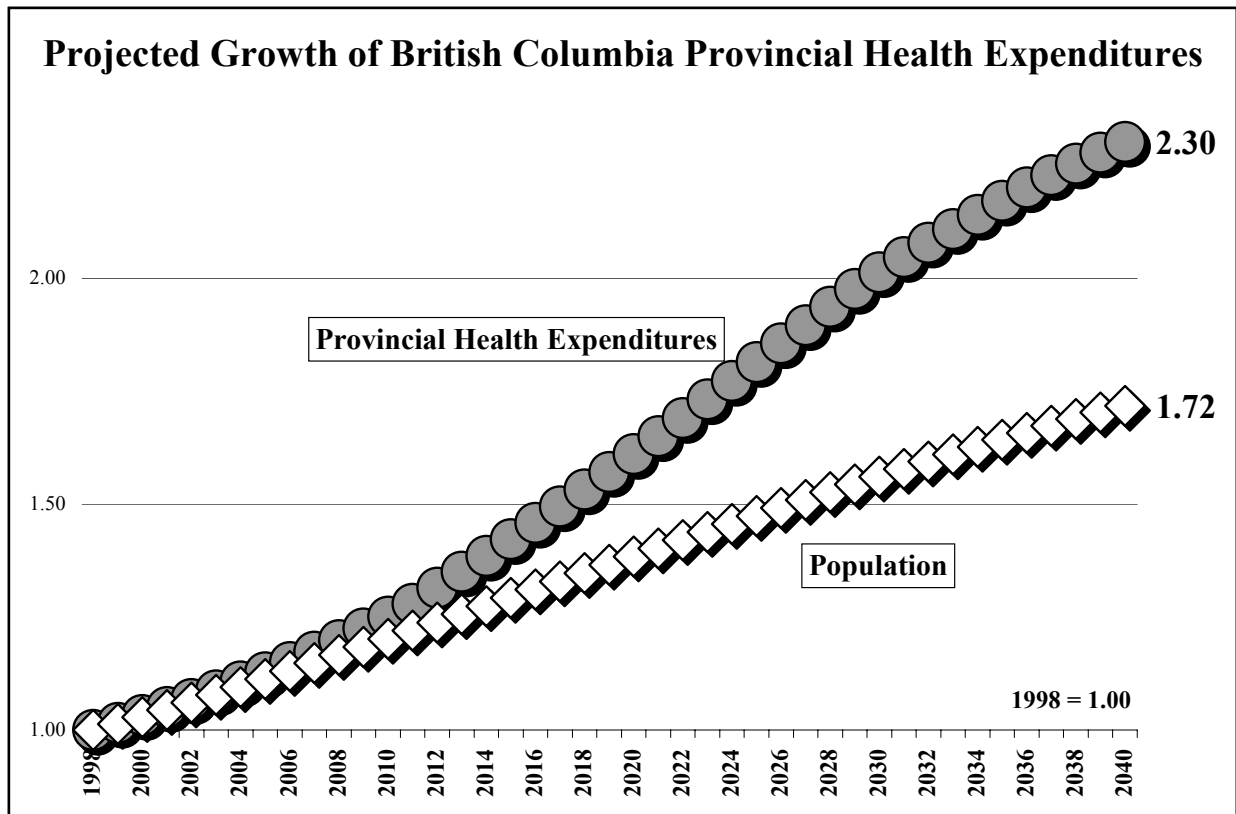


The Urban Futures Institute

Research on Population, Community Change and Land Use

Without Care? Demographics and Health Spending in British Columbia, 1999 to 2040

By David Baxter and Jim Smerdon



The Urban Futures Institute Report 37

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The Urban Futures Institute

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Without Care? Demographics and Health Spending in British Columbia, 1999 to 2040

By David Baxter and Jim Smerdon

July 1999

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Without Care?

Demographics and Health Spending in British Columbia, 1999 to 2040

By David Baxter and Jim Smerdon

Summary

The continuation of current age specific patterns of provincial health expenditures and the inevitable aging of the province's population lead irrefutably to the conclusion that real provincial health expenditures in BC will increase by almost twice the increase in the province's population over the coming decades. This situation can only be avoided if population growth due to migration of young workers to the province increases dramatically or age specific per capita spending declines dramatically. As neither of these are likely to occur, the discussion of health expenditures must turn from the current divisive debates about "how to cut" to development of an inclusive process to find strategies that will show us "how to pay" for the level of health that the people of BC aspire to.

Projections based on empirical evidence show that, given current trends, for every person in the province today, there will be 1.72 people in 2040: without inflation or increases in consumption of health commodities, for \$1.00 spent on health by the provincial government, there will be \$2.30 spent in 2040. Population growth and change alone will increase provincial government spending on health from 1998's \$7.8 billion dollars to \$18.0 billion in 2040, implying an average rate of increase in constant dollars of 2% per year. Real per capita spending is projected to increase by 35%, from \$1,950 in 1998 to \$2,635 in 2040, growing at an average of 0.7% per year.

The aging of the war and post war babies over the next four decades will result in spending on the 65 plus age group increasing from its current 54% of total provincial spending to 68% by 2040. Spending on all other age groups will decline as a share of total spending, from 16% to 14% for the 45 to 64 age group, from 24% to 15% for the 15 to 44 age group, and from 5% to 3% on the 0 to 14 age group.

While the share of provincial health spending on the under 65 age groups will decline, absolute spending will not. In 1998, \$401 million was spent on the 0 to 14 age group: by 2021, this will have increased to \$478 million (constant 1998 dollars), and by 2040 to \$553 million. Spending on the 15 to 44 age group will also increase, from \$1.9 billion in 1998 to \$2.3 billion in 2021, and \$2.7 billion in 2040. Spending on the 45 to 64 age group will increase by a greater percentage, from 1998's \$1.3 billion to \$2.1 billion in 2021, and \$2.8 billion in 2040.

These increases all pale in contrast to the increase in spending on the 65 plus age group. In 1998, provincial health spending on this age group totaled \$4.3 billion: by 2021, under the assumption of constant age specific health per capita spending and in constant dollars, total spending on the 65 plus age group will be \$8.0 billion – the same amount that is currently spent on all age groups in the province. Aging will mean that every year from 2021 on, the provincial health budget for people 65 and older will be greater – in constant dollars – than its total health budget is today.

"Can we afford this increase in provincial health expenditure?" The answer is a qualified "Yes" - if BC's economy expands in real terms by an average of 1.9% per year over the next decade, and an average of 2.5% per year in the following decade. This should be easy – the required growth is well below the 6.4% average real growth in GDP of the 1960s, below the 4.8% per year growth of the 1970s, and even below the 3.7% per year average of the recessionary 1980s. We cannot afford it at the rate of economic growth of the past decade. The 1.6% per year growth that the province's economy has average since 1990, and most certainly the 0.8% it has averaged since 1995, are not good enough. Without better economic performance in the province over the coming decades than we have had in the past one, the answer will be "No, British Columbia cannot afford the health care costs of its aging population!"

Without Care?

Demographics and Health Spending in British Columbia, 1999 to 2040

By David Baxter and Jim Smerdon

July 1999

I. Introduction

This report presents a demographics based projection of British Columbia provincial government expenditures on health using its current age specific expenditure patterns. It is a companion report to two reports previously published by The Urban Futures Institute: Healthy Choices: Demographics and Health Spending in Canada, 1980 to 2035¹ (a projection of health expenditures by sector and type of expenditure in Canada as a whole) and Six and a Quarter Million People: British Columbia's Population in the Next Three Decades², a trend age and sex specific population projection for the province.

This report builds on its companions to show the impact growth and change of the province's population will have on provincial government health expenditures over the coming decades assuming there are no changes to the current age specific pattern of expenditure. The report does not argue that demographics are destiny, nor that demographics explain two thirds of everything. Social systems and services are much more complex than the current wave of demographic ideologues can even imagine, and there is a lot more to be considered in plans and policy with respect to aspects of social systems and services than demographics.

This report simply argues that in our consideration of plans and policies for aspects of social systems and services we must not forget to consider the important role of demographics. The report presents what would happen to BC provincial government health expenditures over the next 40 years if the only factor affecting change was demographics: it shows that the other forces that shape health expenditures are going to have to change significantly in order to offset a dramatic increase in expenditures that otherwise would occur as a result of demographics.

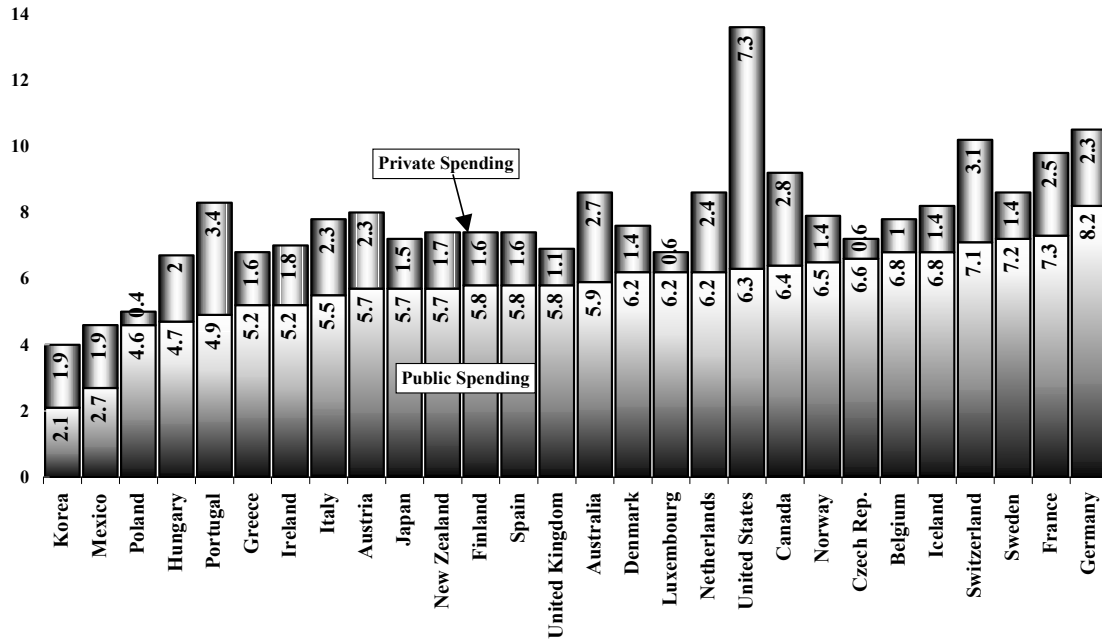
II. Overview

a. The National Context

Health expenditures are a significant component of Canada's economy, accounting for 9.2% of the country's gross domestic product in 1997 (Figure 1)³. This is higher than the OECD average of 7.8%: Canada's 9.2% share is the 5th highest in the OECD. The only OECD countries with a higher proportion of their GDP spent on health are France (9.8%), Switzerland (10.2%), Germany (10.5%) and the United States (13.6%). Unlike the others in the top 5, Canada's health expenditures as a percentage of GDP have fallen (from 10.1% in 1993, when Canada had the second highest percent value), while in the other countries they have increased.

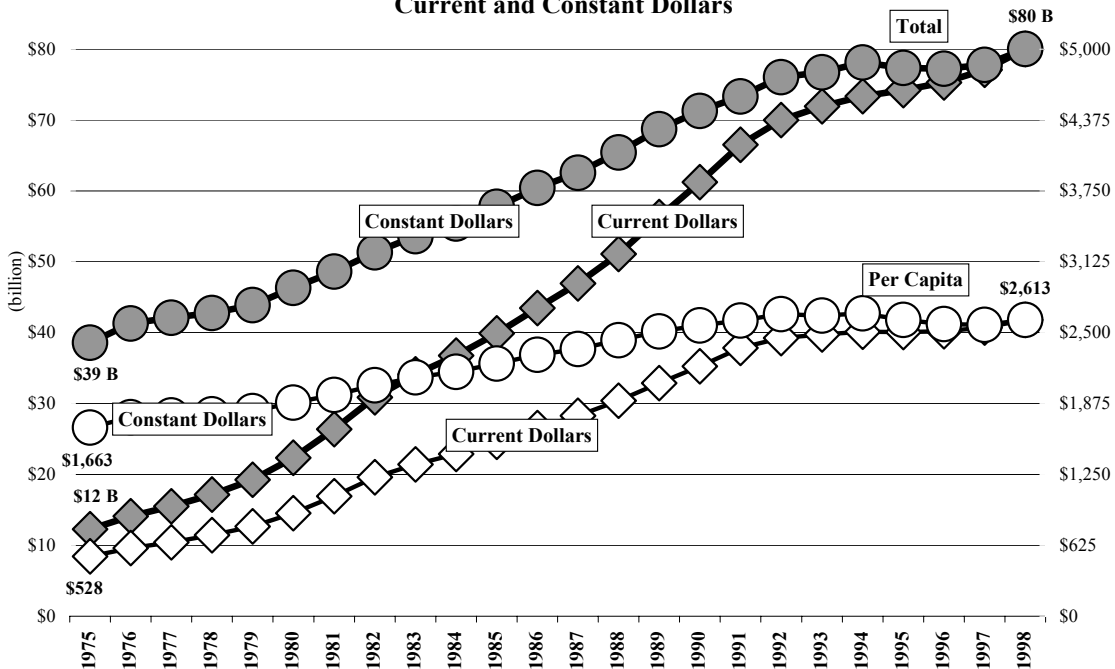
Public health expenditures in Canada account for 6.4% of GDP, approximately the same as their 6.3% share in the United States, and lower than the 7.3% in France, 8.2% in Germany, and 7.1% in Switzerland. The major difference between health care expenditures in Canada and the United States is not the level of public health care expenditure (both are just under 6.5% of GDP), but rather the additional level of private expenditure, which at 7.3% of GDP in the United States exceeds public expenditure, while in Canada private expenditure is less than half of public expenditure (2.9% of GDP for private compared to 6.4% for public expenditure).

Figure 1: Health Spending as a Percentage of GDP, OECD Countries, 1996



Health expenditures in Canada increased dramatically (more than 6-fold) over the past twenty-five years, from \$12.3 billion in 1975 to \$80.0 billion in 1998, at an average annual rate of increase of 8.5% (Figure 2)⁴. Part of this increase was due to population growth: the population of Canada increased by seven and a half million people (33%) over the past 23 years.

Figure 2: Total and Per Capita Health Expenditure in Canada, 1975 to 1998
Current and Constant Dollars



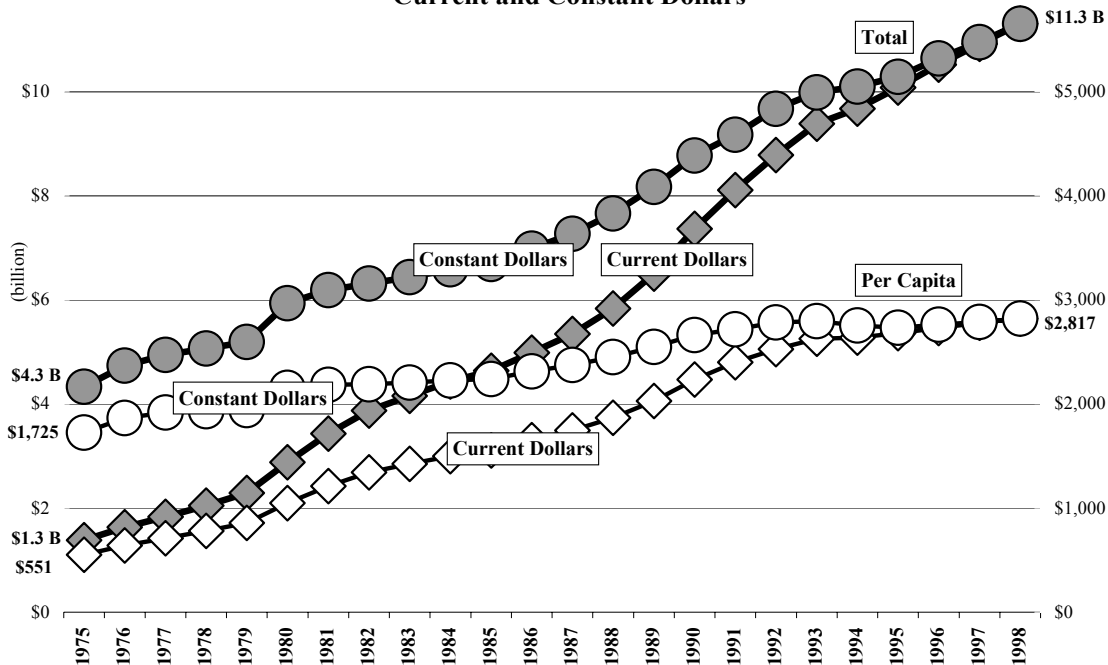
Using per capita expenditures adjusts total health expenditures for population growth: per capita expenditures have also increased dramatically, from \$528 per person in 1975 to \$2,613 per person in 1998, still an impressive 5 fold (7.2% per year) increase. Population growth, therefore, accounted for a relatively small portion of the overall increase. Adjusted for inflation in consumer prices and population growth, health spending showed a more modest increase, with per capita expenditures in constant 1998 dollars increasing from \$1,663 per person in 1975 to \$2,613 in 1998, a 1.57 times (2% per year) increase⁵.

Modest or not, health expenditures in Canada have increased faster than both the population and inflation. The increase in real per capita expenditures have been the result of inflation in health costs that are above the average for consumer prices, increases in consumption of health goods and services, and the aging of the country's population. The relative importance of these changes in health expenditures are discussed in detail in the companion Healthy Choices report⁶.

b. Health Expenditures in British Columbia, 1975 to 1998

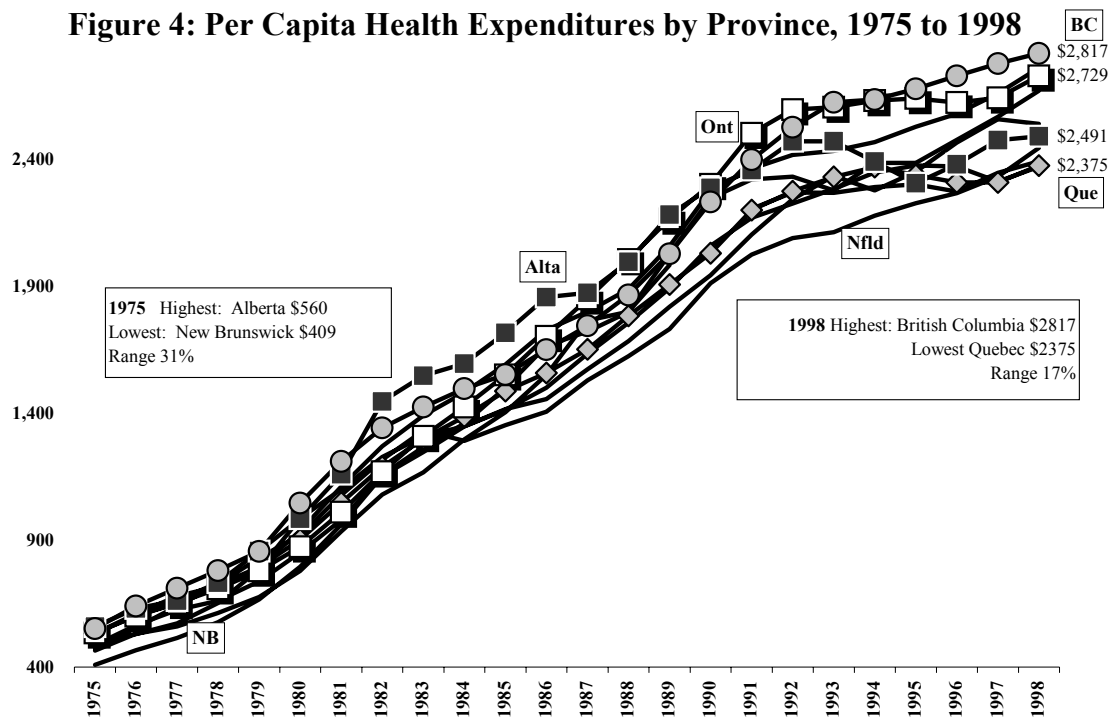
Health expenditures in British Columbia have also increased dramatically since 1975, rising more than 8-fold from \$1.38 billion in 1975 to \$11.3 billion in 1998 (an average annual increase of 9.6% per year)⁷. Given BC's rapid population growth over this period (60%, averaging 2.1% per year), consideration of per capita expenditure is particularly important. Per capita expenditures in current dollars increased 5-fold, from 1975's \$551 per person to 1998's \$2,817 (a 7.3% per year increase). In constant 1998 dollars, real per capita expenditures increased from \$1,725 per person in 1975 to \$2,817 in 1998: there was a 2.2% increase per year in real per capita health expenditures in British Columbia between 1975 and 1998.

