

Population ageing and government health expenditure

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PROVENANCE

This paper is a condensed version of Population Ageing and Government Health Expenditures in New Zealand, 1951 – 2051, New Zealand Treasury Working Paper 04/14, September 2004. A full copy of the paper can be obtained from Treasury's website at: <http://www.treasury.govt.nz/workingpapers/2004/04-14.asp> or accompanying paper at the Ministry of Health's website <http://www.moh.govt.nz/forums.html>

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Summary

Population ageing could put pressure on government health spending...

The average person aged 65 or over currently costs New Zealand's public health system five times as much as the average person under 65. Over the next 50 years, the proportion of the population aged 65 and over is expected to double. This appears to imply that population ageing will put substantial pressure on government health care expenditures.

...but health status, coverage, technology and wages could have more influence

International evidence suggests, however, that changes in age structure may be a less decisive influence on health expenditure than is often assumed. The first reason is that health status, rather than age *per se*, is what matters for health expenditure. The second is that 'non-demographic' expenditure determinants appear to outweigh demographic ones.

We investigate the relationship between ageing, health and health spending

To explore the implications of these issues for New Zealand, an interdisciplinary team from the Treasury and the Ministry of Health has constructed a model of ageing, health, and health expenditures. This paper uses results from the model to address the following questions:

Improvements in health could offset the spending pressures caused by population ageing

- Could improvements in health status offset the extra spending pressures created by the ageing of the New Zealand population?
- How will expenditure be distributed among different age groups?
- How important are changes in age structure, compared to other sources of health expenditure growth?

Over 60% of health costs will be spent on the elderly by 2051

- What would happen to the ratio between government health expenditure and GDP if historical expenditure trends were to continue?

The model results suggest that:

Health status, wages coverage and technology will remain key drivers of government health spending

- Improvements in health could offset over one third of the extra expenditure pressures generated by changing age structure.
- Historically, population change has made a much smaller contribution to health expenditure growth in New Zealand than have "non-demographic" factors such as increases in input prices and changes in medical technology. Population change is likely to assume greater importance from the 2020s, but non-demographic factors will nevertheless remain the key determinant.

If current trends continue, there will be a large increase in the percentage of GDP spent on health

- Recent historical growth rates for non-demographic factors would, if continued, imply large increases in the ratio between government health expenditure and GDP.

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Population ageing and government health expenditure

Introduction

Health currently accounts for about 20% of government expenditure, so rapid increases in the cost of health care have serious implications for government finances

The average 30-year-old New Zealand male currently receives about \$900 of health care per year from the government health care system; the average 90-year-old male receives about \$16,000 of care. The number of 30-year-old males is likely to increase by about 20% over the next 25 years, while the number of 90-year-old males will increase by 150%. The apparent implication of such numbers is that population ageing is about to put substantial upward pressures on government health expenditures. Health currently accounts for about 20% of government spending, so rapid increases in resources devoted to health care have serious implications for government finances.

While population ageing may lead to increased pressure to spend more on health, the relationship between ageing and health spending is not clear

International research has, however, led to some uncertainty about the link between population ageing and spending pressures. Econometric studies have produced mixed findings on the relationship between changes in countries' age structure and changes in their health expenditure. More fundamentally, the focus on age structure may be misplaced, because underlying health status, rather than age, may be the real determinant of the demand for health care, and the relationship between age and health status varies over time.

This paper presents a model of how the demographic and health profile of the New Zealand population is changing, and how these changes create pressures for increased government health expenditure. The model is applied to historical data to estimate the contribution of demographic and health changes to historical expenditure growth. The model is also used to construct projections for coming decades.

We examine how changes in New Zealand's demographic and health profile affect government health spending

Projecting decades into the future requires some strong assumptions, and there are important gaps in data on current health expenditures in New Zealand. The projection results therefore need to be interpreted with care. Projections can, however, illuminate trends and relationships that would otherwise be missed.

