

POPULATION
AGEING AND
HEALTH
SPENDING:
50-YEAR
PROJECTIONS

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INTRODUCTION

New Zealand's population continues to grow larger and to grow older: the proportion of the population who are aged 65 years or over is projected to double over the next 50 years. These population changes will have a significant impact on health spending and on economic growth, as reflected in changes to the gross domestic product (GDP). In particular, the ageing population will require more health care (as older people have greater health needs) but GDP growth will be curbed, as proportionately fewer people will be of working age.

This paper examines the effect of predicted population changes, up to the year 2051, on health spending as a percentage of GDP. This is not intended to be a prediction about what *will* happen: 50 years is an extremely long time over which to project, and the level of health spending is a decision the Government makes each year. Rather, this paper tests a number of scenarios.

In the 'base case' scenario, the projections give an indication of what could happen to health spending given the continuation of current policies and current funding trends. The paper shows that, under this base case, health spending would rise as a proportion of GDP but that this is sensitive to assumptions about the size of 'non-demographic' growth in health spending as well as future levels of economic growth.

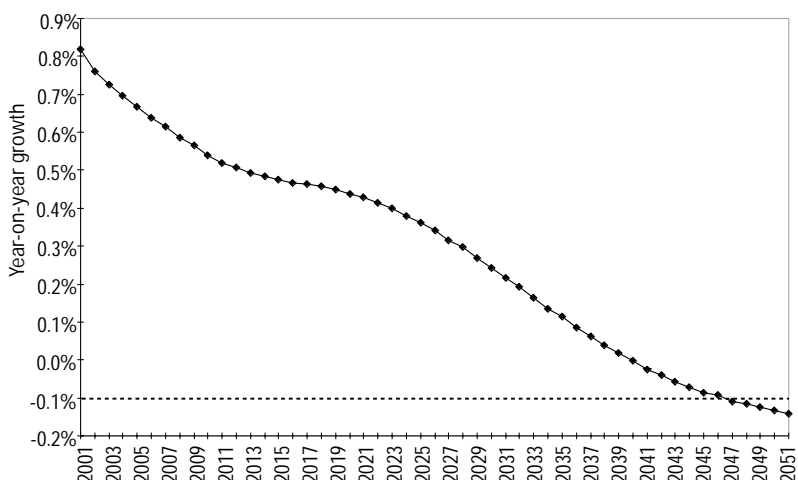
Throughout this paper, 'health spending' refers to Vote Health, which comprises the main government funding for health and disability support services. Vote Health was \$5.9 billion in 1997/98 and accounted for around 70% of total health expenditure in New Zealand.¹ 'Population ageing' or just 'ageing' refers to the growth in the *proportion* of older people in the population (as distinct from growth in the *absolute number* of older people).

¹ Health-related government expenditure that is directed through other Votes, for example ACC, Defence and Education, makes up around 8% of total health expenditure. Vote Health funding also includes some items (rest home subsidies, for example) that are not considered 'health items' by the World Health Organization (WHO). Figures for Vote Health and total health expenditure given in this paper will therefore be different to those reported in some other publications.

NEW ZEALAND'S CHANGING POPULATION

According to Statistics New Zealand's long-term projections² the population of New Zealand will continue to grow and is expected to reach 4.5 million by 2051. The rate of population growth is steadily slowing, however, and after 2040 the population is predicted to decline (Figure 1).

Figure 1: Projected population growth, 2001 to 2051

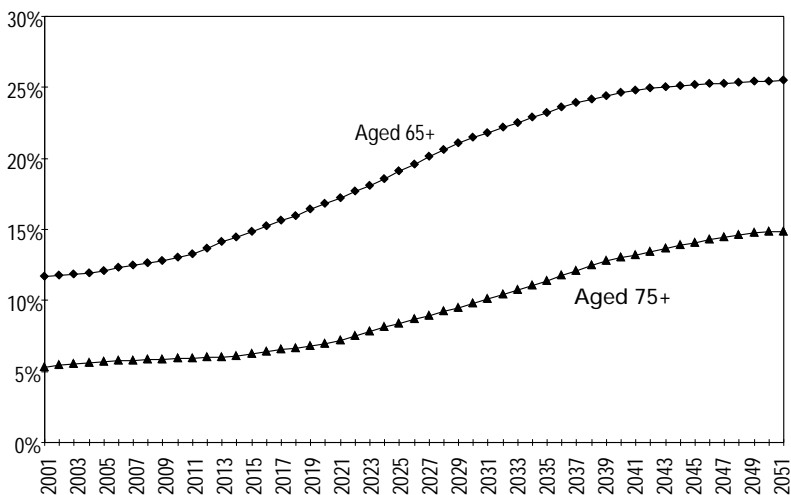


Source: Statistics New Zealand

² Medium series population projections by sex and single year of age, 1996 Census-base, assuming medium mortality, medium fertility and long-term annual net migration of 5,000. Projections are made from 1997 to 2051.

New Zealand's population will also have an older age structure in the future, as Figure 2 shows. People aged 65 and over are expected to increase as a proportion of the population from 12% in 2001 to 26% in the year 2051.

Figure 2: Older people as a proportion of the population, 2001 to 2051



Source: *Statistics New Zealand*

Population ageing is foremost a result of the 'baby boom' – the rapid increase and then decline in birth rates following the Second World War. This period of heightened fertility lasted for around 30 years, peaking in 1961 (Statistics New Zealand 1999). The number of people born during this period was therefore unusually large, relative to the cohorts born in the years before and after. The effect of the 'baby boomers' moving into retirement age is shown in Figure 2 by the rapid increase in the proportion of older people, between the years 2010 and 2040.

