

Commission on the
Future of Health Care
in Canada



Commission sur
l'avenir des soins de santé
au Canada

DISCUSSION PAPER NO.25

How Will the Ageing of the Population Affect Health Care Needs and Costs in the Foreseeable Future?

by

Seamus Hogan

University of Canterbury, New Zealand

and

Sarah Hogan

University of Canterbury, New Zealand



October 2002

Catalogue No CP32-79/25-2002E-IN

ISBN 0-662-32960-0

Although the views expressed in the paper are those of the author(s), each of the papers was subjected to an independent peer-review process. The Commission would like to thank the Institute of Health Services and Policy Research (IHSPR) of the Canadian Institute of Health Research for their oversight and administration of the peer-review process for these papers. The work of the authors, the reviewers and IHSPR will serve to make these papers an important contribution to the Commission's work and its legacy.

Contents

Highlights	iv
Executive Summary	v
1 Introduction	1
2 The Basic Facts	2
Basic Demographics	2
The Relationship between Ageing and Expenditure	4
3 Decomposition of Past Expenditure Trends and Projection into the Future	5
4 Sensitivity Analysis	8
4.1 Analysis of Each Source of Uncertainty	8
Uncertainties over Demographics	8
Trends in Population Health	9
The Cost-of-Dying Effect	10
Generation-Specific Capital Investments	10
Technological Change	11
Policy-Induced Changes	12
General Cost Increases Attributable to Ageing	13
5 Implications of the Baseline Projection and the Sensitivity Analysis	14
6 General Policy Directions	15
6.1 System Reform	15
6.2 Pre-Funding	16
6.3 An Ageing Strategy	19
6.4 Human Resources Planning	20
7 Federal Implications	22
8 Concluding Remarks	24
Notes	25
References	26

Highlights

This paper looks at potential financial pressures on Canada's health system from population ageing. In addition to a basic overview of demographic and health-system trends, the paper includes a decomposition and projection of expenditure data on which policy recommendations are based. The decomposition and projection reveal that:

- the estimated effect of population ageing on health expenditure growth has been small relative to other factors to date; and
- even as the baby-boomers reach their high health expenditure years, population ageing will continue to represent a secondary source of pressure on health system costs.

The sensitivity analysis suggests that:

- there is a wide confidence interval around any projection of expenditure growth in the health sector; and
- probably the most important area of uncertainty is health sector human resources. Some research suggests that over the next fifty years the number of physicians will fall by 30%, with about half the reduction owing to the retirement of the baby-boom generation of physicians.

Based on the projection and sensitivity analysis, the paper makes the following recommendations as to how governments should proceed to address the potential financial challenges posed by population ageing while acknowledging the significant degree of uncertainty as to the magnitude of these challenges:

- not considering system reforms that cannot be justified on their own terms;
- pre-funding expected liabilities in the health sector by building up a dedicated fund;
- treating population ageing as a public finance issue and not a health-system specific issue, by avoiding the temptation to create an "ageing strategy" that would devote current health expenditures to programs designed to reduce future pressures on the system; and
- retaining the flexibility to deal with future problems by accepting the need to use current funding to increase labour supply in the health sector.

The federal government should:

- increase the Canada Health and Social Transfer (CHST) as the country's population ages, over and above any other increases that would be warranted by increasing costs, rising incomes, etc.;
- tie the CHST to the demographic situation of the province so that larger transfers are made to provinces with older populations;
- pre-fund future increases in transfers to the provinces to allow them to set up a dedicated fund to meet the needs of an older population in the future; and
- recognise that the federal government is in a stronger fiscal position than many of the provinces, and so should lead by example in pre-funding future liabilities.

Executive Summary

This paper looks at the population ageing issue from the point of view of the potential financial pressures on Canada's health system and the appropriate response of governments.

A basic overview of demographic facts reveals that over the past 75 years changes in mortality, fertility, and migration patterns have contributed to increasing the average age of Canada's population by 10 years and the fraction of the population aged over 65 from 5% to 12%. However, because the post WWII baby boom is currently under age 65, the percentage of the population aged over 65 is lower than would be the case in the absence of the baby boom. Consequently, in fifty years or so, when most of the baby boomers will have died, the fraction of the population aged over 65 will be higher than it is today. This suggests that the current situation with regards to the age of the population is relatively favourable.

The ageing of the Canadian population has been a significant contributor to the rise in prevalence of many chronic conditions and per capita health expenditures rise very rapidly after age 65, suggesting that population ageing may increase both needs and expenditures. Demographic trends also suggest that we could see a 30% reduction in the number of physicians in Canada over the next 50 years.

Nonetheless, a decomposition of health expenditure data reveals that population ageing has been and will likely continue to be a secondary source of pressure on health expenditures relative to non-ageing factors, although the projection suggests that ageing alone will have generated an increase of more than 30% in real per capita health expenditures by the year 2030.

Sensitivity analysis on the projection made in this paper covers several areas of potential uncertainty: demographic uncertainty, uncertainty over trends in population health, uncertainty over the relationship between expenditure and age, and possible age-related changes in the overall cost of health services.

The implication of the sensitivity analysis is that there is a wide band of uncertainty around any projection of expenditure growth in the health sector, deriving from inherent uncertainties and not just a lack of data or insufficient empirical analysis, so further research and analysis will not significantly reduce the uncertainty faced by Canada's health system.

It seems clear, therefore, that governments must accept the wide band of uncertainty and focus on risk management—that is, on taking uncertainty into account when planning for the future. This paper suggests four main policy directions for governments.

First, population ageing should not be used as a justification for reforming the health system. The health system can always benefit from efficiency improvements but population ageing should not be used to excuse advocates of system reforms from justifying proposed changes on their own terms.

Second, expected public health liabilities from population ageing should be pre-funded by governments building up a dedicated fund to pay for the impact of ageing on future expenditures. The likely impact of ageing on fiscal balances is manageable given the current fiscal outlook if governments resist the temptation to use the favourable fiscal conditions to fund current programs, but the impact could be serious if they do not.

Third, governments should deal with ageing as a public finance problem and avoid the temptation to put in place an “ageing strategy” that would aim current health expenditures on programs and projects designed to reduce future demand. Governments should not look to current expenditures as an *investment*—that is, as an alternative to saving to provide the resources to meet the needs of an ageing population in the future because the high level of uncertainty regarding the efficacy of such programs implies that this would be a very high-risk investment strategy.

Fourth, to retain the flexibility to deal with future problems, governments should accept the need for current funding to be directed towards increasing labour supply in the health sector. Because labour supply reacts slowly to changes in labour market conditions, in order to ensure that there are sufficient human resources in the health sector in the future these conditions must begin to change *now*. It would probably be prudent, therefore, for governments to make one of the major uses of current funding an increase in the remuneration of health-care providers rather than trying to provide more health services.

Although provincial governments carry most of the responsibility for delivery of public health services, and hence will bear most of the impact of population ageing on the health sector, the federal government’s involvement in the sector requires that it also take action to ensure the best possible balance between equity and efficiency. This paper recommends that the federal government:

- increase the Canadian Health and Social Transfer (CHST) as the country’s population ages, over and above any other increases that would be warranted by increasing costs, rising incomes, etc.;
- tie the CHST to the demographic situation of the province so that larger transfers are made to provinces with older populations;
- pre-fund future increases in transfers to the provinces to allow them to set up a dedicated fund to meet the needs of an older population in the future; and
- recognise that the federal government is in a stronger fiscal position than many of the provinces, so it should lead by example in pre-funding future liabilities.

Overall, the conclusion of this paper is that the pressures likely to be placed on the health system by population ageing are real, but small enough to be easily managed. The biggest danger posed by population ageing is that, in rejecting the apocalyptic scenarios of those who see ageing as a major problem, governments and the Canadian public may become complacent and neglect to take action now at a time when it would be relatively easy to do so.

1 Introduction

Concern over ageing is not exclusive to discussions of the future of health care, nor are Canadians alone in dealing with this concern. Many countries are facing the prospect of an increase in the percentage of the population aged 65 or older due to the ageing of the baby boom generation, as is the case in western nations, and/or due to increasing life expectancy, which has had some particularly marked effects in a number of countries, most notably Japan. The main concern with having an older population is that it tends to increase the need for public spending—on pensions, health care, and other services—and to simultaneously reduce the percentage of the population that can be relied upon to provide the necessary resources through income taxes.

