

Ageing New Zealand and Health and Disability Services

**Demand Projections and Workforce
Implications, 2001–2021**

Discussion Document

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Preface

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Executive Summary

Purpose of the report

New Zealand's population, like those of many other developed countries, is ageing. However, the impact of an increase in the number and proportion of older people in the population on demand for health and disability services has not yet been fully explored, nor have the implications for the organisation and development of the health and disability services workforce. As a contribution towards wider work by the Ministry of Health, this report intends to examine both these issues.

The demographic background

Statistics New Zealand's medium population projections indicate that the number of people in the country will increase by 16 percent to 4,505,000 between 2001 and 2021. However, within the total population, the number of people aged 65 and over is projected to increase by 72 percent to 792,000. The percentage increase in the number of older people in the Māori, Pacific peoples and Asian peoples ethnic groups is projected to be even greater.

How ageing affects the demand for health and disability services

The precise reasons why an ageing population is associated with an increased demand for health services is open to debate, but OECD data indicate that, in the developed countries, per capita health expenditure on the 65 and over age group is typically three to five times that for the 15 to 64 age group. Data from New Zealand show that, compared to the adult population as a whole, older people (65 and over) are more likely in the previous 12 months: to have visited a GP, and to have visited on numerous occasions; to have been issued with a prescription, and to have been issued with numerous prescriptions; and to have been admitted to hospital. New Zealand data also show that registration rates for the main types of cancer are roughly 10 times as great for the 65 and over age group as they are for the 25 to 64 age group; and that mortality rates for ischaemic heart disease and the main cancers are 12 to 22 times as great for older people as they are for younger adults.

Current provision of health and disability services in New Zealand

Data on service provision is far from perfect, but hospitalisation statistics indicate that older people accounted for just over one-quarter of all discharges from, and patient numbers in, acute and sub-acute care¹ in New Zealand in 2001, but that they accounted for just over half of all bed days. Similarly, nine of the main diseases and conditions affecting older people accounted for just over one-third of all discharges and patient numbers, but nearly two-thirds of bed days in the population as a whole.

Amongst older people, ischaemic heart disease, diabetes and cancers (other than of the airway) combined account for around half of patient numbers and inpatient bed days in acute and sub-acute services. Measured in terms of inpatient bed days per admission, conditions of the nervous system, dementia and cerebrovascular conditions are the most resource-intensive. In terms of patient numbers, diabetes and chronic obstructive pulmonary disease (COPD) are relatively significant for Māori. Diabetes also accounts for a relatively large proportion of inpatient bed days for both Māori and Pacific peoples.

Ministry of Health data also indicate that per capita health expenditure in New Zealand starts to increase exponentially around the age of 50, so that it is nearly twice the all-age average in the 65 to 69 age group and nearly eight times the all-age average in the 85 and over age group.

Scenarios of future demands for health and disability services

This report sets out three scenarios of future demands for services based on different assumptions about population growth, morbidity rates and the onset of disease and disability in old age. Each scenario indicates that the number of hospitalisations associated with each of the main diseases and conditions affecting older people will increase markedly between 2001 and 2021 and that the rate of increase between 2011 and 2021 will be greater than the rate of increase between 2001 and 2011.

Depending on the precise assumptions used, the share of the number of acute and sub-acute hospitalisations related to the main diseases and conditions accounted for by Māori is projected to increase from 13 percent in 2001 to between 17 percent and 20 percent by 2021. Similarly, the share accounted for by Pacific peoples is projected to increase from 6 percent to between 8 percent and 9 percent over this period. Meanwhile, the share accounted for by Asian peoples is projected to increase from 3 percent in 2001 to 7 percent by 2021. Conversely, the share accounted for by Europeans is projected to fall from 78 percent to between 64 percent and 68 percent in this time.

¹ Acute and sub-acute care includes medical; surgical; assessment, treatment and rehabilitation (AT&R) and palliative care.

The labour market implications of changing demands for health and disability services

Data on the health and disability services workforce is incomplete, but NZIER estimates that around 130,000 people work in the sector, with roughly half in regulated professions. Twenty-seven percent of the estimated total are nurses, and 7 percent are medical practitioners. The size, composition and characteristics of the unregulated workforce (hospital orderlies, ward assistants, home support, residential care workers and so on) are not well researched, despite the fact that many observers believe that future recruitment and retention problems will affect this section of the workforce more severely than regulated professionals.

A key assumption is that demand for labour will grow in line with projected service needs. This implies that clinical and other technological advances that might otherwise be used to increase labour productivity will instead be used to intensify care or increase its quality. As a result, it is predicted that the demand for labour in the health and disability services will grow by between 40 percent and 69 percent by the year 2021 (depending on the scenario used). This implies that population ageing will increase the demand for health and disability services labour by between 2.5 and 4.3 times the rate of increase in the population as a whole.

If the health and disability services maintain their share of the New Zealand working age population, demand for labour will outstrip supply by 2011. Again depending on which scenario is used, the excess of labour demand over supply is projected to be equivalent to between 28% and 42% of the 2001 workforce by 2021.

It is unsafe to assume that the health and disability services will be able to increase their share of the total workforce in New Zealand to avoid labour shortages, nor can productivity increases be counted on, nor can better health education and monitoring be relied upon to reduce service needs. Thus, attention needs to focus on how the health and disability services workforce should be educated, trained, developed and deployed.

Workforce development implications

The consultations with stakeholders about the research findings drew the following conclusions.

- The current approach to health and disability services provision is unsustainable.
- Prescriptions varied, but there is consensus that changes need to be made to:
 - the division of funding between the primary and secondary sectors
 - occupational definitions and boundaries
 - training and development of the workforce
 - recruitment and retention of staff.

- However, change might be impeded by:
 - professional ‘patch protection’
 - the perceived poor state of the primary care sector
 - institutional inertia
 - the existence of funding, and other ‘silos’
 - poor quality and quantity of information about the workforce
 - the lack of accreditation for prior learning and experience and lack of common training for the support workforce and the voluntary workforce.

Questions for discussion

Overall, there are some key messages emerging from the research.

- The ageing of the New Zealand population will mean that the demand for appropriate health and disability services will increase much more rapidly than the size of the population itself.
- There is a strong risk of labour shortages in the health and disability services, especially after 2011, unless pre-emptive action is taken.
- In considering what action to take, attention needs to focus on how the health and disability services workforce should be educated, trained, developed and deployed – other approaches cannot be relied upon to work.

The report was not intended to present a comprehensive catalogue of questions. However, to assist discussion, it sets out a range of questions covering a range of themes, as set out below.

- Changes in primary care
- What needs to be done to promote new ways of working?
- How must education and training change?
- Recruitment and retention
- Māori and Pacific peoples’ health
- Disability support services
- Mental health
- Volunteers.

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1. Introduction

1.1 Background

The near-certainty that the New Zealand population will age presents a range of economic and social challenges to the nation. One of the greatest will be to provide adequate health and disability services to a population that includes a larger number and proportion of old and very old people. It is critically important, therefore, that policy makers should be armed with good quality, detailed knowledge of how the level and pattern of demand for services will change. Only then will it be possible to make sound decisions about developing the health and disability services workforce.

Equally, it is important that there is a strong consensus on what changes are needed in the area of health and disability services workforce development. It is generally acknowledged that major changes will be needed. However, without extensive discussion of the issues, a weak consensus will probably start to collapse because change will inevitably undermine traditions, puncture spheres of influence and threaten group interests.

In order to clarify the picture and to promote the discussion needed, the Ministry of Health commissioned research to model future demands for health and disability services based on the ageing of the population and the views of informed professionals about changes in the prevalence of significant health conditions and groups of conditions. The research would then identify the implications of future changes in demand for the health and disability services workforce.

1.2 Aims and objectives of the research

The Ministry specified research that would:

- build on the literature review and preliminary analysis of trends in age-related disease undertaken in a background paper prepared for the Ministry in 2003 (Cornwall and Davey 2004)
- extrapolate from available data on demographic trends, health status and health and disability services utilisation to identify broad trends for the future of such services
- provide separate analysis for Māori, Pacific peoples and European / other ethnic groups
- model scenarios of future demand for health and disability services and identify the impact of future demand on the health and disability services workforce.

The Ministry also specified that the research would review:

- the Cornwall and Davey background paper
- the literature identified in that report relating to trends in age-related illness and disease
- any other literature that has become available on past or projected trends in age-related conditions
- literature on trends in health and disability services utilisation.

In addition, the research would identify the major areas of anticipated change in demand for health and disability support services in the periods 2001 to 2011 and 2011 to 2021, as the New Zealand population ages.

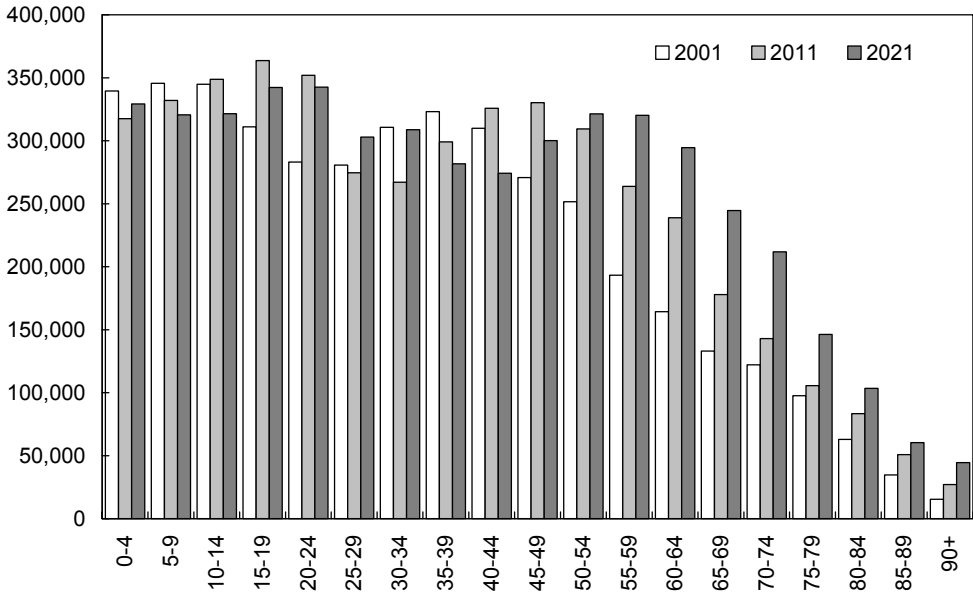
1.3 The demographic background

The broad demographic background to this project is that the number of people in the population aged 65 and over is projected to increase from 461,000 in 2001 to 792,000 in 2021 (an increase of 72 percent). The share of the population accounted for by people aged 65 and over will increase in the same period from 12 percent to 18 percent.

Figure 1 below shows the projected population changes by five-year age cohort for 2011 and 2021 compared to the 2001 base year. By 2021, the bulge in those in older age categories is quite distinct.

Figure 1: Population projections by age cohort

Based on medium population projections



Source: Statistics New Zealand

The ageing of the non-European population will be even more marked. The combined populations of Māori, Pacific peoples and Asian peoples aged 65 and over will increase from 40,000 in 2001 to 137,000 in 2021 (an increase of 242 percent). The share of the non-European population accounted for by people aged 65 and over will increase in the same period from 4 percent to 8 percent. The projected changes are shown in more detail in Table 1.

Table 1: Projected New Zealand population by age group and ethnicity

	Year	Number (000s)			65+ year olds as % of all ages
		0–64 year olds	65+ year olds	All ages	
Māori	2001	566	20	586	3.4
	2011	632	33	665	5.0
	2021	693	57	750	7.6
Pacific peoples	2001	253	9	262	3.4
	2011	317	14	331	4.2
	2021	388	25	413	6.1
Asian peoples	2001	261	11	272	4.0
	2011	464	26	490	5.3
	2021	549	55	604	9.1
Europeans	2001	2340	421	2761	15.2
	2011	2259	504	2763	18.2
	2021	2083	655	2738	23.9
All	2001	3420	461	3881	11.9
	2011	3672	577	4249	13.6
	2021	3713	792	4505	17.6

Source: Statistics New Zealand

1.4 Previous research

Some previous research reports are particularly relevant in this context, and it is worth summarising them briefly to further set the scene for this report.

In 2003, Cornwall and Davey prepared a background paper for the Ministry of Health (Cornwall and Davey 2004) that provides much of the impetus and material for the work here. The paper explored the following key topics:

- New Zealand demographic trends
- uncertainties about whether current trends in service utilisation will continue
- life expectancy and healthy life expectancy
- the concentration of health care costs in the last two years of life
- projections of costs and hospital discharges for 2011 and 2021

- scenarios for the onset of disease and disability as the population ages and lives longer
- New Zealand disease and disability trends
- the age structure of the nursing and medical workforce in New Zealand
- the pattern of informal care in New Zealand.

The overall message from their paper is that research to examine the demand for health and disability services needs to take account of:

- population size and age structure
- ethnicity
- morbidity
- policy and practice in service delivery
- technological change
- the supply of health and disability services labour
- the supply of informal care and family and social structures.

In assessing the international literature on age-related disease trends, the paper concludes that the New Zealand health sector can expect increased health expenditure and demands in the coming two decades from increased incidence of cardiovascular diseases, cancers, cerebrovascular conditions, diabetes mellitus, COPD, osteoporotic fractures and musculo-skeletal diseases. In addition, the paper considers that rates of dementia are likely to increase significantly over the coming two decades, and by virtue of the long-term care often needed, greater demand for health and disability services can be expected. While this is broadly in line with overseas experiences, the key difference for New Zealand is that the data indicate that Māori and Pacific peoples' health demands will increase significantly, requiring group-specific, as well as whole-population, responses.

The most important aspect of Cornwall and Davey's work however, is the claim that "workforce issues may prove to be the greatest challenge facing health systems in the future" (page 80). Among key reasons given for this argument are the long lead-in time for recruitment, training and certification to meet shortfalls, the unpopularity of geriatric medicine and residential care for older people and the challenge of retaining health care workers when faced with overseas recruitment campaigns.

The paper provides much of the material on which we based the consultation rounds detailed below. In essence, we sought the views of professionals in the field to test the validity of using the conclusions of the paper as the basis on which to model scenarios.

In 2002, the Health Workforce Advisory Committee produced *The New Zealand Health Workforce: A stocktake of issues and capacity 2001*, which is referred to later in this report. But it is more relevant at this point to refer to that committee's report of 2003, *New Zealand Health Workforce: Future directions: Recommendations to the Minister of Health* (HWAC 2003b).

The key arguments in this report were as follows.

- In order to meet Government's stated goals, a major cultural change is required in the way in which health is protected and promoted, and in the way services are organised, planned and provided.
- The focus of the whole health system must change and become more firmly fixed on what the users of health services and their associated communities want: a person- and community-centred approach.
- This change of focus will require changes to the way health practitioners are trained and deployed, and to the way they work.
- Some restructuring and redesign of services, and of the workforce, will be needed. Some totally new roles and ways of working will emerge, but it should be largely possible to evolve changes within existing occupational structures and workforce arrangements.
- Evolutionary change must be guided. Numerous organisations (for example, DHBs, health professional organisations and health sector unions) have a role to play, but the Ministry of Health has the task of overseeing and co-ordinating the work of the system in the change process. DHBNZ will also play a pivotal role in interfacing with individual DHBs and educational and professional interests.

The report also made a series of recommendations. However, they were mainly about enabling actions (for example, that the Ministry of Health should require DHBs to include the primary health care workforce in their workforce development plans). An underlying aim of NZIER's research was to promote discussion about more concrete actions.

There does not yet exist a comprehensive body of research examining how the pattern of common diseases and conditions affecting the population will change as the ageing process unfolds. However, two recent reports dealing with major disease groups are worth noting, in order to illustrate what can be done.

In 2003, the New Zealand Orthopaedic Association produced a brief report entitled *The Ageing of New Zealand: An epidemic with major impact on musculo-skeletal disease* (New Zealand Orthopaedic Association 2003). This highlighted that musculo-skeletal problems, such as arthritis and osteoporosis, are directly linked to increasing age.

The report used Statistics New Zealand's population projections to 2051 to make simple projections for 2015, 2030 and 2051 of the number, by age group, of:

- people with arthritis
- ACC claims for fracture injuries
- musculo-skeletal operations
- primary hip replacements
- people with osteoporosis.

The Public Health Intelligence Group of the Ministry of Health has also analysed trends and projections for cancer in New Zealand (Ministry of Health 2002a) and has done some mathematical modelling and forecasting of the incidence of diabetes in New Zealand (see Ministry of Health 2002b for a summary). The group's work had three objectives:

- to quantify the mortality burden of diabetes in 1996
- to provide internally consistent estimates of current diabetes incidence, prevalence, duration and mortality
- to forecast for 2011 diabetes prevalence reflecting demographic changes, epidemiological risk factor exposures (especially obesity) and health service developments.

1.5 Outline of approach and methodology

The methodology NZIER used was based on five main stages of work.

1. **Initial desk research.** The purpose here was to build on the Cornwall and Davey (2004) literature review and their preliminary analysis of trends in age-related disease. The intended output was the establishment of a baseline for the extrapolations and scenario modelling. Among the key questions addressed were: What are the main clinical, social and other conditions that give rise to current levels of demand for services? and What does the current health and disability workforce look like? The desk research was also used to inform the design of the following phase, by suggesting who should be consulted and what the consultation agenda should be.
2. **First-round consultations and further desk research.** A broadly representative group of clinicians and service managers were consulted (see Appendix B for a list of the consultees). The purpose was to lay the foundations for later stages in the project. The consultations focused on identifying the drivers of change in demand for health and disability services and in the way in which demand is dealt with. Key questions included: How is the structure of the population likely to change?

What do these changes imply for patterns of morbidity? What social and institutional changes are going to influence service needs? and What are the likely or possible clinical advances, or changes in clinical practices, that will influence demand and how it is dealt with?