Population ageing has also been intensified by increases in life expectancy at older ages. Life expectancy at age 65 has grown by around two-and-a-half years for both males and females over the last 20 years (Statistics New Zealand 1999). Increasing life expectancy at older ages is predicted to continue in the future, but at a decreasing rate.

These predicted population changes are used throughout this paper to project health spending to 2051 and then to project GDP to 2051.

Health spending is projected to 2051 by calculating the product of:

- population growth
- ageing effects on health spending
- other health spending growth.

GDP is projected to 2051 by calculating the product of:

- population growth
- ageing effects on GDP
- productivity growth.

A projection of health spending as a percentage of GDP is obtained by dividing the health spending projection by the GDP projection. In doing this, population growth cancels itself out: 1% growth in population, for example, will increase health spending by 1%, but will also increase GDP by 1% (all else remaining equal). Population ageing is therefore the key population change in determining future health spending as a percentage of GDP.

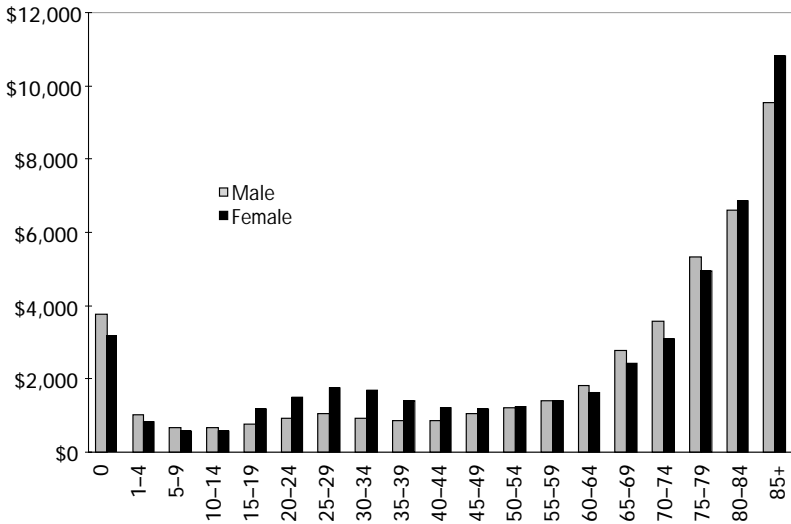
PROJECTIONS OF HEALTH SPENDING

Overall population growth affects health spending because each year more people will need to be provided with health services (all else remaining equal). In recognition of this, current government policy is to automatically increase health spending each year by the expected rate of population growth. Recently, population growth adjustments have been around 0.9% each year. Long term, these adjustments will follow the projected population growth rate shown in Figure 1.

Population ageing also affects health spending because more is spent per person on older people than on younger people, as Figure 3 shows.³ This reflects the association between ageing and poorer health status, a greater number of hospital admissions and an increasing prevalence of disability. As the population ages, a greater proportion of people will be in these more costly age groups.

³ Average per capita government health spending for different age, sex and ethnic groups has previously been estimated for use in resource allocation formulae (Ministry of Health 1995a). For this exercise, the per capita cost weights in these guides have been scaled up to the 1997/98 year, improved where possible, averaged across ethnic and Community Services Card groups, and have been extended to include all the components of Vote Health.

Figure 3: Per capita health costs by age group and sex, 1997/98



Source: Ministry of Health

This effect is also reflected in current government policy: health spending is automatically increased each year to take account of population ageing. The adjustment is calculated by holding everything, except the age structure of the population, constant from one year to the next, and calculating the percentage change in health spending that would result. In equation form:

$$\text{ageing adjustment} = \frac{\sum_i \text{pop}_{i(t+1)} C_{it}}{\sum_i \text{pop}_{it} C_{it}} * \frac{\text{POP}_t}{\text{POP}_{t+1}} \quad \text{where}$$

pop_{it} = the number of people in age / sex group i in year t

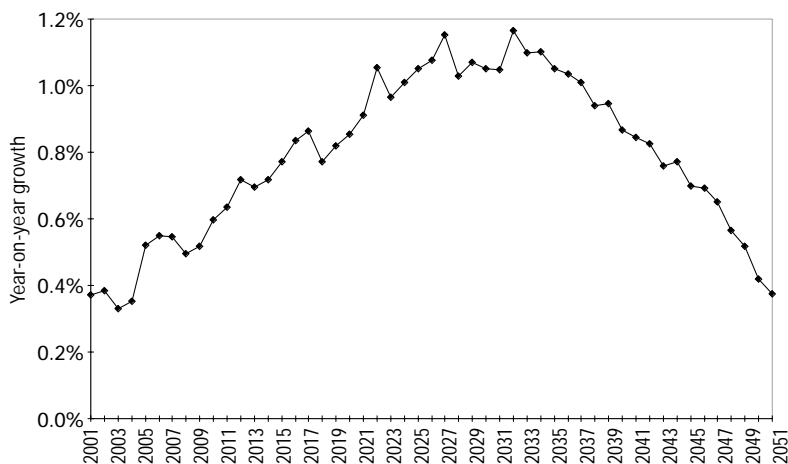
C_{it} = per capita health costs of people in age / sex group i in year t

POP_t = the total population in year $t = \sum_i \text{pop}_{it}$

Recent ageing adjustments have been around 0.4% each year.⁴ A projection of these ageing adjustments through to 2051 is shown in Figure 4. This uses the Statistics New Zealand long-term population projections and the per capita costs from Figure 3. The per capita costs are assumed to remain the same, *relative to each other*, throughout the period of this projection.⁵

Ageing adjustments rise from the current level of around 0.4% to over 1% of health spending for most of the period 2020 to 2040. This is the time of most rapid ageing, when baby boomers are moving into the very old ages.