Figure 3: Total and Per Capita Health Expenditure in British Columbia, 1975 to 1998
 Current and Constant Dollars



Comparing per capita health expenditures in British Columbia to those of other provinces is a natural response to having the data to do so. Note, however, that such comparisons will simply provide contexts for, not conclusions to, discussions about relative health expenditures in BC, given both the nature of the data and the differences in populations in Canada's regions.

In both 1976 and 1998, British Columbia had the highest per capita health expenditures of Canada's ten provinces: between these years, it exchanged the lead several times with both Ontario and Alberta. Looking first at the overall pattern of per capita expenditures, it is useful to compare 1975 to 1998. In 1975, there was a 31% range in per capita health expenditures from Alberta's high of \$560 per capita to New Brunswick's low of \$409 per capita⁸. By 1998, the width of the range had been cut in half, to the 17% between British Columbia's high of \$2,817 to Quebec's low of \$2,375. In 1998, there was only a 5% range – a difference of \$146 per person – between the top four, from BC's \$2,817 per person, past Manitoba's \$2,760 and Ontario's \$2,729 to Saskatchewan's \$2,671 per person.



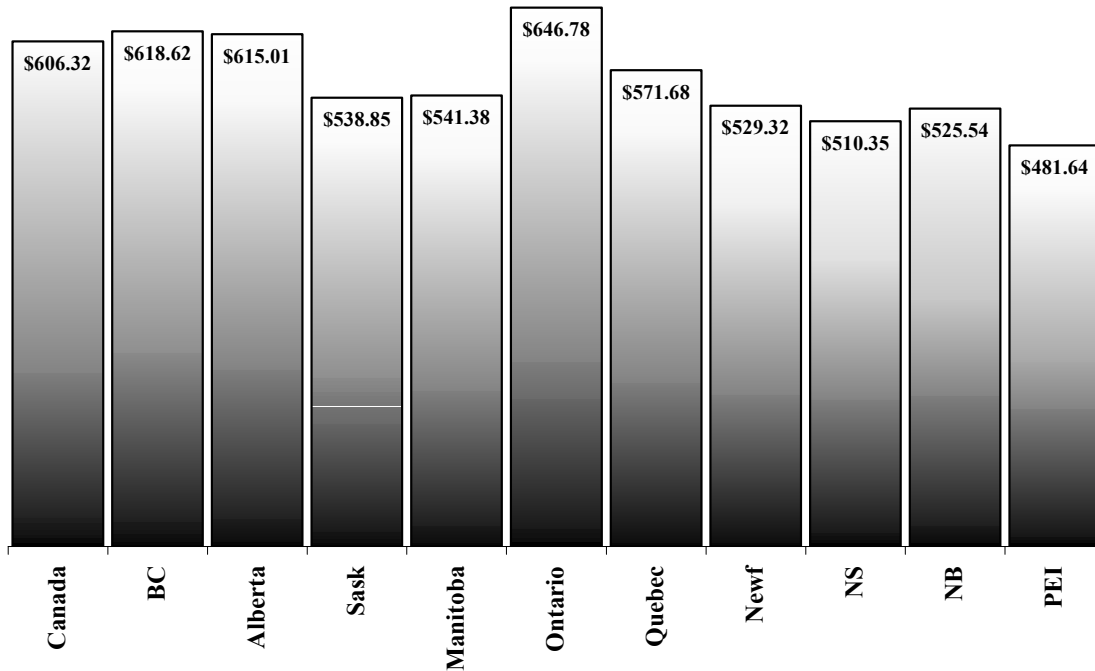
The range narrowed because the greatest increases in per capita health expenditures were in the provinces with below average per capita expenditures in 1975: New Brunswick recorded a 480% increase between 1975 and 1998, Saskatchewan a 449% increase, and Manitoba, Newfoundland and Nova Scotia increases of 415% to 419%. In contrast, 1975's high per capita expenditure provinces recorded below average increases: BC and Ontario increased by 411%. As exceptions to the rule, per capita expenditures in Alberta and Quebec increased by only 345%.

Any discussion of the differences between provincial per capita health expenditures must address the fact that they are converging. Standardization of health practices and standards and a shared national labour force all work to encourage convergence in health expenditures. With Ontario having Canada's highest weekly earnings, and BC and Alberta tied in second place, it is not surprising that these provinces have generally had the highest per capita health expenditures, and that their expenditure patterns have generally moved together.

Generally does not mean always or entirely. From 1990 to 1992, Ontario pulled away from the tie for first place that it shared with Alberta from 1987 to 1990. By 1993, Alberta turned from slower growth to a decline in per capita expenditure, something unprecedented in the 1975 to 1992 period. This decline continued to 1994, but since then per capita health expenditures in Alberta have been increasing roughly at the same rate as they have been in other provinces. This again shows that the forces driving increasing per capita health care expenditures are both strong and common across the country.

Having pointed out this similarity of per capita health expenditures in Canada's provinces, it is important to note that there will always be differences between them, for reasons that lie on both the supply and the demand side of health expenditures. On the supply side, labour costs and costs of living are not the same across Canada. In 1998, average weekly earnings in the provinces of Canada ranged from a low of \$481.64 in Prince Edward Island to a high of \$646.78 in Ontario⁹, a 30% range that was greater than the 17% range that prevailed in 1998 health costs per capita (Figure 5).

Figure 5: Average Weekly Earnings, Canada and the Provinces, 1998



On the demand side, differences in geography and demography also have an impact on health expenditures. In terms of geography, is not unreasonable to expect that Saskatchewan, with the highest mean distance from a doctor (8.3 kilometers, Figure 6), will have a higher per capita health expenditure than Quebec (where the mean distance to a doctor is only 2.0 kilometers)¹⁰.

Another demand issue is the age composition of the population in each province. As is discussed in great deal in following sections, per capita health expenditures are significantly correlated with age: 6% of life time health expenditures in Canada occur in the first 15 years of life, 18% in the 30 years from age 15 to 44, 18% in the 20 years from 45 to 64, and 58% after one's 65th birthday¹¹. A province with a young population will have, all other things equal, lower per capita health care cost than one with an older population even if age specific costs are identical. In Alberta, 71% of the population is under the age of 45, giving it Canada's youngest population

(Figure 7)¹²: even if there were no differences between provincial health systems, Alberta would have Canada's lowest health care costs. British Columbia, with 12.8% of its population 65 and older compared to Alberta's 9.9% (the smallest percentage in Canada), would have higher per capita health care costs than Alberta even if the two provinces were otherwise identical.

Figure 6: Average Distance to Nearest Physician, Canada and the Provinces, 1998 (km)

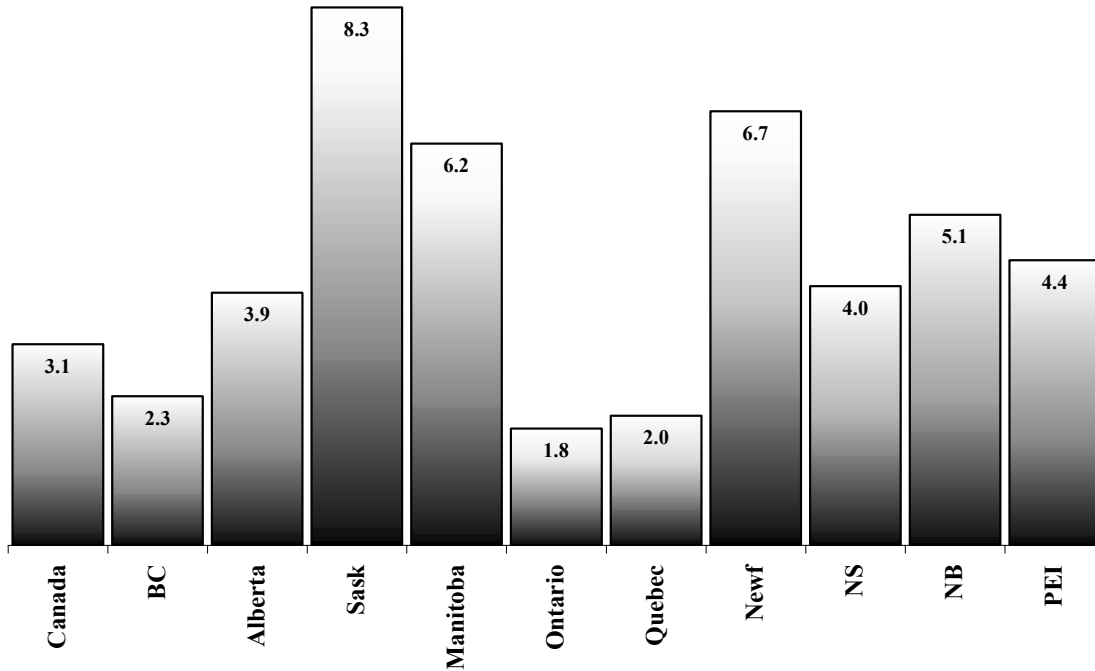
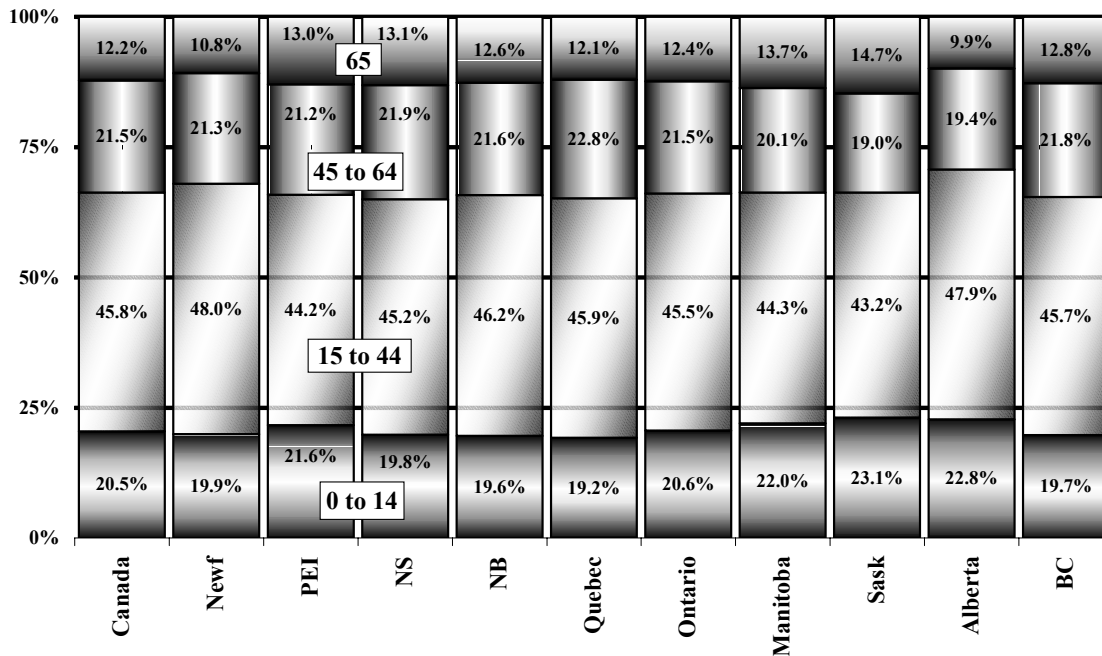


Figure 7: Percent of the Population by Age Group, 1996
 Canada and the Provinces



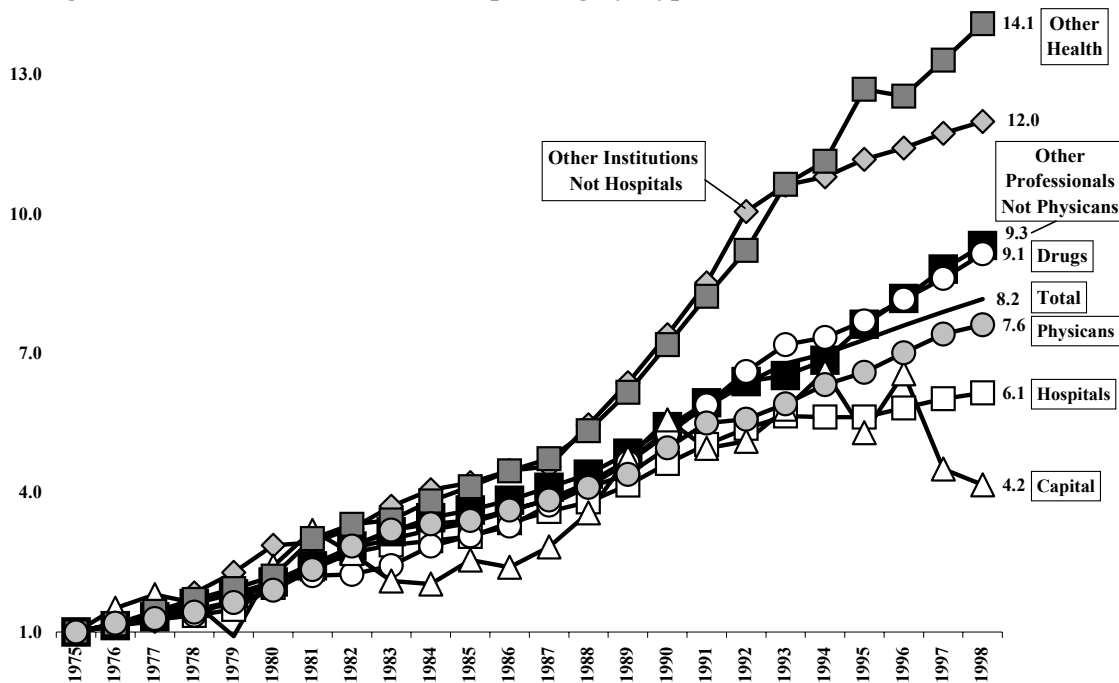
The conclusion is that the usefulness of comparisons of provincial health expenditures is extremely limited, as they address neither the value (as contrasted with the cost) nor the characteristics of supply and demand. Without objective standard measures of the effectiveness of health care applied in all provinces, such comparisons provide no useful information about either health or expenditures. If higher per capita expenditures mean a healthier population, they may be justified: if they do not then they may not be. Similarly, if they result from different age compositions or costs of living, then they may be justified. There are currently no standardized measures of the “value for money” of health care in Canada’s regions, and hence any judgments about “better” or “worse” systems are, at best, suspect as to both value and purpose.

Before examining the relationship between demographics and health expenditures, it is useful to finish the review of trends in health expenditures in BC. There are two dimensions of health expenditure that published data permit us to consider: the first is the type of commodity or service the money is spent on; the second is the sector (public or private) spending the money.

c. Health Expenditures by Type in British Columbia, 1975 to 1998

Total health expenditures increased 8.2 times in British Columbia between 1975 and 1998 (Figure 8). The increases, however, were not uniform across all expenditure categories. Below average increases were recorded in expenditures for capital (a 4.2 times increase), hospital operation (a 6.1 times increase), and physicians (7.6 times increase)¹³.

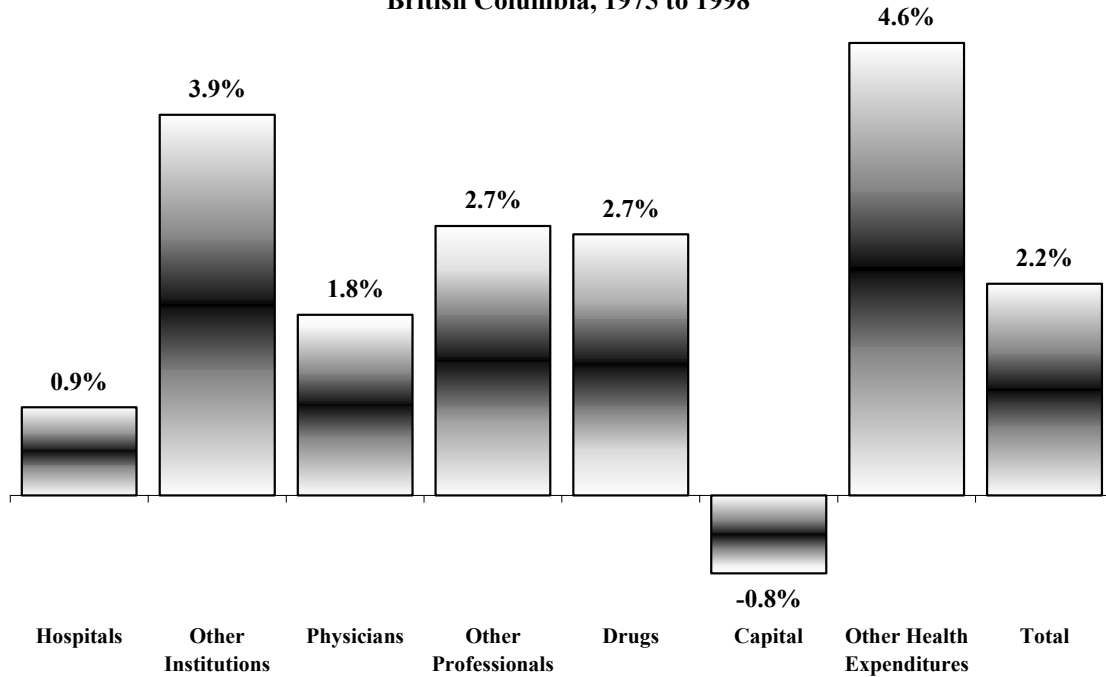
Figure 8: British Columbia Health Spending by Type, 1975 to 1998, Indexed to 1975



Above average increases were recorded for expenditures on Drugs (9.1 times increase), professionals other than physicians (9.3 times), health institutions other than hospitals (12 times), and a whopping 14.3 times increase on the "left over" category of Other Health spending (home care, medical transportation, hearing aids and other appliances and prostheses, public health, prepayment administration, health research, and miscellaneous health care).

Adjusting for population growth and increases in the consumer price index shows the wide range of real per capita increases that have occurred in types of health expenditures in the province (Figure 9). Constant dollar per capita expenditures on Hospitals increased at the rate of 0.9% per year, on Physicians by 1.8% per year, and on Capital declined by 0.8% per year. Above average rates of increase ranged from the 2.7% per year increase in constant dollar per capita expenditures on Drugs to the 4.6% per year increase on Other Health Expenditures.

**Figure 9: Average Annual Increase in Expenditure by Type, Per Capita in Constant Dollars
 British Columbia, 1975 to 1998**



Growth in all expenditure categories in BC was relatively similar from 1975 until 1988, when the big growth in the Other Institutions and Other Health Expenditure categories occurred: from 1989 to 1994, expenditures on these categories almost tripled. From 1994 on, expenditure on the Other Health Expenditure category continued almost unabated, while spending on Other Institutions slowed to the general rate of growth experienced in the rest of the health sector.

These differential growth rates have brought significant change to the distribution of health expenditures in the province (Figure 10). In 1975, 18% of health expenditures in the province were on Physicians, 39.8% were on Hospitals, and 3.8% were on additions to the Capital stock of health facilities in the province. By 1998, these shares had declined to 16.8% on Physicians, 29.9% on Hospitals, and 1.9% on Capital. These three traditional components of health care fell from 62% of the total to only 49% over the past 23 years.

In contrast, expenditures on Other Institutions increased from 7.6% to 11.1%, on Other Professionals from 12.1% to 13.8%, on Drugs from 9.8% to 11.0%, and on Other Health Expenditures from 9.0% to 15.5%. These four components increased their share from 38% to 51% of total health expenditures.

The largest increase (a 14.1 times increase) in health expenditures was on Other Health Expenditures, whose share increased from 9.0% to 15.5% of total health expenditures, placing it in third place just behind physicians in terms of share of total expenditures. Given the diversity

of expenditures that are in the 'other' group, it would be most informative to examine which is causing this growth. Unfortunately, the detailed data for components of this expenditure category are not published for British Columbia. Examining the national data does cast some light on what has caused this growth to occur¹⁴.