3. **Scenario building.** On the basis of the previous two stages, we generated three scenarios of future health and disability services need or, rather, provision.² The scenarios combined different projections or assumptions about population growth and ageing, trends in disease and disability and the onset of disease and disability as longevity increases. The analysis was separated out to distinguish between service provision in two different groups: acute and sub-acute hospitalisations (medical; surgical; assessment, treatment and rehabilitation (AT&R) and palliative care) and aged residential care. Projections of the future supply of labour to the health and disability services were also made so that potential gaps between the demand for, and supply of, labour could be identified.
4. **Second round of consultations.** The consultees in the second stage of consultation included some from the first round but also representatives of a range of institutions, such as the New Zealand Medical Association, the New Zealand medical and nursing councils, the Royal New Zealand College of General Practitioners and trades unions that have members in the health and disability services. The agenda was more policy focused than in the first round of consultation. The consultees were invited to discuss the implications of the findings of the scenario-building in the previous phase. Key questions for discussion included: In the light of the ageing population, is the current approach to meeting the nation's health and disability services needs sustainable? What changes are necessary? How could things be done differently in order to address the particular needs of distinct groups of the population? What, if anything, is likely to inhibit or prevent necessary change? and What, if anything, can New Zealand learn from other countries' situations and their responses to the challenges associated with the ageing population?
5. **Reporting.** This stage dealt with the preparation of this document, including the points for discussion covered in chapter 7.

The approach taken identified the demand for age-related health and disability services and any mismatch between demand and supply, in terms of the labour force that will support people with health and disability needs. This entailed establishing, from the literature available, the key determinants of demand and supply and how overall demand and supply would change as a result of changes in the determinants.

² The distinction between service provision, need and demand is explored at the beginning of chapter 3.

Then we sought to test the literature's findings on practitioners. At the same time, we sought to build in assumptions and the information gleaned from the two stages of consultation in order to derive baseline supply and demand scenarios from which key gaps could be identified.

1.6 Key assumptions

In order to assess the size of the potential labour shortages associated with each of the scenarios of service need, it was necessary to make some fairly bold assumptions. The key assumptions were as follows.

1. The demand for health and disability services labour will increase in line with increased services needs. This is based on the assumption of no major increases in labour productivity, technological advances or social or institutional changes. For example, no assumptions are made about the impact of implementing the Primary Health Care Strategy or the introduction of Primary Health Organisations.
2. The health and disability services' share of the working age population will not change.
3. The number of hospitalisations is an adequate proxy indicator for demand for health services.
4. Current service provision and the current size of the workforce is an adequate basis from which to project future demands for services and labour.

The robustness of these assumptions is discussed at different points in the report.

1.7 The logic and structure of the report

The structure of this report reflects the following logic.

- It is generally accepted that: a) the population is ageing (that is, both the number and percentage of people aged 65 and over in the population will increase) and b) the ageing of the population will result in an increase in the demand for health and disability services.
- Ultimately, we are interested in knowing what sort of health and disability services workforce is likely to be needed to serve this increased demand, but in order to establish a good understanding initially we need to proceed through a number of analytical steps.

- First, we need to recognise that, to a large extent, what is happening in New Zealand is part of a wider phenomenon that is occurring throughout much of the developed world. We, therefore, take the opportunity in chapter 2 to examine the bigger picture. This includes some of the research and policy development work that has been undertaken elsewhere in the world. Chapter 2 also considers the broad question of what difference age makes to health services utilisation.
- In chapter 3 (the core of the report), we focus on the current pattern of demand for health and disability services in New Zealand. In particular, we look at the principal diseases and conditions that give rise to demand and (as far as possible) the age and ethnic groups that experience these diseases and conditions most commonly. The source data is imperfect, but we distinguish the two broad types of service provision. Overall, our aim here is to identify the key drivers of demand that will combine with the fact of an ageing population to generate future demand.
- The next step is to model how the volume and pattern of demand for health and disability services might change over time. In chapter 4, we present three different scenarios of future demand.
- In chapter 5, we refocus attention on the health and disability services workforce that provides for the current demand presented and analysed in chapter 3. Having described the size and composition of the workforce, we consider how its size would have to grow under the three different scenarios of demand outlined in chapter 4 if the current approach to service provision does not change. We also assess how the overall supply of labour to the health and disability services might change and then consider the likelihood of labour shortages.
- In chapter 6 we present the findings of the consultations we undertook on the basis of our scenario building and health and disability services labour market modelling. The consultations were intended partly to test the robustness of the scenarios and modelling, but mainly they were intended to set in motion the process of identifying the health and disability services workforce development implications of the ageing population.
- Lastly, in chapter 7 we set out an agenda of workforce development themes and specific questions arising from the consultation process. We emphasise that the agenda by no means purports to be comprehensive of all the themes and questions that will need to be considered. Rather, it is more of a preliminary view intended to facilitate a wider process of debate and consultation.

Appendix A presents additional results tabulated from the scenarios. Appendix B lists the individuals interviewed as part of the two stages of consultation.

2. The bigger picture of ageing and health

2.1 Introduction

The purpose of this chapter is to illustrate, in broad terms, some of the macroeconomic importance of ageing populations and why ageing makes such a difference to health and disability services utilisation. First, we draw on OECD data to indicate the impact ageing will have on the share of GDP accounted for by health expenditure in developed economies. Then we consider briefly why ageing is associated with increased health expenditure. Lastly, we present selected New Zealand data to indicate the extent to which older people require more health and disability services than younger people.

2.2 Ageing and the developed economies

Work as part of the OECD's Health Project, launched in 2001, has highlighted concerns that the public finance-related importance of health could increase significantly as populations age. For example, Oxley and Jacobzone (2001) suggest that, typically in OECD nations, three-quarters of spending on health care and long-term care for the elderly is financed through the public sector. The 65 and over age group accounts for 40 to 50 percent of health care spending; and this age group's per capita health care costs are three to five times higher than the costs for those under the age of 65. On average, health care and long-term care accounts for around 9 percent of GDP in OECD countries; and the projected doubling of the proportion of the population in the 65 and over age group in most countries will increase this to 12 to 13 percent by 2050. In 1970, the OECD average was approximately 5 percent (Ásgeirsdóttir 2004).

In terms of demographic change, New Zealand diverges slightly from the OECD average. The fertility rate in New Zealand is fractionally below the population replacement rate (that is, the average number of births per woman in her lifetime is less than the number necessary to compensate for the number of deaths in the longer term), but fertility rates in most other OECD countries are lower again, sometimes significantly so. In addition, New Zealand has experienced greater immigration rates than most other OECD nations. As has already been indicated (Figure 1 and Table 1 in chapter 1), New Zealand's population is still expected to age. New Zealand will therefore face similar challenges to other OECD countries in finding the finances, labour and other resources necessary to meet the health and disability services needs of its population.

2.3 How ageing affects demand for health and disability services

Other OECD research focusing on the relationship between health expenditure and age (see Moïse and Jacobzone 2003) has shown that, when measured across different nations, there is a relatively weak correlation between the share of the population aged 65 and over and the share of health expenditure as a percentage of GDP. That is to say, nations where the proportion of older people is large don't necessarily spend a greater share of their national income on health than countries where the proportion of older people is small. Other factors, including the absolute level of GDP and the prominence of privately-financed health expenditure, are also important explanatory variables in modelling the age-expenditure relationship (Jönsson and Eckerlund 2003). More generally, factors such as technological and social change, lifestyles and patients' attitudes have been identified as important in explaining how health expenditure is likely to change in the future.

Nonetheless, age does have an important bearing on health expenditure. Moïse and Jacobzone also looked at age profiles of health expenditure within countries and confirmed that, typically, per capita health expenditure on the 65 and over age group is three to five times that for the 15 to 64 age group. They argued, however, that it is proximity to death, not age itself, that is largely responsible for the positive association between health care expenditure and age. That is to say, regardless of age at death, health care expenditure tends to be very concentrated in the last months of life: it just so happens that more people aged 65 and over are closer to death than people aged 15 to 64. Moïse and Jacobzone also observed that, perhaps because they receive less intensive medical interventions, per capita health care expenditure on the very old (aged 80 and over) is often less than per capita health care expenditure on the less old (aged 65 to 79). However, counterbalancing this decrease in health expenditure, per capita expenditure on long-term care is much greater on the very old.

2.4 Ageing and health and disability in New Zealand

There is some useful data for New Zealand that illustrates the arguments above. Statistics New Zealand (2004) reported that in 2001 people aged 65 and over made up 12 percent of the population but accounted for nearly 78 percent of deaths.

Based on the results of the 1996/97 New Zealand Health Survey, the same report also found that:

- around 10 percent of the population of all ages, but 36 percent of those aged 65 and over, were taking medication for high blood pressure (which is strongly linked with ischaemic heart disease, cerebrovascular conditions and other heart diseases)

- the incidence of Type 2 diabetes is nearly three times as great amongst people aged 75 and over as it is amongst the population of all ages.

Further, drawing on the results of the 2001 Disability Survey, Statistics New Zealand (2004) also showed that 54 percent of people aged 65 and over, compared to 12 percent of 15 to 44 year olds and 25 percent of 45 to 64 year olds, had a disability (that is, a limitation in activity resulting from a long-term condition or health problem).

The effect of the relatively poor health and greater disability found in older people is reflected in the service utilisation data shown in Table 2. This shows that, compared to the adult population as a whole, older people are more likely in the previous 12 months to have:

- visited a GP, and to have visited on numerous occasions
- been issued with a prescription, and to have been issued with numerous prescriptions
- been admitted to hospital.

The table also shows that those aged 75 and over are heavier service users than those aged 65 to 74.

Table 2: Use of health services for people aged 65 and over, 1996/97

	Age group (years)		
	65–74	75+	Total adult population
Number of visits to GP in previous 12 months (% of respondents)			
None	8	4	21
6 or more	22	28	15
Number of prescription items in previous 12 months (% of respondents)			
None	20	15	31
10 or more	36	43	18
Proportion admitted to a hospital in previous 12 months	19	25	15

Source: Statistics New Zealand 2004 (attributed to Ministry of Health)

The Statistics New Zealand 2004 report also showed that ischaemic heart disease and malignant neoplasms account for half of all deaths in both the younger (0 to 64 age groups) and older populations (aged 65 and over). More up-to-date data (Ministry of Health 2004c) show how mortality and morbidity rates related to heart disease and cancer differ dramatically between adults aged 25 to 64 and older people (aged 65 and over). This data is summarised in Table 3, and it shows that registration rates for the two types of cancer listed are roughly 10 times as great for people aged 65 and over as they are for those under 65 years old. Similarly, it shows that mortality rates for the

three diseases are 12 to 22 times as great for people aged 65 and over as they are for the under 65 year olds.

Table 3: Registration and mortality rates (per 100,000 population) for selected diseases in New Zealand, 2000

	25–64 year olds		65+ year olds	
	Registration	Mortality	Registration	Mortality
Ischaemic heart disease	–	44.8	–	979.9
Lung cancer	24.6	19.2	237.2	222.6
Colorectal cancer	40.7	14.0	366.4	180.0

Source: Ministry of Health 2004c

Regardless, therefore, of whether age per se or proximity to death actually accounts for increased per capita health expenditure, an increase in the number and proportion of people aged over 65 in the New Zealand population is likely to lead to a large increase in the need and demand for health and disability services.

3. The current provision of health and disability services in New Zealand

3.1 Introduction

It is important to note at the outset that, in what follows, we attempt to describe the **provision** of health and disability services in New Zealand rather than **need** or **demand**. Need and demand are likely to exceed provision, but most statistics relating to health and disability services are based on provision.

Having said that, it is difficult even to describe health and disability services provision statistically. Provision might be characterised as having four broad components.

1. Primary and community health care (delivered by GPs, nurses and allied health professionals)
2. Support services (including home-based and residential care for people with lifelong disabilities and frail older people)
3. Hospital outpatient services (including emergency)
4. Hospital inpatient services.

However, the problem with describing and measuring provision is that the components described above all have different databases and sources. The databases tend to have different units of measurement (that is, some use costs, and others use admissions, bed days or consultations). They also vary in their coverage of geographical areas, age groups, ethnic groups, genders and diseases and conditions. For example, hospital inpatient data is reasonably comprehensive and can be separated out and analysed according to each of these variables. By contrast, primary care data is survey-based and can be broken down only by age and ethnic group not by type of disease or condition. Data on outpatient services is similarly patchy, covering only some DHB areas and categorised by department (for example, oncology) rather than disease (for example, lung cancer).

The result is that using the different databases to try to create a comprehensive and detailed picture of provision is like doing a jigsaw puzzle where the pieces don't necessarily interlock, where some pieces are two-dimensional but others are three-dimensional and where some are coloured and others black and white or blank.

Accordingly, in this chapter we use a combination of hospitalisation (that is, inpatient) data and aged residential care data to measure the totality of provision.

The hospitalisation data is more comprehensive than other data, and it is useful because hospitalisation is usually preceded or followed by the other main components of health care: primary, community and outpatient care.

The data source was the National Minimum Data Set (NMDS), from which we extracted the data on medical, surgical, AT&R and palliative care (defined hereafter in this report as ‘acute and sub-acute care’). We specifically excluded the NMDS data on residential care for older people because relatively few providers of such services report to the NMDS. We used 2001 data, even though later data was available. This was not only for the sake of symmetry (that is, projecting from 2001 to 2011, and from 2011 to 2021). It is also because much of the labour demand and supply data we relied on for other parts of the report (especially chapter 5) was only available for 2001.

To measure residential care for older people (hereafter referred to as ‘residential care’ for short), we used a different Ministry of Health data set, which included data on the number of older people in specialist dementia units, long-term hospital care (including psycho-geriatric provision) and rest homes.³ We were obliged to use 2003/04 data for residential care because this included an estimate of the number of people paying privately for rest-home care.⁴ However, we believe that the total number of people in residential care in 2003/04 would not have been very different from the total (unknown) number in 2001. We, therefore, believe that it is reasonable to add 2001 data on acute and sub-acute care to 2003/04 data on residential care to approximate and analyse total 2001 provision.

3.2 The current situation

In this section we first present and analyse data on acute and sub-acute care, and then we do the same for data on residential care.

3.2.1 Acute and sub-acute care

Table 4 shows the overall importance of the older population in acute and sub-acute care provision. It also highlights the aggregate importance of the diseases and conditions of interest: that is, nine conditions (based on a slightly longer list identified by Cornwall and Davey (2004)), which were selected because of their prevalence amongst older people and because they were thought likely to give a good indication of current and future demand for health and disability services.

³ The data we used did not include long-term home-based support for older people, nor did it include residential care for younger people with disabilities.

⁴ It has been estimated that 11,590 out of a total of 25,233 residents (that is, 46 percent) in rest homes were fully private in 2003/04. This means that 25 percent of people in all forms of aged residential care were fully private.

The top row of the table shows that older people accounted for a little over a quarter of all hospital discharges and patient numbers⁵ in New Zealand in 2001, but that they accounted for just over half of all bed days. The middle row shows that the nine diseases and conditions of interest accounted for just over one-third of all discharges and patient numbers, but nearly two-thirds of bed days in the population as a whole. The bottom row shows that, amongst people aged 65 and over, these nine diseases and conditions dominated in terms of the number of discharges, patients and bed days.

Table 4: Contribution to total hospitalisations, patient numbers and inpatient bed days in 2001

	% of hospital discharges	% of patient numbers	% of inpatient bed days
65+ years proportion of all ages	29%	26%	53%
Conditions of interest out of all conditions (all ages)	36%	36%	64%
Conditions of interest out of all conditions (65+)	72%	82%	91%

Notes:

1. Conditions of interest for this table include chronic obstructive pulmonary disease and asthma, dementia (all diags), diabetes (all diags), ischaemic heart disease (all diags), lung trachea and bronchus cancer, nervous system diseases, osteoarthritis (all diags), other cancers and stroke.
2. All diags: All diagnoses recorded at time of discharge, not necessarily the primary diagnosis on discharge.

Source: Data extracted from Ministry of Health National Minimum Data Set 2004

Using the same data as for Table 4, we are able to glean a picture of the current patterns of disease and disability in New Zealand. Investigating these patterns will allow us to establish a baseline for the following extrapolations and scenario modelling. We can also get an insight into which of the conditions are likely to be particularly resource intensive.

Tables 5 and 6 assess the current pattern by examining patient numbers and numbers of hospitalisations (discharges) for the selected conditions, by ethnicity and the two age groups of interest (65 to 79 and 80 and over).

Ischaemic heart disease stands out in terms of patient numbers, particularly for those in the 65 to 79 age group. The ‘Other’ ethnicity category (encompassing Europeans, Asian peoples and any other ethnic groups not categorised elsewhere) contributes disproportionately to the number of patients in this category – nearly 95 percent.

⁵ Patient numbers count each person discharged from hospital in the year only once regardless of the number of discharges.

Diabetes is also a significant contributor to patient numbers, but with a relatively large contribution by Māori to this total. Because of the shorter life expectancy for Māori, nearly all the Māori patients with diabetes are in the 65 to 79 age category, whereas for the ‘Other’ ethnic grouping, the distribution between the two age groups is far less extreme (although twice as many patients were aged 65 to 79 as were aged over 80). Other cancers and nervous system diseases also contribute a large number of patients.

As might be expected, the magnitude of the hospitalisation figures correspond closely to the patient numbers, and the ratios of hospitalisations to patient numbers appear to be relatively high for more serious conditions, particularly those related to diabetes and other cancers. This will have implications in terms of the additional resources required to support these cases.

In terms of ethnicity for hospitalisations, the split is slightly different from that of the patient numbers. Māori contribute slightly more to total hospitalisations, than they do to patient numbers, that is they are slightly more likely than the population as a whole to be admitted more than once in the year. Pacific peoples contribute under half of the number of Māori hospitalisations. The ‘Other’ category dominates with around 94 percent of all hospitalisations.

Table 5: Patient numbers for 2001 – acute and sub-acute care
For selected conditions and age groups by ethnicity

Ethnic group	Age group	All categories	COPD and asthma	Dementia (all diags)	Diabetes (all diags)	Ischaemic heart disease (all diags)	Lung trachea and bronchus cancer	Nervous system MDC	Osteoarthritis (all diags)	Other cancer	Stroke
Maori	65–79	3,883	343	82	1,325	979	88	351	220	300	147
	80+	623	49	70	152	152	3	90	30	45	40
Maori 65+ total		4,506	392	152	1,477	1,131	91	441	250	345	187
Other	65–79	63,147	2,562	1,236	9,523	14,610	666	6,173	3,733	8,496	2,683
	80+	34,530	1,180	3,039	4,531	8,518	165	4,524	1,853	4,211	2,129
Other total 65+		97,677	3,742	4,275	14,054	23,128	831	10,697	5,586	12,707	4,812
Pacific peoples	65–79	1,760	119	30	741	316	18	199	64	117	104
	80+	347	21	28	101	66	4	51	14	25	29
Pacific peoples 65+		2,107	140	58	842	382	22	250	78	142	133
Total	65–79	68,790	3,024	1,348	11,589	15,905	772	6,723	4,017	8,913	2,934
	80+	35,500	1,250	3,137	4,784	8,736	172	4,665	1,897	4,281	2,198
Total 65+		104,290	4,274	4,485	16,373	24,641	944	11,388	5,914	13,194	5,132

Notes:

1. COPD = Chronic Obstructive Pulmonary Disorder.
2. MDC = Major diagnostic category.
3. All diags = All diagnoses recorded at time of discharge, not necessarily the primary diagnosis on discharge.