Figure 4: Projected ageing adjustments to health spending, 2001 to 2051



⁴ For more details see (Ministry of Health 1995b). Demographic adjusters have been calculated using more detailed breakdowns of per capita costs than are shown in Figure 3 (see previous footnote) and short-term projections of mean populations for funding (not calendar) years.

⁵ It is not necessary that the per capita costs remain *constant* over the 50 years of the projection but just that the *relative* per capita costs, that is, the shape of Figure 3, remain the same.

In addition to population changes, there are a number of factors that contribute to increases in health spending, including: price changes; technological developments; trends in referring, prescribing and treatment; changes in demand and public expectations of health services; and new initiatives that raise the level of services provided in the public health system.

Over the 20 years from 1977/78 to 1997/98, real per capita health spending grew by an average of 1.3% each year (see Appendix 1). By 'backcasting' using historical population estimates, it is estimated that 0.4% out of the 1.3% average growth can be attributed to population ageing.⁶ Real per capita growth above and beyond that attributable to population changes was therefore around 0.9% per year.

The base projection of health spending therefore takes the level of health spending in 1999/00 (\$6.7 billion) and grows this to 2051 by a product of:

- population growth, as shown in Figure 1
- ageing effects on health spending, as shown in Figure 4
- annual real growth of 1.0% (inflation is assumed to be 1.5%).

This results in average growth in health spending of 3.6% each year over the next 50 years; 1.8% each year in real per capita terms.

⁶ The per capita costs in these backcasts were those in Figure 2 less the costs for all disability support services (until 1993/94), as most of these services were not part of Vote Health until the regional health authorities were formed in 1993/94.

PROJECTIONS OF GDP

Real GDP can be considered as the product of the size of the labour force and labour force productivity.

Overall population growth will therefore affect GDP because the labour force will increase at the same rate as the overall population (if all else remains equal) and this in turn will increase GDP.

Population ageing also affects GDP growth, as the proportion of the population who are in the labour force (who are almost all aged between 15 and 64 years) will be falling each year. The annual effect of ageing on GDP can be calculated in a similar way to the ageing effect on health spending. In equation form this is:

$$\text{ageing effect on GDP} = \frac{\sum_i pop_{i(t+1)} p_{it}}{\sum_i pop_{it} p_{it}} * \frac{POP_t}{POP_{t+1}} \text{ where}$$

pop_{it} = the number of people in age / sex group i in year t

p_{it} = participation rate for people in age / sex group i in year t .

The participation rate is the percentage of people who are in the labour force (that is, either employed or actively looking for work)

POP_t = the total population in year $t = \sum_i pop_{it}$

Participation rates are taken to be constant throughout the period.⁷

In this model, productivity growth is the other factor affecting future levels of GDP. Under the base projection, real productivity growth is assumed to be 1.5% throughout the period to 2051.⁸

⁷ Participation rates for different age and sex groups were taken from a long-term fiscal model developed by the Treasury and refined by the New Zealand Institute of Economic Research (NZIER). Changing the participation rates within plausible bounds made little difference to the GDP projections. Average weekly hours worked, and the rate of unemployment, are also assumed to remain constant.

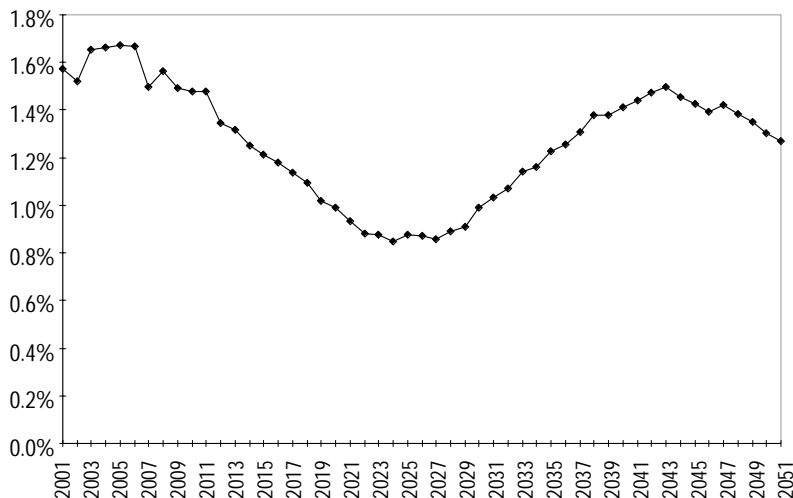
⁸ This productivity assumption was also taken from the Treasury /NZIER model.

The base projection of GDP growth therefore takes the estimated level of nominal GDP in 1999/00 (\$101.3 billion⁹) and grows this to 2051 by a product of:

- population growth
- ageing effects on GDP
- annual real productivity growth of 1.5% (the GDP deflator is assumed to be the same as inflation each year, namely 1.5%).