Figure 10: British Columbia Percentage Distribution of Total Health Spending, 1975 to 1998

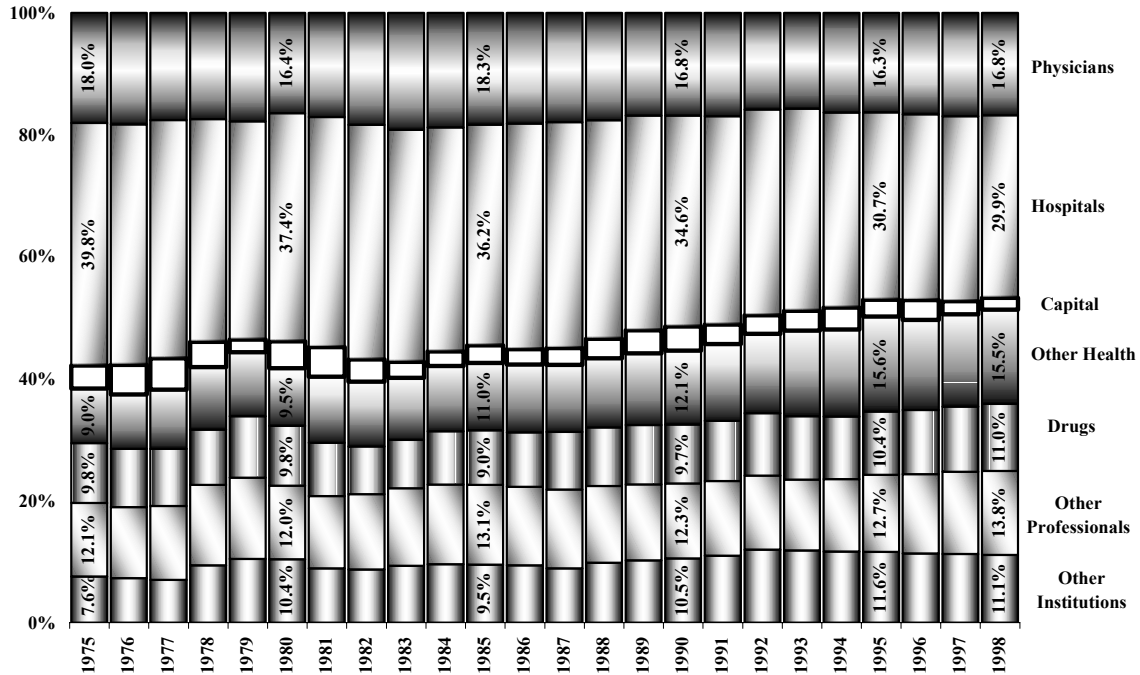
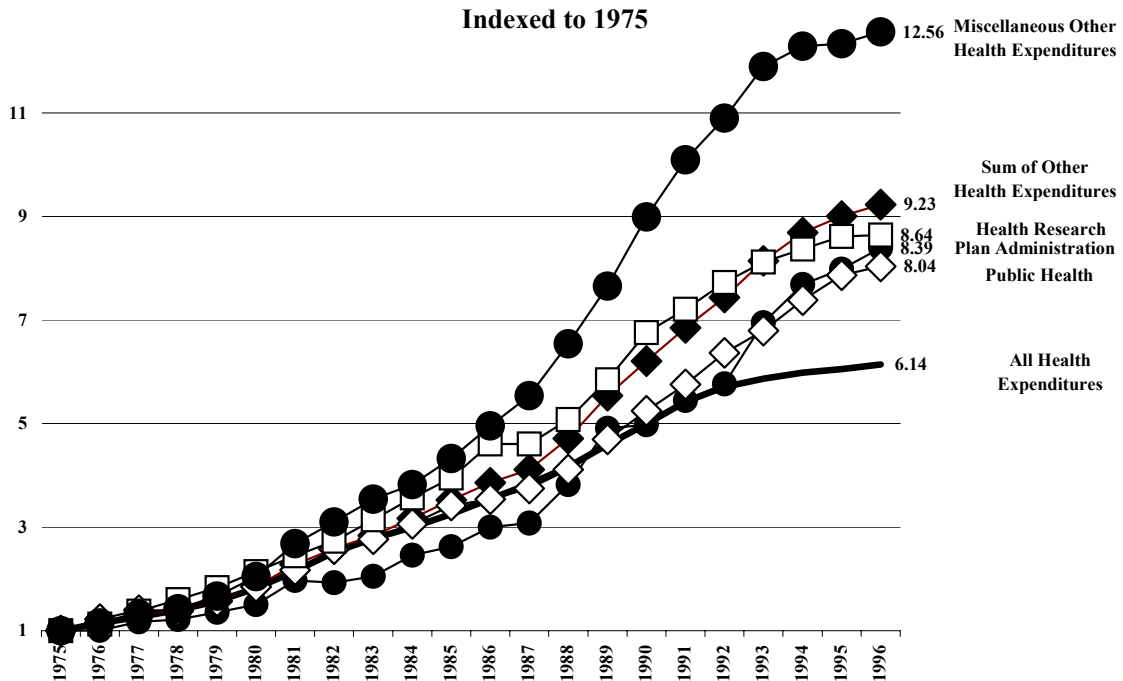


Figure 11: Components of "Other Health Expenditures", Canada, 1975 to 1996



At the national level, expenditures in this “other” category increased 9.23 times between 1975 and 1996, 50% more than the 6.14 times increase in total health expenditures (Figure 11): in BC Other Expenditures increased 12.5 times from 1975 to 1996, 60% more than the 7.6 increase in total expenditure. Public health, plan administration, and research expenditures all increased by between 8 and 8.64 times over the period, faster than the increase in total health expenditures, and much faster than expenditures on physicians (5.8 times) and hospitals (4.7 times).

The most rapid increase, taking it from 23% of other health expenditures to 32%, was for Miscellaneous Other Health Expenditures, which includes home care, ambulances, eyeglasses, hearing aids, health appliances, unspecified services, miscellaneous health care, and other private health care. Unfortunately the existing data do not permit identification of which of these are the rapidly increasing ones. Data for the 1975 to 1992¹⁵ period indicate that the big increases were in home care (a 23 times increase per capita), health appliances (23.5 times increase), and hearing aids (21 times), compared to a 6 times increase in Other Expenditures, and a 4.7 times increase in all health expenditures per capita. Given this sector’s increase in share of health expenditures in BC, it will be important to have greater detail on what is causing its dramatic growth: this will be particularly significant where the growth is a shift from one type of spending (for example, on hospitals) to another (for example, to home care).

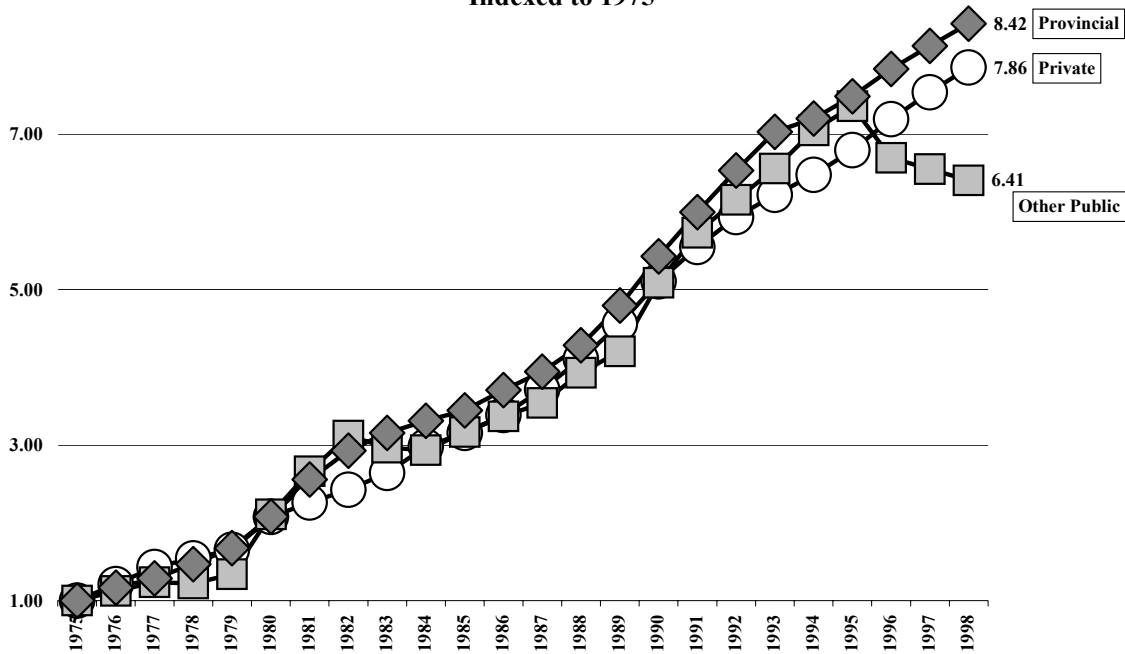
d. Health Expenditures by Sector in British Columbia, 1975 to 1998

The second dimension of health expenditures is by the sector making the expenditure. Total health expenditure is comprised of expenditures by provincial governments, other governments, and by the private sector¹⁶. Provincial expenditures are primarily on insured health and extended care systems, but also include numerous expenditures outside of these programs (e.g., public and environmental health). In 1998, provincial government spending of \$7.8 billion accounted for 69.2% of total health spending in the province, up slightly from its 67.1% share in 1975.

Other government expenditures include those of the federal government (for the First Nations, military, and veteran’s population; on immigration medical examinations; and on the research, protection and care programs of Health Canada), provincial workers’ compensation boards and agencies (prevention, care and rehabilitation services), and municipal governments (building and operating hospitals, municipal public health programs, immunization clinics and environmental health programs). The \$424 million spent by other governments in BC on health in 1998 accounted for 4.0% of total expenditures, down from 4.8% in 1975.

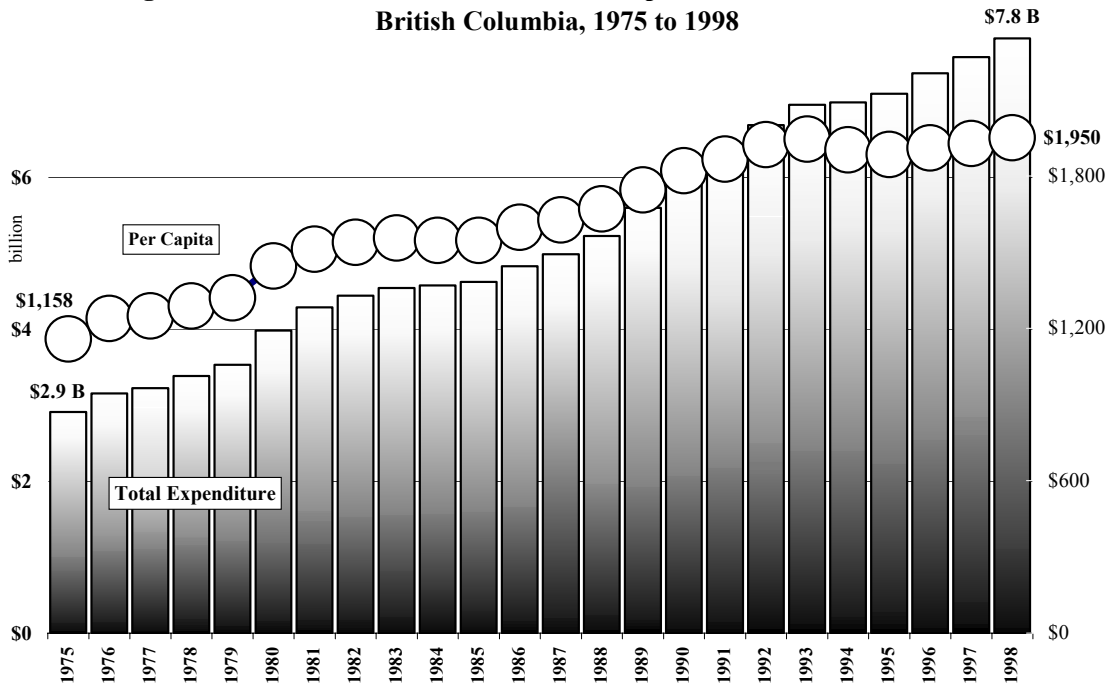
Public sector health spending accounted for 73% of all health spending in BC in 1998, up slightly from 72% in 1975. Private expenditures of \$3.1 billion in 1998 accounted for 27% of total health expenditure. Private health expenditures are **a**) those made by individuals on their own behalf to pay for health goods and services that are not paid for either in full or in part by public or private health insurance and **b**) those made on behalf of individuals by private health insurers, employers and other non-government agencies. Private health expenditures (both by individuals and for them by private insurers and agencies) are primarily for drugs, other professionals (private spending on dentists accounts for 93% of all spending on dentists and 75% of all spending on medical professionals other than physicians in Canada), other expenditures (half of which is on eyeglasses), hospitals and other institutions. [For discussion of national type of spending by sector, see [Healthy Choices](#)¹⁷: data by type and sector for health expenditures in British Columbia are not published].

Figure 12: Health Expenditures By Sector in British Columbia, 1975 to 1998
 Indexed to 1975



Public sector expenditures increased 8.3 times over the 1975 to 1998 year period, compared to a 7.9 times increase in private sector expenditures (Figure 12). Part of the increase in provincial expenditures from 1995 to 1998 was the result of it replacing local health departments with regional health board, as is shown in the drop in other government health expenditures.

Figure 13: Provincial Government Health Expenditure in Constant Dollars
 British Columbia, 1975 to 1998



Provincial government health expenditure in constant 1998 dollars (Figure 13) increased by 169% (2.69 times) from \$2.9 billion dollars in 1975 to \$7.8 billion in 1998. Adjusting for population growth, per capita constant dollar provincial government expenditure on health increased from \$1,158 in 1975 to \$1,950 in 1998. This increase of 68% in real provincial health expenditures was the result of aging of the province's population (in 1975 29% of the province's population was 45 or older while in 1998 35% was in this higher per capita spending age group), inflation in health expenditures exceeding those of other consumer prices, and real increases in the consumption of health goods and services).

To close this section on trends in health spending in British Columbia, it is appropriate to consider provincial health spending in relationship to the provincial GDP. Since 1995, provincial health expenditures as a percentage of GDP have increased steadily, from 6.6% in 1995 to 7.2% in 1998, and total public sector health expenditures have increased from 7.1% to 7.6% of GDP (Figure 14). Total public health expenditures in this period increased by between 3.2% and 3.8% per year (Figure 15).

The increase in the ratio of public sector health expenditures to GDP in BC is not simply the result of increases in health expenditures. GDP grew very slowly (by 1.0% in 1995-1996, and 3.3% in 1996-1997), and declined in 1998, by 0.3% in constant dollars and 0.5% in real terms (Figure 15). With a growing and aging population, health expenditures will increase as a percentage of GDP whenever the economy is growing slowly or shrinking. Many of the current debates about health spending in British Columbia arise not from health spending *per se*, but rather from the very poor performance of the provincial economy since 1995. It is the shrinking of the pie since 1995 that has given rise to much of the discussion of how it is divided.

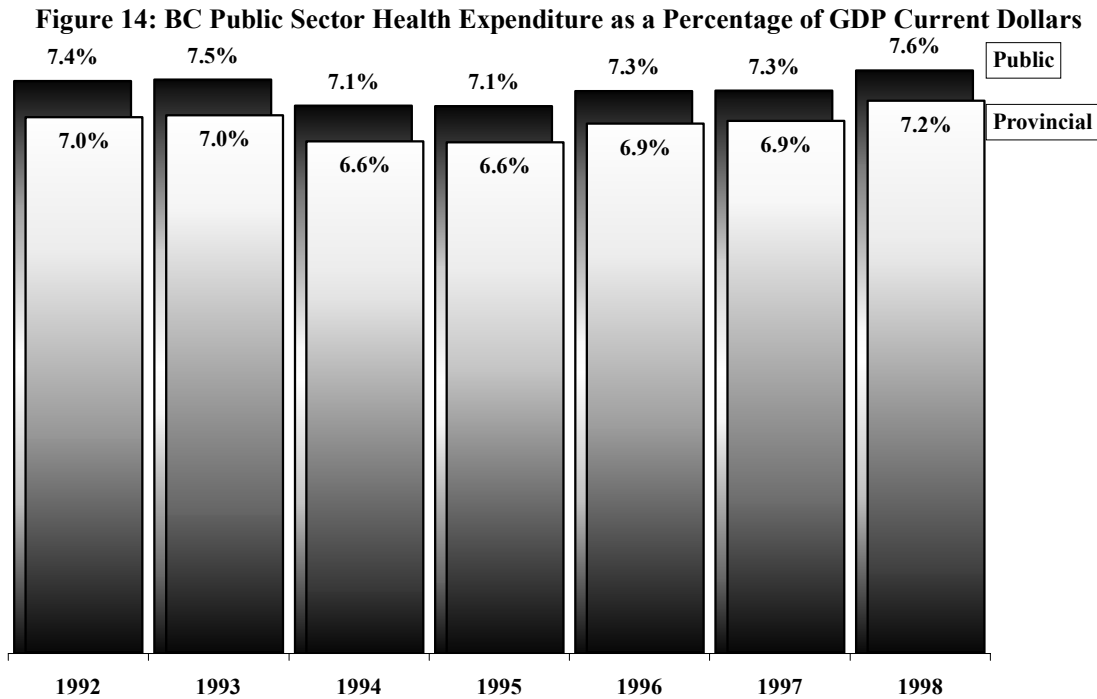


Figure 15: Percentage Change in BC Public Sector Health Expenditure and BC GDP
Current Dollars 1992 to 1998

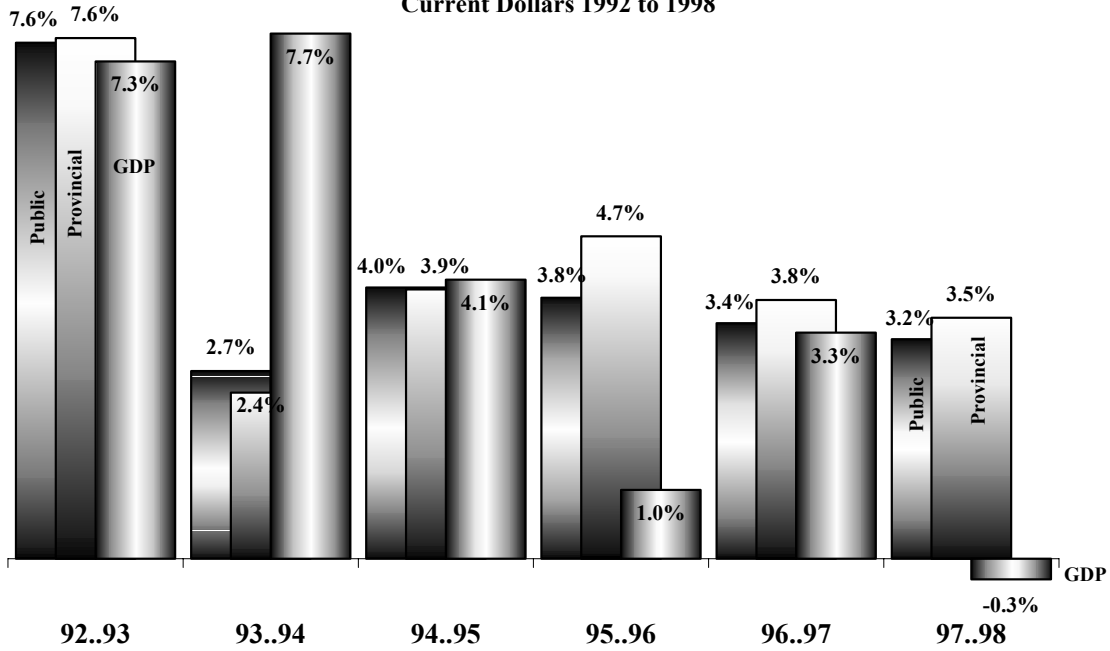
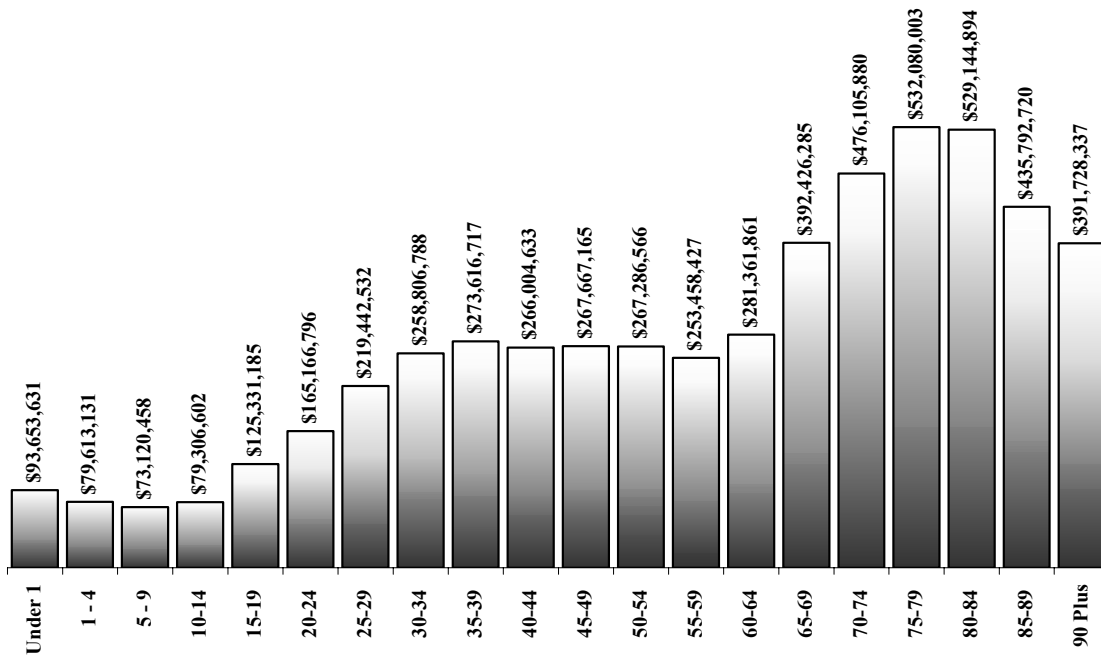