Source: Data extracted from the Ministry of Health National Minimum Data Set 2004.

Table 6: Hospitalisations for 2001 – acute and sub-acute care

For selected conditions and age groups by ethnicity

Ethnic group	Age group	All categories	COPD and asthma	Dementia (all diags)	Diabetes (all diags)	Ischaemic heart disease (all diags)	Lung trachea and bronchus cancer	Nervous system MDC	Osteoarthritis (all diags)	Other cancer	Stroke
Maori	65–79	7,348	541	120	2,732	1,582	123	453	255	464	170
	80+	1,143	78	103	333	227	3	107	33	64	43
Maori 65+ total		8,491	619	223	3,065	1,809	126	560	288	528	213
Other	65–79	104,331	3,767	1,577	17,589	23,172	906	7,595	4,115	11,798	3,056
	80+	55,899	1,503	3,851	7,949	12,629	212	5,095	2,102	5,306	2,288
Other total 65+		160,230	5,270	5,428	25,538	35,801	1,118	12,690	6,217	17,104	5,344
Pacific peoples	65–79	2,975	191	49	1,321	481	26	225	78	174	111
	80+	554	28	37	192	107	6	54	17	29	29
Pacific peoples 65+		3,529	219	86	1,513	588	32	279	95	203	140
Total	65–79	114,654	4,499	1,746	21,642	25,235	1,055	8,273	4,448	12,436	3,337
	80+	57,596	1,609	3,991	8,474	12,963	221	5,256	2,152	5,399	2,360
Total 65+		172,250	6,108	5,737	30,116	38,198	1,276	13,529	6,600	17,835	5,697

Notes:

1. COPD = Chronic obstructive pulmonary disorder.
2. MDC = Major diagnostic category.
3. All diags = All diagnoses recorded at time of discharge, not necessarily the primary diagnosis on discharge.

Source: Data extracted from Ministry of Health National Minimum Data Set 2004

To help complete the picture, we can also examine the number of inpatient bed days for the same selected conditions. The data are summarised in Table 7. The resource implications and effects on service utilisation will clearly differ for conditions where the majority of patients are admitted as inpatients as opposed to when they are day or outpatients. The additional costs required to monitor patients on an ongoing inpatient basis are likely to be considerable in the long term.

Ischaemic heart conditions, conditions of the nervous system and diabetes feature as the greatest contributors to total inpatient bed days, primarily driven by their dominance in terms of total discharges/ patient numbers. In conjunction with Table 5, Table 7 implies that the mean stay for inpatients with diabetes is around 12 days (not necessarily in one hospitalisation). For heart disease it tends to be lower but still around 10 days.

As might be guessed, the number of inpatient bed days for people with dementia is large compared to the total number of hospitalisations for that condition. For most patients, dementia would not be the main reason for hospitalisation but would increase the complexity of care needs, clearly resulting in a large number of bed days. The mean stay for inpatients with dementia is relatively lengthy, at around 21 days. The number

of inpatient bed days per patient for nervous system diseases is also relatively large, at 20 days. Stroke also demonstrates significant inpatient bed day numbers compared to the number of total hospitalisations for this condition.

These conditions for which there are long mean stays will be of interest in the projections of future demand, as increases in their contribution to total demand will have resulting resource implications aside from those strictly related to the demand for, and supply of labour.

There is a tendency for multiple conditions and higher support needs to increase with age, resulting in the need for longer periods of hospitalisation for very old people compared to those in the 65 to 79 age group. This is particularly noticeable for some conditions such as nervous system diseases and stroke, where, in terms of hospitalisations, those in the 65 to 79 age group number more than those aged 80 and over. In terms of bed days, however, more bed days are used by those aged 80 and over, compared to those in the 65 to 79 age group.

Similar tables, broken down by gender, are included in Appendix A.

Table 7: Inpatient bed days for 2001 – acute and sub-acute

For selected conditions and age groups by ethnicity

Ethnic group	Age group	All categories	COPD and asthma	Dementia (all diags)	Diabetes (all diags)	Ischaemic heart disease (all diags)	Lung trachea and bronchus cancer	Nervous system MDC	Osteoarthritis (all diags)	Other cancer	Stroke
Māori	65–79	38,632	2,600	1,265	15,041	9,679	581	4,001	1,896	3,112	2,025
	80+	9,294	408	1,402	2,835	1,290	46	2,668	238	441	1,325
Māori 65+ total		47,926	3,008	2,667	17,876	10,969	627	6,669	2,134	3,553	3,350
Other	65–79	540,933	24,271	25,229	102,116	130,234	6,295	81,352	30,896	56,984	31,172
	80+	520,879	15,683	66,944	74,493	110,568	1,964	138,018	32,597	31,732	46,705
Other total 65+		1,061,812	39,954	92,173	176,609	240,802	8,259	219,370	63,493	88,716	77,877
Pacific peoples	65–79	14,192	901	439	6,458	2,747	156	1,963	622	1,035	948
	80+	3,848	141	269	1,555	949	27	776	121	412	263
Pacific peoples 65+ total		18,040	1,042	708	8,013	3,696	183	2,739	743	1,447	1,211
Total	65–79	593,757	27,772	26,933	123,615	142,660	7,032	87,316	33,414	61,131	34,145
	80+	534,021	16,232	68,615	78,883	112,807	2,037	141,462	32,956	32,585	48,293
Total 65+		1,127,778	44,004	95,548	202,498	255,467	9,069	228,778	66,370	93,716	82,438

Notes:

1. COPD = Chronic obstructive pulmonary disorder.
2. MDC = Major diagnostic category.
3. All diags = All diagnoses recorded at time of discharge, not necessarily the primary diagnosis on discharge.

Source: Data extracted from Ministry of Health National Minimum Data Set 2004

3.2.2 Residential care

The available data on residential care does not include information on medical condition, sex or ethnic group, so the picture of provision shown in Table 8 is much simpler than the pattern shown for acute and sub-acute care. It should also be borne in mind that the data for residential care are for 2003/04 and include estimates for people in rest home care who are paying the full cost of their care.

The table shows that the number of people in rest homes was 55 percent of the total, and that the number in long-stay hospital provision made up 36 percent of the total. More importantly perhaps, the table also shows that people aged 80 and over accounted for 69 percent of total residents.

Table 8: Number of people in residential care

Age group	Dementia units	Long-stay hospital	Psychogeriatric units	Rest homes	All
50–64	89	374	83	555	1,101
65–69	113	560	61	1,324	2,058
70–74	308	1298	121	1,964	3,691
75–79	672	2,444	215	4,259	7,590
80–84	948	3,782	252	5,289	10,271
85–89	766	4,140	193	6,135	11,234
90+	472	3,943	143	5,708	10,266
All ages	3,368	16,541	1,068	25,235	46,209

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: Ministry of Health CCPS database for subsidised residents. Ministry of Health estimates for residents paying the full cost of their care themselves.

3.3 Expenditure on health and disability services

New Zealand's expenditure on health and disability services in 2001/02 was approximately \$6.85 billion⁶ (Ministry of Health 2002c). Table 9 shows how per capita expenditure varied by age group; and it illustrates clearly how an ageing population will create pressure for substantially increased expenditure. It suggests that per capita expenditure starts to increase exponentially around the age of 50, so that per capita expenditure in the age group 85 and over is nearly eight times the all-age average. It also shows that per capita expenditure in the 85 and over age group is nearly 13 times the per capita expenditure in the 40 to 44 age group.

⁶ This amount excludes any ACC-related health expenditure.

Table 9: Per capita health expenditure

By age group

Age group	Expenditure (\$ per annum)	As % of all-age average (\$1750)	As % of expenditure at 40–44 (\$1050)
0–4	1,700	97	162
5–9	650	37	62
10–14	650	37	62
15–19	800	46	76
20–24	1,200	69	114
25–29	1,400	80	133
30–34	1,400	80	133
35–39	1,230	70	117
40–44	1,050	60	100
45–49	1,220	70	116
50–54	1,380	79	131
55–59	1,700	97	162
60–64	2,300	131	219
65–69	3,150	180	300
70–74	4,300	246	410
75–79	6,150	351	586
80–84	8,400	480	800
85+	13,600	777	1,295

Source: Ministry of Health (2002c)

In combination with Table 1 in chapter 1, which showed that the number and proportion of older people in the population is likely to increase substantially by 2021, Table 9 makes it easy to see why there is so much interest in the subject of this report. Undoubtedly, there will be a large increase in demand for health and disability services. This will not only increase the demand for labour in the services but will also have implications for how the labour force is managed and developed.

4. Scenarios of demand for health and disability services

4.1 Introduction

Although it is imperfect because it does not say anything about quality, a useful aggregate measure of provision of health and disability services is expenditure. Using just the number of admissions or discharges from hospitals or the number of GP consultations may overstate some aspects of provision and ignore others. Expenditure data also have the virtue that they can be relatively easily converted into indexes, built into scenarios or forecasts and placed in a wider economic context. We, therefore, use indexed levels of expenditure as the final measure of demand, influenced by the changing structure of the population, changes in the prevalence of certain conditions and diseases and the effect of longevity (whether additional life years attract costs associated with the main conditions/diseases).

In this chapter, we report the results of the first round of consultations we undertook. Building on these results and the statistical base outlined in chapter 3, we then present some scenarios of future demand for services related to the main diseases and conditions experienced by older people.

It should be noted that, in what follows, we refer to future demand for health and disability services. However, the scenarios we use are actually extrapolations of current provision, which is not necessarily the same as demand or need. It should, therefore, be borne in mind that, to the extent that there was any unsatisfied need or demand at the year 2001 baseline, the scenarios presented will tend to understate future demand.

4.2 Views on future demand: First-round consultations

Whilst it was possible to start the demand-side review and scenario-building process with some useful data for the main diseases and conditions most likely to be affected by an ageing population, the question was raised as to whether this was the correct approach to assessing future need. In particular, why focus somewhat narrowly on diseases and conditions specifically? Much discussion took place on whether it was appropriate to use the ‘medical model’ given that the key drivers of changes in demand might fit more closely to a ‘social model’.

The major factor considered likely to impinge on health and disability services demand in the future was lifestyle choice. In particular, nutrition, relative inactivity and time pressures often combine to exert influence on health outcomes that are manifest in, or contribute to, some diseases/conditions but are not amenable to medical treatment as such.

Similarly, future consumers of health and disability services are expected to continue the current trend of being more discerning and more demanding. This phenomenon (assisted by advances in information and communications technology) would add to the pressure of an ageing population but is largely independent of incidence rates. That is, consumers would demand more (and better) health and disability services as they get older, regardless of the rates of incidence in diseases/conditions; and focusing on specific conditions as the basis for assessing future demands does not capture this factor.

In essence, narrow focus on diseases and conditions themselves may miss potentially more important factors influencing demand. This has implications for the predictions of the work but also for the handling of the concerns raised. Changes to lifestyle choices require a sustained, heavily information-based approach, as opposed to a treatment-based approach to illness and disease. Thus, change is likely to be slower and require more co-operation and collaboration across the sector to be effective.

But while the broader factors influencing demand are important and need consideration, they are not necessarily amenable to modelling approaches. Data are not as readily available on these factors in a tractable sense. Thus, while having limitations, the approach of using diseases and conditions as the basis of demand projections is a considered choice, and the scenarios modelled later in this chapter have essentially ignored any impacts of things like lifestyle or diet and nutrition changes.

Against this background, the first round of consultations elicited the following collective views on how the incidence of the main diseases and conditions affecting the older population in New Zealand will change.

Group 1: The rate of increase in incidence of the following will be **much faster** than the rate of increase in the size of the older population:

- Diabetes (Māori and Pacific peoples groups are likely to experience an even more rapid increase in the incidence of diabetes than the older population as a whole.)

Group 2: The rate of increase in incidence of the following will be **slightly faster** than the rate of increase in the size of the older population:

- **Unipolar major depression** (no obvious variation by ethnic group)
- **Osteoarthritis** (Māori and Pacific peoples groups are likely to experience a more rapid increase than the older population as a whole.)
- **Dementia and related conditions** (no obvious variation by ethnic group)
- **Visual impairment** (Māori and Pacific peoples groups are likely to experience a more rapid increase than the older population as a whole)

- **Renal failure** (Māori and Pacific peoples groups are likely to experience a more rapid increase than the older population as a whole)
- **Cancers** other than of the airway (no obvious variation by ethnic group).

Group 3: The rate of increase in incidence of the following morbidity will be **about the same** as the rate of increase in the size of the older population:

- **Chronic obstructive pulmonary disease** (however, Māori and Pacific peoples groups are likely to experience a greater increase than the older population as a whole).

Group 4: The rate of increase in incidence of the following morbidities will be **slightly slower** than the rate of increase in the size of the older population:

- **Ischaemic heart disease** (but this is unlikely to be true for Māori and Pacific peoples groups)
- **Stroke and other cerebrovascular conditions** (but this is unlikely to be true for Māori and Pacific peoples groups)
- **Cancers** of the airway (but this is unlikely to be true for Māori and Pacific peoples groups).

Clearly, Māori and Pacific peoples are generally expected to experience more ill health than other population groups. This expectation has been attributed to their smoking behaviour and diet, leading to increased incidence of cardiovascular diseases, cancers of the airway and diabetes and related conditions, such as visual impairment and renal failure.⁷

None of the consultees assumed that there would be dramatic clinical advances capable of changing the pattern of disease amongst the older population. Many felt that clinical breakthroughs were always possible and someone could come up with a ‘wonder drug’ next year that would mitigate the effects of heart disease, for example, but the strength of feeling was that there was no panacea awaiting approval anywhere. However, a number of more minor advances were mentioned, for example, better monitoring to identify incipient ischaemic heart disease, and hence earlier and less radical intervention, and improved management of dementia.

⁷ It should be noted, however, that joint research by the Ministry of Health and the University Otago (Ajwani et al 2003) indicates that differential impacts of structural change, differential access to health care and disparities in the quality of health care provision to different ethnic groups in New Zealand contributes to differential mortality rates. It could be assumed that the same factors (and not just smoking behaviour and diet) also contribute to differentials in morbidity.

One important finding from the first round of consultations was the lack of unanimity around the ‘compression of morbidity’ debate. At the heart of this debate is the question of whether increased life expectancy will necessarily lead to greater levels of ill health and demands on health and disability services. Consultees were asked to indicate which of the following three scenarios was more likely:

1. A ‘crisis’ scenario, where the age at which disability occurs remains the same but death is postponed, meaning a prolonged period of disability that increases demand for health and disability services.
2. A ‘receding horizon’ hypothesis, where the age of onset of disability is postponed to the same extent as the postponement of the age of death so that the number of years with disability or ill health remains unchanged.
3. A ‘compressed morbidity’ scenario, where both disability and chronic illness are postponed until closer to death, reducing the interval between the onset of disability and death and ergo the demand for health and disability services.

There was no consensus on which scenario was most appropriate. It was felt that different scenarios pertained to different conditions, and thus an overall scenario does not stand out. This contradicts the international literature surveyed in Cornwall and Davey (2004), which suggests that “... ageing will have a considerable, but manageable, effect on projected health expenditure” (page 82).

4.3 Scenarios of future demand

Building from the statistical base outlined in chapter 3 and the results of the first round of consultations, three scenarios of future demand for health and disability services provision were modelled. The scenarios were projections from the 2001 level of provision, based on different combinations of assumptions about three key drivers of change:

1. The size and age structure of the population
2. The rates of incidence of disease in the population
3. The pattern of disease and disability as longevity increases.

The following section gives a brief description of how these key demand drivers are incorporated into the projections.

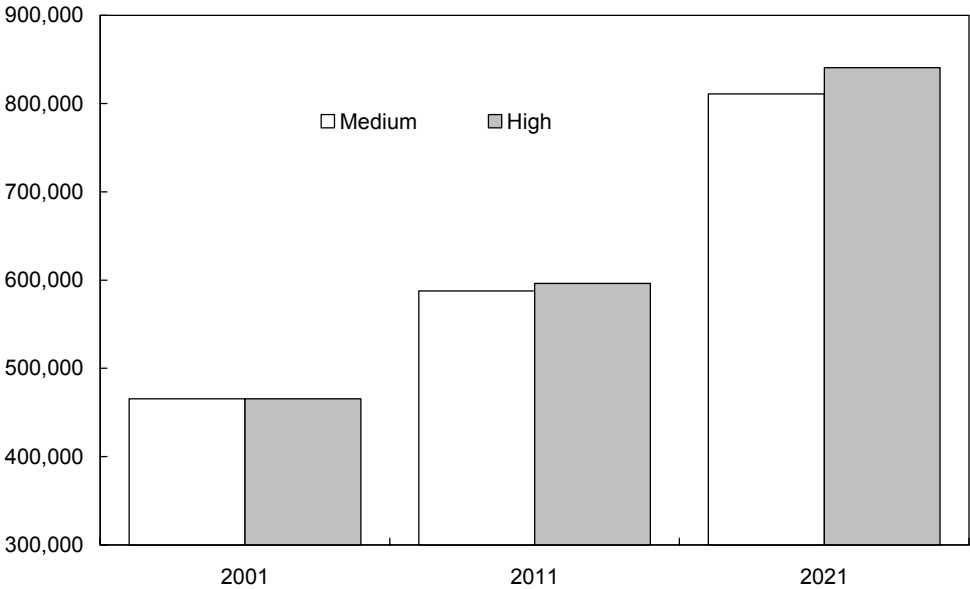
4.3.1 Key drivers of changing demand

The demand projections make use of Statistics New Zealand’s population projections, which give a suitable breakdown of the population going forward. For comparative purposes, 2001, 2011 and 2021 are used as the points of interest. The level of aggregation of the projections enables the effects of the changing population to be examined by various combinations of age (five-year age bands), ethnicity and gender. The population projections are themselves created under three scenarios (low, medium or high) primarily representing various potential net migration inflows.

