost could be avoided by shifting palliative care patients out of hospital care and into home care.[41] Finlayson et al.'s study[42] identified that the treatment of persons with chronic conditions accounts for 40 per cent to 60 per cent of health-care expenditures, which are largely through the publicly funded acute-care medical system (a.k.a. "medicare"), and suggested that as much as 40 per cent of these costs were avoidable through improved nutrition, affordable housing, reduced smoking and regular exercise. We note that all of these inputs to health can be influenced by public policy.

To illustrate the potential that health promotion and health-service reform offers for restoring generational balance in health-care finance, we investigate an "upper bound" calculation for health-care spending reductions associated with lowering the prevalence of chronic conditions in the Canadian population. In other words, we reduce health spending by each year of age by 16 per cent to reflect Finlayson et al.'s[43] estimate that 40 per cent of all medical treatment is accounted for by treatment of persons with chronic conditions and that 40 per cent of such costs are considered to be "avoidable" through prevention and effective management of chronic disease. Next, we calculate the net present value of lifetime health spending reductions from ages 45, 55 and 65 to age 85 associated with this change in utilization rates. We then calculate the annuitized value of that lump sum to produce an annual sum that can be compared to the annual taxes calculated earlier under the pre-funding investigation.

For a 45-year-old who changes his or her behaviour and health so as to avoid chronic disease health problems, the net present value of the reduction in remaining lifetime health spending at age 45 is roughly $16,000. Over his or her 40 years of remaining life, the annuity value of the health improvement's impact on acute-care health spending is $935 per year. Compared to the pre-funding tax calculated above, achieving the maximum potential avoidance of chronic disease eliminates almost half of the implicit liability of health spending for a 45-year-old.

The situation changes for older individuals because the higher levels of health spending on acute-care occur in the nearer term. Consequently, where it was unlikely that sufficient taxes for pre-funding purposes could be collected from persons already closer to age 65, the annuity value of the potential health-care spending reductions for a 55-year-old is $8,114 per year and, for a 65-year-old, $11,826 per year, which is more than sufficient to fully address the implicit liability in health care. Indeed, it appears that size of spending reductions would be sufficient to also cover the shortfall for the 45-year-old.

While we have motivated these calculations based on reducing chronic disease prevalence, the scenario just presented really requires a 16 per cent reduction in health spending by age, particularly for ages 65 and higher. This could be achieved by a combination of: reduced chronic disease prevalence; shifting senior care from acute-care hospitals to the home; shifting care from physician-focused to multidisciplinary teams; and by shifting the site of palliative care. It would seem that the margins for achieving health spending reductions are sufficiently large that the scenario just presented could occur and in the relatively near term.

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[41] Browne, Birch, Thebane and team (2012, viii) report that, in 2006, the per-patient cost for palliative care in an acute-care bed was $19,900, compared to $4,700 for home care.

[42] Greg Finlayson et al, *The Additional Cost, of Chronic Disease in Manitoba* (Winnipeg, MB: Manitoba Centre for Health Policy, April 2010).

[43] Ibid.

VI.   CONCLUSIONS

We have presented a model of Canada's single-payer, "pay-as-you-go"-financed health-care system that makes evident the serious problem with the intergenerational inequities that exist under the status quo of health-care funding. It is clear that if access to health care is to remain universal and levels of quality are to be maintained at the level they are today, then taxes will have to be raised dramatically in the future to support the aging population. The question then becomes: Who pays for it? If things remain as they are, such obligations will be inordinately borne by future generations. We have considered a few possible policy directions for addressing this fiscal challenge for Canadian medicare, such as: doing nothing; pre-funding future health spending through higher taxes today; population policies aimed at offsetting the impact of the aging baby boomers on health spending; and altering the age-spending profile so as to provide the promised levels of health services, but at lower costs.

Only the last option offers any realistic chance of restoring generational balance to pay-as-you-go health care in Canada. Governments have many reasons other than generational equity for reforming health-service delivery and promoting healthier lifestyles to reduce chronic disease burdens. Indeed, the real question is: Why haven't governments pushed harder for these reforms and changes given that they have been proposed on many occasions in past? Generational equity considerations highlight another dividend of health-care reform beyond the direct fiscal impact for government budgets and well-being of the population.

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