Figure 16: Age Specific Direct Provincial Government Health Expenditures 1997/1998

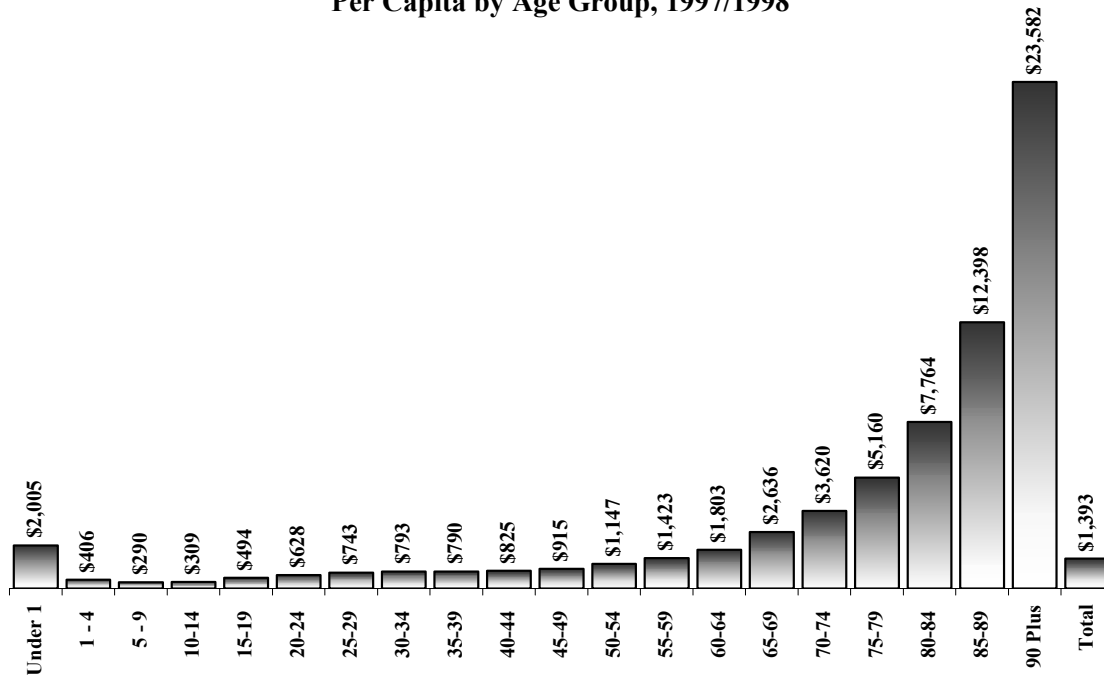


III. Age and Health Spending in British Columbia: The Data

There is a very strong relationship between age and per capita spending on health: the older a person is, beyond infancy, the greater the per capita spending on health. This is shown in the 1997/1998 data from the BC Ministry of Health¹⁸, in which approximately three quarters of provincial government health expenditures have been allocated to age groups (Figure 16). Dividing these expenditures by the number of people in each age group results in a picture of per capita direct spending (Figure 17) that starts with spending of \$2,005 per person under the age of 1, then declines to \$406 per person aged 1 to 4, and then to \$290 per person aged 5 to 9. From this age group on, per capita spending increases steadily to the 50 to 54 age group, and then exponentially to the 90 plus age group.

The coming challenge for health expenditures is obvious from this picture: the front edge for the baby boom is in the 50 to 54 age group, just at the age when per capita health spending starts its steepest climb: in the next five years, the first boomers will be responsible, for the first time since they were infants, for above average per capita health spending. With one third of the province's population entering the stage of the life cycle where health spending almost doubles for every ten years of increasing age, there is no way this (or any other) province will be able to keep health expenditures per capita from increasing, just as they have been unable to do so since the boomers were 10 years old. An aging population, which we have had since the last of the boomers were born, will mean that the long run focus of health expenditure policy cannot be simply on reduction in costs, but rather on the efficiency and allocation of costs.

Figure 17: Direct Provincial Government Health Expenditures Per Capita by Age Group, 1997/1998



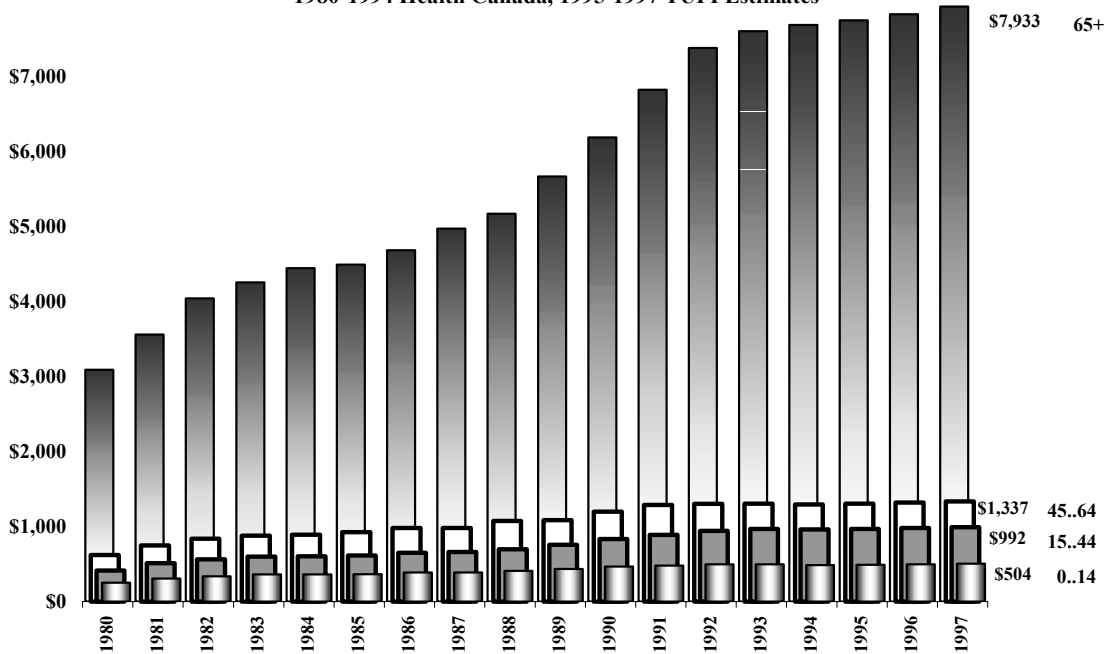
The fact that the 90 plus age group has the highest per capita spending, \$23,582 per year compared to the average of \$1,393, does not mean that this age group is a major component of health expenditures, as there are few people in it. The largest portion of these direct health expenditures are on the 70 to 84 age groups. Using the average life expectancy of 82 years, 41% of the total life time provincial direct expenditures (using the 1997/1998 data), are made before

people's 65th birthday, 23% between their 65th and 75th, and 36% between their 75th and 82nd. It is the 23% that occurs in the 65 to 74 age group, which is where the war babies will be in 6 years and the baby boomers in 12 years, that will be the most immediate challenge for health budgets.

To put the provincial direct age specific data in context, and to allocate the other 25% of the budget to age groups, it is necessary to refer to data from the report National Health Expenditure in Canada, 1975 to 1994 published by Health Canada¹⁹. This report presents total provincial (direct and indirect) health expenditure by age group (for four age groups, 0 to 14, 15 to 44, 45 to 64, and 65 and older) for the 1980 to 1994 period. Inflating the 1994 age specific per capita expenditure data from this source to 1997 using the health component of the BC consumer price index results in estimated 1997 per capita spending by age group²⁰. Multiplying these age specific estimates by BC Statistics estimated population by age group for 1997 results in a value that is only 0.02% different from the total (direct and indirect) expenditure for 1997 provided by the BC Ministry of Health²¹. This almost precise correspondence justifies use of the 1980 to 1994 Health Canada data, and 1995 to 1997 estimates, as they include the allocation of overhead and permit analysis of historical patterns of change in per capita spending.

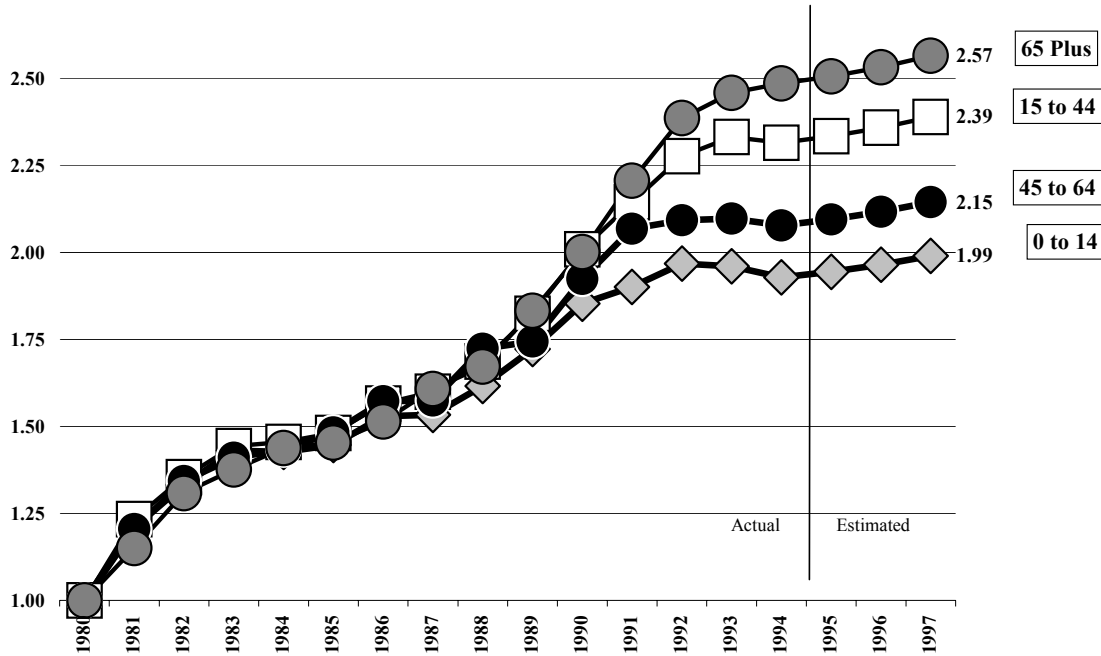
As Figure 18 shows, per capita provincial health spending has increased significantly for all groups. The smallest health spending per capita is for the 0 to 14 age group, which increased from \$253 in 1980 to \$504 in 1997. The next smallest is for the 15 to 44 age group, which increased from \$415 to \$992 in 1997. The second largest spending is for the 45 to 64 age group (which increased from \$623 per capita in 1980 to \$1,337 per capita in 1997). The largest per capita spending is on people in the 65 plus age group, where annual spending per capita increased from \$3,091 per person in 1975 to \$7,933 in 1997.

Figure 18: Age Specific Per Capita Provincial Health Expenditures, British Columbia
 1980-1994 Health Canada, 1995-1997 TUFU Estimates



While per capita BC provincial health expenditures have increased for all age groups, the increases have been neither the same nor have they followed the same pattern over time (Figure 19). All increased within a relative narrow range from 1980 to 1990, and then their paths diverged greatly. Per capita expenditures for the 0 to 14 age group climbed least from 1990 to 1992, and then reached a plateau: the 1997 per capita expenditure was 1.99 times that of 1980 (a 99% increase). The second smallest increase was recorded for the 45 to 64 age group, which increased 2.15 times over the time period. The second greatest increase in per capita expenditures was the 2.39 times increase of the 15 to 44 age group, with the greatest increase being the 2.57 times growth for the 65 plus age group.

Figure 19: Per Capita Age Specific Provincial Health Expenditures, Indexed to 1980



These age specific per capita expenditures facilitate tabulation of health expenditures during a person's lifetime (Figure 20). Of a total 1997 lifetime provincial government expenditure (assuming a life expectancy of 82 years) of \$198,901 per person, \$7,555 (4%) is spent during the first 15 years of life, \$29,756 (15%) during the next 30 years, \$26,732 (13%) during the next 20 years, and \$134,853 (68%) during the last 17 years.

The greater than average increase in per capita provincial spending for the 65 and older age group, combined with this age group's increasing share of the provincial population (in 1980, the 65 and older age group accounted for 10.5% of the province's population, compared to its 1997 share of 12.9%), resulted in this age group increasing from accounting for 46% of provincial health expenditures in 1980 to 54% of the total in 1997 (Figure 21). In spite of its relatively slow growth in per capita expenditure, an above average population growth rate in the 45 to 64 age (as a result of the aging of the front edge of the baby boom into this age group over the past decade) meant that this age group's share remained almost constant (declining from 17% in 1980 to 16% in 1997). The 15 to 44 and 0 to 14 age groups, with slowly growing populations, and in the case of the 0 to 14 age group the slowest rate of increase in per capita spending, saw their share of total provincial spending decline, from 29% and 8% to 25% and 5% respectively.

Figure 20: Estimated Lifetime Provincial Government Health Expenditures, BC, 1997

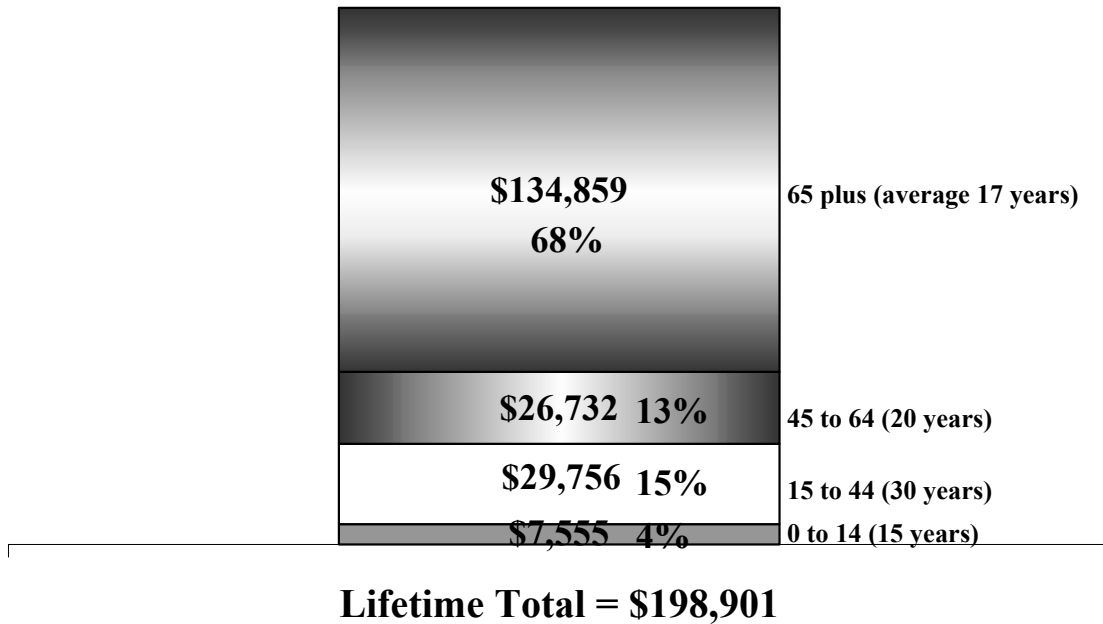
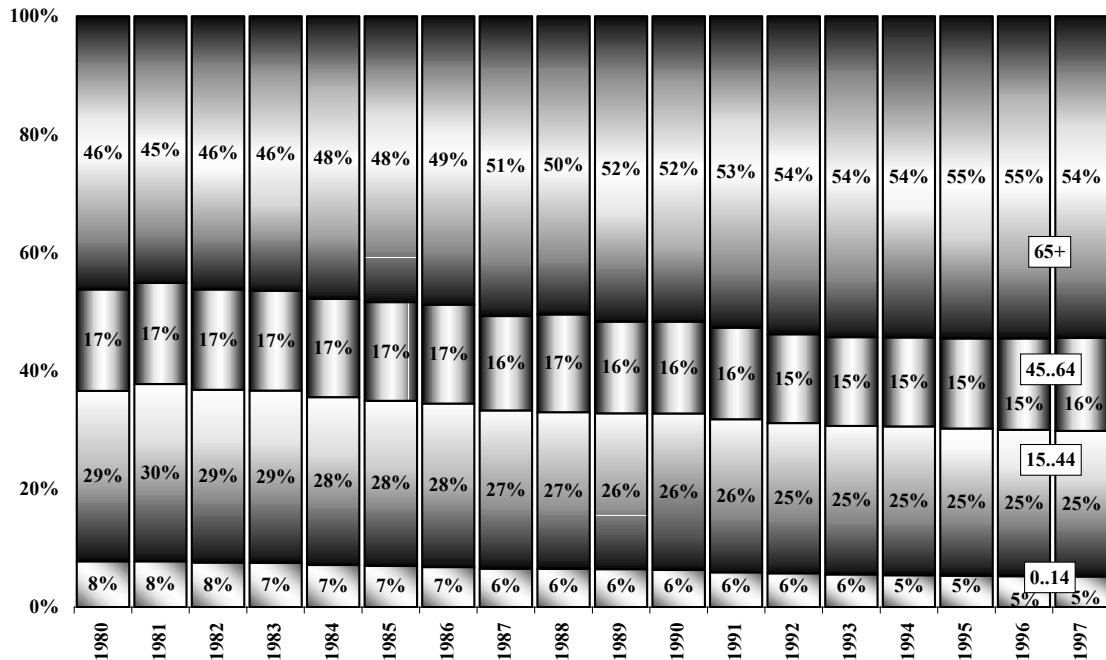
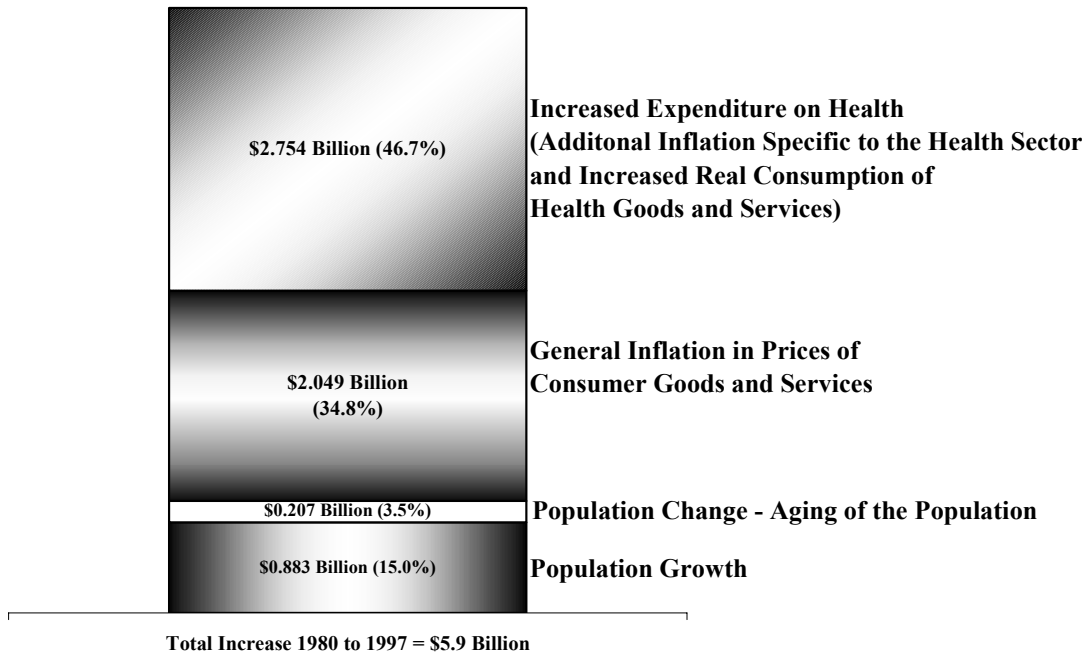


Figure 21: Age Distribution of Provincial Government Health Expenditures, 1980 to 1997



These data permit analysis of the factors that caused provincial health expenditure in BC to increase from \$1.9 billion 1980 to \$7.8 billion in 1997. If all other things (the age profile, age specific per capita spending, and consumption of health services) had remained constant, population growth alone would have led to an increase of \$883 million in provincial government health spending from 1980 to 1997. This accounts for 15% of the total increase of \$5.9 billion (Figure 22). If the only thing that changed were the aging of the province's population, the increase in spending would have been \$207 million, 3.5% of the total. And if the costs of health goods and services had increased at the average rate of inflation in consumer prices, the increase in spending would have been \$2.049 billion dollars, 34.8% of the total. Combined, the factors outside of the health system (population growth, aging, and general inflation) accounted for 53% of the increase in provincial government health expenditures over the past seventeen years.