We can see the impact of different population assumptions in Figure 2. It shows the size of the 65 and over age group under both medium and high population scenarios for the years of interest. Under both scenarios, the size of this older population increases considerably; and under both scenarios the increase is greater between 2011 and 2021 than between 2001 and 2011. The age component in particular plays an important role in determining the stresses on demand for health care services, given the typical relationship assumed between increased age and increased utilisation of health care services (see chapter 2).

Figure 2: Population projections for the 65 and over age group

Medium and high assumptions



Source: Statistics New Zealand 2004

The demand modelling starts by applying rates of hospitalisation for the main diseases and conditions to the projections of population, broken down into five-year age bands. The projections allow for either a continuation of current rates of hospitalisation or the possibility of changing rates of hospitalisation over time. Where changing rates were applied, alterations to the status quo rates of hospitalisation for the 65 and over age groups were in line with the collective views of the first-round consultees (see section 4.2). This allowed for expected changes in hospitalisation over time for particular ethnicity/gender sub-populations. The combination of the population changes and the effect of incidence is a significant driver of future demand.

By creating a picture of overall demand (expenditure) for health care, the population and incidence drivers are then allowed to impact on the growth in total demand. It is here that we allow for various assumptions about the costs associated with increased levels of disease and disability, from a ‘receding horizon’ (whereby life expectancy increases, but the number of years with a disability or ill-health remains the same) through to a ‘crisis scenario’ (whereby projected increases in life expectancy are taken up entirely by extra years of disability and disease). These assumptions impact on total demand through decreases and increases (respectively) in the costs associated with the ageing population and any changes to hospitalisation rates.

4.3.2 The scenarios

In taking into account the major drivers discussed above, the scenarios and the underlying assumptions were defined as follows:

Scenario 1 – Simple extrapolation: This is based on the assumptions that there will be:

- medium population growth
- a continuation of the 2001 rates of hospitalisation in the main diseases and conditions affecting the population
- a ‘receding horizon’ of disease and disability onset and progression (life expectancy increases, but the number of years with a disability or ill health remains the same).

Scenario 2 – First alternative scenario. This is different from the simple extrapolation above in that it is based on informed opinions about future incidence of disease and disability amongst the older population. It assumes:

- medium population growth (as in scenario 1)
- rates of incidence in the main diseases and conditions affecting the over 65s change in line with the collective views of the first-round consultees
- a ‘receding horizon’ of disease and disability onset and progression (as in scenario 1).

Scenario 3 – Second alternative scenario. This assumes:

- high population growth
- continuation of the 2001 rates of hospitalisation in the main diseases and conditions affecting the population (as in scenario 1)
- a ‘crisis scenario’ view of disease and disability onset and progression (years of disability and disease are prolonged by increases in life expectancy).

It should be understood that the scenarios were not intended to represent forecasts, as such. Rather, they were intended to show what might happen to the demand for services under certain conditions. In combination, the scenarios were designed to incorporate as many as possible of the ‘explanatory variables’ highlighted by Cornwall and Davey (2004).

We also re-emphasise that an implicit underlying assumption is that the 2001 approach to the provision of services remains the same in the future – there will be no giant leaps forward in medical technology and no radical social or institutional changes affecting provision of health and disability services.

4.4 What the scenarios show about changing demand

4.4.1 Acute and sub-acute care

Tables 10 and 11 below illustrate an example of the impacts of the underlying assumptions of the various scenarios on the projected hospitalisations of one of the major conditions of interest: ischaemic heart disease. The population growth in the older age groups (65 to 79 and 80 and over) by 2021 drives the numbers of hospitalisations significantly. The assumption of high population growth in scenario 3 gives rise to significant growth in hospitalisations for the 65 to 79 age group.

For each scenario, detailed tables of hospitalisations for the major diseases and conditions, broken down by age group, ethnicity⁸ and gender are contained in Appendix A.

⁸ Due to limitations on projections of incidence rates, the rates of incidence for Asian peoples are assumed to be the same as those for Europeans.

For the wider population, we can view graphically the combined impacts of some drivers of demand on hospitalisation of the major conditions. Figure 3 (which follows the tables) shows, for scenario 2, the combined effects of assuming medium population growth and hospitalisation rates that differ from the status quo (in line with recommendations from the first-round consultees). Each chart represents a major condition, with the lines representing the numbers of hospitalisations over time, across the spectrum of ages.

Looking at Figure 3, the magnitude of the health and disability services strategic challenge is represented by the area under each line, particularly the area under the peaks corresponding with older age. The effect of the various assumptions is particularly marked for a condition such as ischaemic heart disease, where hospitalisations are most common between the ages of around 65 to 80. The population bulge passing through that age group creates the potential for a significant increase in the number of hospitalisations for this condition – one that is likely to attract considerable costs associated with its treatment. For all the conditions shown (except dementia), the gap that develops between 2011 and 2021 is of particular concern and is larger than the gap between 2001 and 2011.

We noted earlier that it would be important to track the impact of conditions where the associated costs of care are likely to be high given the length of stay in hospital associated with providing care. This is particularly the case for dementia, where the mean stay was considerable, as it was with diabetes, heart conditions and conditions of the nervous system. The number of hospitalisations for these conditions will increase over time as the baby boom generations move into age categories where these conditions are more prevalent. By 2021, the number of hospitalisations increases markedly for such conditions. While we are unable to attribute precise costs to length of stay in care, we note that the resource requirements (not just labour) to support this demand are likely to be substantial as the ageing population contributes higher hospitalisations with higher cost conditions. It is possible to create a ‘production function’ for particular health conditions – identifying relevant inputs, and their magnitudes, that go into treating a particular condition.

Table 12 uses the data for all conditions to show how demand for health and disability services is likely to change according to ethnic group. It indicates that the share of hospitalisations accounted for by European people will decrease under all three scenarios between 2001 and 2021, while the share accounted for by each other ethnic group will increase in that time. The index numbers of demand indicate that demand from every ethnic group will increase considerably in absolute terms. However, they show dramatic variations from group to group. Demand for services from Asian peoples is projected to grow extremely rapidly, albeit from a low base. Demand for services from both Māori and Pacific peoples is projected to more than double under all three scenarios.

Table 10: Number of hospital discharges for ischaemic heart disease⁽¹⁾ – acute and sub-acute care

Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	255	267	92	255	267	92	255	267	92
European			4,027	9,457	7,285	4,027	9,457	7,285	4,027	9,457	7,285
Māori			1,365	813	129	1,365	813	129	1,365	813	129
Pacific			355	239	61	355	239	61	355	239	61
Total female			6,002	10,776	7,567	6,002	10,776	7,567	6,002	10,776	7,567
Asian	Male	2001	537	384	86	537	384	86	537	384	86
European			8,758	13,351	5,255	8,758	13,351	5,255	8,758	13,351	5,255
Māori			1,641	765	89	1,641	765	89	1,641	765	89
Pacific			577	243	60	577	243	60	577	243	60
Total male			11,513	14,742	5,489	11,513	14,742	5,489	11,513	14,742	5,489
Total 2001			17,514	25,518	13,056	17,514	25,518	13,056	17,514	25,518	13,056
Asian	Female	2011	567	623	223	567	563	202	590	649	244
European			5,050	10,275	9,553	5,050	9,292	8,640	5,135	10,380	9,699
Māori			2,051	1,357	241	2,051	1,500	266	2,102	1,374	250
Pacific			554	374	114	554	414	126	568	374	114
Total female			8,223	12,630	10,131	8,223	11,769	9,233	8,395	12,779	10,306
Asian	Male	2011	1,158	920	228	1,158	832	206	1,219	954	228
European			10,647	15,232	8,290	10,647	13,776	7,498	10,843	15,416	8,435
Māori			2,381	1,284	168	2,381	1,418	186	2,447	1,314	179
Pacific			894	405	112	894	448	123	907	424	129
Total male			15,080	17,841	8,799	15,080	16,474	8,013	15,417	18,108	8,971
Total 2011			23,302	30,471	18,929	23,302	28,243	17,246	23,812	30,887	19,277
Asian	Female	2021	939	1,234	600	939	1,010	491	1,026	1,293	641
European			5,343	13,918	11,319	5,343	11,384	9,258	5,578	14,270	11,809
Māori			2,745	2,226	526	2,745	2,716	642	2,910	2,312	554
Pacific			816	609	202	816	743	247	856	631	224
Total female			9,842	17,987	12,648	9,842	15,852	10,638	10,370	18,506	13,227
Asian	Male	2021	1,878	1,768	616	1,878	1,446	504	2,075	1,874	673
European			10,834	20,699	10,664	10,834	16,930	8,722	11,356	21,348	11,273
Māori			3,074	2,141	401	3,074	2,612	490	3,281	2,229	423
Pacific			1,228	742	223	1,228	905	272	1,290	774	249
Total male			17,014	25,349	11,905	17,014	21,893	9,988	18,001	26,225	12,618
Total 2021			26,856	43,337	24,553	26,856	37,745	20,626	28,372	44,731	25,845

Note: (1) Data is for all diagnoses recorded on discharge, not necessarily the primary diagnosis.

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data.

Table 11: Change in hospital discharges for ischaemic heart disease⁽¹⁾ – acute and sub-acute

For three scenarios

		Scenario 1			Scenario 2			Scenario 3		
		<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
% increase 2001–2011										
Asian	Female	123%	134%	144%	123%	111%	120%	132%	143%	166%
European		25%	9%	31%	25%	-2%	19%	28%	10%	33%
Māori		50%	67%	86%	50%	84%	105%	54%	69%	93%
Pacific		56%	57%	86%	56%	73%	106%	60%	57%	86%
Total female		37%	17%	34%	37%	9%	22%	40%	19%	36%
Asian	Male	116%	140%	166%	116%	117%	141%	127%	149%	166%
European		22%	14%	58%	22%	3%	43%	24%	15%	61%
Māori		45%	68%	90%	45%	85%	110%	49%	72%	101%
Pacific		55%	67%	86%	55%	84%	106%	57%	74%	115%
Total male		31%	21%	60%	31%	12%	46%	34%	23%	63%
All groups		33%	19%	45%	33%	11%	32%	36%	21%	48%
% increase 2011–2021										
Asian	Female	66%	98%	169%	66%	79%	143%	74%	99%	163%
European		6%	35%	18%	6%	23%	7%	9%	37%	22%
Māori		34%	64%	119%	34%	81%	142%	38%	68%	121%
Pacific		47%	63%	78%	47%	80%	97%	51%	68%	97%
Total female		20%	42%	25%	20%	35%	15%	24%	45%	28%
Asian	Male	62%	92%	170%	62%	74%	144%	70%	96%	195%
European		2%	36%	29%	2%	23%	16%	5%	38%	34%
Māori		29%	67%	138%	29%	84%	163%	34%	70%	137%
Pacific		37%	83%	100%	37%	102%	121%	42%	83%	94%
Total male		13%	42%	35%	13%	33%	25%	17%	45%	41%
All groups		15%	42%	30%	15%	34%	20%	19%	45%	34%
% increase 2001–2011										
Asian	Female	269%	363%	555%	269%	278%	436%	303%	385%	600%
European		33%	47%	55%	33%	20%	27%	39%	51%	62%
Māori		101%	174%	306%	101%	234%	396%	113%	184%	328%
Pacific		130%	155%	232%	130%	211%	305%	141%	164%	266%
Total female		64%	67%	67%	64%	47%	41%	73%	72%	75%
Asian	Male	249%	361%	619%	249%	277%	488%	286%	388%	686%
European		24%	55%	103%	24%	27%	66%	30%	60%	115%
Māori		87%	180%	352%	87%	241%	452%	100%	191%	377%
Pacific		113%	205%	273%	113%	273%	355%	124%	218%	316%
Total male		48%	72%	117%	48%	49%	82%	56%	78%	130%
All groups		53%	70%	88%	53%	48%	58%	62%	75%	98%

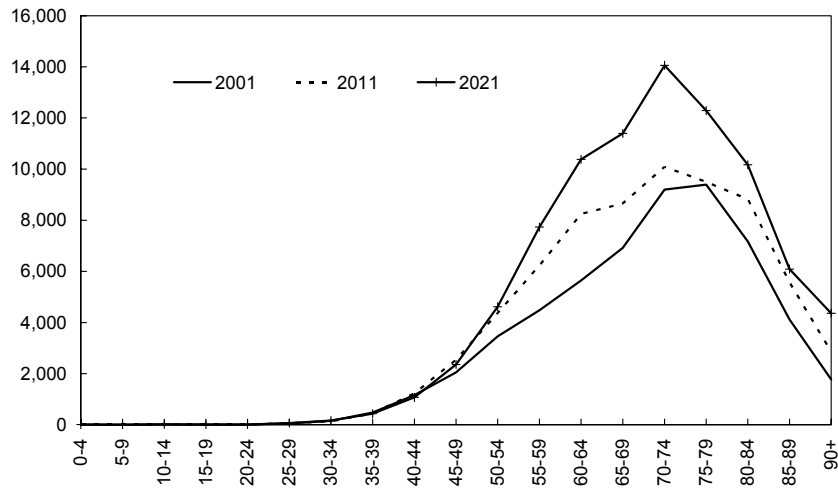
Note: (1) Data is for all diagnoses recorded on discharge, not necessarily the primary diagnosis.

Source: NZIER, generated from Ministry of Health NMDs and Statistics New Zealand population data.

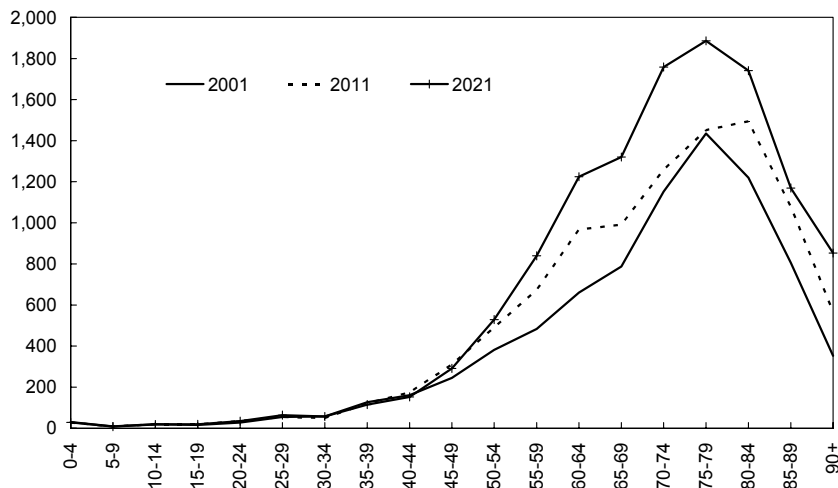
Figure 3: Acute and sub-acute hospitalisations from scenario 2