There is a wide range of opinions on the impact that population ageing will have on the Canadian health system. Some predict a dire future and use the spectre of ageing as a justification for major structural changes to the public health system or for changes to the system of federal transfers to the provinces; others insist that the problems of ageing have been overstated and that no special actions need to be taken. The former view is mostly expressed in the media or the political debate, as in the well-publicized provincial cost-drivers report¹. The academic literature has tended to take the latter view (see, for instance, Evans *et al.* 2001a, and the references cited therein), although some papers argue that ageing, while not the dire threat suggested by some, *is* a serious concern that does require some policy actions now (e.g. Robson 2001).

The starting point for all analyses of this type is a projection of current trends into the future taking into account demographic change, but there are many uncertainties about the continuation of current trends. The diversity of policy conclusions concerning the impact of ageing on the health system stems partly from differences of opinion about what assumptions should be made when projecting current trends, and partly from differences of opinion on how to interpret the projections and derive policy conclusions from them. In this paper, we present a simple baseline projection, and then discuss the various factors that could make the future deviate from that baseline. We then discuss the policy implications that arise from this analysis.

There are a number of issues regarding the impact of population ageing on health care, health status and the health system. This paper focuses on the implications of population ageing for financing Canadian public health systems, rather than on issues of delivery such as service levels and specific delivery mechanisms.

The main message of this paper is that there is sufficient uncertainty about the effect of ageing to support either pessimistic or optimistic conclusions, depending on what assumptions one chooses from a wide menu of reasonable alternatives. Our policy analysis is therefore based on asking what a prudent course of action would be given the inherent uncertainty. Our conclusion is that the ageing issue is serious and cannot be ignored, but there is no need for drastic measures like significantly reforming the health system. What is needed is an immediate decision to save for the specific purpose of meeting increased needs in the future, rather than spending now in the naive expectation that an ageing strategy will turn out to have been perfectly clairvoyant in the future. Finally, the one area for increasing current spending is the remuneration of health sector human resources, a shortage of which must be avoided in the years to come.

2 The Basic Facts

This section briefly presents the basic facts about the ageing of the Canadian population, the relationship between age and health-care utilization, and the relationship between age and health-care expenditures. These basic facts will lay down the groundwork for the projections made in the next section and the policy implications discussed in the remainder of the paper.

Basic Demographics

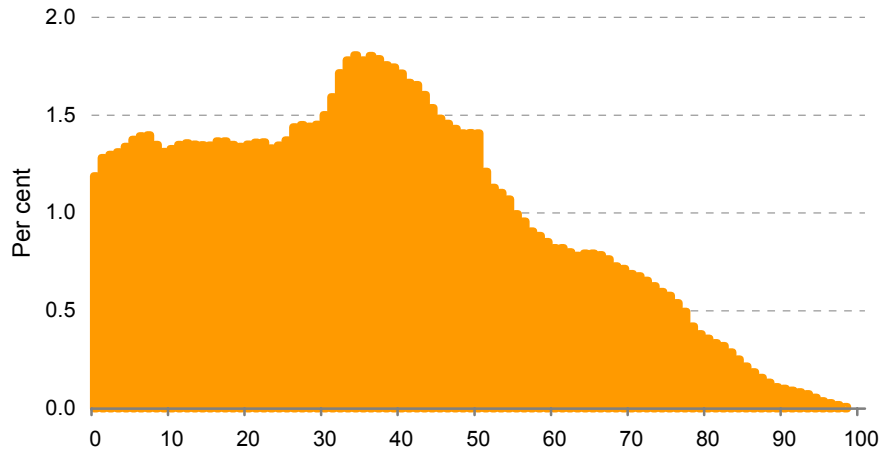
Over the past 70 years, the age structure of the Canadian population has changed significantly, with the fraction of the population aged over 65 increasing from 5% to 12%, and the fraction aged over 85 from 0.2% to 0.8%. This increase has resulted in the average age of Canadians rising by almost 10 years. Changes in mortality and migration patterns, and a fluctuating fertility rate have all contributed to this increase.

The most important reason for the current concern over ageing is the ageing of the baby-boom generation, that arose from the big increase in fertility immediately after the second world war, followed by a steady decline in fertility from the 1960s on. The post-baby-boom decrease in fertility is very important for understanding the effect of the baby boom: Initially the baby boom led to a large reduction in the average age of the population, simply due to the large and sudden increase in the number of children; but once the fertility rate fell back, the population steadily aged along with the baby boom since that cohort represents a very large fraction of the population. Currently, however, because baby boomers are only in their forties and fifties, the fraction of the population over 65 is at a lower level than would be the case if the fertility rate had remained constant. Consequently, in fifty years or so, when most of the baby boomers will have died the fraction of the population that is elderly will be higher than it is now. These trends are illustrated in Figure 1, which shows the age distribution of the Canadian population in 1997, and Figure 2, which shows both the historical and projected changes in the fraction of the population aged over 65.

While the ageing of the post-World-War-II baby-boom generation is the main reason for ageing to figure prominently in policy discussions, it is important to note that fertility cycles have not been the main determinant of ageing over the past century. Rather, the steady decline in mortality rates at all ages over that period have led to a continual increase in the fraction of successive cohorts reaching old age. Since changes in mortality rates depend heavily on long-term factors such as changes in nutrition, medicine, health care, and behaviour, they usually follow long-term trends rather than display cyclical behaviour. One can thus expect mortality rates to continue to decline in the future (although at a slower rate than in the past), and therefore add to the pressures of ageing brought about by the baby-boom effect.

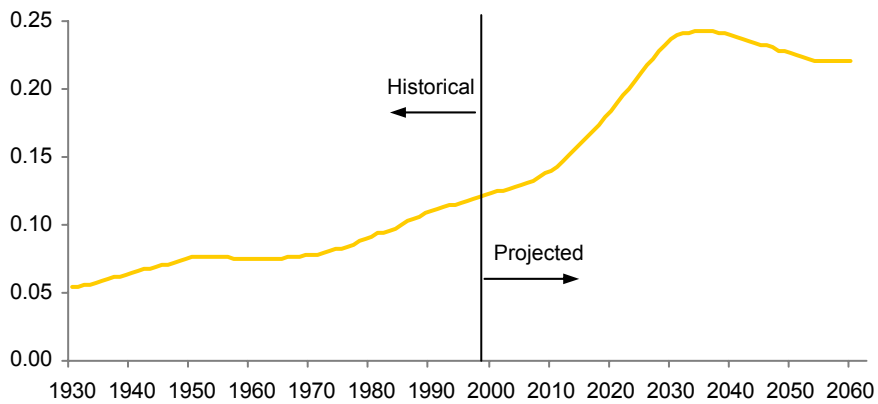
FIGURE 1: Population Age Structure

Distribution of Canadian Population 1997



Source: Statistics Canada.

FIGURE 2: Fraction of the Population Aged 65+



Source: Historical Data, Statistics Canada; Population Projections, Health Canada (2002).

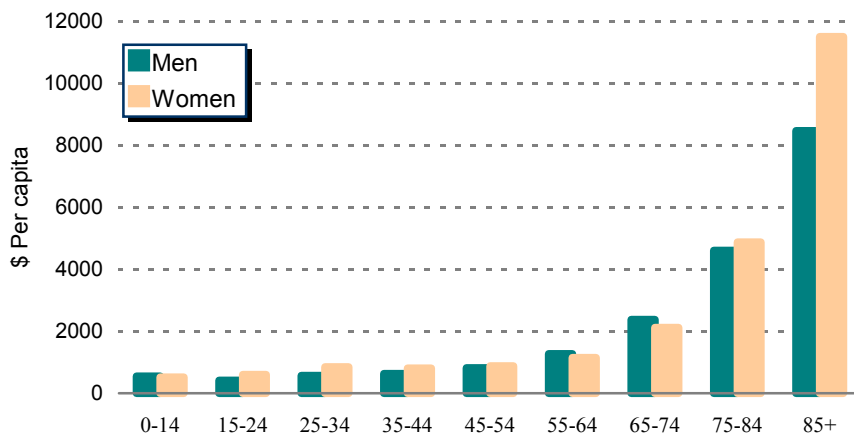
The Relationship between Ageing and Expenditure

The fact that a person’s health tends to deteriorate with age is self-evident and clearly backed up by the available data, and one would expect a corresponding increase in health expenditures with age. This relationship is confirmed by Figure 3, which breaks down total (public and private) health expenditures by age group and sex, and shows that per capita health expenditures increase very rapidly after age 65.² Although age-specific figures for health expenditures are not always reliable, it is fairly clear that the data do reflect an underlying truth.