Figure 22: Sources of Increase in BC Provincial Health Expenditure 1980 to 1997



This means that 46.7% (\$2.8 billion) of the \$5.9 billion increase in provincial health spending was the result of factors within provincial health expenditures. The two types of increase in spending within the health system are a) inflationary increases in prices of goods and services within the health system, and b) real increases in the goods and services purchased.

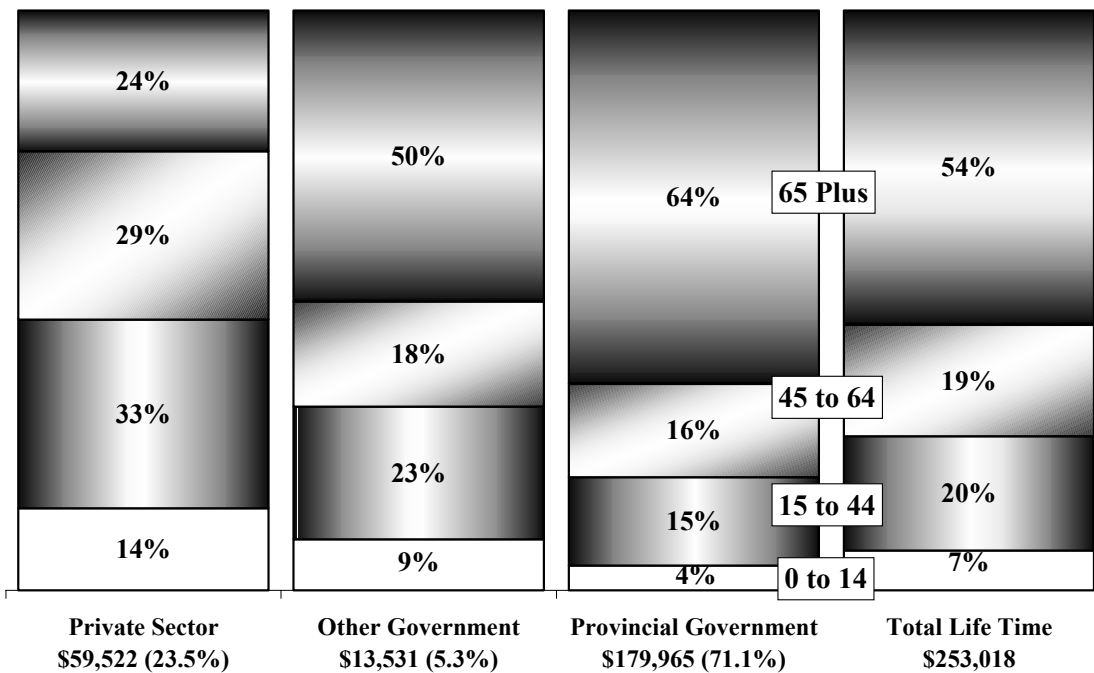
Additional inflation in the health system would involve increases in the prices of wages and salaries, medicines and supplies above the general level of inflation. As most of the goods and services on which the provincial government spends health dollars are not purchased directly by consumers, inflation in the prices of these commodities is not measured by the consumer price index. As a result, it is not possible to ascertain to what extent inflation within the health sector has contributed to the increase in provincial government spending. There is evidence that, for example, wages and salaries in hospitals in BC have increased faster than average wages and salaries²² and that the prices consumers have paid for medicinal and pharmaceutical products have increased faster than inflation in all consumer prices²³. Unfortunately this data is not sufficient to measure the extent of inflation in provincial government health spending. Real increases in consumption involve increased visits per capita to doctors and hospitals,

increased use of specialists, and increased use of technologies and commodities. Again, there are no data on the extent to which the provincial government expenditures on health were the result of increases in the real quantity and quality of the goods and services it purchased.

As this report is on demographics and health care, it is sufficient to say that population growth and change accounted for 18.5% of the increase in provincial government health spending over the 1980 to 1997 period, and that inflation, both inside and outside the health system, and increased real per capita purchases of health goods and services accounted for the remaining 81.5%. In the next sections of this report, we will see how continued population growth and change will continue to bring real increases to provincial health spending.

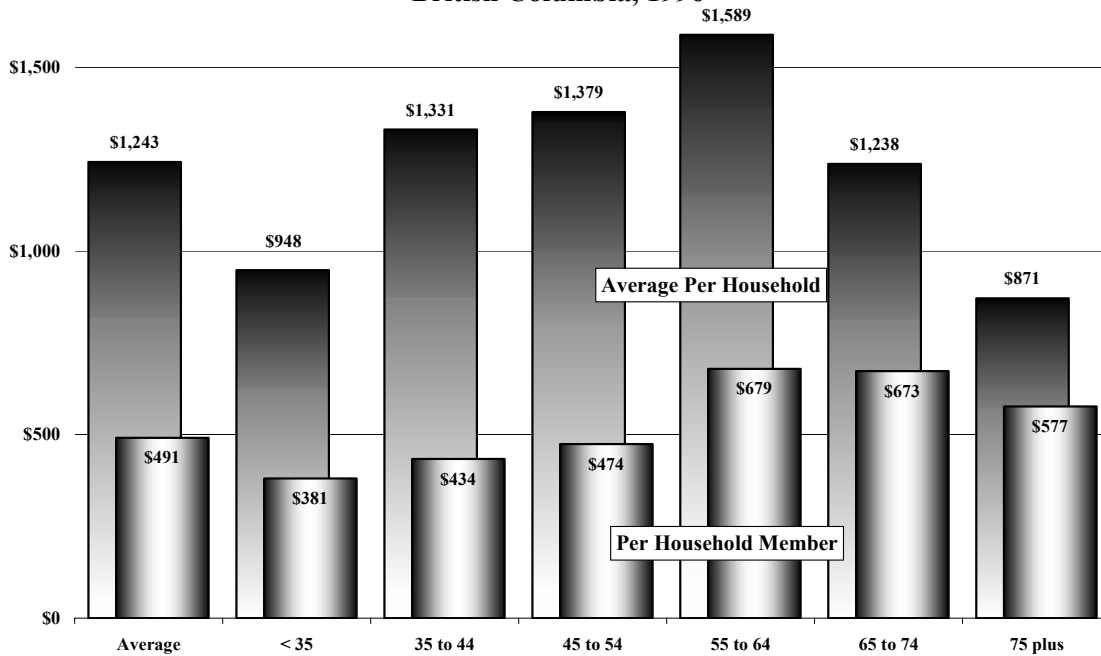
As a closing to this section on age specific patterns of health spending, note that private spending is also age specific. At the national level, 1994 data are available for all three sectors by age group (Figure 23)²⁴. These data show that of a total lifetime health expenditure of \$253,018 per person in 1994, 71% (\$179,965) was in the provincial sector, 5.3% was in the other government sector, and 23.5% was in the private sector. Private sector spending was most focused on the younger age groups, with 14% for the 0 to 14 age group, 33% on the 15 to 44 age group, and 29% on the 45 to 64 age group, the largest shares for each of these age groups. In turn, the 24% of private sector spending on the 65 plus age group is the smallest share. This is precisely the opposite of the picture for provincial governments' spending, which is focused on the 65 plus age group for 64% of its spending. Thus aging will, under current spending patterns, have less (but still significant) consequence for private expenditures than it will for provincial governments.

Figure 23: Life Time Health Expenditure in Canada by Sector, 1994



Age specific data are available for one part of private spending on health, that of household spending on health related goods and services²⁵. They show the pattern of health spending by age of household maintainer, with the highest average household spending occurring in the 35 to 44, 45 to 54 and 55 to 64 age groups, and below average household spending in the under 35 and over 65 age groups (Figure 24). As the size (and composition) of households change with age, per household member spending indicates a slightly different pattern. Above average household spending per household member increases with age, with the 55 to 65 and 65 to 74 age group having the highest spending per household member, followed by the 75 plus age group. All other age groups have lower than average household spending on health care per household member.

Figure 24: Average Household Spending, Health Care Costs Paid By Household, British Columbia, 1996



It is also important to consider household spending on health care in the context of the income that the household has to spend. In this context, there is an even stronger age pattern (Figure 25). The average household in British Columbia allocated 3.4% of its household consumption to health expenditures in 1996: households with maintainers under the age of 45 allocated a smaller percentage of consumption to health expenditures while household with maintainers 45 and older allocated more than the average. The greatest shares of household consumption allocated to health care were the 4.8% of the 65 to 74, and the 4.9% of the 75 plus, age groups.

Household spending on health reflects the changing needs of households over their lifecycle (Figure 26). In all age groups, the largest share of spending is on health insurance premiums, accounting for a range of between 41% (in the youngest age group) and 30% (in the oldest) of spending. Medicinal and pharmaceutical products have their largest share of spending in the over 55 age groups, while payment for hospital fees and other health care services is highest in the youngest age groups. Dental care expenditures are highest in the 45 to 74 age groups, as households pay first for their kids' teeth, and then for their own.

Figure 25: Average Household Spending, Health Care Costs Paid By Household, British Columbia, 1996

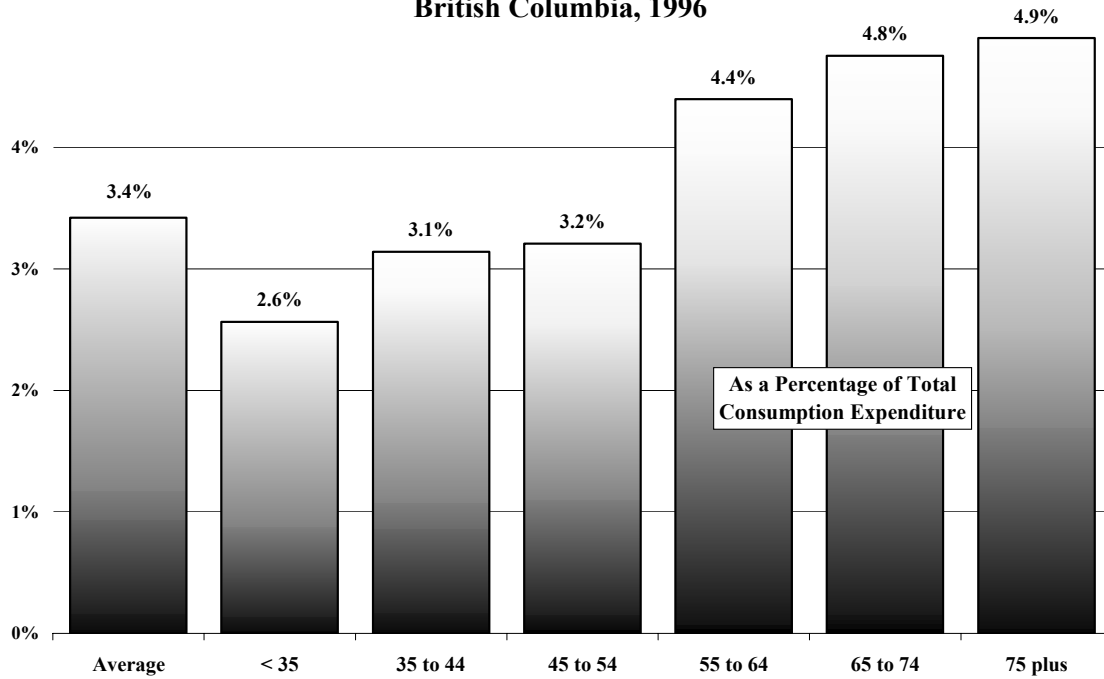
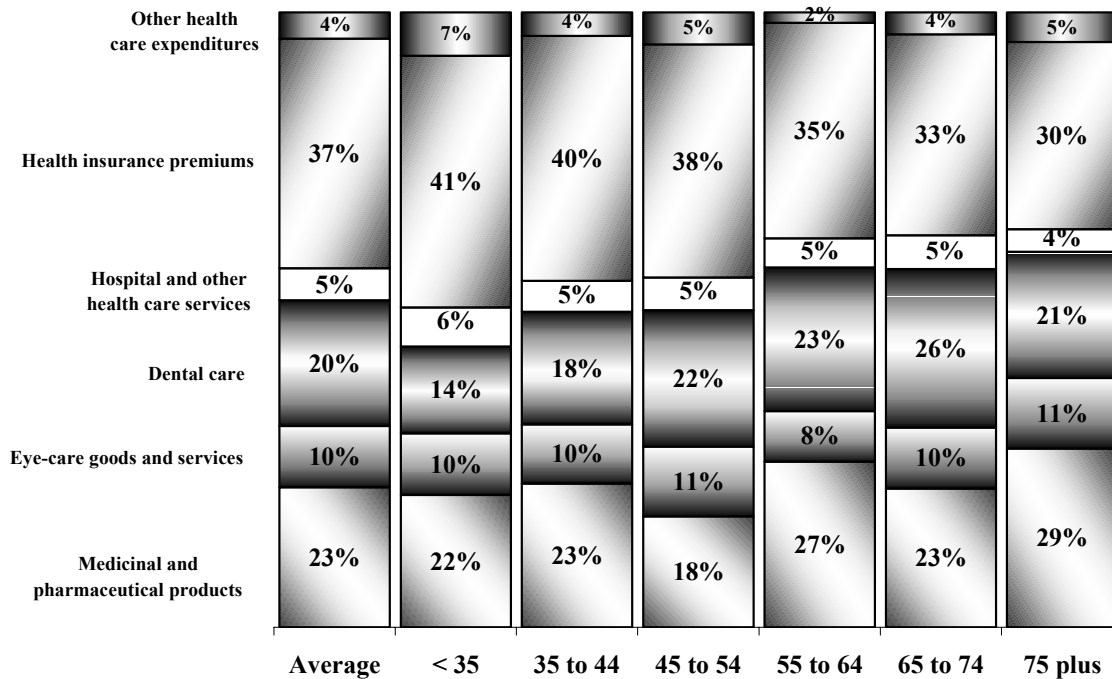


Figure 26: Distribution of Household Expenditures on Health Care, BC, 1996



IV. Age and Health Spending in British Columbia: The Projection

Demographically based projections of future provincial health expenditures rely on two other underlying projections. The first is projected future age specific per capita health expenditures: in the base projection presented here, it is assumed that the values for these expenditures will remain constant at the level estimated for 1997. This constant expenditure assumption eliminates the need to incorporate a projection of inflation: all projected dollar values will be in constant 1998 dollars. It also eliminates the need to measure the direction and magnitude of change that might occur in real age specific per capita expenditures in the future.

To some, such an assumption will appear conservative, as per capita health expenditures have increased much faster than inflation over the past 23 years. To others, the assumption will appear, well, wildly conservative, as many will argue that health expenditures will fall in the near future as the result of new technology, healthy lifestyles, and more efficient delivery systems. Perhaps, but new technology, healthier lifestyles and more efficient delivery systems have been the characteristics of the health system for the past quarter century (and more) and they have not resulted in lower per capita rates. One of the realities of health is that it is valued, and hence there will always be a demand for better health. This constant rate projection, while not dealing with either the increasing or decreasing costs arguments, does show the implications of per capita age specific health spending not changing, and how much change will have to occur to avoid going where demographic change would otherwise take us.

The second underlying projection required is an age specific projection of population for a period of time long enough to cover the full aging of the baby boom generation. This projection is briefly discussed in the next section. Following that, in Section IV. b., the projection of provincial health expenditures is presented and discussed.

a. British Columbia's Projected Population, 1998 to 2040

The size, and composition, of British Columbia's population in the future will be determined by its current characteristics, by birth and death rates, and the rate and composition of migration between the province and other provinces and countries. The history of changes in these demographic variables is documented and discussed in the Urban Futures Institute report Six and a Quarter Million People: British Columbia's Population in the Next Thirty Years²⁶. For this report, the population projection has been extended to 2040.

British Columbia's population will increase steadily from its 1998 population of 4,014,200 to reach 6,895,400 by 2040 (Figure 27). This 72% increase, adding 2,881,100 people, will involve much slower growth than the province has experienced in the past. The rate of increase in the province's population is projected to increase initially, from the current 1.3% per year range to 1.6% per year in the 2003 to 2008 period, before dropping steadily to 0.9% by 2040.

Accompanying population growth will be a more significant change in its age composition, the result of the aging of its current population. The province's current age profile shows a distinct baby boom generation bulge (Figure 28), the result of the record number of births that occurred in Canada between 1947 and 1966. This generation is now between the ages of 32 and 51, and accounts for 32% of the province's current population. The first of the baby boomers, preceded by the second world war babies, is the front edge of a wedge just entering the stage of the life cycle that has above average per capita health expenditures: they represent the challenge facing health systems in Canada, in the United States, in Europe, in Japan, and in Oceania.