By condition and age group

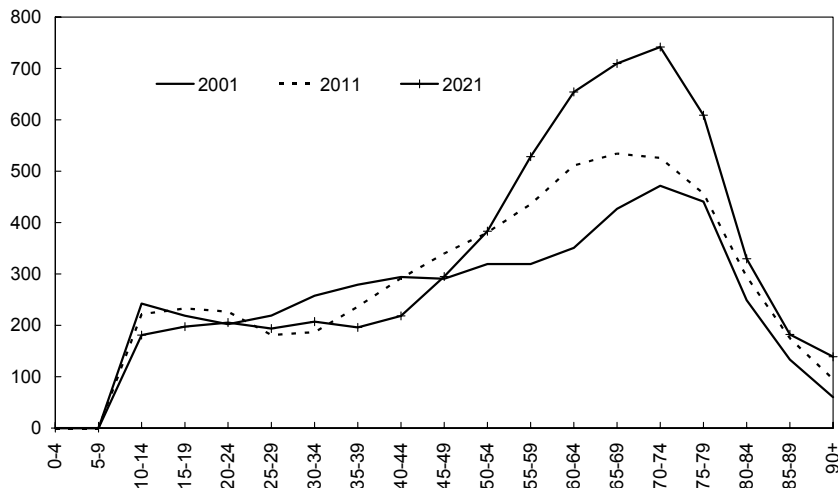
Ischaemic heart disease



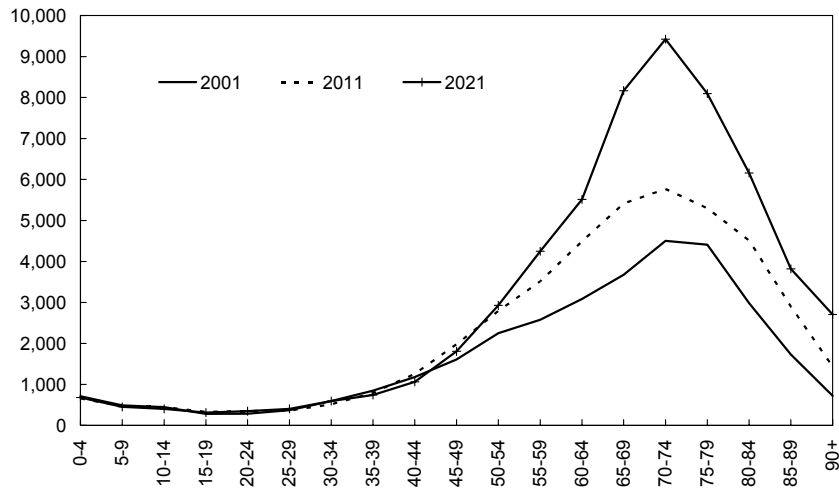
Stroke



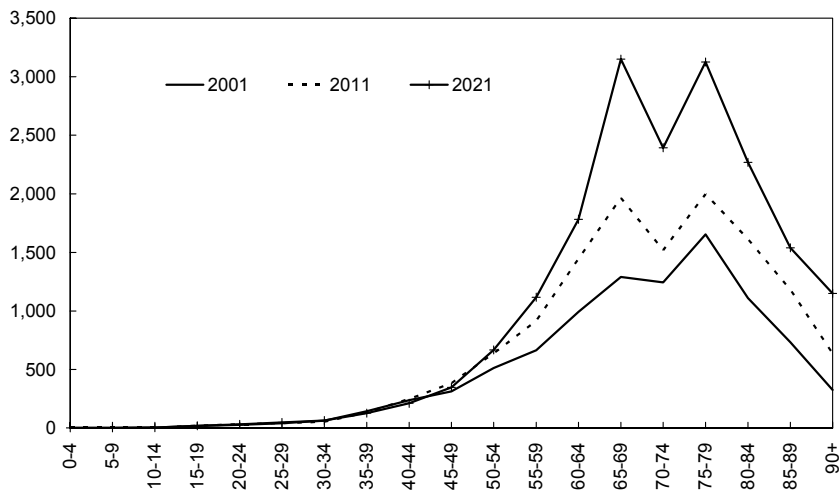
Lung cancer, trachea and bronchus



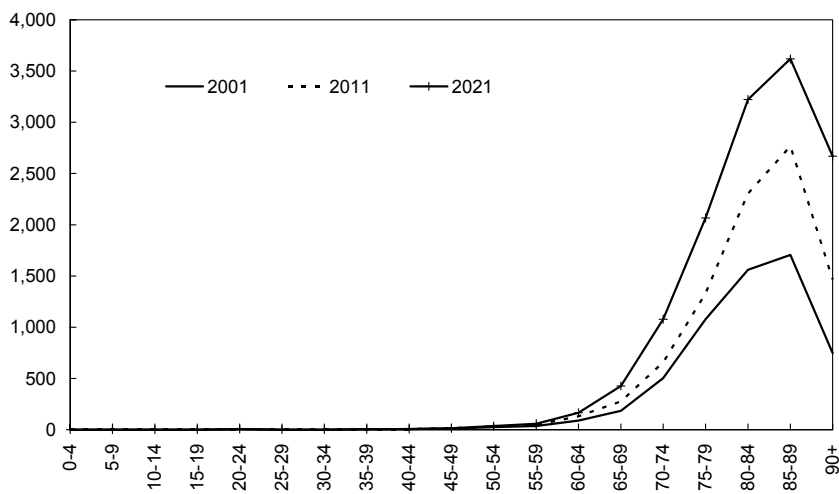
Other cancers



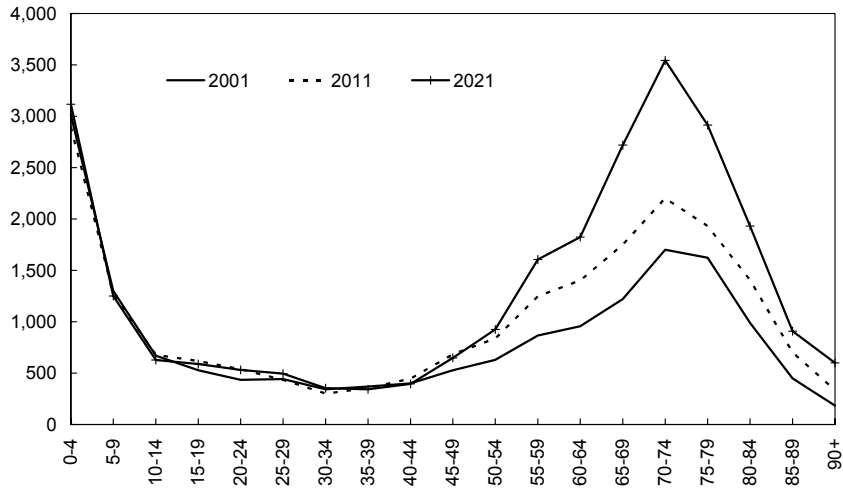
Osteoarthritis



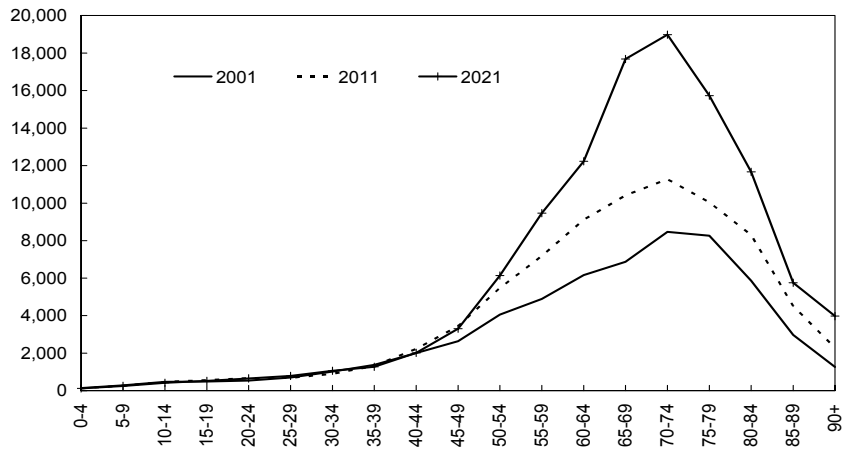
Dementia



Chronic obstructive pulmonary disease (and asthma)



Diabetes



Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data.

Table 12: Shares/index of hospitalisation by ethnicity

For acute and sub-acute hospitalisations

		Share of total hospitalisations		Index	
		2001	2021	2001	2021
Scenario 1	Asian	3%	7%	100	381
	European	78%	68%	100	145
	Māori	13%	17%	100	212
	Pacific	6%	8%	100	228
	Total	100%	100%	100	166
Scenario 2	Asian	3%	7%	100	380
	European	78%	64%	100	144
	Māori	13%	20%	100	266
	Pacific	6%	9%	100	289
	Total	100%	100%	100	176
Scenario 3	Asian	3%	7%	100	420
	European	78%	68%	100	152
	Māori	13%	17%	100	225
	Pacific	6%	8%	100	242
	Total	100%	100%	100	175

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data.

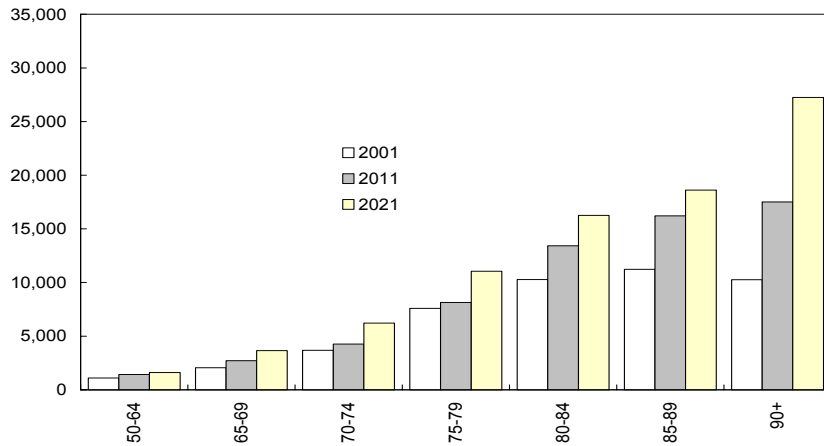
4.4.2 Residential care

The source data on residential care is not as detailed as that for acute and sub-acute care because it does not include any breakdown by condition, sex or ethnic group. Nonetheless, Figure 4 and Table 13 show clearly that demand for residential care is likely to grow rapidly, regardless of what population projections are used. Even on the low population growth projection, for example, the number of people in residential care is projected to grow by 83% between 2001 and 2021. The most rapid increases are from people in the 80 and over age group, which is in line with projections (for example, in Cornwall and Davey 2004). In other words, the population aged 65 and over is itself ageing. Table 13 implies that the proportion of people in residential care who are aged 80 and over will increase from 69 percent in 2001 to between 73 percent and 75 percent in 2021 (depending on which population projection is used).

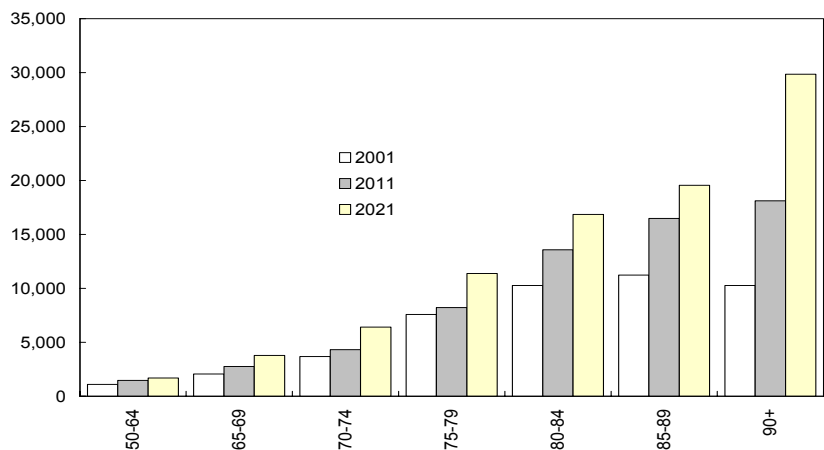
Figure 4: Projected residential care clients – using different population projections

By age group – using constant rates of residential care use over time

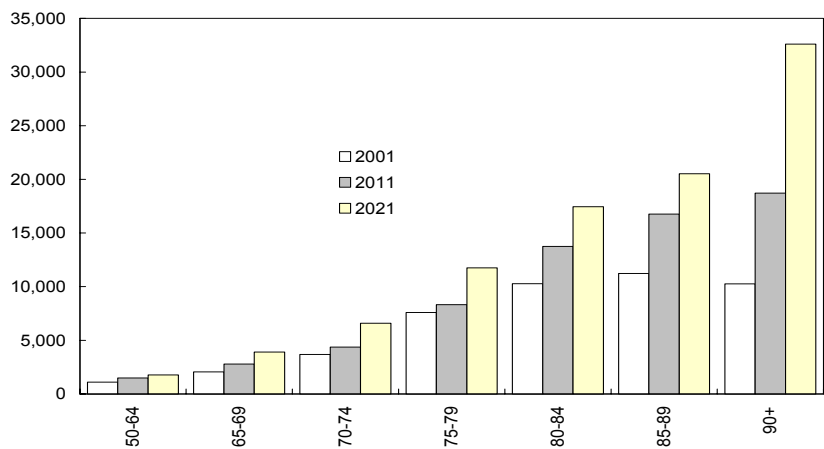
Low population projection



Medium population projection



High population projection



Source: NZIER, generated from Ministry of Health CCPS database and estimates for people paying the full cost of rest home care themselves, and Statistics New Zealand population data.

Table 13: Projected number of people in residential care

	Age	Low population projection			Medium population projection			High population projection		
		2001	2011	2021	2001	2011	2021	2001	2011	2021
Dementia unit	50–64	89	116	130	89	119	137	89	121	143
	65–69	113	149	201	113	151	208	113	153	215
	70–74	308	356	519	308	360	534	308	365	550
	75–79	672	720	978	672	728	1,008	672	737	1,041
	80–84	948	1,238	1,500	948	1,253	1,556	948	1,270	1,610
	85–89	766	1,106	1,269	766	1,124	1,333	766	1,143	1,400
	90+	472	805	1,252	472	833	1,373	472	861	1,499
Hospital	50–64	374	489	547	374	499	575	374	508	603
	65–69	560	739	995	560	749	1,030	560	759	1,064
	70–74	1,298	1,502	2,186	1,298	1,519	2,252	1,298	1,539	2,317
	75–79	2,444	2,619	3,557	2,444	2,647	3,667	2,444	2,682	3,785
	80–84	3,782	4,941	5,985	3,782	5,001	6,207	3,782	5,067	6,423
	85–89	4,140	5,977	6,860	4,140	6,073	7,206	4,140	6,180	7,564
	90+	3,943	6,726	10,463	3,943	6,958	11,468	3,943	7,190	12,525
Psycho-geriatric hospital	50–64	83	109	121	83	111	128	83	113	134
	65–69	61	80	108	61	82	112	61	83	116
	70–74	121	140	204	121	142	210	121	143	216
	75–79	215	230	313	215	233	323	215	236	333
	80–84	252	329	399	252	333	414	252	338	428
	85–89	193	279	320	193	283	336	193	288	353
	90+	143	244	379	143	252	416	143	261	454
Rest home	50–64	555	726	812	555	740	853	555	754	894
	65–69	1,324	1,747	2,353	1,324	1,771	2,435	1,324	1,795	2,515
	70–74	1,964	2,273	3,307	1,964	2,299	3,407	1,964	2,329	3,507
	75–79	4,259	4,564	6,198	4,259	4,612	6,390	4,259	4,673	6,595
	80–84	5,289	6,909	8,369	5,289	6,993	8,680	5,289	7,085	8,982
	85–89	6,135	8,857	10,165	6,135	8,998	10,678	6,135	9,158	11,208
	90+	5,708	9,736	15,145	5,708	10,072	16,600	5,708	10,408	18,130
Total	5064	1,101	1,440	1,611	1,101	1,468	1,692	1,101	1,495	1,774
	6569	2,058	2,716	3,658	2,058	2,753	3,785	2,058	2,790	3,909
	7074	3,691	4,271	6,215	3,691	4,320	6,403	3,691	4,377	6,590
	7579	7,590	8,134	11,046	7,590	8,220	11,388	7,590	8,329	11,754
	8084	10,271	13,417	16,253	10,271	13,580	16,857	10,271	13,759	17,444
	8589	11,234	16,219	18,615	11,234	16,478	19,553	11,234	16,769	20,525
	90+	10,266	17,512	27,240	10,266	18,116	29,857	10,266	18,719	32,608
	Total	46,209	63,709	84,639	46,209	64,934	89,535	46,209	66,239	94,603

Note: Uses constant rates of residential care admission over time; that is, the driver is population growth.

Source: NZIER, generated from Ministry of Health CCPS database and estimates for people paying the full cost of rest home care themselves, and Statistics New Zealand population data.

4.4.3 Aggregate demand

Table 14 provides an aggregate view of how total demand for health and disability services is projected to change under the three scenarios.

The outstanding feature of the table is that demand for residential care grows much more rapidly than demand for acute and sub-acute care, especially in the period 2011 to 2021 and under scenario 3. This rapid growth is driven mainly by the large increase in the number of very old people (aged 85 and over) there will be in the population. In fact, under scenario 3 (based on high population growth) the index level of demand for residential care more than doubles between 2001 and 2021.

Table 14: Index of demand for the three scenarios, by component of demand

2001 = 100

	2001	2011	2021
Scenario 1			
Acute and sub-acute	100	128	166
Aged residential care	100	141	194
Total	100	130	170
Scenario 2			
Acute and sub-acute	100	131	176
Aged residential care	100	141	194
Total	100	132	179
Scenario 3			
Acute and sub-acute	100	131	175
Aged residential care	100	143	205
Total	100	133	179

Source: NZIER, generated from Ministry of Health NMDS and CCPS data and estimates for people paying the full cost of rest home care themselves, and Statistics New Zealand population data.

5. The labour market implications of changing demand

5.1 Introduction

We start this chapter by profiling the current health and disability services workforce (strictly speaking, the 2001 workforce). The profile is sketchy in parts because of a lack of good data, especially on disability support workers in the sector. We then show, given simple assumptions, how the demand for labour in the health and disability services is likely to change under each of the three scenarios of demand presented in the previous chapter. We then make some projections of labour supply in the sector and indicate the possible mismatches between labour demand and supply. Lastly, we consider the broad options for avoiding mismatches.

5.2 The size and composition of the 2001 health and disability workforce

Table 15 is based on research by the Health Workforce Advisory Committee (HWAC) (HWAC 2002). This research focused mainly on the regulated health and disability services workforce, that is, people in the occupations listed above the sub-total in the table. The numbers shown are for registered and active professionals. They do not include, for example, nurses who are qualified but who do not hold an Annual Practising Certificate. The table indicates that nurses accounted for 52 percent of the regulated workforce and that medical practitioners accounted for a further 13 percent.

It should be noted that the number of disability support workers shown in the table represents a rough estimate and that more recent research (Parsons et al 2004) indicates that their number is in the range of 40,000 to 50,000. The number of alternative and complementary health practitioners is also estimated. Moreover, it should be noted that the figures exclude workers in certain occupations, such as hospital orderlies, ward assistants and all those listed in note 2 of the table. We estimate, therefore, that the true size of the health and disability services workforce is around 130,000⁹ people, roughly half of whom are regulated professionals.

The projections of labour demand and supply in the remainder of this chapter relate mainly to the regulated workforce, where the data are reasonably reliable, but it should be borne in mind that the health and disability services workforce is probably twice as large.

⁹ This figure is broadly consistent with the Statistics New Zealand estimate of 124,300 full time equivalent (FTE) employees in ANZIC Division O: Health and Community Services, allowing for the fact that the HWAC research counted people, rather than FTEs and that veterinary services are also included in ANZIC Division O.

Table 15: Composition of the health and disability services workforce in 2001

Nurses	34,895
Medical practitioners	8,615
Pharmacists	2,831
Social workers	2,697
Physiotherapists	2,500
Midwives	2,081
Dentists	1,591
Medical radiation technologists	1,459
Occupational therapists	1,372
Medical laboratory technologists	1,292
Registered psychologists	1,124
Other occupations with fewer than 1000 workers	6,532
Sub-total	66,989
Disability support workers (1)	30,000
Alternative and complementary health practitioners	10,000
Total	106,989

Notes:

1. Mainly semi-skilled, unqualified and unregistered, lowly paid workers – does not include family members providing care.
2. The figures in the table do not include workers in the following groups, where numbers are thought to be small at present but may grow in future: community mental health workers; counsellors; disability support needs assessors and service co-ordinators; health promoters; health managers.

Source: HWAC 2002

Tables 16, 17 and 18 are also derived from the HWAC research, and again it should be noted that they are not comprehensive. For example, Table 17 does not even hazard a guess at the possible number of support workers in the mental health sector. Instead, the 30,000 included in Table 15 are all allocated to the disability sector workforce in Table 18. However, Table 18 excludes nurses and medical practitioners who work in the disability sector. The tables are not mutually exclusive. For example, the total number of physiotherapists shown across the three tables is 4000, although Table 15 indicates that there are only 2500 physiotherapists in the entire health and disability services workforce. A further weakness in the data is that there is no distinction between the number of disability support workers caring for people with lifelong disabilities and the number caring for frail older people.

Table 16: Composition of the primary health care workforce in 2001

GPs and other medical practitioners	3,396
Nurses	3,385
Pharmacists	2,831
Physiotherapists	2,500
Midwives	2,081
Others with fewer than 1000 workers	1,119
Total	15,312

Note: Excludes disability support workers and alternative and complementary health practitioners.

Source: HWAC 2002

Table 17: Composition of the mental health workforce in 2001

Nurses	2,889
Social workers	2,000
Psychologists	1,124
Mental health support workers	875
Alcohol and drug workers	785
Others with fewer than 500 workers	815
Total	8,488

Note: Excludes disability support workers and alternative and complementary health practitioners.

Source: HWAC 2002

Table 18: Composition of the disability sector workforce in 2001

Disability support workers	30,000
Physiotherapists	1,500
Occupational therapists	1,372
Social workers	1,000
Optometrists and opticians	604
Others with fewer than 500 workers	691
Total	35,167

Source: HWAC 2002

In regards to Table 18, more recent work on the size and composition of the disability support workforce (Parsons et al 2004) indicates that it comprises approximately 45,000 people, roughly half of whom are working in residential care (and roughly half of whom are working in home-based care).