This results in average growth in GDP of 3.1% each year over the next 50 years; 1.3% each year in real per capita terms. The base projection of GDP growth, in real per capita terms, is shown in Figure 5 below.

Figure 5: Projected real per capita GDP growth, 2001 to 2051, base projection



⁹ NZIER June 1999 forecast.

The 'U-shape' of Figure 5 shows the effect of population ageing in curbing GDP growth. Growth in real per capita GDP is lowest between 2020 and 2030. From 2020 onwards, the absolute size of the labour force is expected to decline.

However, despite the effects of an ageing population, the base projection is for greater GDP growth than in New Zealand's recent experience. As noted above, real GDP per capita is projected to grow by an average of 1.3% each year over the next 50 years. This compares with an average of 1.1% over the 20 years from 1977/78 to 1997/98.

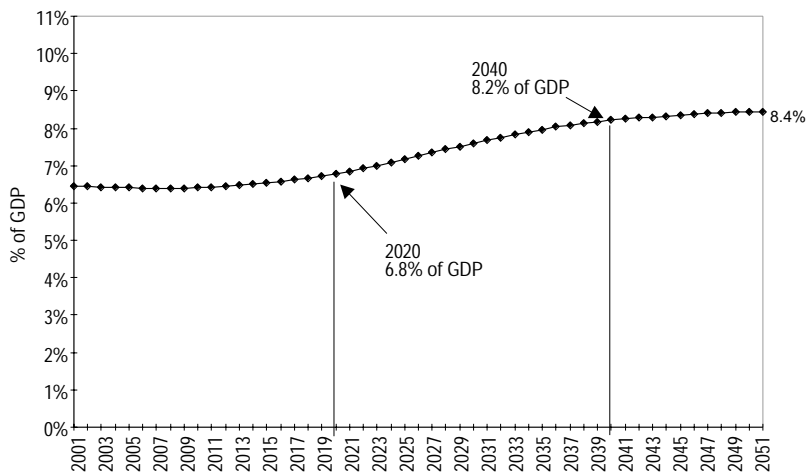
HEALTH SPENDING AS A PERCENTAGE OF GDP

Under the base projection, health spending must increase as a percentage of GDP. This is because health spending grows by an average of 3.6% each year to 2051, while GDP grows by an average of only 3.1%.

Health spending in 2000/01 is expected to be around 6.5% of GDP. Given the base projections, health spending will grow to 8.4% of GDP in 2051 (Figure 6).¹⁰ Not surprisingly, the greatest increases happen during the period of most rapid ageing, between the years 2020 and 2040. Over this period, health spending is projected to rise by 1.4% as a percentage of GDP.

¹⁰ Note that this does not include private health expenditure, which is much more difficult to project. Private health expenditure has grown more quickly than public expenditure over the past 20 years, although not in the most recent years. If public health spending continues to be around 70% of total health expenditure in the future, total health expenditure could be up to 12% of GDP by 2051 (under the base projection assumptions).

Figure 6: Health spending as a percentage of GDP, 2001 to 2051, base projection



The base projection shown in Figure 6 shows health spending as a percentage of GDP growing by two percentage points over the next 50 years. An increase of this magnitude should not be surprising: an older population will have a greater need for health care than for many other goods and services. There are no absolute criteria, however, for judging whether such an increase in health spending is sustainable or not. An increase of 2% of GDP is certainly significant, and is approximately the current level of government expenditure on defence and corrections combined (The Treasury 1999). This increase, however, occurs over a 50-year time period; 50 years ago, health spending was around 3% of GDP. The United States currently spends over 14% of its GDP on health care (although this includes private as well as public expenditure).

An increase in health spending as a percentage of GDP does have important fiscal implications, however. Such spending growth would need to be financed by an increase in tax rates or government borrowing, or by a corresponding decrease in other areas of government expenditure. Reallocation of spending will be even more difficult because government expenditure in other social areas will also come under pressure from population ageing – superannuation in particular (see Appendix 2).

The base projection of health spending as a percentage of GDP relies on a number of assumptions about:

- per capita health costs by age group and sex
- projected population structure
- real increases in health spending over and above those attributable to population changes
- productivity growth.

The first two of these assumptions affect the magnitude of future ageing adjustments. The last two do not affect ageing adjustments themselves, but will impact on the affordability of ageing-related increases. In the following sections, the sensitivity of the projections is tested by varying these four factors in turn.

SENSITIVITY TO CHANGES IN PER CAPITA COSTS

The base projection assumes that relative per capita health costs – that is, the shape of Figure 3 – will remain constant over the next 50 years. This may not be the case. Improvements in nutrition, environmental conditions, education, smoking habits and medical technology could mean that older people have more healthy years of life in the future and that health problems could be compressed into the very old ages (Campbell 1993; Fries 1980). Life expectancy for the older is predicted to increase. Some authors have argued that these improvements in health status