The fact that expenditures seem to start to rise rapidly soon after age 65 is the reason why the fraction of the population aged over 65 is the most common summary measure of the age of the population. The behaviour of expenditures after age 65 also highlights why ageing is very much a current concern: The baby-boom generation is still aged under 65, but rapidly approaching that point, with the first members of the generation reaching 65 in 2011. The choice of 65 as the cut-off between young and old is, however, somewhat arbitrary, but it is important to note that none of the projections presented in this paper depend on this particular cut-off.

The combination of an ageing population with a positive relationship between age and expenditures is the starting point for concerns over the future of the health system as these elements form the basis for projections showing escalating expenditures.

FIGURE 3: Health Expenditures: 1980-81



Source: Health Canada.

3 Decomposition of Past Expenditure Trends and Projection into the Future

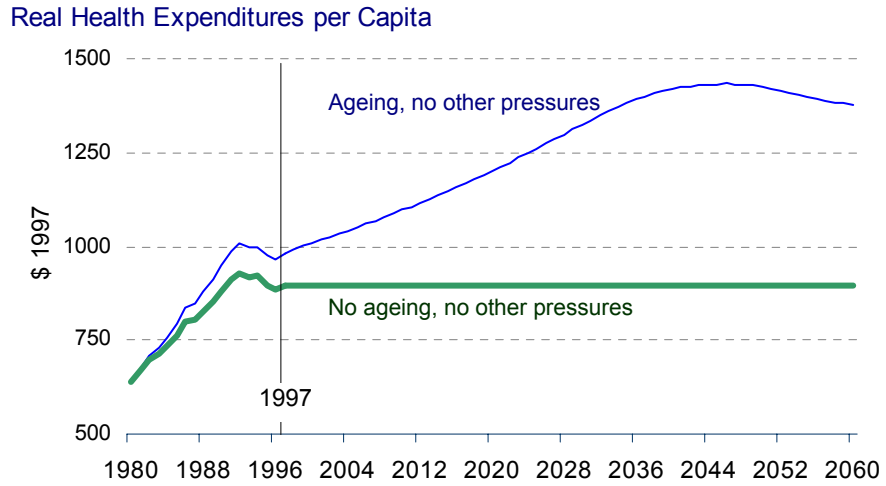
This section briefly describes a baseline projection of the contribution of ageing to future growth in health expenditures. This projection then forms the organizing framework for the rest of the paper. The policy implications discussed in the remainder of the paper centre on whether the projected increase in expenditures would have serious implications for policy if this increase came to pass, whether the projection is reasonable, and how the sources of uncertainty underlying the projection might be taken into consideration.³

There has been significant growth in health expenditures over the last twenty years. But ageing is not the only factor behind health expenditure growth: Some of the growth may be due to other factors, including wage pressures in the health sector and the development of new technologies. The effect of ageing on health expenditures can be determined by decomposing expenditure data into different effects. The resulting decomposition is illustrated in Figure 4. For the period prior to 1997, the top line shows total health expenditure and the lower line shows what health expenditures would have been if the population had remained constant at its 1980 level while per capita health expenditures for each age group and sex had changed in the way observed over the period 1980-97. This line, then, represents the change in health expenditures that cannot be attributed to ageing and must be due to other factors. The effect of ageing is the difference between this and the total. Clearly, the estimated effect of ageing on health expenditure growth has been small relative to the effect of other factors, as confirmed by Figure 5, which shows that ageing accounted for only 0.5% out of an average annual growth of 2.5%.

The picture looks different when we project expenditure pressures into the future. This projection is also presented in Figures 4 and 5. If we assume that the relationship between real per capita health expenditures and age will stay at its 1997 level (the last year in the expenditure data set used in this paper) while the population ages according to a simple demographic projection, ageing alone would create pressure for an average annual growth in health expenditures of about 0.9% over the next 30 years. The cumulative effect would be an increase of more than 30% in health expenditures by the year 2030 purely as a result of population ageing. In Figure 4, in order to isolate the projected effect of ageing, it is assumed that ageing is the only source of real per capita expenditure growth. In Figure 5, however, to keep the numbers in perspective, it is assumed that other factors will continue to contribute an average of 2 percentage points to growth each year. Relative to this figure, the projected average annual growth in health expenditures of 0.9% due to ageing is still relatively small.

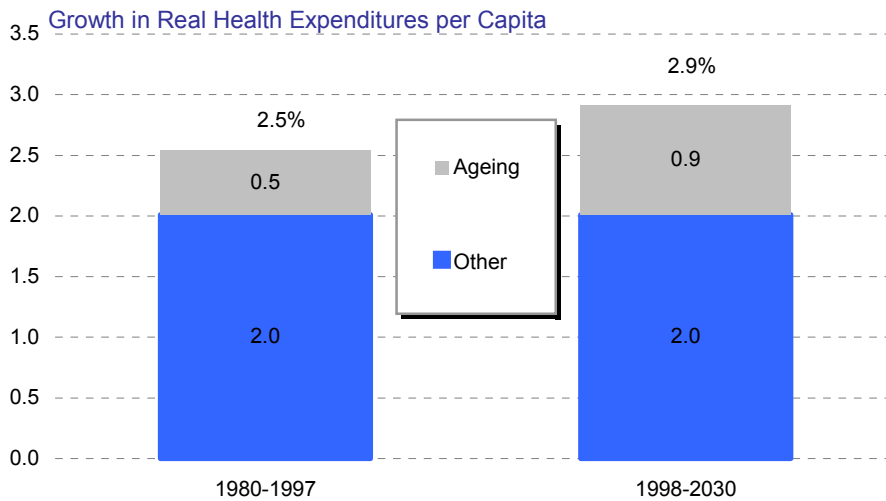
It is also interesting to decompose the historical and projected effects of ageing into the effect of an increasing life expectancy (decreasing mortality) and the effect of fluctuations in fertility, because the policy implications of expenditure growth and the sensitivity of the projection to demographic assumptions may differ depending on which effect is the principal cause of population ageing.

FIGURE 4: Ageing and Health Expenditures



Source: Health Canada (2002).

FIGURE 5: Health Cost Drivers



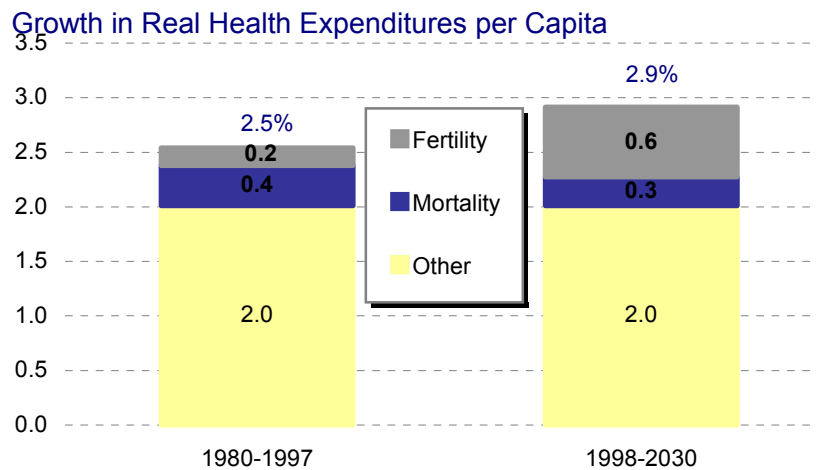
Source: Health Canada (2002).

This further decomposition is shown in Figure 6. It reveals that 70% of the 0.5% average annual historical growth attributable to ageing comes from reductions in mortality, and only 30% from fertility fluctuations, highlighting the point that the ageing of the baby-boom generation has yet to have a major impact on health expenditures. The relative importance of the two effects reverses almost exactly in the projection to 2030, with 71% of the projected growth due to ageing coming from the fertility effect and only 29% from reductions in mortality.

Whereas the ageing debate generally focuses on the idea that an ageing baby boom is causing an increase in the number of older people, it is often forgotten that the baby-boom generation is currently younger than 65. Therefore, there is currently a disproportionately large fraction of the population in low health-care cost ages. As a result, health-care costs are much lower than they would have been in the absence of the post-war baby boom. As the baby-boom generation ages, a greater fraction of the population will move into older and more expensive ages, causing a temporary, yet significant, increase in per-capita health expenditures.

Nonetheless, the results also suggest that, although the contribution of ageing to total annual expenditure growth will rise to about 0.9% as the post-WWII baby boom reaches its high health-expenditure years, ageing will continue to represent only a secondary source of pressure on health-care costs in the future while other factors remain responsible for most of the pressure.

FIGURE 6: Fertility and Mortality Effects



Source: Health Canada (2002).