5.3 Projected demand for labour in the health and disability services

The projections of future demand for labour in the health and disability services presented in this section are based on the key assumption that demand for labour will grow in line with service demands, as projected in the scenarios outlined in chapter 4. This assumption implies that there will be zero labour productivity growth overall (that is, clinical and other technological advances that might otherwise be used to save labour will instead be used as the opportunity to intensify care or increase its quality).

Reflecting the projections of total demand from the previous chapter and the key assumption about productivity, Table 19 suggests that the demand for labour in the health and disability services will grow by between 40 percent and 69 percent, depending which scenario is used. Given that the medium population growth projections for New Zealand imply an increase of just 16 percent by 2021 (see Table 1 in chapter 1), demand for health and disability services and labour is projected to increase at roughly 2.5 to 4.3 times the rate of increase in the population as a whole.

Table 19: Projected demand for registered health professionals in the health and disability services

	Numbers of workers			% changes		
	2001	2011	2021	2001–11	2011–21	2001–21
Scenario 1	66,989	79,528	94,009	19	18	40
Scenario 2	66,989	80,432	98,519	20	22	47
Scenario 3	66,989	88,256	113,060	32	28	69

Note: The projections above are for the regulated workforce only.

Source: NZIER, based on HWAC data and demand projections from Chapter 4

Allowing for the fact that the figures in the table are for the regulated section of the workforce only (that is, roughly half the total workforce), by 2021, the total demand for labour in the health and disability services can be expected to have grown to roughly 190,000 (under scenario 1) or roughly 225,000 (under scenario 3).

However, even this might understate the growth in the demand for labour because (as will be recalled from chapter 4) the component of demand that is likely to grow most rapidly (that is, long-term care for older people) is the area in which most of the unregulated workforce of disability support workers is engaged.

The percentage increases in demand for labour are fairly evenly spread over the 20 year period, with the 2001 to 2011 and 2011 to 2021 changes being relatively close in all three scenarios. However, the absolute changes are greater between 2011 and 2021 than between 2001 and 2011.

5.4 Projected labour supply

If it is further assumed that the health and disability services will be able to maintain their 2001 share of the total New Zealand working age population, then it becomes possible (using Statistics New Zealand data) to project the supply of labour to the services under the three scenarios. The projections are shown in Table 20, and it will be noted that the projections under scenarios 1 and 2 are identical because they are based on the same Statistics New Zealand medium population growth projections.

The data in the table do indicate that the supply of labour to the health and disability services will increase, but the critical point to note is that the growth rates are very slow compared to those shown in Table 19. In other words, the projected increase in the supply of labour to the health and disability services will not keep up with the projected increase in demand.

Table 20 also shows that the increase in the health and disability services labour supply is projected to slow between 2011 and 2021, whereas Table 19 showed that the increase in labour demand is projected to remain fairly constant over this period.

Table 20: Projected supply of regulated professionals to the health and disability services

	Numbers of workers			% changes		
	2001	2011	2021	2001–2011	2011–2021	2001–2021
Scenario 1	66,989	72,244	75,052	8	4	12
Scenario 2	66,989	72,244	75,052	8	4	12
Scenario 3	66,989	78,105	84,943	17	9	27

Note: The projections above are for the regulated/qualified workforce only.

Source: NZIER, based on HWAC data and Statistics New Zealand workforce projections

5.5 Mismatches between demand and supply

Table 21 brings together the projections of demand for labour from Table 19 with the projections for labour supply from Table 20 to show the projected excess of demand over supply for each of the three scenarios.

Table 21: Projected excess of demand over supply of regulated professionals in the health and disability services

	Shortfall in workers			As % of number in 2001	
	2001	2011	2021	2011	2021
Scenario 1	–	7,284	18,957	11	28
Scenario 2	–	8,188	23,467	12	35
Scenario 3	–	10,151	28,117	15	42

Note: The projections above are for the regulated workforce only.

Source: NZIER, derived from Tables 19 and 20

No excess demand is shown for the year 2001 because it is assumed (favourably, it might be argued) that the provision of services met demands in that year and that, consequently, demand for labour was matched by the supply of labour.

However, under all three scenarios, an excess of demand over supply emerges by the year 2011. Moreover, the gap between demand and supply become substantially larger between 2011 and 2021. The table expresses the projected gaps between demand and supply as percentages of the baseline workforce (that is, the 66,989 workers in 2001). By 2021, the health and disability services will have a shortfall of labour equivalent to 42 percent of the 2001 workforce under scenario 3 and 35 percent of the 2001 workforce under scenarios 2. If it is accepted that there was already an excess of demand for services over provision in 2001, and also an excess of demand for labour over supply, then it follows that the projected shortfalls in labour supply shown in Table 21 are actually understated.

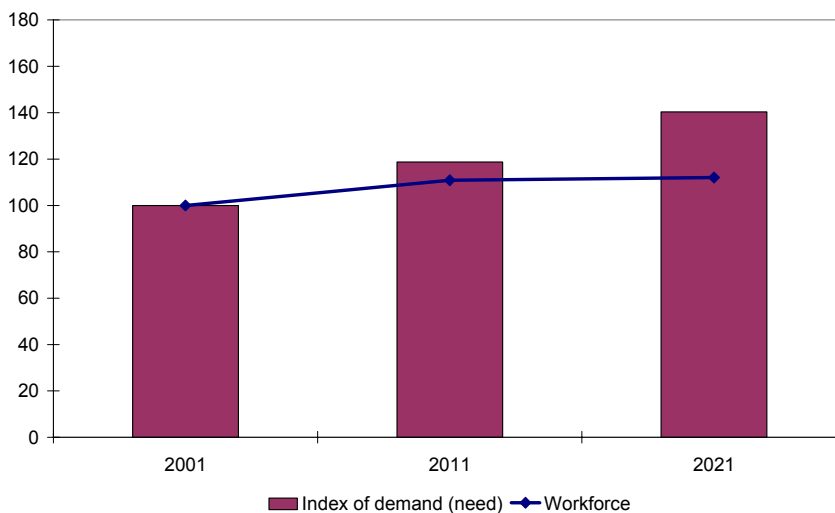
Again, it should be noted that the analysis of labour supply shortfalls given above excludes the support workforce. A number of the individuals interviewed as part of the second-round consultations (see chapter 6) thought that problems with mismatches between labour supply and demand would actually be more acute in the unregulated section of the workforce than in the regulated section. However, lack of reliable data about the unregulated workforce, and consequent uncertainty about how this labour sub-market might behave, made quantified forecasts or projections difficult.

Figures 5, 6 and 7 below provide an alternative way of analysing the interaction between changes in demand and the availability of a workforce to help support that demand for the three scenarios. The figures show the change in demand over time via an index (2001 = 100) compared to an index of the health and disability services workforce over time. This allows for a comparison of the extent to which changes in demand are being met with increases in the supply of health and disability services workers.

Again, in each case, it is assumed that initially in 2001 the level of demand was met with a suitable supply of workers. Under each scenario, a gap between the demand growth and the supply index is created, representing a shortage in supply to support the growing demand. Scenario 3 shows the largest gap between demand growth and supply growth by 2021, as was shown in Table 7. This is despite the fact that the greatest increase in labour supply occurs under this scenario.

Figure 5: Index of demand (cost) versus index of health and disability services workforce – scenario 1

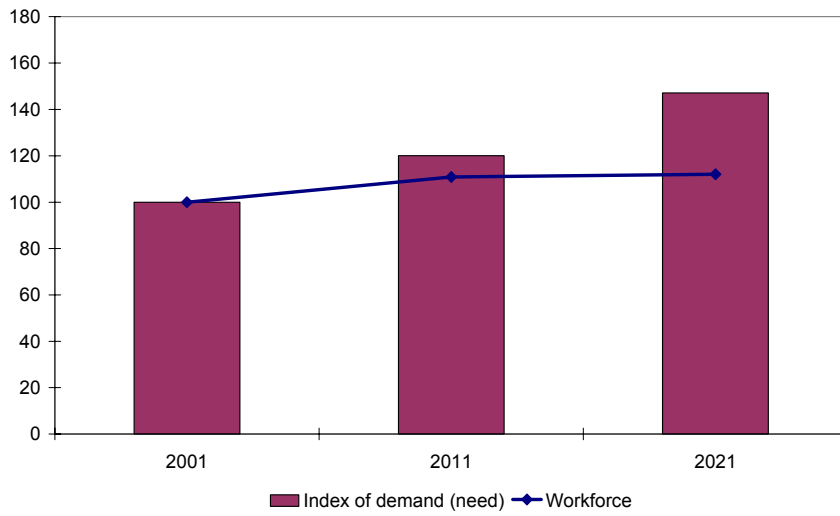
Based on medium population projections



Source: NZIER

Figure 6: Index of demand (cost) versus index of health and disability services workforce – scenario 2

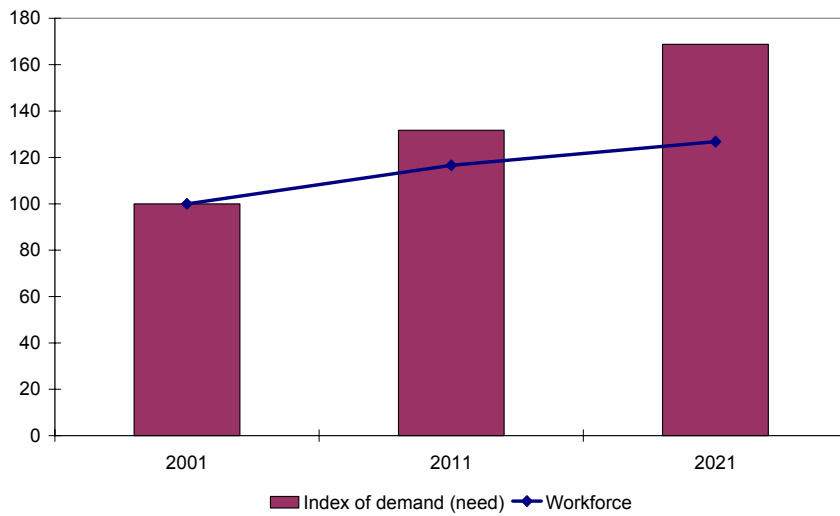
Based on medium population projections



Source: NZIER

Figure 7: Index of demand (cost) versus index of health and disability services workforce – scenario 3

Based on high population projections



Source: NZIER

5.6 Options for avoiding labour demand and supply mismatches

It is worth considering the broad options for avoiding the projected labour supply shortfalls shown in Table 21. In effect, this means seeing what might happen if the key assumptions underlying the scenarios we have outlined were relaxed.

One possibility would be to increase the proportion of the working age population accounted for by the health and disability services; and we can show what proportion these services would need by the year 2021 in order for the projected labour supply shortfalls shown above to be reduced to zero.

In 2001, the health and disability services employed 4.6 percent of the working age population. Under scenario 1, the services would need to increase this share to 5.8 percent by 2021. Under scenario 2, the services would have to increase their share to 6.0 percent, and under scenario 3, they would have to increase it to 6.1 percent.

These increases might not seem particularly great, but there are two major reasons why the health and disability services might find it difficult to command a larger share of the working age population than they do already. The first is that much of the regulated labour in the sector is internationally mobile; and other countries might intensify their recruitment of New Zealand-trained doctors, nurses and so on as their own populations age. Therefore, relying solely on recruiting and training more health professionals as a means of meeting service needs might become even more like filling a leaking bucket than it is already.

The second reason is that, if New Zealand is successful in achieving the Government's target of returning the nation to the top half of the OECD per capita GDP rankings, the long-term economic growth rate of around 4 percent per annum that would be necessary would lead to approximately 50 percent growth in the demand for labour in the economy as a whole by 2021. In these circumstances, the health and disability services would face intense domestic competition for labour, and much of the unregulated labour in the sector could be attracted to other sectors (for example, retail, hospitality and other service industries) where many of the employment opportunities are likely to be created.

If it is not possible for the health and disability services to command the increased shares of the working age population indicated above, they would have to increase labour productivity by around 1.5 percent per annum under scenario 3.

Evidence on labour productivity in the health and disability services is poor, but research by The Treasury (Black et al 2003) suggests that multifactor productivity in the personal and community services in New Zealand failed to sustain these rates of increase during the period 1988 to 2002.¹⁰

In theory, technological breakthroughs could lead to significant productivity improvements, but they cannot be counted upon. They could also have a perverse effect on productivity; if, for example, a technological advance made it possible to treat (albeit resource-intensively) conditions that are currently hard to control. Therefore, it is to be doubted whether productivity improvements alone will hold the answer to the potential labour shortages indicated in Table 21.

It is possible that, in time, improved health education, coupled with increased emphasis on health monitoring in the primary sector, might reduce the need for health and disability services; and, hence, the demand for labour. Again, however, the reverse might be true; if, for example, health education results in more self-aware and demanding patients or if monitoring uncovers conditions that would otherwise have gone untreated.

The key conclusion to be drawn from all this is that, given the certainty of increased service needs and the clear possibility that other approaches towards avoiding labour shortages will not work, attention needs to focus on how the health and disability services labour supply should be educated, trained, developed and deployed. The next chapter considers what needs to be done on this front.

¹⁰ Multifactor productivity encompasses productivity of capital and productivity of labour. The Treasury research indicated that the annual rate of increase in multifactor productivity in the personal and community services almost reached 1.5 percent at one point during the 1988 to 2002 period. However, NZIER suspects that, even if this rate of increase extended to the health and disability services, it was more attributable to productivity of capital than to productivity of labour.

6. Options and imperatives for action

6.1 Introduction

The results of the scenario building set out in the previous chapters suggest very strongly that action is needed to avoid severe labour and skills shortages in the health and disability services. The consultees in the second round of consultations were invited to discuss the following set of questions after they had been presented with the scenario findings.

- 1) In light of the ageing population, is the current approach to meeting the nation's health and disability services needs sustainable?
 - i) Division of funding between primary and secondary services
 - ii) Occupational mix and occupational boundaries
 - iii) Training and development of the workforce
 - iv) Recruitment and retention of staff
 - v) Other points.
- 2) If 'no' to any of the above, what changes are necessary?
 - i) Division of funding between primary and secondary services
 - ii) Occupational mix and occupational boundaries
 - iii) Training and development of the workforce
 - iv) Recruitment and retention of staff
 - v) Other points.
- 3) How could things be done differently in order to address the particular needs of distinct groups of the population?
 - i) The very old (85 and over)
 - ii) Māori and Pacific peoples
 - iii) People with increasingly prevalent diseases or conditions; for example, diabetes and related conditions, osteoarthritis, dementia and other(s).
- 4) What, if anything, is likely to inhibit or prevent the changes suggested?
- 5) What, if anything, can New Zealand learn from other countries' situations and their responses to the challenges associated with the ageing population?

In this chapter, we summarise the results of the consultations. The sub-section and paragraph numbers used in this chapter relate to the question numbers shown above.

The summary is intended to be a faithful reflection of what the consultees said rather than expressing NZIER's views.

6.2 Summary of consultation findings

6.2.1 Sustainability of the current approach

i) Division of funding between primary and secondary services

None of the consultees thought that it would be possible to sustain the current division of funding between the primary and secondary sectors, but a number of them commented that it would not be realistic to think in terms of a simple shift of resources in favour of the primary care sector. It was argued, for example, that there would be a blurring of the boundaries between the two sectors. Several of the consultees also foresaw the emergence of a completely different, non-medical model of provision in which the present-day concepts of primary and secondary care would have no meaning. Others cautioned that it was not sensible to talk about re-allocating resources without at the same time devising a management of change process encompassing all aspects of service provision.

ii) Occupational mix and occupational boundaries

None of the consultees felt that the current approach was sustainable. Most thought that occupational mixes and boundaries could not possibly remain the same in the future, partly because of the need for efficiency gains but mainly because the growth in patient-centred care would necessitate new ways of working. Several consultees were concerned, however, about entrenched positions making change difficult. One consultee was concerned that it might be difficult to maintain accountability if occupational boundaries were blurred and, at the same time, hierarchical care teams were replaced by horizontal, interdisciplinary teams.

iii) Training and development of the workforce

The consultees felt that the current approach to training and development of the workforce was unsustainable. In particular, they felt that the training and development needs of support workers in the health and disability services had been neglected and that their needs would have to be addressed, if they were to take on a more prominent role in the workforce as the population ages. Other factors thought likely to make it impossible to sustain the current approach to workforce training and development were: the move towards patient-centred care; the development of a more flexible, co-operative

and collaborative way of working and the necessity to accredit prior learning and experience for people wishing to move between occupations and practice areas in the health and disability services.

iv) Recruitment and retention of staff

Most of the consultees felt that the current approach to recruiting and retaining staff was unsustainable, but two agreed that it was sustainable with some qualifications. Those who felt it was unsustainable were equally divided in their concerns about the recruitment and retention of nurses and about the recruitment and retention of support workers. Both of the people who thought that current approaches to recruitment and retention were sustainable indicated that they did not foresee an across-the-board shortage of skills and labour. One predicted patchy shortages in particular geographical areas and medical specialities but was more concerned about the potential for shortages in the support services and the voluntary care sector. The other did not think that the recruitment and retention of health professionals was a major problem and agreed that the real problem was with the support workforce because of, for example, unattractive wages and working conditions leading to high rates of staff turnover.

v) Other points

Reflecting the belief that, over time, patients would become more informed and demanding of better treatment, several consultees remarked that the current ‘medical model’ of service could not be sustained and that the client-centred model would come to dominate. The baby boomers who would join the ranks of the older population by 2021 would be better-educated and more rights-conscious than the previous generation.

6.2.2 What changes are necessary?

i) Division of funding between primary and secondary services

Most of the consultees argued for increased funding for the primary care sector and preventive care. However, most indicated that it was not a simple matter of effecting a transfer, or relative transfer, of funds from the secondary sector to the primary sector. Several indicated that it would be necessary to increase funding to the secondary sector whilst increasing the primary sector’s ‘share of the cake’. Several also thought that the primary-secondary boundary would become blurred by other changes: for instance, increased client-centred care would mean that many of what are currently regarded as secondary services would be provided in the community in the future. It was also suggested that it might be necessary to create several funding streams in the primary sector for different patient groups (for example, a ring-fenced Primary Health Organisations fund for services to the older population, which employs higher salaried GPs).

ii) Occupational mix and occupational boundaries

All consultees suggested changes were necessary in this area, but there was a range of different views about what was needed most. A majority of the consultees discussed the role of nurse practitioner. Some clearly related the term to that defined under the regulatory framework of the Nursing Council of New Zealand as being a registered nurse with a clinically focused Masters degree and at least 3 or 4 years' practice in a specific area. Others appear, however, to have used the term nurse practitioner more loosely to mean someone with a nursing qualification who had also acquired non-nursing skills and qualifications, such as in social work, occupational therapy or basic physiotherapy. This was especially so for those consultees with an interest in mental health.