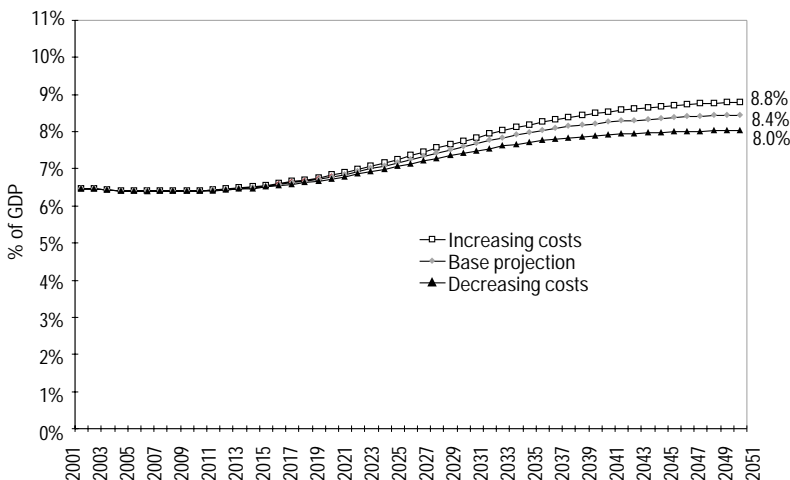
and length of life will lead to relative decreases in the per capita health costs of older people. In particular this follows from the observation that health care costs are more a function of distance from death rather than distance from birth (see Appendix 3).

On the other hand, the experience to date of countries such as the United Kingdom (Harrison et al 1997), the United States (Fuchs 1984), Sweden (Gerdtham 1993) and the Netherlands (Meerding et al 1998) has been that per capita health costs for older age groups have actually been growing faster than costs for younger age groups.

To test the impact of different relative per capita costs, the projections were repeated under two scenarios:

- decreasing per capita costs for ages 65 and over by a constant proportion each year so that by 2051 these costs have *decreased by a third*
- increasing per capita costs for ages 65 and over by a constant proportion each year so that by 2051 these costs have *increased by a third*.

Figure 7: Health spending as a percentage of GDP, 2001 to 2051, under different per capita cost assumptions



Even when per capita costs are changed quite significantly, older people still attract much more health spending than younger people. Changing relative per capita costs therefore appears to make little difference to the projection of health spending as a percentage of GDP.

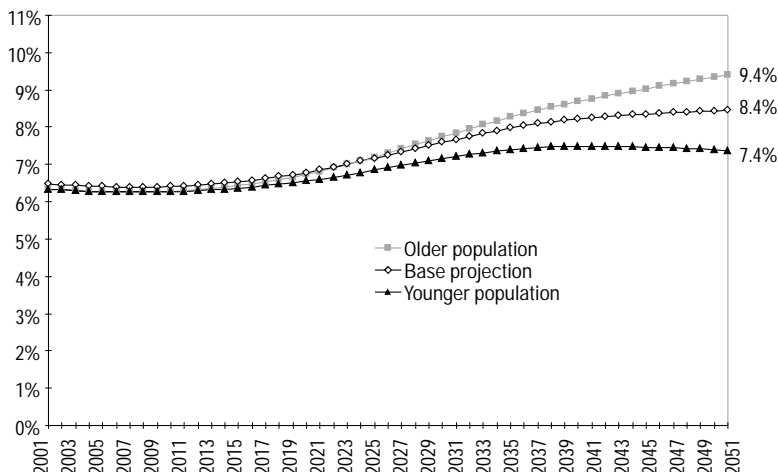
SENSITIVITY TO CHANGES IN POPULATION PROJECTIONS

Projections of ageing adjustments and projections of GDP both depend on assumptions about the future population structure. Medium fertility and mortality, and long-term net annual migration of 5,000 were assumed for the base projection. To test the impact of different population structures, the projections were repeated under two scenarios:¹¹

- an older population structure, assuming low fertility and low mortality. Under this scenario, people aged 65 and over make up 30% of the population in 2051.
- a younger population structure, assuming high fertility and high mortality. Under this scenario, people aged 65 and over make up only 22% of the population in 2051.

¹¹ These were prepared for use in this paper by the Population and Demography Division, Statistics New Zealand.

Figure 8: Health spending as a percentage of GDP, 2001 to 2051, under different population assumptions



Different assumptions about population structure do make a difference to the projections, although it should be noted that the populations used above represent the extremes of population structure. Even with a very young population, health spending in 2040 still reaches 7.5% of GDP.

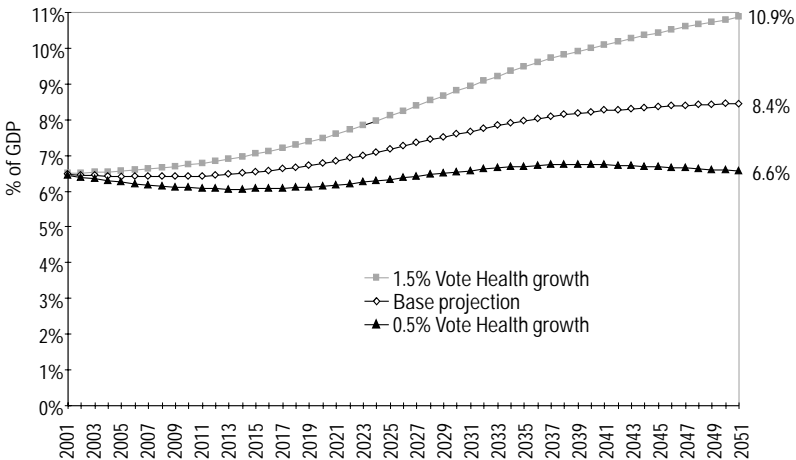
The assumed level of annual migration also makes a difference to these projections. Assuming net migration of 10,000 rather than 5,000 in the base projection results in health spending levels of 8.0% of GDP in 2051. A greater number of immigrants increases growth in the working age population, raising GDP at a slightly greater rate than growth in health spending.