4 Sensitivity Analysis

It is important to note that the expenditure projection made in the previous section is, indeed, a projection and not a forecast. That is, it is not a prediction of what will actually happen but rather a statement of what would happen if certain conditions applied—namely assumed changes in fertility, migration and mortality rates and no change in the relationship between health expenditures and age. The reality could differ from the assumptions underlying the projection for each of the following reasons:

- Changes in demographic trends from the baseline projection.
- Changes in the relationship between age and expenditures due to
 - trends in population health;
 - a cost-of-dying effect;
 - baby-boom-specific capital investment pushing up the relative cost of older age groups;
 - changes in medical technology that have age-specific effects on the cost of delivery of services;
 - policy-induced changes in service levels.
- Ageing-related changes in the overall cost of health services delivery.

In the remainder of this section, we will consider each of these possibilities in turn and then assess their importance for policy.

4.1 Analysis of Each Source of Uncertainty

Uncertainties over Demographics

It is difficult to argue with demographic projections because there is really very little meaningful uncertainty in demographic projections over 60 years or less. Most of the projected effect of ageing on expenditures arises from the baby-boom effect, which, because it is pre-determined, is not subject to uncertainty. Furthermore, most of the effect of falling mortality rates is also pre-determined: That is to say, the fraction of people aged over 65 who will survive each year will be much higher than in the past, not because of future falls in mortality, but because of falls in mortality that have already occurred. Finally, while future birth rates may affect the fraction of the population that is old, they cannot seriously change the ratio of the elderly to the working-age population over the 30-year horizon we are looking at here.

Future immigration patterns may, however, also make demographic projections inaccurate. Significant immigration can dampen the speed at which the population ages but it does not change the main conclusion that the post-World War II baby boom will lead to significant increases in the fraction of the population aged 65 and over. Similarly, emigration can affect projections but because emigrants tend to be relatively young the effect may actually be to speed up population ageing.

Trends in Population Health

The relevance of trends in population health is that we must ask whether changes in the health status of Canadians, particularly older Canadians, might result in the health expenditure effects of an ageing population being dampened or amplified. Unfortunately, it is very difficult to come up with a definitive answer to whether the health status of older Canadians has been improving or declining in the past, let alone make a projection as to what might happen in the future.

Using data from the Canada Health Survey (1978-79) and the National Population Health Survey (1998-99), Hogan (2002) has shown that, by at least one measure—the age-adjusted prevalence of chronic conditions, which are particularly a problem for the aged—Canadians are not becoming healthier; so, on the surface at least, it seems unreasonable to expect any savings from reduced health-care needs. For some of these conditions, notably hypertension and arthritis, this increase in age-adjusted prevalence arises from the current cohort of elderly Canadians. Chen and Millar (2000), show that the baby-boomer generation, however, has a lower prevalence of these conditions than previous cohorts, and so can expect to reach the 65+ age groups in better health than the current elderly.

On the other hand, changes in the *prevalence* of conditions is only one way of measuring changes in health status and we should be equally interested in other measures of morbidity such as health adjusted life expectancy (HALE) that take the duration of ill health into account, since expenditures is affected not only by how many people require care but for how long they require it.

HALE figures were calculated by Martel and Bélanger (1999) for activity limitations and by Hogan (2002) for a number of chronic conditions including activity limitation. These results show that, in 1998-99, Canadians could generally expect to live more years free of chronic conditions than they would have in 1978-79, indicating that the onset of chronic conditions is generally later than in the late 1970s. The *fraction* of life an individual can expect to live free of a given chronic condition, however, has decreased for seven conditions among both males and females due to the proportionately greater increase in life expectancy at age 12 than in HALE at age 12. Put simply, although Canadians can expect to be healthy for longer than previously, a greater proportion of the increase in life expectancy will be experienced as unhealthy years. These results suggest that, for most chronic conditions, there has been a significant positive survival effect—an increase in the number of years a person can expect to live *with* a given condition rather than dying. When the increase in survival is proportionately larger than the increase in healthy years, there is, by definition, an expansion of morbidity. This has been the case for most chronic conditions. Nonetheless, there has been some compression of morbidity—a proportionately greater increase in the number of *healthy* years—for several serious conditions: heart disease, arthritis, emphysema, and activity limitation.

Perhaps most significantly, the compression of morbidity for activity limitation, achieved through a simultaneous *increase* in the number of years Canadians can expect to be free of limitations and a *decrease* in the number of years Canadians can expect to spend *with* limitations, suggests that Canadians are generally living a greater *percentage* of their lives with a reasonable

quality of life. Since this has occurred at the same time as an expansion of morbidity for many chronic conditions, it appears that significant gains have been made in reducing the activity-limiting effects of these or other conditions, supporting the hypothesis that management of chronic conditions has improved sufficiently to allow Canadians to continue to work and play for longer than they used to. The costs of this are not revealed by the data. Indeed, what cannot be determined from these or any data is to what extent these changes have affected the need for health expenditures or have come about *as a result* of health expenditures. More importantly, the data cannot tell us what effect trends in population health will have on expenditures, so it seems clear that Canadians cannot rely on these trends to generate significant savings.

The Cost-of-Dying Effect

The cost-of-dying effect refers to a particular mechanism whereby reductions in mortality may flatten the relationship between age and health expenditures. Specifically, it relates to the proposition that health expenditures increase with age not simply because of a direct age effect but because most health expenditures on an individual occur in the last year or two of life. If this is so, then future reductions in mortality rates will not cause an increase in the fraction of the population that is expensive, even though they will cause an increase in the fraction of the population that is elderly.

Hogan and Pollock (2001) estimate the extent of the cost-of-dying effect in the past. If their estimated ratios between the amount spent on those who are in their last year of life and those who are not were to continue into the future, then most of the impact on health expenditures of population ageing due to reductions in mortality would be eliminated. Caution is needed in drawing an optimistic conclusion from this, however, because:

- the Hogan and Pollock estimates, which are inferred indirectly from aggregate data rather than being based on direct observation, are subject to wide confidence intervals and are almost certainly over-estimates;⁴
- in any event, as we have seen, the projected impact on health expenditures of population ageing due to reduced mortality is fairly small relative to the baby-boom effect—a point that is often overlooked in discussions about the effect of so-called “compression of morbidity” on projections of expenditure pressures due to ageing.

The key element to note about the cost-of-dying effect, however, is that it will tend to offset the effect on projections if mortality rates fall by more than expected. That is, the existence of a cost-of-dying effect will tend to reduce the sensitivity of the projection to unexpected falls in mortality.

Generation-Specific Capital Investments

Data on per capita health expenditures for different age groups probably underestimate the future cost of providing health care to the baby-boom generation as it ages. This is because the temporarily increased absolute number of elderly people will necessitate investment in additional

health care infrastructure and human capital, the need for which will have diminished before that capital has fully depreciated. This is probably only a small issue, but it does raise a caution when considering the proposition that the overall effect of ageing on public expenditures will be small, as savings in education on the young will offset the increased costs of health care for the elderly. Claims such as this, based on per capita expenditure figures, probably understate the cost of servicing the baby-boom generation as it ages and overstate the savings available from baby-bust age groups, as they implicitly assume that schools can be costlessly converted into health care facilities, teachers into physicians, etc. One might be tempted to argue that there exists an unused stock of hospitals and other health care facilities that were shut down during fiscal cutbacks and that it might be easy to simply re-commission these facilities. But this line of thought ignores the fact that many of the shut-down facilities were selected for closure because the population they serviced was not sufficient to justify the operating costs of the facility or because the buildings were old and deemed sub-standard. Although individual cases may indeed be made for reversing past decisions, it seems unlikely that this would be worthwhile on a large scale.

Technological Change

In this section, we refer to technological change in the way it is used by economists. That is, it refers to any change in the way of producing a given output, and does not necessarily involve a move to using more modern or sophisticated technologies, although such change is an important component of technological change in the health sector.

Technological change is often the wild card in any projection. Technological change has obviously been an important driver of both health expenditures and health outcomes, but there is currently no good or accepted measure of technological change so it is difficult to quantify the overall impact that it has had in the past. Furthermore, technological change, by its very nature of being the discovery of previously unknown ways of doing things, is impossible to predict, so even if we did have backward-looking measures of technological change, they would be of little use for predicting the future. Another problem is that any technological change that may affect health care in Canada in the future could be expenditure-saving *or* expenditure-generating for the health sector. Expenditure savings could arise if technological progress generated cheaper ways of delivering particular health outcomes (for example, if the discovery of new techniques for preventing heart disease seriously reduced the need for treatment or if a new, less expensive, treatment were developed. Similarly, expenditure increases could arise if an expensive new treatment became available and it proved to be irresistible to the health system—a new cure for cancer, for example—or if wages in the health sector increased as technological progress in other sectors pushed up wages in the economy in general.