Several of the consultees also argued that it was important to take a 'clean slate' approach to the issue of occupational mixes and boundaries. This approach dictates that the work to be done is defined first, and then jobs are defined. This is the essence of the client-centred model, and it contrasts with what is perceived as fitting the patient to the services available.

iii) Training and development of the workforce

Most of the consultees argued for more interdisciplinary training, or common training modules delivered across the current occupational boundaries. It was generally thought that training would need to be delivered and available in short courses and modular format. If such an approach were to be implemented, it would mean, for example, that trainee doctors, nurses and physiotherapists would follow at least some of the same training courses and modules.

Two of the consultees also argued for a more fundamental change to the training system rather than simply packaging and delivering training differently and more cost-effectively. The change in the system would be mainly to enable freer movement across the current occupational boundaries (for example, nurse to doctor or physiotherapist to nurse). There is, at present, little or no accreditation of prior learning and experience, and this means that people who change occupation have to go back to square one in their training (which is wasteful) or are discouraged from changing (which inhibits the development of a flexible workforce).

Several of the consultees speculated that it would be necessary to improve the training and development of the support workforce. However, the same people also suggested that it would be important to understand the characteristics, circumstances and needs of this section of the workforce better before strategic action is decided upon.

iv) Recruitment and retention of staff

Not all the consultees commented on this issue; and no dominant themes emerged. Student debt was mentioned as a barrier to recruitment (that is, the acquisition of debt made training for some occupations unattractive because the post-qualification rates of pay were poor). Waiving student debt was seen as a potential means of improving recruitment and retention (for example, debt write-off in return for a specified length of service). More generally, though, the consultees were reticent because the factors affecting recruitment and retention were perceived as varying markedly between occupations and sections of the health and disability services workforce.

6.2.3 Addressing the needs of distinct groups of the population

i) The very old (85 and over)

Only four of the 18 consultees commented on addressing the particular needs of the very old; and they did not present a united view. Two highlighted the need to give greater emphasis to primary and community care in the future, including better monitoring, earlier interventions and more support for independence. One suggested that there should be more specialist practitioners, but not necessarily doctors, caring for this group of the population and advocating on their behalf. The other implied that the needs of this group tended to be overstated and that the very old were receiving disproportionate attention.

ii) Māori and Pacific peoples

Again, relatively few of the consultees expressed a view on issues for Māori or Pacific peoples, but those who did emphasised the importance of increased cultural awareness training to ensure that the needs of Māori, in particular, were adequately addressed. Two also specifically mentioned the need to increase the number and proportion of Māori health care professionals.

iii) People with increasingly prevalent diseases or conditions

Similarly, relatively few of the consultees commented on the issue of people with increasingly prevalent conditions, but those who did, shared concerns about two particular conditions, or sets of conditions. One was mental ill-health in the older population, and the other was the existence of co-morbidities.

Attention in health services has tended to focus on Alzheimer's disease as an increasingly prevalent cognitive condition, but the consultees believed that depression might become more commonplace amongst the old in the future.

The past and current professionalisation of the workforce in the economy as a whole could mean that many more recently retired people could suffer an acute loss of status when they gave up work. At the same time, social changes leading to an increase in the number and proportion of single-person households will mean that more older people are deprived of the benefits of partner support. These two factors could significantly increase the demand for mental health services.

In regards to co-morbidities, the increase in the number of people living longer would inevitably result in increases in the number of people presenting with more than one physical illness or condition, or a combination of physical and mental health problems. At present, however, service provision tends to address morbidities individually.

6.2.4 What is likely to inhibit or prevent necessary changes?

This question attracted the greatest number and volume of responses. In broadly descending order of frequency, the main impediments identified were:

- ‘patch protection’ (that is, to defend spheres of influence, status, income or a combination of these things)
- the perceived poor state of the primary care sector (see following paragraph)
- inertia (that is, the inability of large and complex institutions, such as those that characterise the health sector, to change)
- the existence of funding, and other, ‘silos’ that maintain inflexible service provision and training systems, amongst other things
- poor quality and quantity of information about the health and disability services workforce, especially the support workforce and the voluntary workforce
- lack of accreditation for prior learning and experience
- lack of common training.

On the particular issue of the state of the primary care sector, a number of the consultees questioned whether it (specifically general practice) was sufficiently robust to fulfil the expanded role that is widely envisaged for it. In particular, the New Zealand Medical Association (see: NZMA 2004) and the Royal New Zealand College of General Practitioners highlighted the following problems.

- GPs are overburdened with paperwork, and this is one of the chief reasons why there is an outflow of doctors from this sector.
- There have been difficulties embedding the new Primary Health Organisations frameworks.

- There is an over-reliance on overseas-trained (and, consequently, less effective¹¹) doctors, especially in the rural areas.
- The funding mechanisms do not exist to enable some of the practice changes envisaged (for example, the use of nurse practitioners).

6.2.5 What can New Zealand learn from other countries?

The consultees acknowledged the perils of trying to fit overseas solutions to the New Zealand context, but they identified a few potential lessons from elsewhere. Most referred to the United Kingdom's experience. Several commented favourably on the National Health Service's planning and foresight, and several also mentioned the 'clean slate' approach to training and development being experimented with in the United Kingdom (see Cochrane et al 2002).¹²

Two of the consultees also alluded to the possibility of using telecommunications technology to take a more systematic approach to monitoring the health of older people living independently. It was suggested that experience in the United States had shown that, especially in warden-supported housing or purpose-built retirement communities, old people could be encouraged to take their own blood pressure and other routine tests and then send the results electronically to a nurse or doctor for monitoring.

¹¹ It was not suggested that overseas doctors are less effective per se. Rather, the point was made that many rural GPs are overseas-trained locums who, naturally, take time to acclimatise and become familiar with the New Zealand way of doing things.

¹² For a fuller discussion of possible lessons from elsewhere, see the accompanying document *Ageing New Zealand and Health and Disability Services 2001–2021: Background information: International responses to ageing populations* (Ministry of Health 2004b).

7. Points for discussion

7.1 Introduction

The key messages emerging from the previous chapters are as follows.

- The ageing of the New Zealand population will mean that the demand for health and disability services will increase much more rapidly than the size of the population itself.
- There is a strong risk of labour shortages in the health and disability services, especially after 2011, unless action is taken to avoid this.
- In considering what action should be taken, attention needs to focus on how the health and disability services workforce should be educated, trained, developed and deployed – other approaches cannot be relied upon to work.

We end this report with a set of discussion points based on these key messages and the other findings of the research. We believe that there is a host of further questions that merit discussion in advance of any strategy development. What follows is intended to start the discussion. It is not intended to represent a comprehensive catalogue. The questions cover a range of themes, as set out below.

7.2 Changes in primary care

It is widely believed that the primary care sector will need to expand to provide for increased needs, with care delivered differently from the way it is currently delivered. Primary Health Organisations are well established throughout the country. However, there are concerns within general practice that primary care is not in particularly good shape. Questions associated with this theme are as follows.

- Is primary care equated with general practice, or should there be an entirely different model of primary care delivery in a community setting?
- What needs to be done to ensure that general practice services continue to be available, particularly in rural areas?
- What can be done to make the sector more attractive to doctors? (that is, is it a matter of improving financial rewards or working conditions or both?)
- Is there scope for extensive employment of nurse practitioners (ie. highly trained clinicians) in the primary sector; or are broadly trained generalists/case managers needed?

7.3 What needs to be done to promote new ways of working?

It is widely accepted that the interests of client-centred care are not best served by maintaining the current occupational boundaries and occupational mixes in service delivery. It is also accepted that a 'business as usual' approach is impossible in light of the real prospect of severe labour shortages in the future. However, again, many questions arise.

- Should we take a universal evolutionary approach to redefining jobs and occupations, or should there be more radical pilot programmes?
- Would it be feasible to train paramedical specialists to undertake certain skilled but routine tasks that currently only medical practitioners are permitted to perform?
- How will accountability be maintained if definitions become blurred and team work becomes more extensive?
- Will the Health Practitioners Competence Assurance Act (2003) (HPCA) be a help or a hindrance in this respect?
- What other institutional or legislative changes might be needed?

7.4 How must education and training change?

It is difficult to imagine how the current approach to educating and training the health and disability services workforce can be maintained if there are to be new models of provision, revised occupational definition and other new ways of working. Questions here include the following.

- Can accreditation of prior learning and experience be used more extensively to promote the development of a more flexible workforce and inter-occupational mobility?
- Would it be feasible to introduce more modular training common to a range of jobs and skills (for example, anatomy for doctors, nurses and physiotherapists) while maintaining standards?
- Who should chiefly determine what health-related education and training courses are developed and delivered: the Tertiary Education Commission (TEC), the universities and polytechnics, the regulatory bodies or the DHBs?
- Should regulation cover more of the workforce, such as support workers; and, if so, what education, training and accreditation systems might be needed?

7.5 Recruitment and retention

There was some debate amongst consultees about what was at the root of problems in the areas of recruitment and retention, and about whether attention should be focused more on one area than the other. Likewise, there was considerable discussion about whether recruitment and retention problems were more critical in the regulated workforce than in the unregulated support workforce. There are some related questions for further discussion.

- When it comes to recruitment and retention, are pay and conditions equally important?
- What particular aspects of conditions are critical, and in which sections of the workforce?
- What is the role of student debt in recruitment problems, and what is the potential for debt alleviation in both recruitment and retention?
- Can geographical and speciality-related recruitment problems be tackled better through centralised action?
- What action is needed to improve recruitment and retention in the support worker and volunteer sections of the labour force?

7.6 Māori and Pacific peoples' health

Disease and disability are likely to increase more rapidly amongst Māori and Pacific populations than amongst New Zealanders of European descent. It is recognised that health and disability services have to be delivered in culturally appropriate ways, but Māori and Pacific peoples are under-represented in the health professions. Accordingly, key questions are as follows.

- How can the number and proportion of Māori and Pacific health professionals be increased in the workforce?
- Does more need to be done to develop cultural awareness training for European and Asian health workers?
- Is enough being done to ensure that Māori and Pacific peoples are not overburdened with avoidable diseases, and if not, what new or additional action is needed?

7.7 Disability support services

As was indicated in chapter 5, information on the workforce supporting disabled people is sketchy and inconsistent. The research findings also make no distinction between people with lifelong disabilities and frail older people. Clearly, it would be helpful to have more research in this area,¹³ but in the meantime, the following questions can be considered.

- Is it reasonable to think in terms of a single labour force for people with lifelong disabilities and frail older people?
- What are the distinctive support needs of these two groups?
- What does this imply for the training and development of different parts of the disability support services workforce?

7.8 Mental health

Similar points might be made about mental health as have been made above about disability. However, a recent report for the Mental Health Commission (Ashton et al 2004) examined labour market constraints affecting the mental health sector, and study of this report has led to the following questions that are specific to the sector (most other issues for this sector also apply to other sectors and are set out elsewhere).

- Is there sufficient funding to ensure effective recruitment and retention of staff for community-based mental health services?
- Is the current training and continuing education provision for mental health workers sufficiently accessible and of a high enough quality?
- How can working conditions be improved to promote better retention of staff?

7.9 Volunteers

Most observers seem to agree that this section of the workforce is important and is likely to become more so, but relatively little is known about it. Again, more research would be helpful, but the following questions can be considered.

- What are the workforce research priorities for this sector?
- Should it be an aim of policy to regulate and formalise this sector?
- Is it safe, from a supply of labour viewpoint, to rely on volunteers to support the health and disability services?

¹³ Some recent research findings are discussed on the Ministry of Health website. See: http://www.moh.govt.nz/moh.nsf/wpg_Index/about-quality+and+safety+project.

Appendix A: Acute and sub-acute hospitalisation projections

Table 22: Ischaemic heart disease hospitalisations (all diagnoses) – acute and sub-acute
Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	255	267	92	255	267	92	255	267	92
European			4,027	9,457	7,285	4,027	9,457	7,285	4,027	9,457	7,285
Māori			1,365	813	129	1,365	813	129	1,365	813	129
Pacific Island			355	239	61	355	239	61	355	239	61
Total female			6,002	10,776	7,567	6,002	10,776	7,567	6,002	10,776	7,567
Asian	Male	2001	537	384	86	537	384	86	537	384	86
European			8,758	13,351	5,255	8,758	13,351	5,255	8,758	13,351	5,255
Māori			1,641	765	89	1,641	765	89	1,641	765	89
Pacific Island			577	243	60	577	243	60	577	243	60
Total male			11,513	14,742	5,489	11,513	14,742	5,489	11,513	14,742	5,489
Total 2001			17,514	25,518	13,056	17,514	25,518	13,056	17,514	25,518	13,056
Asian	Female	2011	567	623	223	567	563	202	590	649	244
European			5,050	10,275	9,553	5,050	9,292	8,640	5,135	10,380	9,699
Māori			2,051	1,357	241	2,051	1,500	266	2,102	1,374	250
Pacific Island			554	374	114	554	414	126	568	374	114
Total female			8,223	12,630	10,131	8,223	11,769	9,233	8,395	12,779	10,306
Asian	Male	2011	1,158	920	228	1,158	832	206	1,219	954	228
European			10,647	15,232	8,290	10,647	13,776	7,498	10,843	15,416	8,435
Māori			2,381	1,284	168	2,381	1,418	186	2,447	1,314	179
Pacific Island			894	405	112	894	448	123	907	424	129
Total male			15,080	17,841	8,799	15,080	16,474	8,013	15,417	18,108	8,971
Total 2011			23,302	30,471	18,929	23,302	28,243	17,246	23,812	30,887	19,277
Asian	Female	2021	939	1,234	600	939	1,010	491	1,026	1,293	641
European			5,343	13,918	11,319	5,343	11,384	9,258	5,578	14,270	11,809
Māori			2,745	2,226	526	2,745	2,716	642	2,910	2,312	554
Pacific Island			816	609	202	816	743	247	856	631	224
Total female			9,842	17,987	12,648	9,842	15,852	10,638	10,370	18,506	13,227
Asian	Male	2021	1,878	1,768	616	1,878	1,446	504	2,075	1,874	673
European			10,834	20,699	10,664	10,834	16,930	8,722	11,356	21,348	11,273
Māori			3,074	2,141	401	3,074	2,612	490	3,281	2,229	423
Pacific Island			1,228	742	223	1,228	905	272	1,290	774	249
Total male			17,014	25,349	11,905	17,014	21,893	9,988	18,001	26,225	12,618
Total 2021			26,856	43,337	24,553	26,856	37,745	20,626	28,372	44,730	25,845

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

Table 23: Stroke hospitalisations – acute and sub-acute

Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	49	37	18	49	37	18	49	37	18
European			678	1356	1444	678	1356	1444	678	1356	1444
Māori			233	96	32	233	96	32	233	96	32
Pacific Island			88	56	24	88	56	24	88	56	24
Total female			1048	1545	1518	1048	1545	1518	1048	1545	1518
Asian	Male	2001	57	46	13	57	46	13	57	46	13
European			892	1655	828	892	1655	828	892	1655	828
Māori			181	74	9	181	74	9	181	74	9
Pacific Island			95	55	8	95	55	8	95	55	8
Total male			1225	1829	859	1225	1829	859	1225	1829	859
Total 2001			2274	3374	2377	2274	3374	2377	2274	3374	2377
Asian	Female	2011	102	87	44	102	79	40	109	91	48
European			803	1453	1907	803	1314	1725	822	1468	1937
Māori			318	159	60	318	176	66	328	161	62
Pacific Island			134	89	44	134	98	49	137	89	44
Total female			1357	1788	2055	1357	1667	1880	1396	1808	2091
Asian	Male	2011	120	112	36	120	102	32	128	117	36
European			1078	1871	1315	1078	1692	1189	1101	1894	1338
Māori			258	125	18	258	138	20	266	128	19
Pacific Island			139	92	15	139	102	17	142	96	18
Total male			1594	2201	1384	1594	2034	1258	1638	2235	1410
Total 2011			2951	3989	3439	2951	3701	3138	3033	4043	3502
Asian	Female	2021	154	170	118	154	139	97	173	179	127
European			827	1964	2265	827	1607	1852	874	2014	2365
Māori			397	263	131	397	321	159	428	273	137
Pacific Island			194	144	76	194	176	93	205	149	83
Total female			1572	2542	2590	1572	2243	2202	1679	2615	2712
Asian	Male	2021	191	213	97	191	175	79	214	226	106
European			1107	2553	1702	1107	2088	1392	1167	2633	1801
Māori			323	208	43	323	254	52	347	217	45
Pacific Island			189	169	31	189	206	38	202	175	35
Total male			1810	3143	1873	1810	2722	1562	1929	3252	1988
Total 2021			3382	5685	4463	3382	4965	3763	3608	5867	4699

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDs and Statistics New Zealand population data

Table 24: Lung cancer, trachea and bronchus hospitalisations – acute and sub-acute

Hospitalisations for three scenarios

		Scenario 1			Scenario 2			Scenario 3		
		<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female 2001	18	11	1	18	11	1	18	11	1
European		2471	619	302	2471	619	302	2471	619	302
Māori		114	49	2	114	49	2	114	49	2
Pacific Island		9	7	4	9	7	4	9	7	4
Total female		2612	686	309	2612	686	309	2612	686	309
Asian	Male 2001	15	16	2	15	16	2	15	16	2
European		262	545	128	262	545	128	262	545	128
Māori		80	74	1	80	74	1	80	74	1
Pacific Island		23	19	3	23	19	3	23	19	3
Total male		381	653	133	381	653	133	381	653	133
Total 2001		2993	1339	442	2993	1339	442	2993	1339	442
Asian	Female 2011	39	24	3	39	22	2	40	25	3
European		2501	690	393	2501	624	355	2604	697	399
Māori		173	82	4	173	90	4	178	83	4
Pacific Island		13	11	8	13	13	9	14	11	8
Total female		2726	808	407	2726	749	370	2836	817	413
Asian	Male 2011	33	38	6	33	34	5	35	39	6
European		327	623	201	327	563	182	333	630	205
Māori		122	123	1	122	136	1	124	126	2
Pacific Island		36	31	4	36	35	5	36	33	5
Total male		517	815	212	517	768	193	528	829	217
Total 2011		3244	1623	619	3244	1517	564	3364	1646	630
Asian	Female 2021	61	50	7	61	41	6	67	53	7
European		2330	928	465	2330	759	380	2588	952	485
Māori		234	134	8	234	164	10	248	139	8
Pacific Island		18	18	13	18	22	16	19	19	14
Total female		2644	1131	493	2644	986	412	2922	1163	514
Asian	Male 2021	56	73	15	56	60	12	62	77	16
European		339	847	258	339	693	211	354	874	273
Māori		170	206	4	170	252	5	180	215	4
Pacific Island		50	58	9	50	70	10	53	60	9
Total male		616	1184	286	616	1074	239	649	1226	303
Total 2021		3260	2315	779	3260	2061	650	3571	2389	817