SENSITIVITY TO CHANGES IN HEALTH SPENDING GROWTH

The base projection was made under the assumption that real health spending will increase by 1.0% each year, over and above population growth and ageing adjustments. This assumption was made on the basis of average annual growth in real health spending of 0.9% over the 20 years to 1997/98. To test the impact of different health spending growth assumptions, the projections were repeated under two scenarios:

- 1.5% annual real growth in health spending (on top of population growth and ageing adjustments)
- 0.5% annual real growth in health spending (on top of population growth and ageing adjustments).¹²

Figure 9: Health spending as a percentage of GDP, 2001 to 2051, under different health spending growth assumptions



¹² Note that 1.5% annual real per capita growth represents an elasticity of health spending with respect to GDP of 1.9 (given the base projection of GDP). Growth of 1% and 0.5% represents elasticities of 1.4 and 1.0 respectively. Over the past 20 years, New Zealand has had an elasticity of 1.1.

Changing the health spending growth assumptions makes an appreciable difference to the projections. Under the 0.5% growth scenario, health spending stays relatively constant as a percentage of GDP, despite ageing-related increases. On the other hand, sustained real increases of 1.5% each year push health spending up to 10.9% of GDP by 2051.

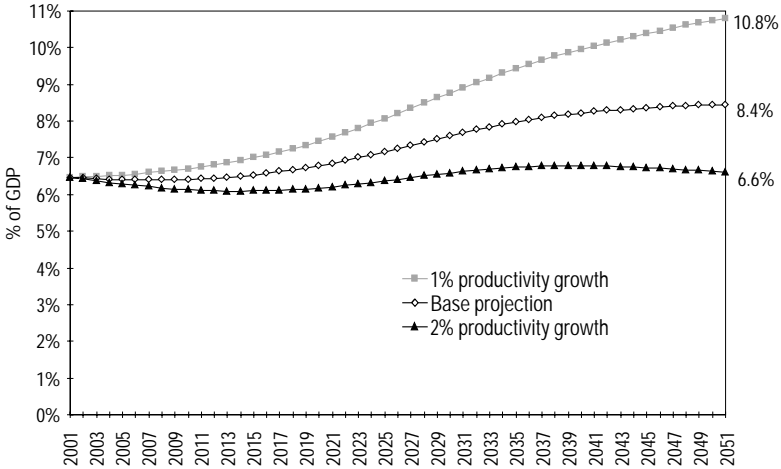
SENSITIVITY TO CHANGES IN PRODUCTIVITY GROWTH

Apart from population growth, GDP growth in this model depends on assumptions about labour force participation rates and productivity growth. Changing participation rates made little difference to the projections, but GDP growth was found to be sensitive to changes in the assumptions about future productivity growth.

The base projection assumes annual productivity increases of 1.5%, resulting in average annual real GDP growth of 1.5% over the period 1998 to 2051. To test the impact of different health spending growth assumptions, the projections were repeated under two scenarios:

- 1.0% annual productivity increases
- 2.0% annual productivity increases.

Figure 10: Health spending as a percentage of GDP, 2001 to 2051, under different productivity assumptions



Changing the assumptions about GDP growth produces an almost identical result to changing the assumptions about real per capita health costs. Strong economic growth throughout the period (the 2% productivity growth scenario) leads to health spending remaining relatively constant as a percentage of GDP. Weak economic growth, on the other hand, pushes health spending to 10.8% of GDP by 2051.

It may not be, however, that the assumptions about health spending and about GDP growth act in concert to either ‘blow out’ or dramatically reduce health spending as a percentage of GDP. Future real per capita health spending increases are likely to be influenced in some way by the state of the economy – conditions of low economic growth are not likely to produce high health spending increases, for example.

CONCLUSION

Health spending should rise as a percentage of GDP in the future, given a continuation of current policies of population growth adjustments and ageing adjustments, and a continuation of recent trends in health spending growth. In the base case presented in this paper, health spending rises as a percentage of GDP from 6.5% in 2001 to 8.4% in 2051. Growth is particularly rapid between the years 2020 and 2040.

Countries spend differing proportions of GDP on health care, and there is no predetermined threshold at which health spending becomes unsustainable. However, were there to be such a growth in spending, this would need to be paid for through an increase in tax rates or government borrowing, or there would need to be a corresponding decrease in other areas of government expenditure.

The pressures of population ageing on health spending are unavoidable. Future changes in the relative per capita health costs of older people, or in fertility and mortality trends, do not make a large difference to the projections.

What does make a difference to the projections is the rate of growth in health spending which is above and beyond population growth and ageing adjustments. Large increases in health spending as a percentage of GDP could be avoided by controlling this 'non-demographic' spending growth. Alternatively, strong growth in the economy would help to finance any future spending growth. For example, if real increases (on top of population growth and ageing increases) were to average 0.5% each year, or if productivity growth averaged 2.0%, health spending is projected to remain relatively constant as a percentage of GDP, despite considerable ageing pressures. On the other hand, given greater health spending growth, or a weaker economy, health spending could rise rapidly as a percentage of GDP.