One form of technological change that seems particularly relevant to discussions of ageing, because of its importance to elderly patients, and that illustrates the difficulty in quantifying and predicting effects is developments in pharmaceuticals.

Expenditures on pharmaceuticals now exceed expenditures on physicians, and are second only to hospital expenditures among the major components of health expenditures in Canada. There are different interpretations of this trend. It could be that the increase in expenditures

represents the development of newer and better drugs leading to increases in both total health expenditures and in health outcomes, but it could also be that the technological progress in pharmaceuticals has been expenditure-reducing overall, by allowing reductions in hospitalisation. In contrast, Evans *et al* (2001a) contend that the trend in pharmaceutical expenditures simply represents a tendency for physicians to prescribe newer and more expensive drugs that do not provide a significant therapeutic advantage over older and cheaper drugs. With these conflicting claims about the past, the difficulty of predicting what advances in pharmaceuticals will be made in the future, and the uncertainty as to whether the prescribing effect described by Evans *et al*, if it is real, will be reversed in the future, it is impossible to predict whether further technological change in the pharmaceutical industry will have the effect of strengthening or weakening the relationship between health expenditures and age.

Policy-Induced Changes

Obviously, population ageing does not have to affect public expenditures in the way suggested by the projection because governments can choose to respond by restricting expenditures, particularly expenditures on the elderly. If governments in fact restrict expenditures when faced with pressures, the conclusions from using a projection based on an assumption of no change in service levels would still be valid, but they would imply that the costs of ageing would be absorbed as a reduction in service rather than an increase in expenditures, and not that the costs were non-existent. In other words, if governments do not allow health expenditures to increase as much as ageing pressures would require, the difference between actual future expenditures and the projections in this paper would represent a monetary estimate of the reduction in per capita service levels. This may be felt more tangibly as longer waiting lists or decreased quality of care.

However, the possibility of governments choosing to restrict expenditures despite significant pressures (or, similarly, to spend more in the absence of real pressure to do so), does have implications for the interpretation of data. There simply does not exist reliable expenditure data that separate out price from level of service since both are measured in dollars and there is no general unit of measurement for health services. It is therefore not possible to distinguish between the cost of achieving a particular health outcome and the policy decisions that change the quantity of health services provided. For example, *Health Canada* age-expenditure data show a striking fall in relative expenditures on the 85+ age group in the mid to late 1990s. The question is: Did expenditures on this group fall because the cost of achieving a given health outcome fell or because the health status of this group was allowed to fall in order to reduce costs? It is tempting to attribute the fall in expenditures to the former, but there is also some anecdotal evidence that hospitals responded to fiscal cutbacks in that period by quantity and quality cutbacks that were felt most acutely by elderly patients. As unreliable as anecdotal evidence may be, the data do not allow the claim to be refuted. The difficulty in improving the data is clear when one considers how one might calculate the cost of achieving a given health outcome when that cost may vary significantly from one person to the next.

Similarly, since governments in other countries may also make policy decisions that affect health expenditures and their data also do not allow for the isolation of price from level of

service, little useful information can be gained by looking at international data to see how other governments have adjusted to the expenditure pressures of ageing. The ageing issue in Canada requires a policy response that cannot be drawn from the past or from elsewhere.

General Cost Increases Attributable to Ageing

The final source of deviation from the baseline projection is that ageing, by increasing the overall demand for health services, might raise the price of scarce health resources and thus cause an increase in the cost of providing health care to *all* age groups. The area where this is a particular concern is health human resources. Data from McMaster University⁵ show that the aged use physician services more intensively than younger people, and it seems likely that an even stronger relationship between age and service levels exists with nursing.

This concern about the effect of demographics on the demand for physicians and nurses is intensified when one considers that demographics also affect labour supply. Research at *Health Canada* using data from the Southam Medical Database has estimated that, given the current rates at which physicians of different ages and sexes enter and leave the profession, we would expect to see a 30% reduction in the number of physicians in Canada over the next 50 years, with about half of that reduction deriving from the baby-boom generation of physicians reaching retirement age, and half from the smaller fraction of the population in the age groups that tend to enter the profession.⁶

The data also show that, although demographics will have a notable effect on the excess demand for physicians, a return to the rates at which physicians entered and exited the profession in Canada in the early 1980s would more than compensate the demographic effect on both the demand for and supply of physicians. It is doubtful, however, that the required increase in health human resources could be obtained without an increase in the relative wages and salaries of health workers. Indeed, Chan (2002) decomposes the reduced entry rate of physicians into the profession in the early 1990s and finds that most of the decline was due to the greater amount of time that physicians spend in post-graduate training and to a slower inflow of foreign doctors, and that only a small fraction was due to cuts in medical school enrolment. Increasing physician supply, therefore, is not simply a matter of returning to former enrolment levels.

Recognition that wage and salary rates in the health sector are not fixed but respond to changes in this sector is important when considering one common suggestion for lowering the costs of treating elderly patients—a move toward greater use of home care as an alternative to hospitalization or residential care facilities. A study by Hollander and Chappell (2001) suggests that home care is a cheaper way of caring for seniors with low or moderate levels of disability, even when taking into account the burden imposed on family members. Based on this and other studies, and noting that home services account for only 2 to 6 per cent of provincial health budgets, Hébert (2002) concludes that a “real shift in resources is needed to reverse the traditional hospital-centred approach”. It is not clear, however, that home care would continue to be cost effective if such a real shift in resources were to occur given the possibility that a substantial increase in the number of home-care workers would require a real increase in wage rates in the sector.

5 Implications of the Baseline Projection and the Sensitivity Analysis

The baseline projection suggests that, based on the current relationship between age and health expenditures, ageing is likely to lead to pressure for increased real per capita expenditures on health, but that this pressure is also likely to be small relative to historical rates of growth of expenditures attributable to non-ageing factors, and it is important to keep this perspective when discussing the implications of ageing for the Canadian health system. However, the fact that population ageing is likely to be a secondary driver of health expenditures is not in itself a reason for dismissing ageing as an important public policy issue in the health sector. We still have to ask whether the projected 0.9 per cent average annual growth in real per capita expenditures due to ageing requires an immediate policy response.

Furthermore, the implication of the previous section is that there is a very large band of uncertainty around any forecast of future health expenditures and that this uncertainty is largely driven by inherent uncertainties, not just a lack of data or empirical analysis. The key conclusion from this is not to say that we need more research, but instead to accept the wide band of uncertainty and focus policy conclusions on risk management—that is, on taking uncertainty into account when planning for the future. It is also a caution against accepting demagogic analysis that selectively considers only the best-case or the worst-case scenarios for the impact of ageing on the health system, and then derives policy conclusions based on those scenarios being the true outcome.

The other main implication from the sensitivity analysis concerns the need for health human resources planning since the biggest risk of a greater ageing-derived pressure on expenditures than shown in our baseline projection arises from health-human-resources shortages.

We discuss these implications in more detail in Section 6.

6 General Policy Directions

This section considers the appropriate approach to the population ageing issue for governments in areas where they have direct jurisdiction—that is, principally provincial governments except in some specific areas of federal jurisdiction such as First Nations and Inuit health. Section 7 considers some cross-jurisdiction implications for the federal government. The four main policy directions in this section are:

- Population ageing does not represent a justification for reforming the health system. The health system can always benefit from efficiency improvements, but population ageing should not be used to excuse advocates of system reforms from justifying proposed changes on their own terms.
- Expected health liabilities from population ageing should be pre-funded. Governments should be building up a dedicated fund to pay for the impact of ageing on future expenditures. That is, the likely impact of ageing on fiscal balances is manageable given the current fiscal outlook, but would be serious if fiscal management turns to pay-as-you-go thinking.
- Governments should deal with ageing as a public finance problem and avoid the temptation to put in place “an ageing strategy” of current health expenditures on programs and projects designed to reduce future demand.
- To retain the flexibility needed to deal with future problems, governments should accept the need to direct current funding towards increasing labour supply in the health sector.

In the remainder of this section, we consider each of these in turn.

6.1 System Reform

As noted in the Introduction, the spectre of ageing is often used as a justification by commentators who advocate reform of the health system in Canada in order to constrain expenditures, usually by those who favour greater use of private funding or delivery. The issue of ageing as a cost driver in the health system, however, is misplaced in discussions of general system reform.