This report deals exclusively with government health expenditure, and makes no attempt to model private health expenditure. Government health expenditure currently makes up about 80% of total health expenditure in New Zealand. It should also be noted that the definition of government health expenditures used in this report differs from the definition used in

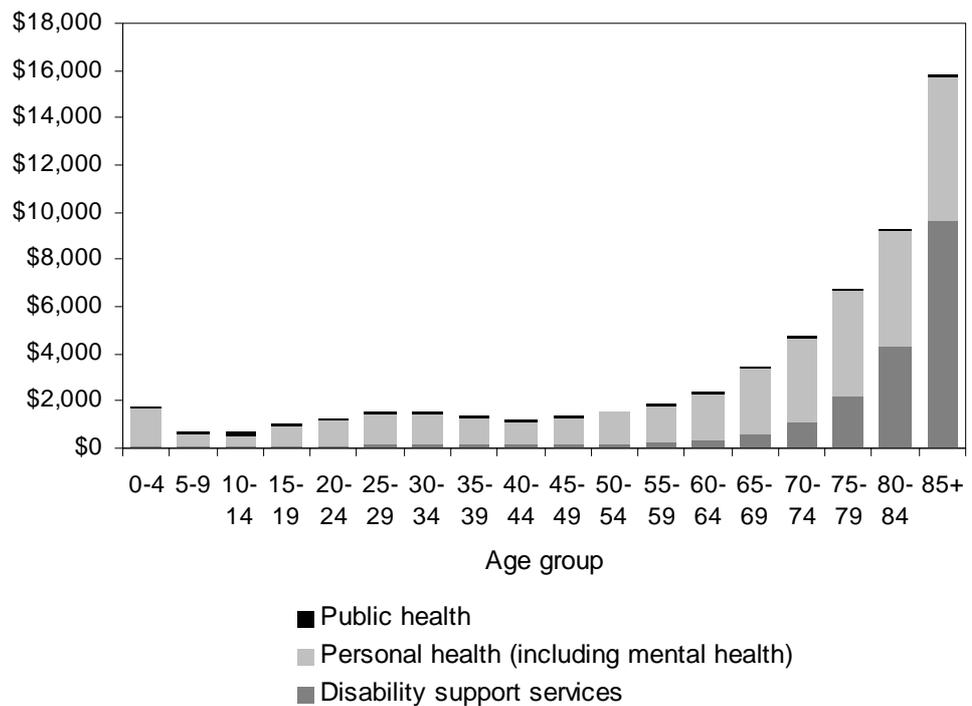
many overseas studies, in that it includes long-term care as well as acute care. In New Zealand, acute and long-term care is currently funded through the same appropriation, "Vote Health".¹

Links between ageing, health, and health expenditure

Health expenditure rises steeply at older ages

Figure 1 shows the relationship between age and average government health expenditure per person in New Zealand, in the financial year 2001/02. Public health covers things such as health protection, health promotion and disease control. Disability support services include items such as home support, residential care, and equipment, while personal health includes primary, secondary and tertiary medical care.

Figure 1 – Annual government health expenditure by age and service group (males and females combined), 2001/02



Source – Ministry of Health

¹ A detailed description of the model and the findings can be obtained from the working paper which can be found at <http://www.treasury.govt.nz/workingpapers/2004/04-14.asp>

Per capita expenditure on personal care and disability support services increases with age, though the most pronounced increases occur with disability support services. For people aged 85 and over, 61% of health expenditure is accounted for by disability support services.

High health expenditure is not a product of age *per se*, but of poor health

Why does health expenditure increase with age? International research suggests that people in poor health need more health care than people in good health, and that the prevalence of poor health, particularly chronic disease and associated disability, rises with age. The health measures that we use in our model are “distance to death” (ie, the proportion of people in their final year of life), and disability (i.e. the proportion of people experiencing functional limitation requiring assistance).

The model

The model contains two parts: a demographic-health component and an expenditure component.

The demographic-health component

We model the changes in health status by age group, based on historical trends

The population is divided by sex, and by 20 age groups (0-4, 5-9, and so on up to 95 and over.) Each age-sex group is subdivided into 4 health states by distance to death and by disability. Changes over time in the health of an age-sex group, and hence its demands on the healthcare system, are captured by changes in the relative size of the four health states. With two sexes, 20 age groups, and four health states, the model partitions the population into a total of 160 (=2×20×4) different categories. Overall changes in population structure and health are captured by changes in the number of people in these 160 categories.