Figure 27: British Columbia's Population, 1971 to 1998, Projected to 2040

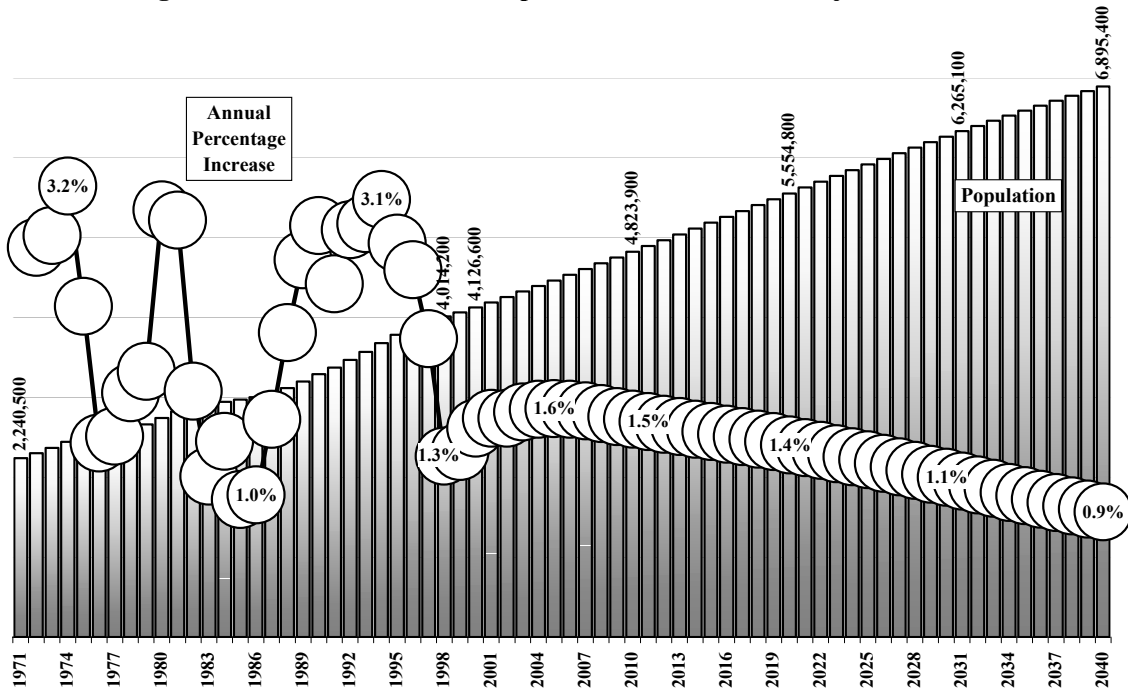


Figure 28: Population of British Columbia, by Age and Sex, 1998

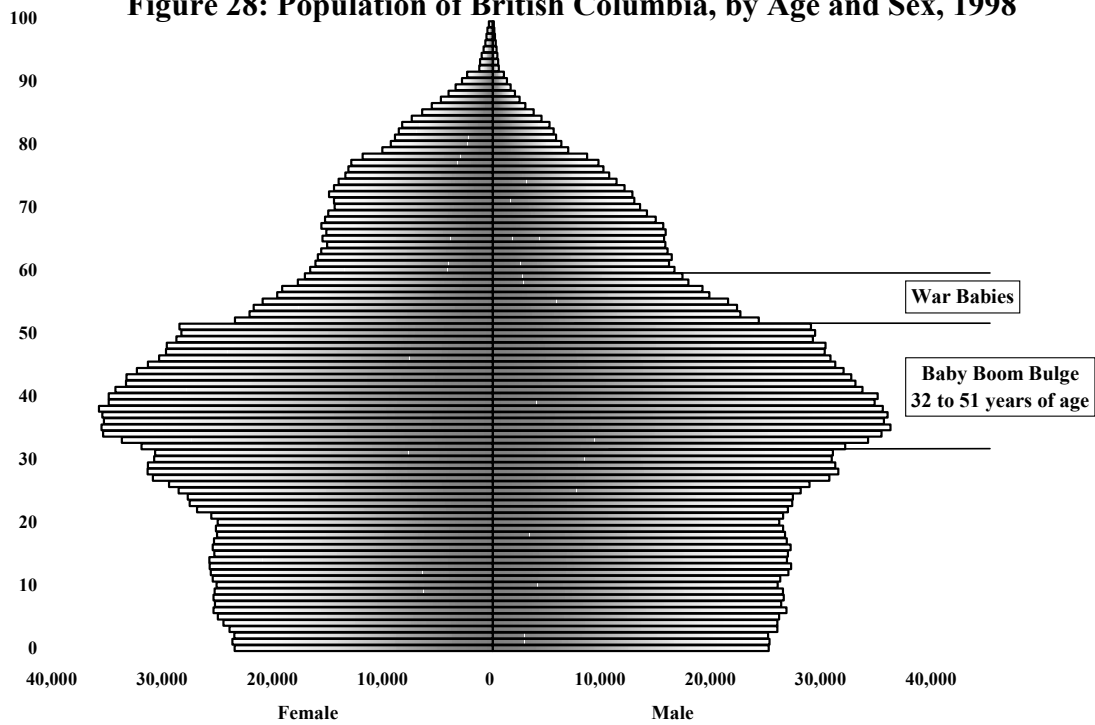


Figure 29 shows the effects of aging and population growth on BC's age profile. In 1998 the baby boom was between the ages of 32 and 51: in 2020, they will be aged 54 to 73, and in 2040 they will be 74 to 93 years old. Between 1998 and 2020 there will be a substantial absolute and percentage increase in the number of people in the 54 to 73 age range, as the baby boomers aging into this age group will be replacing the much smaller generation currently aged 54 to 73. This age group will increase from its 1998 population of 652,600 people to 1,345,800 in 2020, an increase of 693,200 (a 106% increase over 22 years). The upward shift of the province's age profile will continue between 2020 and 2040, with the aging of the baby boom generation bringing substantial increases to the 74 to 93 age group: the number of people in this age group will increase by 592,000 (122%) from 1998 to 2040, and by 400,400 (100%) from 2020 to 2040.

Without net migration to the province, the demographic story would be only about aging: with only its below the replacement level birth rate and long life expectancies, the province's population would decrease - but the current population would continue to age. The result would be the shifting up of the baby boom bulge and a narrowing of the base of the age pyramid, much like a tree whose branches got ever further from the ground while its trunk got ever narrower. British Columbia is fortunate to be able to attract migrants, and particularly young migrants: 60% of the inter-provincial migrants and 52% of the international migrants to the province are under the age of 30. As a result, with migration the province's age profile will not only move up, it will expand outwards, broadening the base that must support the rapid growth of the older age groups.

Figure 29: Age Profile of British Columbia Population, 1998, Projected 2020 and 2040

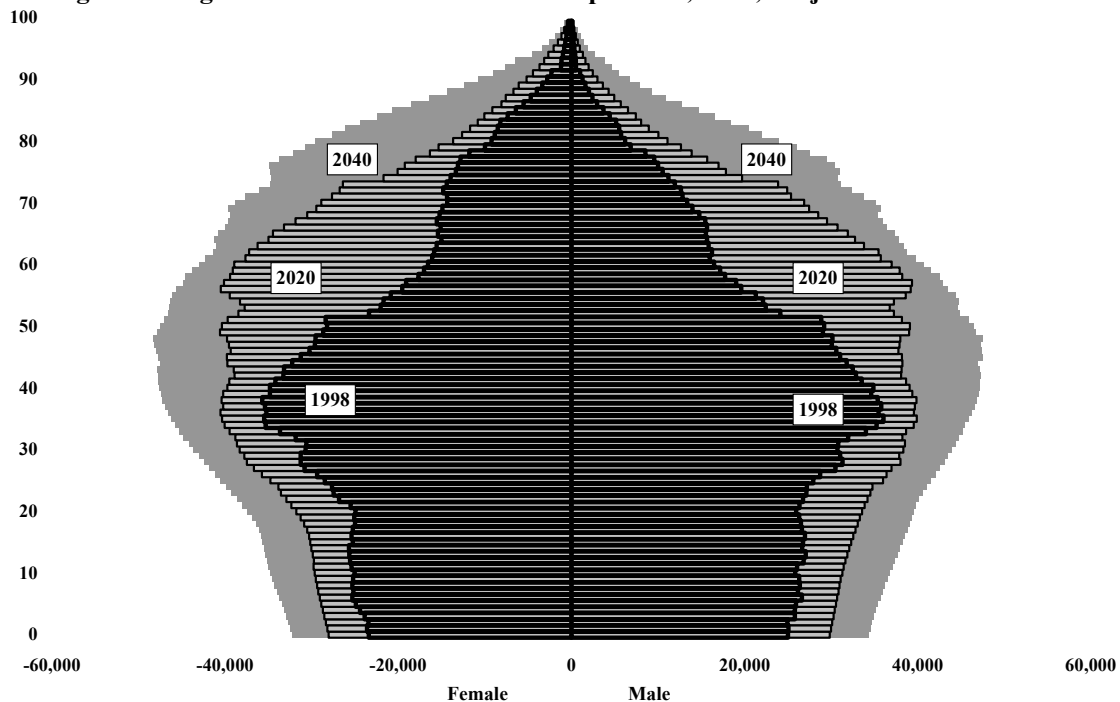
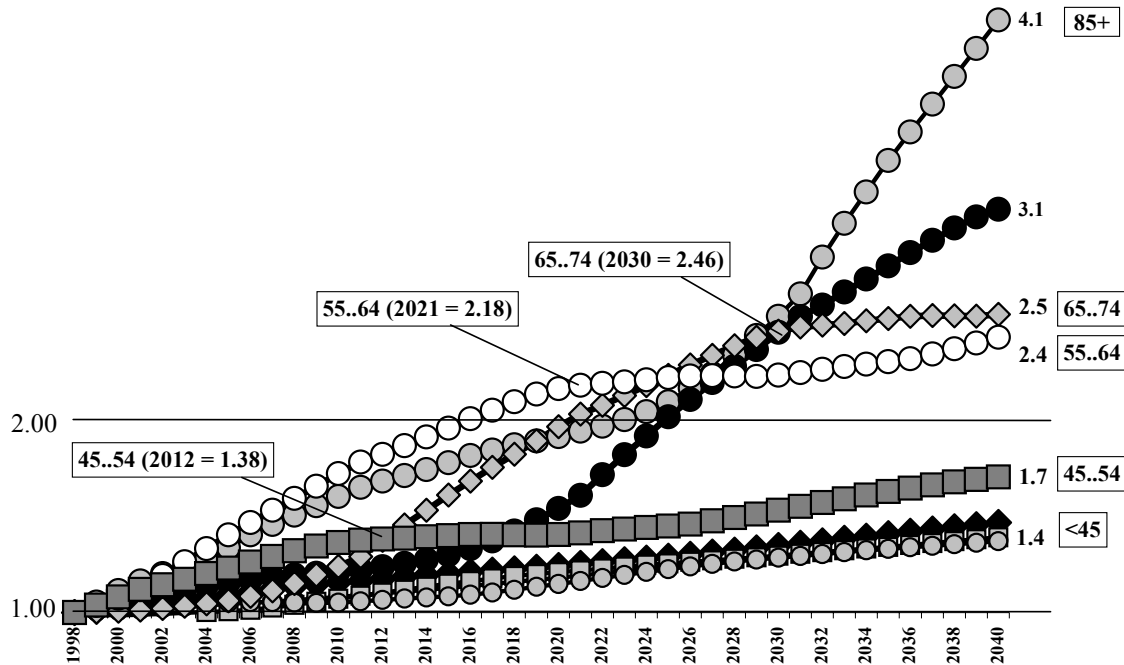


Figure 30 shows the pattern of change that will accompany the growth and aging of the province's population. The increase in population from 4 million to 6.9 million between 1998 and 2040 will be a 72% increase in population: for every one person in the province today, there will be 1.72 people in 2040. The number of people in all of the 45 and older age groups will increase by more than 72% and the number the younger age groups by less than 72%.

The 45 to 54 age group will be the most rapidly increasing age group over the 1998 to 2001 period as the result of the aging of the front edge of the baby boom into the age group. It will continue to increase in size until 2012 when it will have increased by 38%: after this year, the aging of the front edge of the boomers out of the age group will slow its growth. In 2040, there will be 1.7 people in the age group for every 1 there is today.

Figure 30: Population Growth By Age Group, British Columbia, 1998 to 2040 (1998=1.00)



Starting in 2001, the 55 to 64 age group will become the province's most rapidly growing age group, a distinction it will hold until 2022. With the first of the boomers having their 55th birthday in 2002, and the typical boomer having theirs in 2022, the next two decades will see a boom in 55th birthday cards. In 2040, there will be 2.4 people aged 55 to 64 for every one today.

2011 will mark the beginning of two decades of 65th birthdays, as the aging of the baby boom generation will bring rapid growth to the 65 to 74 age group, which will pass the 55 to 64 age group in growth by 2025. But even before 2011 the number of people in this age group will begin to increase rapidly as the first of the Second World War babies reach it in 2006. By 2040, there will be 2.5 people aged 65 to 74 for every one person in this age group in 1998.

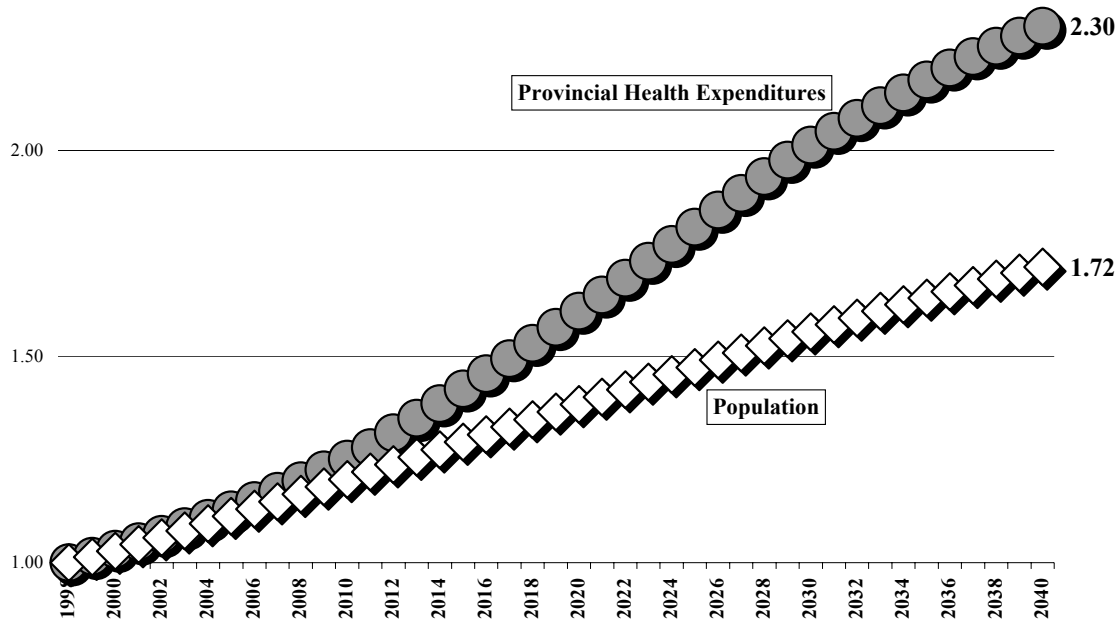
By 2021 the 75 to 84 age group will become the fastest increasing age group as it, in turn, receives the aging boomers. By 2031, this age group will have almost pulled into first place in terms of growth relative to 1998, being beaten only by the growth of the 85 plus age group. There will be 3.1 people in the 75 to 84 age group in British Columbia in 2040 for every one person in the age group today.

The first of the boomers will not reach the 85 plus age group until 2031, yet it will be one of the most rapidly growing age groups throughout the next four decades. The reasons for this strong growth are the relatively few people in the age group today, the dramatic and continuing increases in life expectancy we have experienced, and the wedge shape of the 35 plus portion of our age profile today. For every one person aged 85 and older today, there will be 4 in 2040.

b. Projected BC Provincial Government Health Spending, 1998 to 2040

Assuming constant (1997) age specific provincial government health expenditures and using the population projection just discussed leads to the conclusion that provincial health expenditures in constant dollars will increase by 130% over the next four decades, compared to population growth of only 72%. If there are no changes to per capita provincial health expenditures, and without inflation, these expenditures will increase by almost twice as much as the population will. For every person in the province today, there will be 1.72 people in 2040 (Figure 31): without inflation or increases in consumption of health commodities, for \$1.00 spent on health by the provincial government, there will be \$2.30 spent in 2040. Growth in constant dollar provincial health expenditures and in the province's population will be roughly similar from 1998 to 2006, and then, with the entry first of the war babies and then of the baby boomers, into the 65 plus age groups, the rate of increase in health spending will exceed that of the population.

Figure 31: Indices of Projected Provincial Health Expenditures and Population, BC, 1998 to 2040 (Assuming Constant 1997 Age Specific Per Capita Spending)



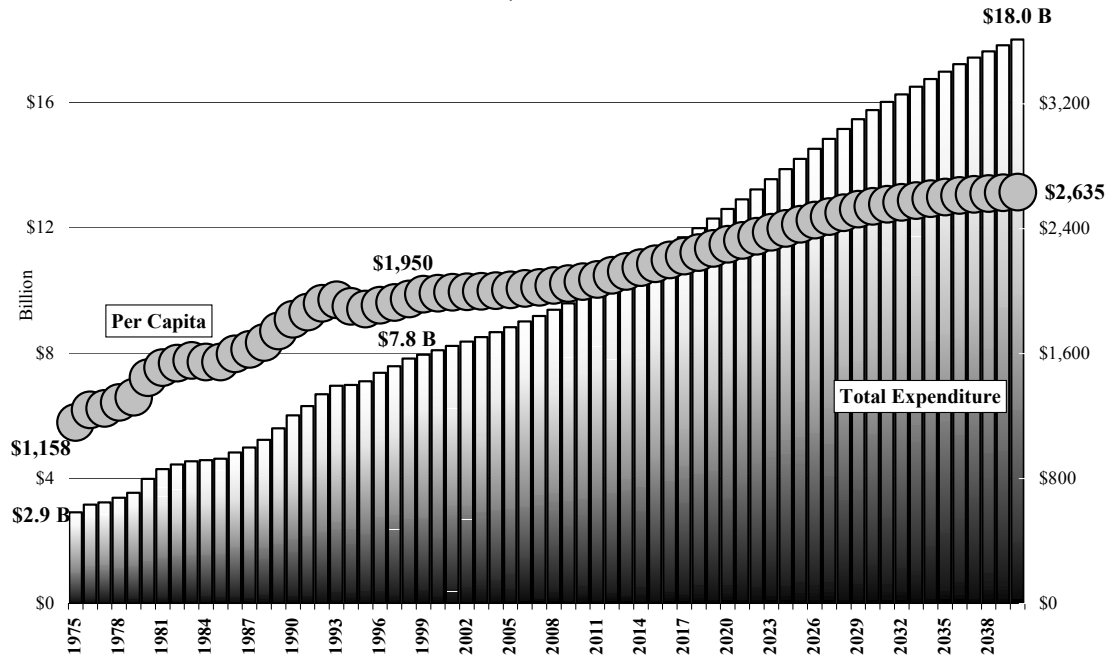
Population growth and change alone will increase provincial government spending on health from 1998's \$7.8 billion dollars to \$18.0 billion in 2040, implying an average rate of increase in constant dollars of 2% per year. While a significant rate, it is less than the 3% per year rate of increase in constant dollar provincial health expenditures between 1975 and 1998 (Figure 32).

While health expenditures increased more rapidly from 1975 to 1998 than they are projected to increase over the next four decades, the province's population also increased faster over the past two and a half decades than it is projected to in the future. The effect of population growth on expenditures is eliminated by comparing per capita constant dollar expenditures. Per capita spending is projected to increase from \$1,950 in 1998 to \$2,635 in 2040, growing at an average rate of 0.7% per year, compared to the 1.3% per year increase experienced from 1975 to 1998. Thus the increase in constant dollar provincial health expenditures per capita will be slower than it has been over the past quarter century – that is the good news – but we had better be prepared for them to increase by more than a third.

A 35% increase in real provincial health spending per capita over the next forty years means that we must be prepared to see:

- a) health expenditures continue to be the relative growth sector in provincial budgets, and/or
- b) dramatic reductions in provincial per capita health expenditures, and/or
- c) more rapid population growth in younger age groups than is currently projected, and/or
- d) a significant increase in private spending on health.