First, note that even under the most pessimistic scenario imaginable from the considerations presented in Section 4, ageing represents mostly a one-time pressure on expenditures (admittedly over an extended period of about 30 years), and not ongoing growth. If one were to make an argument that the system needs to be reformed to deal with that 30-year pressure, then the same argument would suggest a return to the old health system after 30 years. For a one-time increase in needs, it would be simpler and probably less costly to absorb the expenditure increase by diverting resources from other uses, in contrast to an ongoing pressure, where there might be a real imperative for system reform.

Second, and more importantly, ageing and the associated expenditure pressures will occur whatever the system—that is, the fiscal pressures associated with ageing are not *caused* by the system. In other words, the increased pressures on expenditures likely to arise as the population ages are associated with real needs, due to the inherent nature of ageing, that will increase regardless of the type of system, and not to some distorted way in which the current system is unnecessarily generous with the aged. Unless we are willing to argue that the current system is providing too much health care to the aged, we cannot argue that reforming the system is the key to reducing expenditure pressures.

Of course, if there are reforms that can help reduce costs and hence offset the fiscal pressures of ageing without causing a serious reduction in service levels, these reforms should be implemented, but such efficiency enhancers would be desirable even if there were no fiscal pressures from ageing. That is, reforms need to be justified on their own terms, and not piggy-backed onto concerns over ageing. Such efficiency reforms would have been and will always be desirable and should have their own debate rather than being treated as a sub-section of the ageing debate. The same holds for reforms that would improve the quality of care for the aged because this should always be a concern and not become part of the solution to population ageing.

Note that the conclusion that cost pressures associated with ageing should not be used as a justification for system reform does *not* derive from the result seen above—that ageing is likely to be only a secondary driver of health expenditure growth—but rather because the link between ageing pressures and system design is a *non sequitur*. Ultimately, the issue of population ageing is a public finance rather than a health system problem. The question is whether we should cover future costs by diverting resources from other uses or allow the impact of population ageing to be absorbed as a reduction in service. This choice is the subject of the following sub-section.

6.2 Pre-Funding

The analysis of the previous sub-section is that governments should not look to system reform to avert the pressures created by ageing. Instead, they have three options to respond to the increased demand for services created by population ageing: reducing the extent and generosity of publicly funded health care at the time of the increased demand; funding the increased demand when it occurs by raising taxes or cutting back on other public expenditures; or funding the increased demand over time by running larger budget surpluses in advance.

The system for financing public health expenditures in Canada, in which current tax revenues are used to pay for current health expenditures, involves an implicit social contract between governments and citizens whereby current working-age Canadians pay taxes to fund health care expenditures that go disproportionately to older Canadians in the expectation that they will receive the same higher share of public health expenditures when they reach their senior years. The option of cutting back on health services during the period when the baby-boom generation is in its high health expenditure years would be a violation of this implicit contract, and hence would not be good public policy.

The issue, then, is determining the best way for governments to ensure that they can meet their implicit contractual obligations to fund a reasonable level of health care to an increasingly elderly population. The policy debate here hinges on whether future liabilities should be partially met from current taxes (i.e. by pre-funding future health care), or by maintaining a pay-as-you-go health system. We argue that governments should choose pre-funding. This could imply treating health in a way similar to the Canada Pension Plan, by setting up a fund into which government payments would initially be made while the population is still relatively young, and which would then be drawn down to help fund public health spending in later years.

Of course, pre-funding is possible simply by having governments run budget surpluses without bearing the administrative costs of a separate trust fund. The advantage of a formal trust fund is that it would create a mechanism whereby governments could credibly commit to carry over some tax revenues to pay for future expenditures. The main issue here is not the institutional form that government savings would take, but the idea that governments should seek to finance future health expenditures now. In the remainder of this sub-section, we address three common arguments against any form of pre-funding.

Argument #1 against pre-funding: The increase in expenditures due to ageing will be small relative to likely economic growth, and will therefore not require a change in funding style.

This argument for continuing on a pay-as-you-go style of funding is based on the idea that the increase in health care costs that can be attributable to ageing is small relative to other historical drivers of health expenditures, and hence not important enough to justify moving away from the pay-as-you-go method of funding public health care. The statement about the relative importance of ageing is true (as is shown in the simple projection of Section 3), but one has to be careful about drawing too optimistic a conclusion from this. For one thing, population ageing is an expenditure driver that does not fund itself. To see the importance of this, consider two other expenditure drivers: increases in demand associated with higher GDP, and increases in the cost of labour in the health sector. Much of the increase in real per capita health expenditures over time is closely related to increases in real per capita GDP. This occurs for two reasons. First, higher GDP leads to an “income-effect” increase in the demand for health services; that is, as GDP growth leads to higher individual incomes and government tax revenues, the demand for health services, along with other goods and services, rises. Second is the phenomenon known as Baumol’s “cost disease” (Baumol and Bowen 1966). This is the idea that general economic growth tends to lift wages and salaries in the economy as a whole and hence pushes up costs in labour-intensive industries like health and education, as workers will not continue to enter those sectors if their wage and salary levels fall behind those available elsewhere. As Baumol (1993) points out, increases in the demand for public health expenditures that are *caused* by increases in GDP do not present a funding dilemma for governments as they are essentially self-funding. On the other hand, the same analysis suggests that we cannot rely on future GDP growth to fund the costs of ageing as that growth is already spoken for in terms of increased demand for health services or increased wages and salaries from the ‘cost disease’.

Baumol's cost disease relies on the assumption that productivity gains in the labour-intensive sector will be lower than in the rest of the economy, so that increases in wages and salaries in the sector will not be offset employing less labour to produce a given output. Evans *et al* (2001b) criticize this line of analysis in the health sector because there is evidence of huge productivity changes in that sector. Although there is no doubt that there has been productivity growth in the health sector, future productivity growth will only negate the cost disease to the extent that this growth will enable reduced employment in the sector rather than simply allowing a greater range of health services to be provided with the same labour input. It would be a very high-risk strategy for governments to predicate their policies on the assumption that they will be able to contain expenditures by delivering the current range of public health services with lower numbers of doctors and nurses in the future, but this is the implied policy prescription of the Evans *et al* line of analysis.

To put this analysis into perspective, in the 18 years to 1997, the average annual increase in real per capita health expenditures due to factors other than ageing, *in excess of GDP growth*, was only 0.7%. The projected 0.9% average annual growth in health expenditures due to ageing is not small relative to this number.⁷

An alternative form of the argument that the costs of ageing will be too small to necessitate pre-funding is based on accepting some of the more optimistic scenarios for predicting lower increases in expenditures than in the baseline projection. As we noted in the sensitivity analysis in Section 4, these scenarios cannot be dismissed, but they also cannot be relied upon: The uncertainty involved in making these projections is simply too great. In the face of such uncertainty, it would be more prudent to indulge in precautionary savings rather than relying too heavily on optimistic projections.

Argument #2 against pre-funding: There will be simultaneous downward pressures in other areas that will offset increased pressures in the health sector.

This argument against pre-funding suggests that when all age-related expenditures are looked at as a whole, there is no serious financing issue since at the same time that ageing is putting upward pressure on health-care budgets and CPP/QPP, other demographic changes will be creating an offsetting downward pressure on other areas of public expenditures, notably education. This point has been made by Denton and Spencer (1995) among others.

Again, the basic premise with this line of argument is correct: If, as we have argued, the pressures on health care budgets from ageing should be viewed as a public finance rather than a health-system issue, then it follows that one needs to look at all aspects of ageing and public expenditures and not just health when discussing the public finance implications. There are, however, three problems with using this line of argument. First, as discussed in Section 4.1, one cannot assume that resources can be transferred at no cost from one activity to another or even that they can be transferred at all (can teachers simply retrain as physicians? Blackboards and school gymnasiums transformed into hospital beds and palliative care units? Decrepit unused hospitals renovated and put back into use at a reasonable cost?) Second, one cannot assume that governments will be prepared to make the offsetting reductions in education or other expenditures; that is, even if it is economically feasible to substitute resources away from

education towards health, it may not be politically feasible to do so as these other sectors may well have good uses for the extra resources that become available. Finally, even if the savings from some areas were to offset most or all of the projected increases in health expenditures over time, they cannot be expected to do so each year, so that for reduced expenditures on education to pay for increased expenditures on health, the savings from the former would need to be hoarded until the need for the latter arises. Pre-funding into a dedicated public trust fund provides a mechanism for doing so. With such a fund, if the political will exists to make offsetting reductions in education, these can be used as a source of revenue for the fund at the time they arise.