The projections are based on the assumption that, across both sexes and all ages, mortality rates decline at 1.5% per year, which is approximately the historical average. Based on a review of international disability trends, it is assumed that the prevalence of disability within each age group declines at 0.5% per year. Experiments with alternative values for mortality and disability decline are also carried out.

Expenditure

We estimate changes in *per capita* health expenditure

Each of the 160 categories is assigned a value for government health expenditure per person per year. Multiplying costs per person by the number of people in each category, and then summing, gives total expenditure.

The growth rate for *per capita* health expenditure equals the sum of two terms. The first is the “ageing and health” effect. It measures the extent to which spending must increase to offset unfavourable changes in the age structure or health profile of the population. For instance, if there is a rise in the proportion of the population that is disabled, this will be captured by a rise in the ageing and health effect.

The second term is the “coverage and price” effect. This is an “everything else” term, measuring expenditure growth beyond that required to offset population trends. Growth in coverage and price reflects things such as expansion in the range of treatments offered, changes in the efficiency of service provision, changes in demand, and rises in wages or pharmaceutical prices. Because New Zealand, unlike some other developed countries, lacks good data on costs by health status, we have had to estimate these costs indirectly. This is an important limitation of our study.

Findings

Improvements in health could offset a significant proportion of the age-related spending pressures

Improvements in health could offset around a third of the extra health costs of an ageing population

We constructed two sets of expenditure projections: one that only took account of changes in age structure, and one that also incorporated changes in health status within each age group. The second set produced results that showed growth in expenditure from 2002 to 2052, about one-third lower than the first set. In other words, the model suggested that improvements in health could offset about one third of the extra costs attributable to population ageing.

The figure of one third depends crucially on the assumption that disability rates decline at 0.5% per year and mortality rates decline at 1.5% per year. If, instead, disability rates were to remain roughly constant, or mortality rates were to decline more rapidly, then little such offsetting would occur.

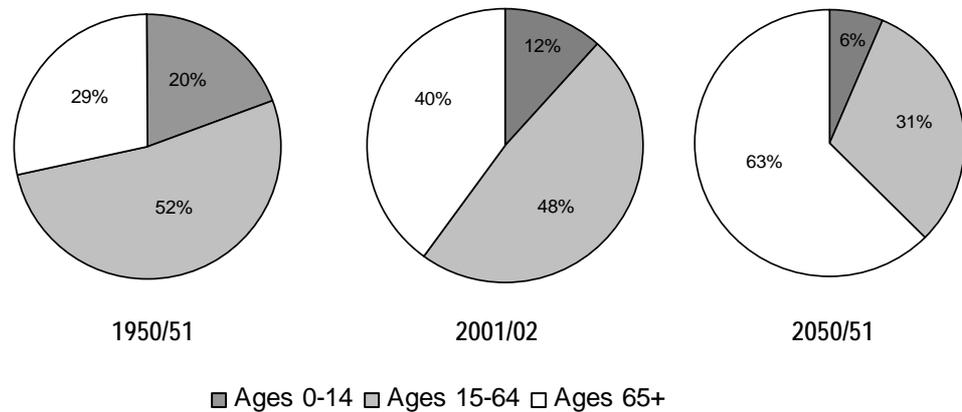
Rise in proportion of expenditure on the aged

The share of expenditure on people over 65 will grow to 63% by 2050/51 due to the ageing population and despite decreasing disability among the elderly

Figure 2 shows, the expenditure share of people aged 65 rose by about 11 percentage points over the past 50 years, and is projected to grow by a further 23 percentage points over the next 50 years. The model suggests that by 2051 over 60% of government health expenditure will go towards people aged 65 and above.

The increase in the proportion of total spending going towards the aged occurs despite the fact that, in our model, expenditure per young person rises more quickly than expenditure per old person. The reason why expenditure per young person grows more quickly is that their disability rates are already low. Low disability rates mean that there is little scope for further reductions to restrain expenditure growth.