APPENDIX 1

VOTE HEALTH 1977/78 TO 1997/98

Table 1: Trends in Vote Health funding, 1977/78 to 1997/98

| Funding year | Vote Health (\$million) | Real Vote Health per capita (\$) | Nominal GDP (\$billion) | Vote Health as % of GDP |
|--------------|-------------------------|----------------------------------|-------------------------|-------------------------|
| 1977/78 | 810 | 1184 | 14,970 | 5.4% |
| 1978/79 | 981 | 1292 | 16,958 | 5.8% |
| 1979/80 | 1138 | 1297 | 19,795 | 5.7% |
| 1980/81 | 1358 | 1326 | 22,992 | 5.9% |
| 1981/82 | 1603 | 1349 | 27,891 | 5.7% |
| 1982/83 | 1768 | 1279 | 31,409 | 5.6% |
| 1983/84 | 1808 | 1228 | 34,839 | 5.2% |
| 1984/85 | 1914 | 1187 | 39,346 | 4.9% |
| 1985/86 | 2313 | 1238 | 45,282 | 5.1% |
| 1986/87 | 2961 | 1381 | 54,725 | 5.4% |
| 1987/88 | 3397 | 1385 | 61,641 | 5.5% |
| 1988/89 | 3653 | 1412 | 66,454 | 5.5% |
| 1989/90 | 3782 | 1339 | 71,043 | 5.3% |
| 1990/91 | 4027 | 1350 | 72,129 | 5.6% |
| 1991/92 | 4006 | 1312 | 73,204 | 5.5% |
| 1992/93 | 4066 | 1302 | 75,604 | 5.4% |
| 1993/94 | 4430 | 1383 | 82,375 | 5.4% |
| 1994/95 | 4688 | 1398 | 88,091 | 5.3% |
| 1995/96 | 4884 | 1396 | 92,330 | 5.3% |
| 1996/97 | 5288 | 1457 | 95,889 | 5.5% |
| 1997/98 | 5681 | 1531 | 98,038 | 5.8% |

Notes:

1. March years to 1989/90, June years from 1990/91 onwards.
2. In order to compare with previous years, Vote Health from 1993/94 onwards includes CHE deficit financing and excludes net transfers. Transfers are composed mainly of funding for disability support services which transferred from Social Welfare to Health. Vote Health in 1997/98, without these inclusions and exclusions, was \$5861 million.
3. De facto population (DPEA.SBEC and DPEA.SBFC), CPI (CPIQ.SE9A) and nominal GDP (SNBA.SB9 and SNBQ.SBN) from INFOS, Statistics New Zealand.

APPENDIX 2

SUPERANNUATION AND HEALTH EXPENDITURE

Ageing-related issues of growing costs and higher dependency also apply to government spending on superannuation. Superannuation has been much discussed in recent times, and its long-term sustainability, under current policies, has been questioned.¹³ How do our projections of health spending growth compare with projected growth in government expenditure on superannuation?

The Treasury/NZIER fiscal model referred to previously in this paper projects government spending on superannuation to 2051.¹⁴ The model assumes that superannuation benefits move over the next few years to 60% of the average wage, and remain at this level, and that the number of superannuation beneficiaries is a constant percentage of the population aged 65 and over.

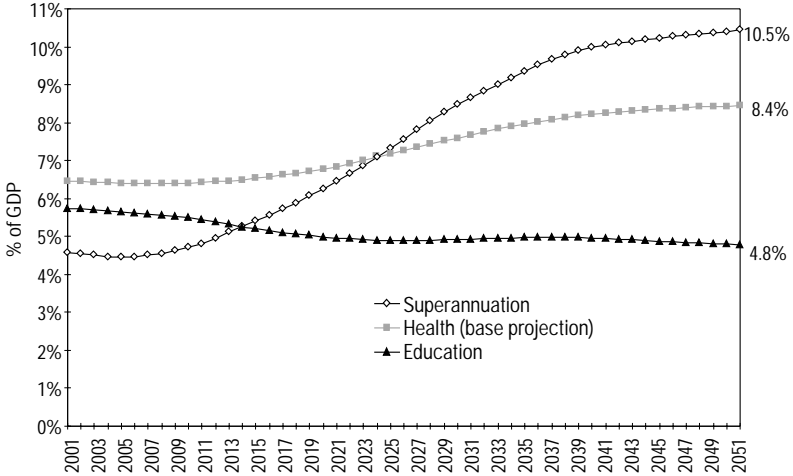
Figure 11 compares this projected superannuation spending as a percentage of GDP with the base projection of expenditure on health. One of the 'flip-sides' of ageing is that pressure on education spending will ease in the future, so the Treasury/NZIER projections of education spending are shown in Figure 11 as well.¹⁵

¹³ See, for example, Periodic Report Group (1997). This report – known widely as the 'Todd Report' – was produced before the most recent (1998) changes to superannuation policy.

¹⁴ An earlier version of this model was in fact used to inform the Periodic Report Group on retirement income policies. The per capita superannuation costs that were in this earlier version have been retained, but the model has been adapted to reflect the 1998 changes and the population projections used in this paper.

¹⁵ The assumptions about education spending are that the number of primary and secondary students is 100% of the relevant population groups and the number of tertiary students is set at a constant percentage of the relevant population group.

Figure 11: Areas of social spending as a percentage of GDP, 2001 to 2051



If current superannuation policy is maintained, government expenditure in this area is projected to rise by over 5% of GDP over the next 50 years. This is greater than any projected increases in health-related expenditure.¹⁶ Education spending is projected to fall, but only by 1% of GDP.