**Figure 32: Provincial Government Health Expenditure in Constant Dollars
BC, 1975 to 2040**

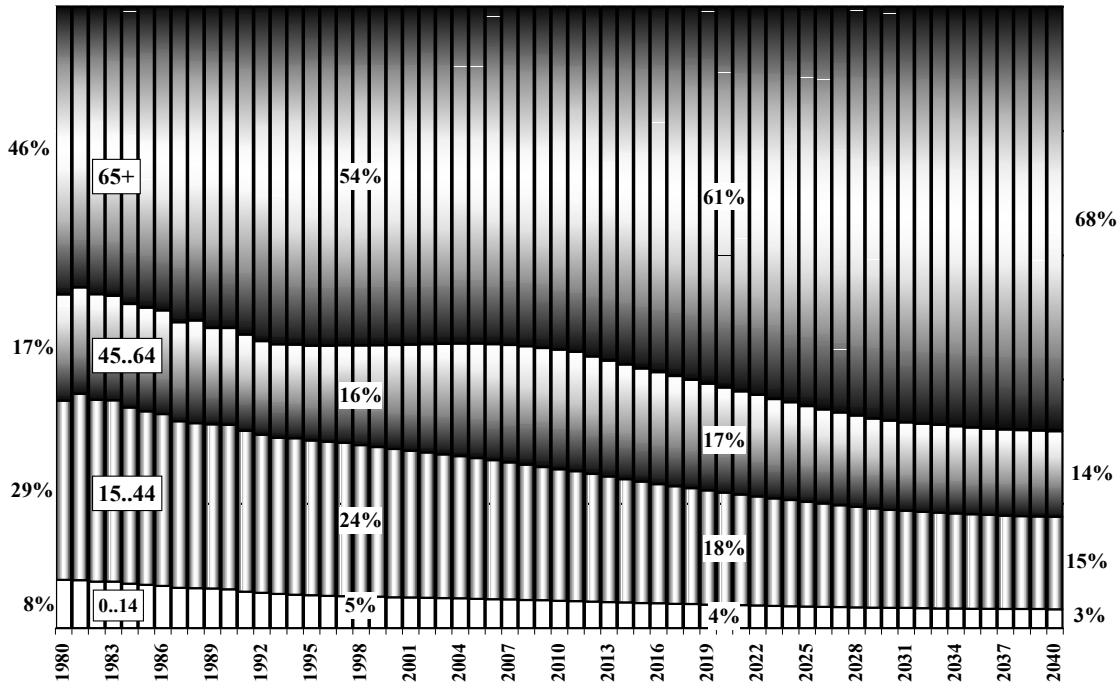


We must also be prepared to see a continuation of the shift in provincial health expenditures towards the goods and services required by an older population. In 1980, 46% of provincial health expenditures were on people 65 and older, 17% on the 45 to 64 population, 29% on the 15 to 44 age group, and 8% on the 0 to 14 age group (Figure 33). By 1998, the aging of the population had increased the 65 and older population's share to 54% of the total, reduced the 45 to 64 age group's share slightly (to 16%), and reduced the younger age groups' shares noticeably (to 24% for the 15 to 44 age group and 5% for the 0 to 14 age group).

The aging of the war and post war babies over the next four decades will continue this shift, with 68% of provincial health expenditures in 2040 focused on the 65 plus age group, 14% on the 45 to 64 age group, only 15% on the 15 to 44 age group and only 3% on the 0 to 14 age group. The share of the 45 to 64 age group will increase from 16% to 19% during the 1998 to 2010 period, as the bulk of the baby boom ages into it. From 2010 on, this age group's share will decline as the boomers age out of it and into the 65 and older age group.

In this environment of real increases in the share of budgets that go to health, and within the health budget the share that go to the 65 plus population, it will be important not to lose sight of the fact that while the most emotional and vocal demands may be made for services to older age groups, it will by and large be the younger age groups who will pay the bills. To reduce the effectiveness of the health system to ensure the health of the young and working aged population to meet the demands of the older population would not be a particularly sound investment.

Figure 33: Distribution in Provincial Health Expenditures, BC, 1980-2040



While the share of provincial health spending on the under 45 age groups will decline, absolute spending will not (Figure 34). In 1998, \$401 million was spent on the 0 to 14 age group: by 2021, this will have increased to \$478 million (constant 1998 dollars), and by 2040 to \$553 million. Spending on the 15 to 44 age group will also increase, from \$1.9 billion in 1998 to \$2.3 billion in 2021, and \$2.7 billion in 2040. Spending on the 45 to 64 age group will increase by a greater percentage, from 1998's \$1.3 billion to \$2.1 billion in 2021, and \$2.8 billion in 2040.

These increases all pale in contrast to the increase in spending on the 65 plus age group. In 1998, provincial health spending on this age group totaled \$4.3 billion: by 2021, under the assumption of constant age specific health per capita spending and in constant dollars, total spending on the 65 plus age group will be \$8.0 billion – the same amount that is currently spent on all age groups in the province. Aging will mean that every year from 2021 on, the provincial health budget for people 65 and older will be greater – in constant dollars – than its total health budget is today.

There are some people who would like to reduce population growth in British Columbia²⁷. Whatever this might do to satisfy advocates of exclusion, it would have a very negative impact on the province's ability to support its health care system. Natural increase alone (births and deaths only, no inter-provincial or international migration) would certainly result in a smaller population in BC, with the resultant population in 2040 of 3.8 million people being fewer than the 4.1 million who live here today. It would also result in lower provincial health expenditures, \$12.2 billion in 2040 compared to the projected \$18.0 billion.

While fewer people would mean spending less on health, it also means spending more per capita (Figure 34). With BC's current below the replacement level birth rate and baby boom age profile and without the benefit of the flow of additional young people that migration brings, the province's population would age much more rapidly. This older population would require provincial health spending of \$3,203 per person in the province, 65% higher in constant dollars

than today's \$1,950. With out the continual infusion of young people from migration, the base of BC's population pyramid will not be strong enough to support its current branches as they age over the coming decades.

Figure 34: Age Group Specific Provincial Health Expenditures, BC, 1980 to 2040
 Constant 1998 Dollars Assuming Constant 1998 Age Specific Provincial Health Expenditures

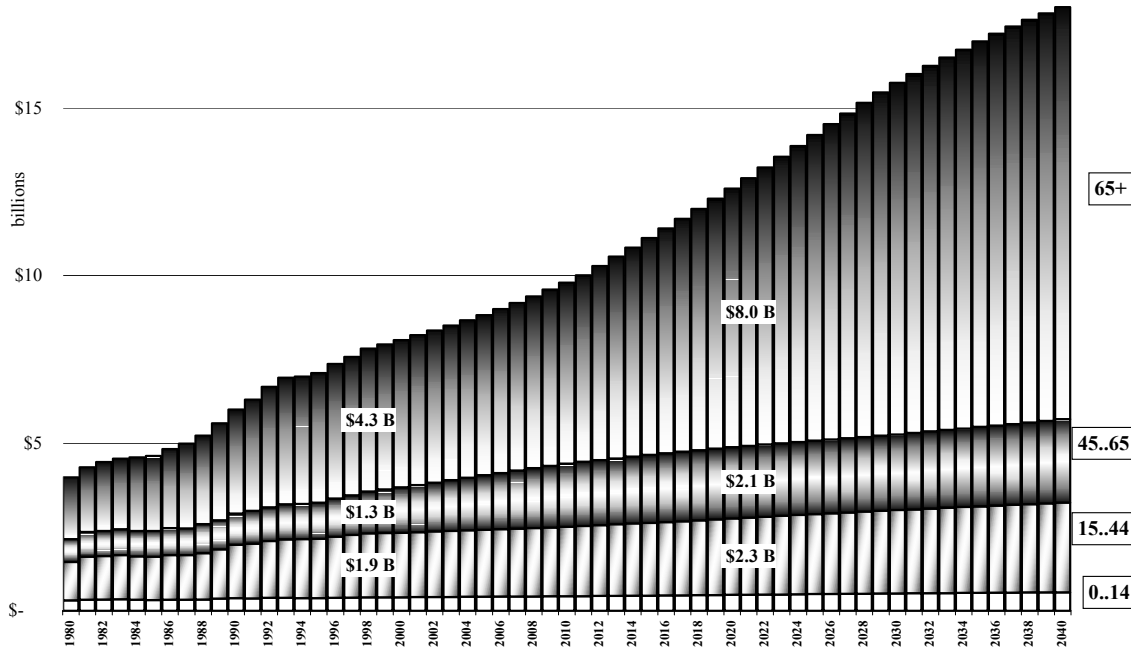
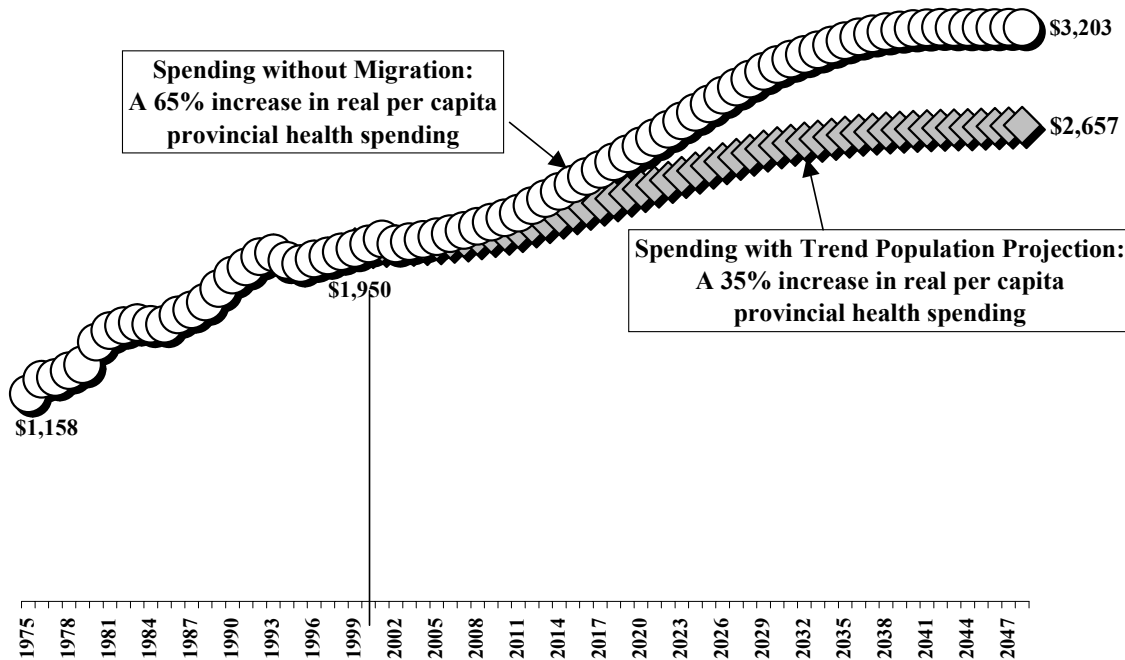


Figure 35: Projected Per Capita Spending on Health, BC, With and Without Migration

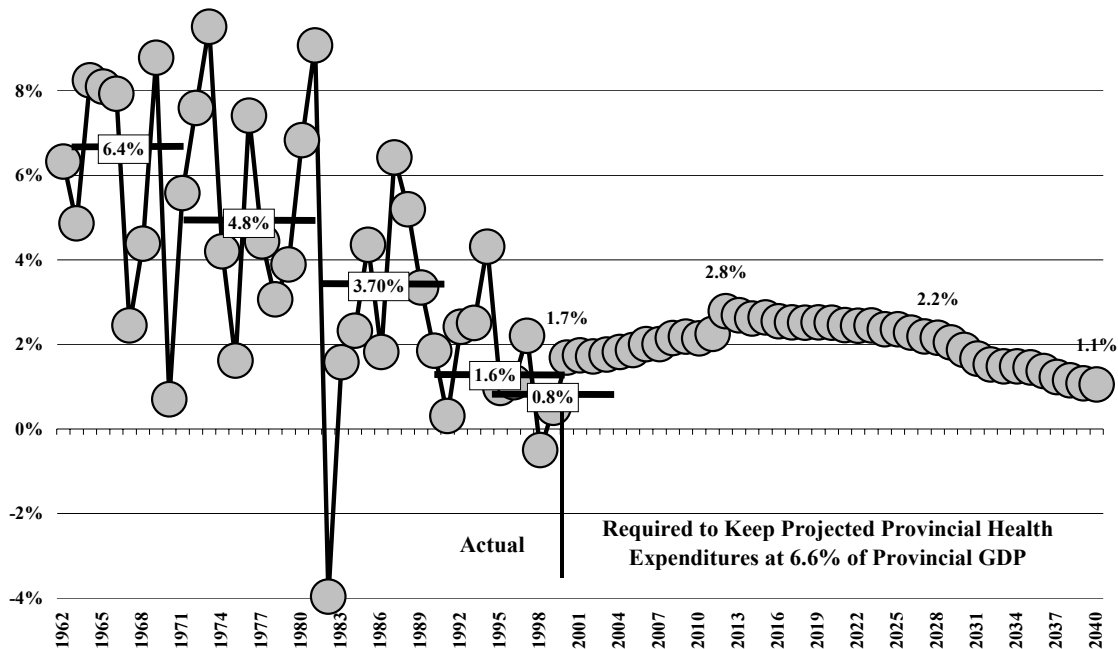


Another way of evaluating future provincial health care expenditures is as a share of provincial GDP. As was noted in Section II of this report, the poor economic climate in the province since 1995 has resulted in provincial health expenditures as a percentage of GDP increasing from 6.6% to 7.2% over the past 3 years. It is appropriate to consider the rate at which the province's economy must expand to bring provincial health expenditures down from 7.2% of GDP to 6.6%, and to remain the 6.6% level in the future. This would essentially answer the question "Can we afford this increase in provincial health expenditure?"

The answer, as Figure 36 shows, is a qualified "Yes". If BC's economy expands at the rate of 1.7% next year and increases its rate of growth to 2.8% by 2012, and then maintains a 2.2% to 2.5% per year growth rate until 2028, and then declines to 1% growth by 2040, provincial government health expenditures will remain at 6.6% of the province's real GDP, even with the dramatic aging of our population and without reductions in per capita age specific spending.

Can this be done? This would mean that over the next decade, the provincial economy must expand in real terms by an average of 1.9% per year for the next decade, and an average of 2.5% per year in the following decade. This is well below the 6.4% average real growth in GDP of the 1960s, below the 4.8% per year real growth of the 1970s, and even below the 3.7% per year average of the recessionary 1980s. Certainly it can be done, but not at the rate of economic growth of the past decade. The 1.6% per year growth that the province's economy has average since 1990, and most certainly the 0.8% it has averaged since 1995, are not good enough. Without better economic performance in the province over the coming decades than we have had in the past one, the answer to the question may well be "No, British Columbia cannot afford the health care costs of its aging population!"

Figure 36: Rate of Growth of Real Provincial GDP, British Columbia
 Actual to 1999 Required for Projected Health Expenditures to be 6.6% of GDP



Of course, if the growth of the economy is sufficient to keep up with projected provincial per capita health expenditures, the rate of increase in the province's population will be well above the projected 1% to 1.5% per year growth. An economy expanding in real terms at the rate of 2.0% to 2.8% per year will require a corresponding labour force expansion. With the baby boomers not only aging into the higher age specific health expenditure age groups, but into retirement age groups as well, economic growth and replacement of retirees will mean increased rates of growth in the working aged, and hence total, population – but that is a story for another publication²⁸.

The implications of an aging population for health expenditures are both straight forward and significant: BC provincial government health expenditures will increase twice as much as the province's population will over the next four decades, with the most significant increases starting to occur within the next ten years. We have a decade to get ready for substantial real increases in health spending. Given the current age structure of the province's population, there is no way this situation can be avoided without dramatic increases in economic and population growth – unless age specific per capita health spending declines substantially. In the next section of this report, the possibility of such a decline occurring is discussed.

V. Away from the Baseline: Changes in Age Specific Health Spending

Ultimately, the projection presented here rests on two assumptions. The first is that the province's population will increase as projected. The examination of spending with and without migration showed that a higher growth rate of population would reduce the relative increase in per capita real expenditures. It also showed that the aging of the 4 million people in the province today will dominate health spending in spite of the addition of 2.25 million more people over the next 40 years.

The second assumption was that constant dollar age specific per capita provincial health spending will remain at their 1997 levels. If we look to the data, there is clear evidence to the contrary: real per capita age specific provincial health spending has changed, and significantly, over the past 18 years. The problem, at least for those who are concerned by the projected 35% increase in real per capita provincial spending on health, is the change has been an upward change, particularly for the 65 and older age group. Thus the projection given here is both conservative and optimistic, as it assumes that the long-term pattern of real increases in per capita age specific spending has stopped.

From an empirical perspective, one can find evidence only to support a constant or increasing rates assumption. If real per capita age specific increases, there will be a proportionate increase in the share of the provincial budget allocated to the health sector. As this point, any discussion of a decreasing rates assumption must be considered speculative: the remainder of this section, which discusses reduction in per capita rates is therefore speculative rather than empirical.

Sometimes, when demographically based projections of health expenditures are presented, there are claims that we will not experience such increases because age specific per capita rates in the future will decline. This supposed (hoped for) decline is based on assumptions of everything from “silver bullet” technology and new miracle drugs to the fact that today's population is fitter and healthier than populations of the past, and hence the population in the future will be healthier and hence will require less in the way of health expenditures.

There is certainly evidence to support the claim that people in some age groups today are healthier than people in the age group were in the past, and that technological change will

improve health in the future. For an example, we need only look at one of the major age related health problems, osteoporosis:

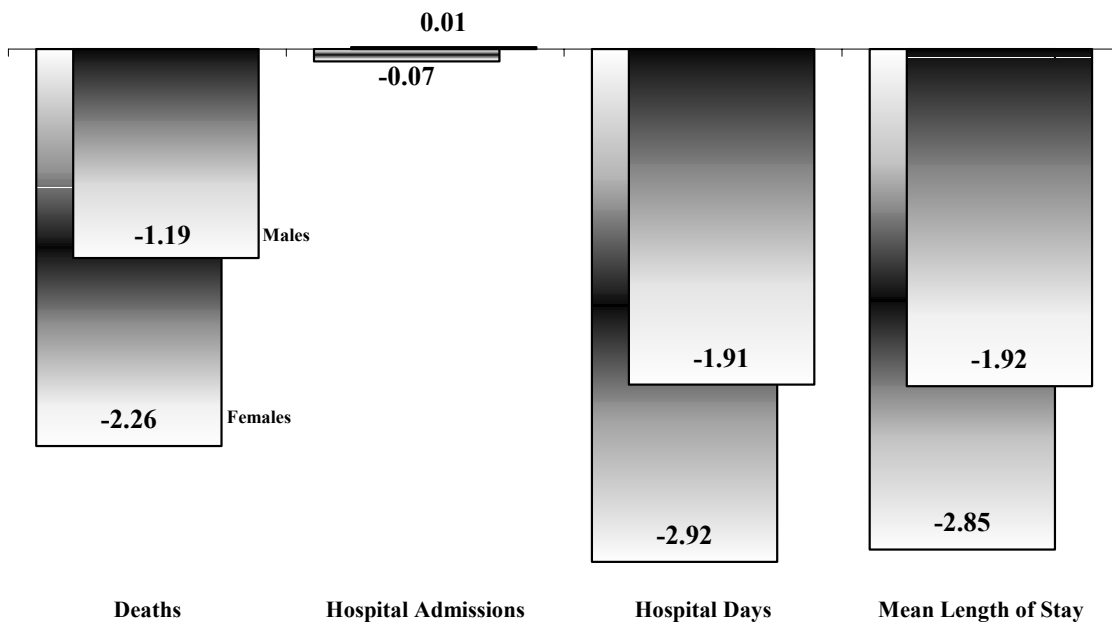
In coming years, more than two million Canadians will likely develop osteoporosis, or “porous bones”, which causes bones to thin and weaken. In Canada, one in four women and one in eight men over the age of 50 has osteoporosis. For them, simply bending to pick up a heavy bag or even sneezing could cause a bone to fracture. The cost of treating hip fractures alone is more than \$600 million per year. These costs will likely increase as the baby boom generation ages²⁹.

The treatment of the consequences of osteoporosis has not remained static: from 1972 to 1990, morbidity and mortality rates due to femoral fractures in the 55 plus population in Canada declined substantially (Figure 37). While there was almost no decline in the rate of hospital admission due to these fractures, (a 0.01% increase for males and a 0.07% for females), mortality rates declined by 1.19% per year for men and 2.26% per year for women, hospital days declined by 1.91% per year for women and 2.92% per year for men, and mean length of stay declined by 1.92% for men and 2.85% for women³⁰

Not only has the treatment for osteoporosis improved, so has its prevention:

Research has proven that weight-bearing exercises, such as walking, tennis, stair climbing, and low-impact aerobics can prevent the loss of bone mass. One study has revealed that a group of women aged 50 to 70 increased their resistance to risk of fractures by lifting weights two days a week. As an added bonus, the women increased muscle strength and improved balance, thereby lessening the risk of falls and fractures³¹.