Argument #3 against pre-funding: Canada's fiscal position is such that population ageing will not require pre-funding

This is a similar argument to the previous one in that it considers other aspects of the overall fiscal position to address whether the impact of ageing on health expenditures will be a problem. The argument here is that although ageing may, on balance, place expenditure pressures on governments, the current debt and deficit levels in Canada imply that when one considers all future explicit and implicit liabilities (interests on government debt, expenditures on health and CPP for an ageing population, etc.), there would be no need to increase taxes or reduce other expenditures in the future to meet those obligations given current trends. This argument is alluded to by Mérette (2002), who notes that future implicit liabilities of Canadian governments for age-related expenditures are offset to a large extent by the implicit asset of deferred taxes that will be paid as retirees cash in their RRSPs.

It is beyond the scope of this paper to make an assessment of the overall fiscal position of Canadian governments, but even if the country is in a position of fiscal balance (i.e. that future liabilities can be met without increasing taxes or reducing services), ageing is still a fiscal concern. Specifically, if Canada is in fiscal balance, the concern is not that it will be difficult to meet our obligations to future generations of elderly Canadians. Rather, it is the risk that, by not making the financial liability of those obligations explicit through pre-funding, governments will take Canada out of fiscal balance by devoting budget surpluses to current rather than future priorities. Pre-funding of the health system, then, would not so much be a way of starting now to bear the costs of ageing, but a mechanism for ensuring that the necessary resources are available for health care in the future and are not spent now or devoted to other uses.

It is also important to note that, although the country as a whole may be in fiscal balance, this is not necessarily true of every province, and it is at the provincial level that most public funding of health arises.

6.3 An Ageing Strategy

The key message of the sensitivity analysis of Section 4 is that, although ageing is predictable, the future relationship between age and health needs and the future of medical technology is not. In such an environment, the most important thing that governments can do is to make sure that the financial resources will be available as ageing puts pressure on the system,

and not invest in high-risk strategies such as programs to promote healthy ageing as a means to averting the pressure.

This is not to say that there are no programs or services involving the aged that would be worth funding, just as there will always be potential for improvements or innovations in the delivery of health services to any age group. Rather, the point here is that governments should not look to current expenditures as an *investment*—that is, as an alternative to saving to provide the resources to meet the needs of an ageing population in the future, because the high level of uncertainty regarding the efficacy of such programs implies that this would be a very high-risk investment strategy.

This point is worth stressing as there is an inevitable tendency for democratic governments to opt for immediate spending on programs that are purported to generate great benefits in the future, rather than saving resources because the latter means that a different government may benefit from a former government's saving efforts and that the latter may be seen as failing to spend on important programs. To reconcile the interests of government with those of the Canadian population, the former must find some way of making the public understand why resources must be put away for the future. Given the high level of public awareness on the ageing issue, this should not be difficult. In fact, public awareness of this issue is so high that if governments *fail* to save for the future they may well be seen as irresponsible.

6.4 Human Resources Planning

Although it would be unwise to assume that the best-case scenario of ageing pressures on expenditures can be achieved through an ageing strategy, it would certainly be prudent for governments to try to avert the worst-case scenario of costs and service levels generated by chronic shortages of health-care professionals. A shortage of health professionals would affect the entire Canadian population, not just the aged. It would be felt as a significant deterioration in service and quite possibly a significant deterioration in the health status of Canadians of all age groups, but particularly the aged and those whose need for health care is greatest. Furthermore, a shortage of health human resources will affect existing health human resources in the system, pressuring them to extend their working hours and subjecting them to additional stress. In turn, the Canadian health sector could lose even more human resources and the performance of those who remain may suffer. It could well trigger a vicious downward spiral in the quality of care and level of service.

Of course, the picture painted here is grim, but there is a serious risk that it is not far from the truth. This is because, quite apart from the issue of an ageing population, Canada has had difficulty retaining and recruiting human resources in the health sector for at least a decade. The downward spiral resulting from a loss of health sector human resources could, therefore, be a challenge for Canada *even without* population ageing. Once ageing is added to the problem, increasing the demand for physicians and decreasing the supply of physicians through retirement, it becomes clear that a grim scenario must be acknowledged as possible. Even if the probability is slim, if it does occur it could well be the biggest challenge that the Canadian health

system has ever faced. And turning things around once they have begun to spiral downward will be much more difficult than avoiding the scenario in the first place.

But because labour supply reacts slowly to changes in labour market conditions, due to the time it takes to train more people or to attract them from other countries, conditions must begin to change *now* in order to ensure that there are sufficient human resources in the health sector in the future. It would probably be prudent, therefore, for governments to make one of the major uses of current funding an increase in the remuneration of health care providers rather than trying to provide more current health services. Due to the time required to change the supply of labour in the health sector, if governments wait until the situation is desperate, it will take years before Canadians feel a turnaround and that wait would take place while unacceptable conditions in the health sector persist. Clearly, it would be better to start waiting now, before serious pressures are felt.

Of course, as seen earlier in the paper, it is unclear how much wages and salaries would need to change in the health sector in order to generate sufficient change (which further suggests that the earlier governments start to figure it out, the better), but given the consequences of underestimating the required increase, it would be prudent to err on the high side, leaving room for adjustment later.

7 Federal Implications

Until now we have considered the policy implications for governments that are directly responsible for the provision of health services to Canadians. Given that health is mostly a provincial jurisdiction in Canada, these policy implications are most relevant to provincial governments, but also to the federal government in areas coming under its jurisdiction such as First Nations and Inuit health. In contrast, we consider in this section some cross-jurisdictional implications—that is, federal implications of ageing in areas of provincial jurisdiction.

This section operates from the framework known as “fiscal federalism”; that is, it asks what is the essential *federal* interest in ageing in areas of health that are under provincial jurisdiction. Before addressing this, it is worthwhile listing the criteria in this framework by which federal involvement in provincial areas is justified.

As is so often the case in economics, there are the twin, but sometimes opposing, criteria of efficiency and equity to be considered. The equity justification for government involvement in areas of provincial jurisdiction is to seek an equitable distribution of publicly provided goods among Canadians of different provinces. This is the motivation behind equalization payments, which seek to compensate for inter-provincial differences in the tax base and hence minimise the extent to which Canadians living in poorer provinces have lesser access to public services than those of richer provinces.

There are two aspects to the efficiency criteria. First, federal government intervention should seek to minimise the extent to which a provincial government has an incentive to take action that would benefit its own province by imposing greater costs on others. Second, federal intervention should seek to promote efficient inter-provincial migration, in which citizens choose the province where they will live based on their own preferences and the underlying opportunities available in each province, rather than on distortions created by an unequal distribution of government “goodies”.

As in so many areas of public policy, fiscal federalism will often involve trade-offs between equity and efficiency. For instance, equalization payments to poorer provinces can promote inter-provincial equity, but they reduce the incentives on those provinces to implement policies promoting economic growth (as higher provincial GDP will lead to an automatic reduction in federal transfers to the province), and they create a disincentive at the margin for citizens of poorer provinces to relocate to provinces where their productivity would be higher.

Now let’s consider these criteria in the context of federal policy with respect to ageing and the public health system.

First, note that, through equalization payments, CHST, and the *Canada Health Act*, the federal government is involved in the implicit contract that Canadian governments have made with the population to provide pay-as-you-go health care. That is, working-age Canadians have paid federal taxes to fund transfers to provinces that help finance health care expenditures that go disproportionately to older Canadians, and so can expect to similarly receive the benefit of such federal spending as they age.

The second thing to note is that the age distribution in Canada varies across provinces, and the differences are expected to widen. For instance, Saskatchewan and Manitoba have a relatively old population, but one that is not ageing quickly. In contrast, Newfoundland has a relatively young but rapidly ageing population. Such geographical differences in demographics are discussed in more detail in Moore and Rosenberg (1995) and Robson (2001).

By the equity criterion for federal involvement, the first of these points suggests that the federal government should be increasing the CHST to provinces as the country's population ages, over and above any other increases that would be justified by increasing costs, rising incomes, etc., because to do otherwise would deny current taxpayers the health care they have been led to expect for their senior years, thereby violating the implicit contract. The second point then suggests that, again by the equity criterion, these transfers should be tied in some way to the demographic situation of the province, with larger transfers being made to provinces with a relatively old population.

One can also justify a policy of demographically determined federal transfers by the efficiency criterion. A situation in which there was no federal involvement in financing provincial health expenditures would create incentives for individuals to locate in low-tax, low-health-expenditure provinces during their working years, and live their retirement years in high-tax and high-health-expenditure provinces. This distortion would probably be small and not sufficient to justify demographically determined federal transfers, but the point here is that, in this context, the efficiency criterion complements the equity criterion rather than implying a trade-off.