These projections show that population ageing impacts more on superannuation expenditure than on health expenditure. However, if the growth in superannuation spending is not controlled, there may be flow-on effects for health spending. If there are large superannuation increases in the future, they will

¹⁶ The policy of indexing superannuation to prevailing wage rates means that when GDP rises, national superannuation will generally rise with it, and as the number of retirees grows there is no ability to deal with this pressure through economic growth.

need to be funded through increases in taxation or borrowing, or through reprioritising within the government budget. Reprioritisation will put pressure on other areas of government expenditure, including health spending. Population ageing may therefore have a significant indirect effect on health spending, in addition to the direct effects described earlier in this paper.

APPENDIX 3

'DISTANCE FROM DEATH' ARGUMENTS

Health care costs are especially high in the last months or year of life. A number of studies have found that, within age groups, the health care costs of people who die (decedents) are much higher than those of survivors. In 1988, for example, the US Health Care Financing Administration reported that Medicare payments for decedents aged 65 to 69 years were almost 11 times higher than those for survivors of the same age. The relative difference diminished with age, and payments for the oldest decedents, aged 90 and over, were four times higher than for survivors (Scitovsky 1994).

For this reason, many authors think of health care costs as more a function of time to death rather than a function of time since birth (Fuchs 1984). Future increases in life expectancy should therefore lead to reductions in per capita health costs for most groups of older people, relative to younger people. Projections based on current age-specific costs will be overestimates of the effects of ageing on health expenditure.

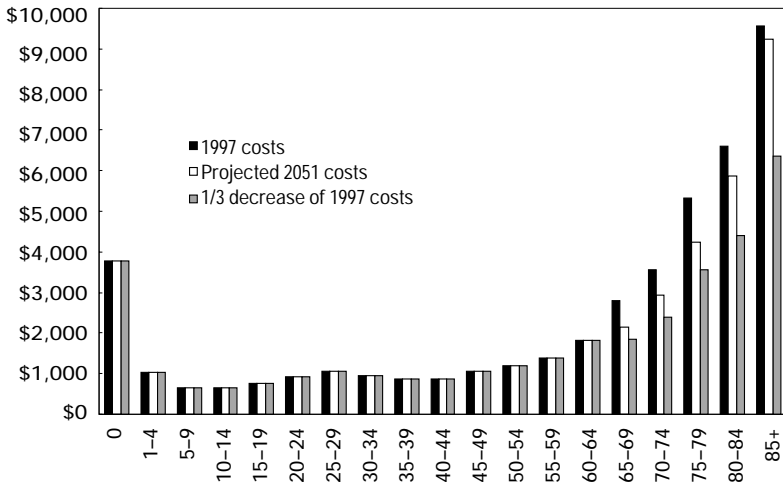
The effect of increasing life expectancy on future per capita health costs is estimated below. This is compared with the sensitivity testing in the body of this paper, where per capita costs for ages 65 and over at 2051 were both increased and decreased by a third. The method used was:

- per capita costs for single years of age and sex (from age 65 onwards) were estimated by taking the five-year age group cost-weights to be the per capita cost of people with the average age in this group
- costs for single years of age were assumed to lie on a line between these points

- projected life expectancies by single year of age and sex (from age 65 onwards) for 1997 and 2051 were provided by Statistics New Zealand
- for the year 2051, each single age was given the 1997 per capita costs of age- x , x being the difference in life expectancy between 2051 and 1997
- the single year 2051 costs were then aggregated back into five-year age bands.

Figure 12 shows the results of these projections for males; the corresponding graph for females is almost identical. Increases in life expectancy over the next 50 years have reduced the projected 2051 per capita costs for those aged 65 and over. These reductions, however, are within the minus-one-third sensitivity tested in the body of this paper.

Figure 12: Average per capita health spending by age group and sex, males



The reason for using the plus-or-minus-one-third sensitivity in the sensitivity testing is that increases in life expectancy are likely to be only one of a number of factors which will influence per capita costs. In any event, this paper (see pages 16–18) shows that even relatively large increases or decreases in per capita costs will make only small differences to ageing pressures in the future.

REFERENCES

- Campbell J. 1993. Physiology and health status of the elderly. In: P Koopman-Boyden (ed). *New Zealand's Ageing Society*. Wellington: Daphne Brasell Associates Press.
- Fries J. 1980. Aging, natural death and the compression of morbidity. *New England JM* 303: 130–5.
- Fuchs V. 1984. 'Though much is taken': Reflections on aging, health and medical care. *Milbank Quarterly* 62: 143–66.
- Gerdtham U-G. 1993. The impact of ageing on health care expenditure in Sweden. *Health Policy* 24: 1–8.
- Harrison A, Dixon J, New B, et al. 1997. Is the NHS sustainable? *BMJ* 314: 296–8.
- Meerding W, Bonneux L, Polder J, et al. 1998. Demographic and epidemiological determinants of healthcare costs in Netherlands: cost of illness study. *BMJ* 317: 111–15.
- Ministry of Health. 1995a. *Population-based Funding Formulae Technical Guides*. Wellington: Ministry of Health.
- Ministry of Health. 1995b. *Demographic Adjusters*. Wellington: Ministry of Health.
- Periodic Report Group. 1997. *1997 Retirement Income Report: A review of the current framework*. Interim report. Wellington: GP Print.
- Scitovsky AA. 1994. 'The high cost of dying' revisited. *Milbank Quarterly* 72: 561–91.
- Statistics New Zealand. 1999. *Demographic Trends 1998*. Wellington: Statistics New Zealand.
- The Treasury. 1999. *The Estimates of Appropriations for the Government of New Zealand for the Year Ending 30 June 2000*. Wellington: GP Print.