Figure 37: Annual Percentage Change in Mortality and Morbidity Rates for Femoral Fractures Canada, 1972 to 1990



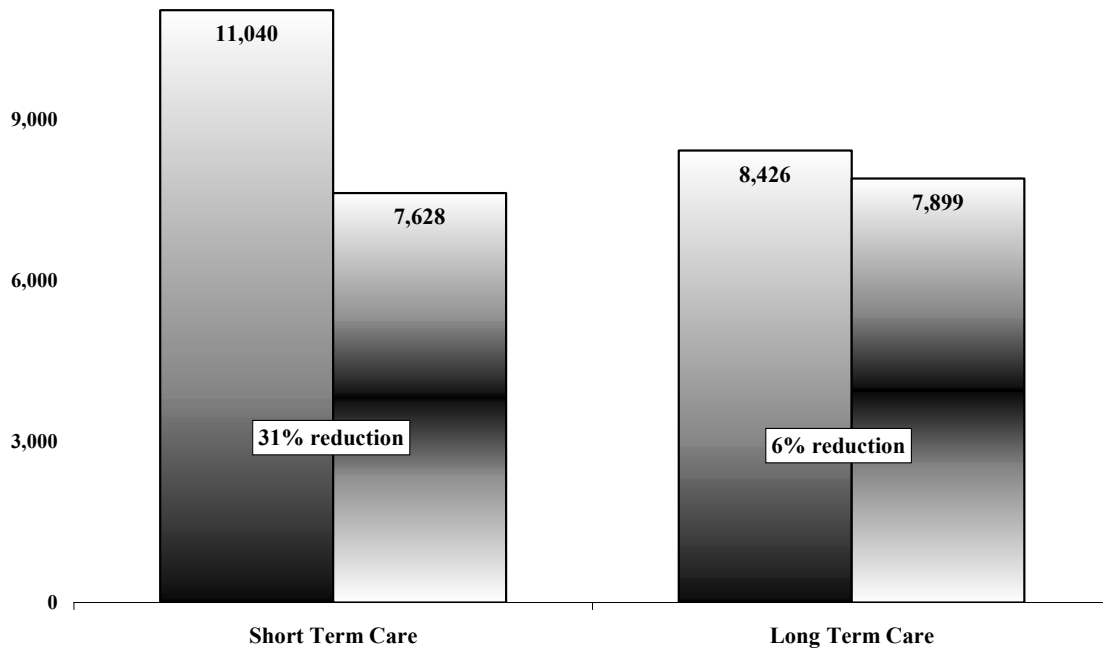
Such changes have not been limited to osteoporosis: studies also show that overall disability rates of seniors have declined sharply. For example, in the United States, from 1982 to 1994, the

percentage of seniors with disabilities declined by 15%, from 25% of the seniors to 21%³². This means that 17% (1.5 million) fewer seniors had disabilities in 1994 that would have been the case without the reduction in disability rates. The reduction was brought about by a combination of medical advances, exercise, diet modification, reduction in smoking and lifestyle change.

There is clear evidence that these changes resulted in a healthier population. The unanswered question is whether they resulted in a reduction in expenditures on health. The per capita age specific data do not show any reduction, although this does not necessarily mean that there will not be any in the future. It would be very useful to have research to see to what extent improved health means increased, rather than reduced, age specific health expenditures, acknowledging that the expenditure pattern will be quite different, with more emphasis on diagnostics, monitoring, and prevention rather than remediation and emergency.

Certainly the greater emphasis on prevention, especially with respect to exercise and fitness, indicate a wider definition of spending on health, as exercising with weights and aerobics are now part of health care, even though they have yet to be given formal recognition as part of the health care system. Aerobic exercise programs for stroke recovery are included in the medical system: such programs prior to the event, and particularly prior to the evidence that the event might occur, are not yet part of the medical system. In any evaluation of the impact of preventative and alternative programs, the new costs (often not borne by medical plans) must nonetheless be accounted for before talking about reductions in cost of one type or for one sector.

Figure 38: Staffed Hospital Beds by Type of Care Unit, British Columbia, 1987 and 1995



It is also important to note that while age specific per capita health care expenditures have been climbing, a number of programs intended to reduce them have been put in place. For example, in British Columbia between 1987 and 1995 there was a 31% reduction in the number of staffed short term care beds, and a 6% reduction in the number of staffed long term care beds, for a total reduction of 20% in staffed hospital beds (Figure 38)³³. The next 20% reduction in the number of staffed hospital beds will be much more difficult to achieve, as there is some minimum number of

hospital beds per capita. Once the point that no reduction can be achieved, the offset of the reductions against other increasing costs will be gone, and the per capita rates will climb.

Also note that the savings that have been gained in the hospital sector from such reductions have been gross, not net, gains, as to some extent they have resulted in increases in other types and sectors of expenditure. Thus, as was shown in Section II. C, while hospital costs have been growing at a below average rate, those of public health, health plan administration, and most particularly the other expenditure category that includes home care have increased much faster than average. These increased costs to some extent represent a transfer, not a saving.

Home care has been offered as a cheaper alternative to long term and institutional care³⁴, a supposition that will require significant evaluation before it can be accepted. For example, part of the benefit of home care was its reliance on cheaper workers. In the case of formal home care, it will be necessary to ask how long a significant differential in labour rates will last as the sector grows in size, becoming more formalized and unionized, and as the task and responsibilities of formal home care increasingly approach those of institutions.

It will also be important to evaluate the cost transference from the public sector to the private household that occurs with a shift from institutional to home care. Home care also imposes costs on the household where the home care is delivered, including both out of pocket costs (for washing linen, cleaning dishes, etc., and in some jurisdictions, home care fees) and time costs, as members of the household become unpaid parts of the delivery of care. While these costs do not show up in the provincial accounting for health care expenditures, they are most certainly costs that must be accounted for as we move from today's situation where one in eight people are seniors to a situation where one in four people are seniors by 2032.

In 1996, 2.8 million adults in Canada were providing some form of informal health care to people with long term health problems³⁵: regardless of the normative value of such caring, the economic cost of providing these services must be accounted for in any attempts to reduce age specific per capita costs in any one sector: if the costs are merely pushed to another sector, there has been no reduction in the costs, but simply a downloading of them.

There is another potential unaccounted cost from replacing hospital care with home care, and that is that the care may in fact not occur: "a recent study in Saskatchewan of hospital patients discharged to their homes (showed that) sixty percent of those who were assessed in hospital as requiring home care did not go on to receive formal services"³⁶. Any evaluation of reduction in health expenditures as a result of alternatives must start with evaluation of the health consequences, then of the transfer of the burden of the costs, before consideration of the savings. To reduce health expenditures by reducing health is to confuse means and ends.

It is highly unlikely that significant reductions in real age specific per capita health expenditures can be achieved in the future. Cutting health care costs has been actively pursued over the past decade, and, as with most activities, the law of diminishing returns applies to reducing health care costs. Any cutting in one type or sector of service is likely now to shift it to other sectors or types of service, or to reduce health more than costs. In any attempt to reduce costs, the external costs that changes would impose must be accounted for, including not only the dollar costs, but also the costs of unpaid services and the impact on the quality of health of the people of British Columbia. Working from the premise that people view health as a good thing, and will utilize the health system to preserve their health, either preventatively or retroactively, it is unlikely that there will be a real reduction in health care expenditures in the future. There will be an increasing shift towards private payment, in both the preventative and corrective parts of the system, as down

sizing, down loading, and "up feeling" continue to occur.

The current medical health system will broaden to include aspects of prevention, with very significant opportunities for physicians, as the health experts, to widen the scope of their activities to lead health care spectrum teams ranging from nutritionist to personal trainers as prevention becomes acknowledged as the foundation of a healthy population. This trail is already being blazed by sports medicine doctors. As governments will be faced with increasing financial constraints as their debts squeeze them against the demands of an aging population, the range of publicly funded health expenditures will likely narrow, which means that mechanisms will have to be developed to permit increased professional participation in the important, large and growing private and NGO health care system that lies outside of provincial medical plans.

There will also be, finally, an acknowledgement that we already have a three tiered medical system: a) those who get services under the medical plan, b) those who are on the waiting list to get services or not covered and c) those who can get services outside the provision of the plan (Workers Compensation and people able to pay for private services here or elsewhere). This acknowledgement will permit development of a system, much like that which exists in pension planning, where there is a basic plan for everyone and additional plans (employment pensions and RRSPs) for those who can and wish to spend more for a higher level of future consumption. Thus, just as people today can "top up" their health plan with extended coverage or private insurance for travel, we will see a system where, while everyone will contribute to a universal health care plan, some will be able to choose to contribute to other, additional medical plans for additional service in British Columbia. One of the great virtues of adding private plans for medical expenditures is that it will move some small part of expenditure away from the unfunded public "pay as we go" system we have today where short term economic conditions have a disproportionate influence on long term health care.

To close this section of speculation, we will also see a greater emphasis on patient responsibility. In the current format of medical coverage, there is a very high level of moral hazard, as there is no financial incentive for those covered by a medical plan to act in their own, and the plan's, best interest. As with almost all insurance plans, the risk of moral hazard is great. Right now a smoker pays the same for medical coverage as a non-smoker, a person who is aerobically fit pays the same as a person whose only exercise is surfing channels and web sites, a person who is a weight-lifting calcium-eating bone and body builder pays the same as a person whose only experience with weight lifting is getting up in the morning. The goal of the medical plan should be not to simply have low per capita health care spending, but rather to have a healthy population at a reasonable cost. Patient responsibility – financial and behavioural – will be built into the medical plan in order to encourage health, rather than merely chasing problems with remedies.

In closing, while there are many interesting changes occurring in patterns of health expenditures, there is no conclusive empirical evidence at this time to support the assumption they will lead to reduced age specific provincial (or total) health expenditures. Until there is, the assumption of constant rates is the most prudent one.

VI. Conclusions and Summary

The continuation of current age specific patterns of provincial health expenditures and the inevitable aging of the province's population lead irrefutably to the conclusion that real provincial health expenditures in BC will increase by almost twice the increase in the province's population over the coming decades. Only if population growth due to migration of young workers to the province increases dramatically or age specific per capita spending declines dramatically can this situation be avoided. As neither of these are likely to occur, the discussion of health expenditures must turn from the current divisive debates about "how to cut" to development of an inclusive process to find strategies that will show us "how to pay" for the level of health that the people of BC aspire to.

Projections based on empirical evidence show that given current trends, for every person in the province today, there will be 1.72 people in 2040: without inflation or increases in consumption of health commodities, for \$1.00 spent on health by the provincial government, there will be \$2.30 spent in 2040. Population growth and change alone will increase provincial spending on health from 1998's \$7.8 billion dollars to \$18.0 billion in 2040, implying an average rate of increase in constant dollars of 2% per year. Real per capita spending is projected to increase by 35%, from \$1,950 in 1998 to \$2,635 in 2040, growing at an average of 0.7% per year.

The aging of the war and post war babies over the next four decades will result in spending on the 65 plus age group increasing from its current 54% of total provincial spending to 68% by 2040. Spending on all other age groups will decline as a share of total spending, from 16% to 14% for the 45 to 64 age group, from 24% to 15% for the 15 to 44 age group, and from 5% to 3% on the 0 to 14 age group.

While the share of provincial health spending on the under 65 age groups will decline, absolute spending will not. In 1998, \$401 million was spent on the 0 to 14 age group: by 2021, this will have increased to \$478 million (constant 1998 dollars), and by 2040 to \$553 million. Spending on the 15 to 44 age group will also increase, from \$1.9 billion in 1998 to \$2.3 billion in 2021, and \$2.7 billion in 2040. Spending on the 45 to 64 age group will increase by a greater percentage, from 1998's \$1.3 billion to \$2.1 billion in 2021, and \$2.8 billion in 2040.

These increases all pale in contrast to the increase in spending on the 65 plus age group. In 1998, provincial health spending on this age group totaled \$4.3 billion: by 2021, under the assumption of constant age specific health per capita spending and in constant dollars, total spending on the 65 plus age group will be \$8.0 billion – the same amount that is currently spent on all age groups in the province. Aging will mean that every year from 2021 on, the provincial health budget for people 65 and older will be greater – in constant dollars – than today's total health budget. Few can discuss the increasing share of expenditures for the 65 plus age group with any impartiality, as everyone over 23 today will be part of this older population during this projection period.

"Can we afford this increase in provincial health expenditure?" The answer is a qualified "Yes" - if BC's economy expands in real terms by an average of 1.9% per year over the next decade, and an average of 2.5% per year in the following decade". This should be easy – the required growth is well below the 6.4% average real growth in GDP of the 1960s, below the 4.8% per year growth of the 1970s, and even below the 3.7% per year average of the recessionary 1980s.

We cannot afford it at the rate of economic growth of the past decade. The 1.6% per year growth that the province's economy has average since 1990, and most certainly the 0.8% it has averaged since 1995, are not good enough. Without better economic performance in the province over the

coming decades than we have had in the past one, the answer will be “No, British Columbia cannot afford the health care costs of its aging population!” If we do not have a better economic performance than we have had over the past decade, then the provincial government is going to have to face the hard choices of cutting the real resources spent on health, thereby downloading these costs directly onto patients and their families and households, or cutting the resources spent on other sectors. Further cutting of health expenditures will be difficult.

While total health expenditures increased 8.2 times in British Columbia between 1975 and 1998, the increases were not uniform across all expenditure categories. Below average increases were recorded in expenditures for capital (a 4.2 times increase), hospital operation (a 6.1 times increase), and physicians (7.6 times increase). Above average increases were recorded for expenditures on Drugs (9.1 times increase), professionals other than physicians (9.3 times), health institutions other than hospitals (12 times), and a 14.3 times increase on the "left over" category of Other Health Spending (home care, medical transportation, hearing aids and other appliances and prostheses, public health, prepayment administration, health research, and miscellaneous health care).

These differential growth rates have brought significant change to the distribution of health expenditures. In 1975, 18% of health expenditures in the province were on Physicians, 39.8% were on Hospitals, and 3.8% were on additions to the Capital stock of health facilities in the province. By 1998, these shares had declined to 16.8% on Physicians, 29.9% on Hospitals, and 1.9% on Capital. These three traditional components of health care fell from 62% of the total to only 49% over the past 23 years: it would be useful to have research on the extent to which the reduction of costs in these three expenditure categories were simply matched with increases in the other categories, and the extent to which health was improved, if at all, by the changes.

This report discussed three topics. The first was a review of historical patterns of health expenditures. The discussion showed that health expenditures have increased faster than both inflation and demographic change, that the fastest growth was outside the traditional core of doctors and hospitals, and that, given the significant difference between the provinces in Canada, comparisons of provincial health expenditures, if done at all, must be highly qualified.

The second topic was the age specific nature of health expenditures. Consideration of this topic showed that per capita spending, in both the public and private sector, increases with age. Assuming that age specific per capita provincial health expenditures remained constant at their 1997 level, the ongoing aging of the province's population will mean that real per capita provincial government spending on health will increase by 35% over the next forty years.

The third topic of discussion was whether the historical growth in age specific per capita provincial spending would be reversed in the future, thereby reducing per capita rates and hence the real increases in health spending. While there are indications that the health is improving as a result of changing technology and behaviour, there is no comprehensive evidence that this is reducing health costs, rather than reallocating them from preventable to remedial. Similarly, there is no comprehensive evidence that the shifting of care between sectors is resulting in lower overall cost for the same level of care. Before empirically based scenarios involving falling per capita age specific costs can be explored, it will be necessary to have data on expenditures for all types of expenditure and all sectors. The next edition of the National Health Expenditure Report from Health Canada – due next year - will facilitate this analysis.

Discussion of these three topics leads naturally to a fourth: how should the people of British Columbia prepare for the significant increase in real per capita spending on health? Enormous

challenges and significant changes face the health support system in British Columbia. Now is the time for everyone who is involved in the delivery system, and the people who pay for and benefit from the expenditures, the people of British Columbia, to work together to develop a process that will ensure that people in the province will not be without care. The goal of health expenditures, both public and private, is to ensure our health, and therefore, the measure of expenditures must be their contribution to the health of British Columbians.

Endnotes:

- ¹ David Baxter and Andrew Ramlo, Healthy Choices: Demographics and Health Spending in Canada, 1980 to 2035, The Urban Futures Institute, July 1998
- ² David Baxter, Jim Smerdon, and Andrew Ramlo, Six and a Quarter Million People: British Columbia's Population in the Next Three Decades, The Urban Futures Institute, April 1999
- ³ Source: Organization of Economic Cooperation and Development (OECD) web site.
- ⁴ Health expenditure data are from Canadian Institute for Health Information (CIHI) web site.
- ⁵ Consumer Price Index and historical population data for Canada from Statistics Canada publications. Calculations and tabulations by The Urban Futures Institute
- ⁶ Healthy Choices, pages 4 to 9.
- ⁷ BC health expenditure data are from CIHI web site; Consumer Price Index for British Columbia and historical population data for British Columbia from Statistics Canada publications. Calculations by The Urban Futures Institute
- ⁸ Provincial health expenditure data are from CIHI web site
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- ¹⁰ "How far to the nearest physician?", Health Reports, Statistics Canada, Spring 1997, Vol.8 No. 4, page 29.
- ¹¹ Healthy Choices, pages 11-13.
- ¹² 1996 Census of Canada, Statistics Canada
- ¹³ Provincial health expenditure data are from CIHI web site; analysis by The Urban Futures Institute.
- ¹⁴ National health expenditure data are from CIHI web site; analysis by The Urban Futures Institute.
- ¹⁵ Health Canada, National Health Expenditures In Canada, 1975 to 1994, Ottawa, 1996, Table 13B.
- ¹⁶ Provincial health expenditure data are from CIHI web site; analysis by The Urban Futures Institute.
- ¹⁷ Healthy Choices, pages 2-3.
- ¹⁸ Data provided in correspondence from the BC Ministry of Finance.
- ¹⁹ Health Canada, National Health Expenditures In Canada, 1975 to 1994, Ottawa, 1996.
- ²⁰ Statistics Canada, Consumer Prices and Price Indexes, Ottawa 1999
- ²¹ BC Statistics, PEOPLE23 Projection, July 1998.
- ²² See Poorer Now: Average Weekly Earnings and Purchasing Power In British Columbia, 1983 to 1996, The Urban Futures Institute, January 1998, Pages 18 to 20.
- ²³ The consumer price index for health care in British Columbia increased by 112% from 1980 to 1997, while the overall consumer price index increased by only 106%. Statistics Canada, Consumer Prices and Price Indexes.
- ²⁴ Healthy Choices, pages 11 to 21.
- ²⁵ Data are from a custom tabulation of Statistics Canada Survey of Family and Household Expenditures for 1996.
- ²⁶ Six and a Quarter Million People: The Urban Futures Institute, April 1999.
- ²⁷ For example, "Discourage immigrants to curb population: Planner", The Province, Monday Nov. 16, 1998, p A8.
- ²⁸ David Baxter and Jim Smerdon, Help Wanted: Projections of Canada's Labour Force Over the Next Four Decades, The Urban Futures Institute, July 1999.
- ²⁹ Statistics Canada, Canada Yearbook 1997, page 105.
- ³⁰ Wayne J. Millar and Gerry B. Hill, "Hip Fractures: Mortality, Morbidity and Surgical Treatment", Statistics Canada, Health Reports 1994 Vol. 6 No. 3 Pages 323 – 337.
- ³¹ Canada Yearbook 1997, page 105.
- ³² Manton, K.G., Stallard E., Corder L.S.: The Dynamics of Dimensions of Age Related Disability, 1982 to 1994, in the US Elderly Population, Journal of Gerontology: Biological Sciences 53A (1): B59-B70, 1998.
- ³³ Patricia Tully and Etienne Saint-Pierre, Downsizing Canada's Hospitals, 1986/87 to 1994/95, Health Reports, spring 1997 Vol. 8 No.4 Pages 33 to 39.
- ³⁴ Kathryn Wilkins and Evelyn Park, "Home Care in Canada", Statistics Canada Health Reports Vol.10 No.1 Page 29.
- ³⁵ Wilkins and Park, Pages 29 – 37.
- ³⁶ Wilkins and Park, Page 36.