The implication of this analysis is that, if we accept the argument in the preceding sections that some amount of pre-funding is needed for the health system, then there is an automatic need for the federal government to pre-fund future increases in transfers to the provinces and to relate these transfers to demographics in some way. This recommendation, which has also been made by Robson (2001), among others, implies a major overhaul of the CHST. Robson also makes the point that in the absence of a pre-funded demographically based form of federal transfer, federal transfers for health could become highly efficiency reducing in the face of ageing. In Robson's words, "One danger is that, as provinces get into trouble one by one (from the health expenditure pressures created by ageing), the federal government will make repeated *ad hoc* deals for enriched transfers, creating incentives that discourage longer-term reforms".

A final point to note regarding the federal role with respect to ageing and the health system is that the federal government is currently in a stronger fiscal position than many provinces, and so is in a good position to lead by example in initiating some degree of pre-funding of the health system.

8 Concluding Remarks

The analysis presented in this paper has led to a fairly simple conclusion about how best to deal with population ageing and its impact on the health system—a conclusion which points to a course of action that is not as revolutionary as some who raise the spectre of ageing might recommend, but still implies taking the issue seriously and taking action now to forestall future problems. Insofar as the required course of action is not revolutionary, it should be possible to accomplish it with a minimum of disruption. What disruption there may be as a result of this course of action, however, will likely be more political than economic because the problems that arise from population ageing are certainly manageable from the point of view of Canada's finances, but they require governments to behave in a way that is not usually expected of them.

Specifically, the governments of Canada—and the voting public—must be convinced of the need to put future needs ahead of short-term consumption by dedicating current savings to future health expenditures, and by investing in health human resources rather than increasing current service levels. If governments fail to do so, there is a risk that population ageing will have a severe impact on the health system, which could have significant negative consequences for the health of Canadians well beyond the horizon contemplated here. The downward spiral in the health system that could occur if Canada fails to prepare for the years to come could take decades longer to reverse and be far more costly than to prevent. If, on the other hand, governments succeed in preparing for the future, the system should have enough flexibility to cope with the uncertainty that lies ahead, and thus they will have ensured that Canadians can count on Canada's health system to see them through the next forty years and beyond.

Overall, the conclusion of this paper is that the pressures likely to be placed on the health system by population ageing are real, but small enough to be easily managed. The notion that ageing is likely to cause the public health system to collapse has been thoroughly rebutted many times. The biggest danger posed by population ageing is that, in rejecting the apocalyptic scenarios of those who see ageing as a major problem requiring system reform, advocates of the ageing-is-not-a-problem view might encourage governments and the Canadian public to become too complacent and avoid taking action now at a time when it would be relatively easy to do so.

Notes

1. Provincial and Territorial Ministers of Health (2000).
2. The health expenditure data used in this paper come from the National Health Expenditures Database compiled by Health Canada.
3. The projection used here is one that we were involved in constructing at Health Canada. It is described in the briefing notes that constitute Health Canada (2002). The reason for using this projection rather than a more widely cited one such as CIHI (2000) is partly that the results presented here rest on a common set of demographic assumptions and are internally consistent, and partly that the Health Canada projection includes a decomposition of the ageing effect into fertility and mortality components, which is important for the policy implications one draws from the results. It is important to note, however, that all demographic projections of current expenditure patterns produce pretty much the same numbers: The debate about the importance of ageing is over how the expenditure patterns themselves are expected to evolve and over the interpretation of the results of a simple projection, not over the projections themselves.
4. Direct evidence from Medicare data in the U.S. suggests that expenditures on people in their last year of life is between 4 and 11 times that on non-decedents (Scitovsky 1994). This is about a quarter of the magnitude estimated by Hogan and Pollock.
5. The data come from the System for Health Area Resource Planning (SHARP) model.
6. These results are contained in Srivastava (2002). It is interesting to compare this supply-side analysis to the demand-side analysis of Denton, Gafni and Spencer (2002), who look at the effect of demographics on physician demand in Ontario. Their conclusion is that the increase in demand for physicians is likely to slow down in the coming decades as the effect of ageing is more than compensated for by a slowdown in the rate of population growth. The slower population growth, however, is unlikely to alleviate pressures on the labour market, as it is also a key determinant of labour supply.
7. For an analysis of the importance of GDP growth to wage and salary growth in the health sector and the relative importance of that factor in total health expenditure growth, see Ariste and Carr (2001).

References

- Ariste, Ruolz, and Jeff Carr. 2001. "Health Human Resources – Cost Driver of the Canadian Health Care System". Paper presented to the Canadian Economics Association Annual Meetings, June 2001.
- Baumol, William J., and William G. Bowen. 1966. *Performing Arts—The Economic Dilemma*. New York: Twentieth Century Fund.
- Baumol, William J. 1993. "Health Care, Education and the Cost Disease: A Looming Crisis for Public Choice". *Public Choice* 77, 17-28.
- Canadian Institute for Health Information (CIHI). 2000. *National Health Expenditure Trends: 1976-2000*. Ottawa: Canadian Institute for Health Information.
- Chan, Ben. 2002. *From Perceived Surplus to Perceived Shortage: What Happened to Canada's Physician Workforce in the 1990s?* CIHI Report. Ottawa: Canadian Institute for Health Information.
- Chen, J., and W.J. Millar. 2000. "Are Recent Cohorts Healthier than their Predecessors?" *Health Reports* 11 (4), 9-24.
- Denton, Frank T., and Byron G. Spencer. 1995. "Demographic Change and the Cost of Publicly Funded Health Care". *Canadian Journal on Aging* 14 (2), 174-92.
- Denton, Frank T., Amiram Gafni and Byron Spencer. 2001. "Population Change and the Requirements for Physicians: The Case of Ontario". *Canadian Public Policy—Analyse de Politiques* XXVII (4), 469-85.
- Evans, Robert G., et al. 2001a. "Apocalypse No: Population Aging and the Future of Health Care Systems". *Canadian Journal on Aging* 20 (suppl.1), 160-91.
- Evans, Robert G. et al. 2001b. "Apocalypse Regained, A Note to Accompany Apocalypse No: Population Aging and the Future of Health Care Systems", <http://www.chspr.ubc.ca/Apocalypse-Regained.htm>.
- Health Canada. 2002. "Briefing Notes on Aging". (Forthcoming at the Health Canada web site <<http://www.hc-sc.gc.ca>>).
- Hébert, Réjean. 2002. "Research on Aging: Providing Evidence for Rescuing the Canadian Health Care System, Brief Submitted to the Commission on the Future of Health Care in Canada", May 28 (forthcoming in *Canadian Journal on Aging*, September 2002).
- Hogan, Sarah. 2002. "Chronic Conditions in an Aging Society". In: Health Canada. 2002. *Briefing Notes on Aging*.
- Hogan, Seamus, and Allan Pollock. 2001. "Why Does Health Care Utilization Increase With Age: The Cost of Living or the Cost of Dying?" Paper presented to the Canadian Economics Association Annual Meetings, June 2001. (earlier version available at <http://www.chera.ca/program.html>).

*How Will the Ageing of the Population Affect Health Care Needs and
Costs in the Foreseeable Future?*

- Hollander, M.J., and N.L. Chappell. 2001. *Final Report of the Study on the Comparative Cost Analysis of Home Care and Residential Care Services*. National Evaluation of the Cost Effectiveness of Home Care, Victoria (B.C.).
- Martel, Laurent, and Alain Bélanger. 1999. "An Analysis of the Change in Dependence-Free Life Expectancy in Canada between 1986 and 1996". *Report on the Demographic Situation in Canada. Current Demographic Analysis*. Ottawa: Statistics Canada, 164-83.
- Mérette, Marcel. 2002. "The Bright Side: A Positive View on the Economics of Aging". *Choices* 8(1), Institute for Research on Public Policy.
- Moore, E.G., and M.W. Rosenberg with D. McGuinness. 1997. *Growing Old in Canada: Demographic and Geographic Perspectives*. Ottawa and Toronto: Statistics Canada and ITP Nelson.
- Provincial and Territorial Ministers of Health. 2000. *Understanding Canada's Health Care Costs: Final Report*. August 2000. http://www.gov.on.ca/health/english/pub/ministry/ptcd/ptcd_doc_e.pdf.
- Robson, William. 2001. "Will the Baby Boomers Bust the Health Budget? Demographic Change and Health Care Financing Reform". *Commentary* 148, C.D. Howe Institute.
- Scitovsky, A. 1994. "'The High Cost of Dying' Revisited", *Milbank Quarterly* 72, 561-91.
- Srivastava, Divya. 2002. "Aging and the Future Supply of Physicians in Canada". In: Health Canada. 2002. *Briefing Notes on Aging*.