Figure 2 – Distribution of expenditure by broad age group



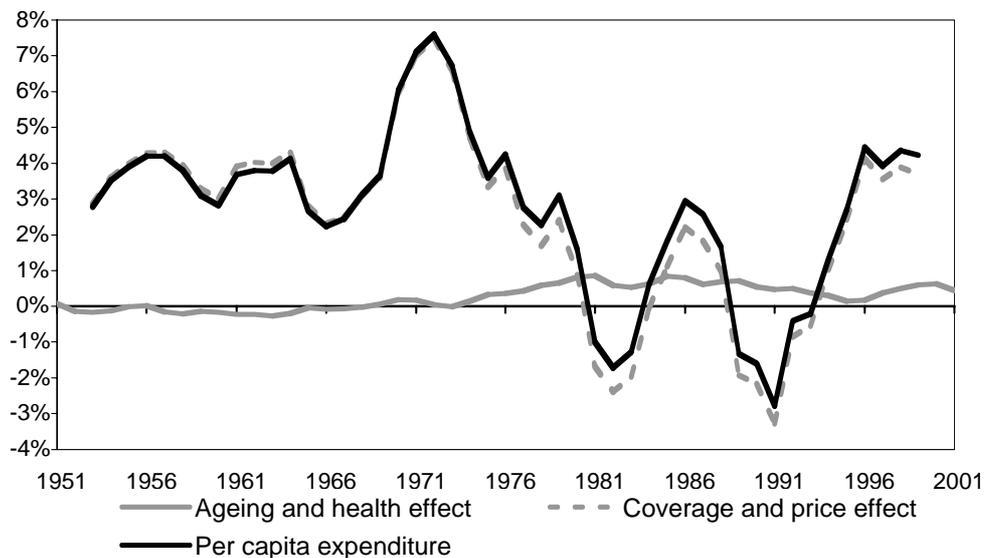
Note – The calculations are based on the assumption that disability rates decline at 0.5% per year and mortality rates decline at 1.5% per year from 2001/02 to 2050/51.

The continuing importance of non-demographic determinants of expenditure growth

Non-demographic factors such as technology, coverage levels, and input prices will continue to have more effect on health expenditure than demographic factors such as population ageing

Figure 3 shows historical trends in *per capita* expenditure growth and its determinants from the 1950s. As described above, the model allows us to distinguish between expenditure growth due to “ageing and health” effects, and growth due to “coverage and price” effects. Coverage and price effects include such things as expansion in the range of treatments offered, increases in wages and drug costs, and increases in overheads. Coverage and price effects clearly drove the long-run trends and the fluctuations around these trends during the period shown.

Figure 3 – Historical growth rates for per capita health expenditure and its determinants



Note – The graph shows 5-year moving averages, centered on the years indicated.

In the 1950s and 1960s, government health expenditure grew extremely rapidly, though demographic conditions were, if anything, reducing the need for spending. Real *per capita* expenditure actually fell several times during the 1980s and early 1990s, just as demographic change started to absorb extra expenditure. Spending has increased quickly since the early 1990s, because growth in coverage and price has risen to 3-4% per year.

Future health expenditure growth rates are also likely to depend predominately on non-demographic factors. Our projection model suggests that population ageing will add around half a percentage point to annual *per capita* expenditure growth. Unless growth rates for coverage and price becomes much lower and more stable in the future than they have been in the past, then they will overwhelm the effects of ageing.

Current growth rates, if sustained, would lead to large increases in health expenditure as a percent of GDP

If coverage and price were to grow at a modest 2.1% per year, then government health expenditure would reach 12% of GDP in 2050/51.

The model can be used to ask how fast the coverage and price effect can grow if government health expenditure is to equal a given percentage of GDP by 2050/51. In 2001/02, government health expenditure accounted for 6.2% of GDP. Under our benchmark set of assumptions, coverage and price could grow by a mere 0.7% per year if health expenditure were to be restricted to 6.2% of GDP in 2050/51. If health expenditure were allowed to rise instead to 12.0% of GDP, then coverage and price could grow at 2.1% *per annum*. As can be seen in Figure 3, coverage and price has grown at a significantly more than 2.1% per annum for most of the period since 1950, and has been growing at 3-4% per annum in recent years.

Our model can say nothing about the “optimal” ratio between government health expenditure and GDP. However, it does provide us with better insights into the drivers of public health expenditure trends, and confirms that growth in coverage and prices is the key determinant of spending.