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

Table 25: Other cancer hospitalisations – acute and sub-acute

Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	445	141	33	445	141	33	445	141	33
European			5,777	4,719	2,590	5,777	4,719	2,590	5,777	4,719	2,590
Māori			1,104	200	24	1,104	200	24	1,104	200	24
Pacific Island			417	89	13	417	89	13	417	89	13
Total female			7,742	5,149	2,659	7,742	5,149	2,659	7,742	5,149	2,659
Asian	Male	2001	405	197	44	405	197	44	405	197	44
European			5,625	6,889	2,677	5,625	6,889	2,677	5,625	6,889	2,677
Māori			696	262	37	696	262	37	696	262	37
Pacific Island			258	85	19	258	85	19	258	85	19
Total male			6,985	7,434	2,777	6,985	7,434	2,777	6,985	7,434	2,777
Total 2001			14,727	12,583	5,436	14,727	12,583	5,436	14,727	12,583	5,436
Asian	Female	2011	894	320	79	894	354	88	960	334	87
European			6,602	5,224	3,401	6,602	5,770	3,757	6,783	5,278	3,453
Māori			1,448	328	44	1,448	362	49	1,505	332	46
Pacific Island			570	139	25	570	154	27	595	139	25
Total female			9,514	6,011	3,549	9,514	6,640	3,920	9,843	6,083	3,610
Asian	Male	2011	810	474	116	810	524	128	887	492	116
European			6,392	7,848	4,230	6,392	8,669	4,673	6,605	7,943	4,305
Māori			886	441	75	886	488	83	936	452	78
Pacific Island			352	142	38	352	157	41	365	149	43
Total male			8,440	8,905	4,459	8,440	9,837	4,926	8,793	9,035	4,541
Total 2011			17,955	14,917	8,008	17,955	16,477	8,846	18,636	15,119	8,152
Asian	Female	2021	1,286	647	213	1,286	790	260	1,476	677	228
European			6,625	7,042	4,032	6,625	8,592	4,919	7,076	7,222	4,207
Māori			1,741	543	95	1,741	663	116	1,903	565	99
Pacific Island			744	226	45	744	276	56	808	235	51
Total female			10,396	8,459	4,385	10,396	10,321	5,351	11,264	8,699	4,585
Asian	Male	2021	1,178	911	314	1,178	1,111	383	1,376	965	343
European			6,385	10,682	5,452	6,385	13,034	6,653	6,876	11,017	5,765
Māori			1,092	736	173	1,092	899	211	1,212	767	181
Pacific Island			443	260	75	443	317	92	485	270	84
Total male			9,098	12,589	6,014	9,098	15,361	7,338	9,949	13,020	6,374
Total 2021			19,494	21,047	10,399	19,494	25,682	12,689	21,213	21,718	10,959

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDs and Statistics New Zealand population data

Table 26: Osteoarthritis hospitalisations (all diagnoses) – acute and sub-acute

Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	81	57	18	81	57	18	81	57	18
European			1217	2169	1470	1217	2169	1470	1217	2169	1470
Māori			160	122	23	160	122	23	160	122	23
Pacific Island			51	43	12	51	43	12	51	43	12
Total female			1508	2391	1523	1508	2391	1523	1508	2391	1523
Asian	Male	2001	78	44	10	78	44	10	78	44	10
European			1185	1632	618	1185	1632	618	1185	1632	618
Māori			199	94	8	199	94	8	199	94	8
Pacific Island			48	26	8	48	26	8	48	26	8
Total male			1510	1795	644	1510	1795	644	1510	1795	644
Total 2001			3018	4187	2168	3018	4187	2168	3018	4187	2168
Asian	Female	2011	175	133	45	175	147	50	183	138	49
European			1507	2284	1932	1507	2522	2134	1535	2308	1962
Māori			237	201	44	237	270	59	243	203	45
Pacific Island			76	70	22	76	94	30	78	70	22
Total female			1995	2687	2043	1995	3033	2273	2039	2718	2079
Asian	Male	2011	162	107	26	162	118	29	172	112	26
European			1414	1867	986	1414	2062	1089	1443	1889	1004
Māori			276	156	17	276	210	23	285	161	17
Pacific Island			69	43	13	69	58	17	71	45	15
Total male			1920	2173	1042	1920	2449	1158	1971	2206	1063
Total 2011			3915	4861	3085	3915	5482	3430	4009	4924	3142
Asian	Female	2021	282	258	121	282	315	148	310	272	129
European			1584	3008	2291	1584	3671	2796	1659	3085	2391
Māori			315	333	95	315	601	171	335	346	100
Pacific Island			111	112	40	111	203	73	117	117	45
Total female			2292	3711	2547	2292	4789	3187	2421	3820	2664
Asian	Male	2021	253	203	73	253	248	89	284	216	80
European			1432	2471	1283	1432	3015	1565	1509	2551	1359
Māori			351	264	39	351	477	70	377	275	41
Pacific Island			93	78	26	93	141	46	99	82	28
Total male			2128	3016	1420	2128	3881	1770	2269	3124	1507
Total 2021			4420	6728	3967	4420	8670	4957	4689	6944	4172

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

Table 27: Dementia hospitalisations (all diagnoses) – acute and sub-acute

Hospitalisations for three scenarios

			Scenario 1			Scenario 2			Scenario 3		
			<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female	2001	3	18	32	3	18	32	3	18	32
European			58	752	2559	58	752	2559	58	752	2559
Māori			12	75	74	12	75	74	12	75	74
Pacific Island			6	20	16	6	20	16	6	20	16
Total female			80	866	2681	80	866	2681	80	866	2681
Asian	Male	2001	5	19	20	5	19	20	5	19	20
European			79	806	1266	79	806	1266	79	806	1266
Māori			10	45	26	10	45	26	10	45	26
Pacific Island			4	29	21	4	29	21	4	29	21
Total male			99	898	1333	99	898	1333	99	898	1333
Total 2001			178	1764	4014	178	1764	4014	178	1764	4014
Asian	Female	2011	8	45	75	8	49	83	8	46	83
European			75	771	3471	75	852	3835	76	779	3530
Māori			18	133	138	18	147	152	18	134	143
Pacific Island			10	33	30	10	36	34	10	33	30
Total female			111	981	3715	111	1084	4104	113	992	3786
Asian	Male	2011	11	52	52	11	57	58	11	54	52
European			101	888	2051	101	981	2266	103	899	2091
Māori			15	79	47	15	87	52	15	81	51
Pacific Island			7	48	51	7	53	56	7	52	54
Total male			133	1067	2201	133	1179	2431	136	1086	2248
Total 2011			244	2048	5916	244	2263	6535	249	2078	6034
Asian	Female	2021	14	83	206	14	101	252	15	87	221
European			82	1045	4149	82	1275	5062	85	1070	4346
Māori			26	213	301	26	260	367	27	221	316
Pacific Island			15	53	54	15	64	66	15	55	60
Total female			136	1393	4710	136	1700	5747	142	1433	4944
Asian	Male	2021	17	95	149	17	115	182	19	101	164
European			105	1219	2717	105	1488	3316	110	1258	2889
Māori			21	131	114	21	160	140	22	137	121
Pacific Island			10	90	101	10	110	124	11	94	116
Total male			153	1535	3082	153	1873	3761	162	1590	3290
Total 2021			289	2928	7792	289	3573	9508	304	3023	8233

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDs and Statistics New Zealand population data

Table 28: Chronic obstructive pulmonary disease (including asthma) hospitalisations – acute and sub-acute

Hospitalisations for three scenarios

		Scenario 1			Scenario 2			Scenario 3		
		<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female 2001	281	50	9	281	50	9	281	50	9
European		2,998	1,691	731	2,998	1,691	731	2,998	1,691	731
Māori		1,563	345	44	1,563	345	44	1,563	345	44
Pacific Island		689	48	20	689	48	20	689	48	20
Total female		5,531	2,133	803	5,531	2,133	803	5,531	2,133	803
Asian	Male 2001	240	56	12	240	56	12	240	56	12
European		2,716	2,018	761	2,716	2,018	761	2,716	2,018	761
Māori		1,373	195	32	1,373	195	32	1,373	195	32
Pacific Island		617	143	11	617	143	11	617	143	11
Total male		4,947	2,411	816	4,947	2,411	816	4,947	2,411	816
Total 2001		10,477	4,544	1,620	10,477	4,544	1,620	10,477	4,544	1,620
Asian	Female 2011	506	114	23	506	114	23	578	119	25
European		3,086	1,861	936	3,086	1,861	936	3,276	1,880	949
Māori		1,884	572	82	1,884	697	100	2,015	579	86
Pacific Island		858	76	37	858	92	45	924	76	37
Total female		6,334	2,622	1,078	6,334	2,764	1,104	6,793	2,654	1,097
Asian	Male 2011	431	137	33	431	137	33	512	142	33
European		2,667	2,282	1,202	2,667	2,282	1,202	2,894	2,310	1,223
Māori		1,520	335	61	1,520	408	74	1,677	343	65
Pacific Island		749	237	22	749	289	27	818	251	25
Total male		5,368	2,991	1,318	5,368	3,116	1,337	5,901	3,046	1,346
Total 2011		11,702	5,613	2,396	11,702	5,880	2,441	12,694	5,699	2,443
Asian	Female 2021	633	229	61	633	229	61	794	239	65
European		2,996	2,518	1,102	2,996	2,518	1,102	3,382	2,582	1,146
Māori		2,224	941	174	2,224	1,399	258	2,519	978	180
Pacific Island		1,076	123	66	1,076	182	98	1,223	127	74
Total female		6,929	3,810	1,403	6,929	4,327	1,520	7,918	3,926	1,465
Asian	Male 2021	527	261	89	527	261	89	699	277	98
European		2,560	3,115	1,548	2,560	3,115	1,548	2,989	3,213	1,636
Māori		1,749	555	145	1,749	824	216	2,064	578	153
Pacific Island		937	437	45	937	649	66	1,089	456	50
Total male		5,773	4,368	1,827	5,773	4,850	1,919	6,842	4,524	1,938
Total 2021		12,702	8,178	3,230	12,702	9,177	3,439	14,759	8,450	3,403

Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

Table 29: Diabetes hospitalisations (all diagnoses) – acute and sub-acute

Hospitalisations for three scenarios

		Scenario 1			Scenario 2			Scenario 3		
		<65	65–79	80+	<65	65–79	80+	<65	65–79	80+
Asian	Female 2001	519	224	57	519	224	57	519	224	57
European		6,521	7,738	4,525	6,521	7,738	4,525	6,521	7,738	4,525
Māori		3,726	1,375	195	3,726	1,375	195	3,726	1,375	195
Pacific Island		1,707	688	126	1,707	688	126	1,707	688	126
Total female		12,472	10,025	4,903	12,472	10,025	4,903	12,472	10,025	4,903
Asian	Male 2001	470	274	55	470	274	55	470	274	55
European		6,779	9,573	3,367	6,779	9,573	3,367	6,779	9,573	3,367
Māori		3,269	1,351	127	3,269	1,351	127	3,269	1,351	127
Pacific Island		1,299	635	88	1,299	635	88	1,299	635	88
Total male		11,817	11,833	3,636	11,817	11,833	3,636	11,817	11,833	3,636
Total 2001		24,289	21,858	8,540	24,289	21,858	8,540	24,289	21,858	8,540
Asian	Female 2011	1,017	517	141	1,017	517	141	1,097	539	153
European		7,461	8,476	5,859	7,461	8,476	5,859	7,667	8,564	5,945
Māori		5,261	2,265	365	5,261	3,044	490	5,423	2,294	381
Pacific Island		2,487	1,074	232	2,487	1,444	311	2,560	1,074	232
Total female		16,226	12,333	6,596	16,226	13,481	6,801	16,747	12,471	6,711
Asian	Male 2011	957	659	147	957	659	147	1,028	683	147
European		7,943	10,907	5,306	7,943	10,907	5,306	8,140	11,038	5,398
Māori		4,676	2,260	249	4,676	3,037	335	4,814	2,314	261
Pacific Island		1,984	1,059	170	1,984	1,423	228	2,017	1,105	193
Total male		15,560	14,884	5,871	15,560	16,025	6,015	15,999	15,141	5,998
Total 2011		31,786	27,217	12,467	31,786	29,506	12,816	32,745	27,612	12,709
Asian	Female 2021	1,457	1,033	376	1,457	1,033	376	1,677	1,081	401
European		7,567	11,469	6,919	7,567	11,469	6,919	8,087	11,760	7,206
Māori		6,837	3,741	782	6,837	6,757	1,412	7,322	3,887	817
Pacific Island		3,480	1,747	405	3,480	3,155	731	3,689	1,811	443
Total female		19,340	17,989	8,482	19,340	22,413	9,439	20,776	18,539	8,867
Asian	Male 2021	1,444	1,265	394	1,444	1,265	394	1,644	1,340	431
European		7,983	14,841	6,816	7,983	14,841	6,816	8,482	15,306	7,203
Māori		5,993	3,774	581	5,993	6,816	1,049	6,418	3,930	611
Pacific Island		2,708	1,935	340	2,708	3,494	613	2,853	2,015	381
Total male		18,128	21,814	8,131	18,128	26,415	8,873	19,398	22,591	8,625
Total 2021		37,469	39,803	16,613	37,469	48,828	18,311	40,174	41,131	17,493

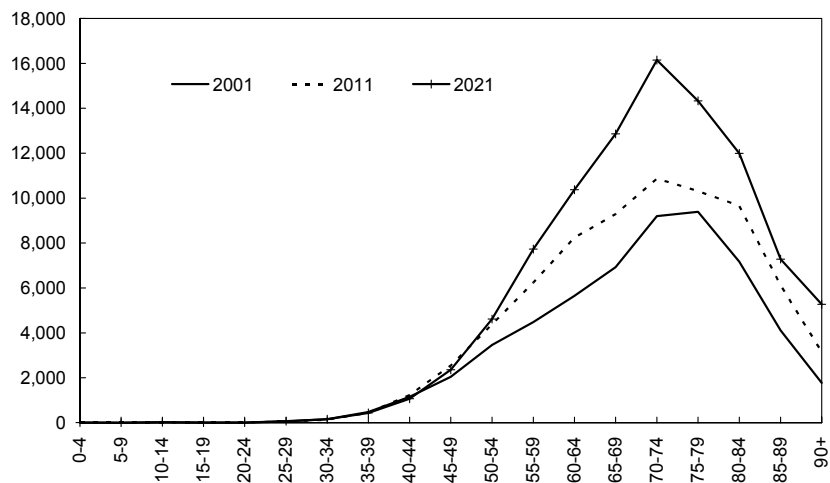
Note: Any discrepancies in the totals are due to rounding figures to the nearest whole number.

Source: NZIER, generated from Ministry of Health NMDs and Statistics New Zealand population data

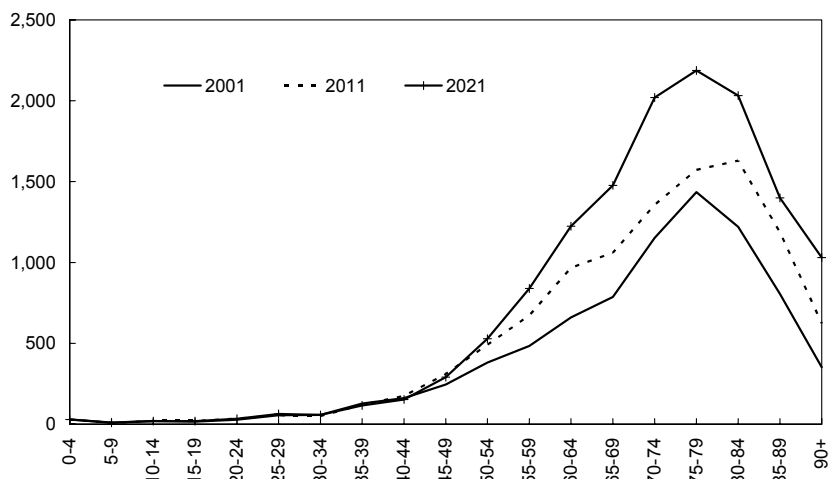
Figure 8: Acute and sub-acute hospitalisations for scenario 1

By condition and age group

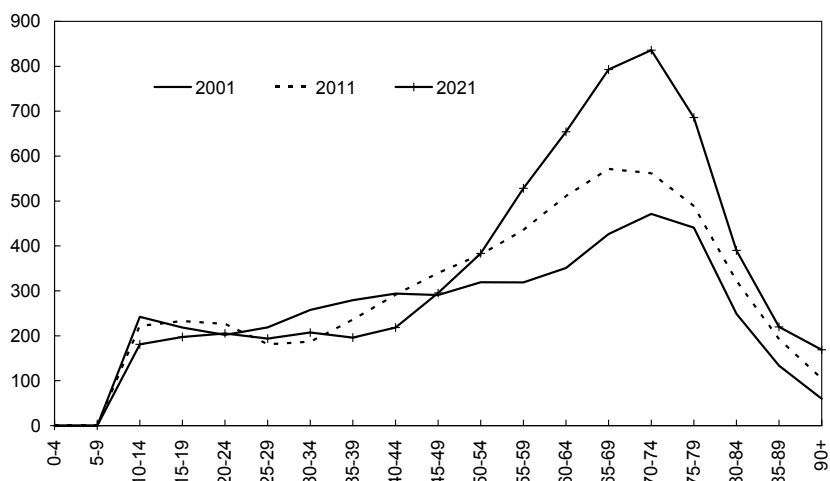
Ischaemic heart disease



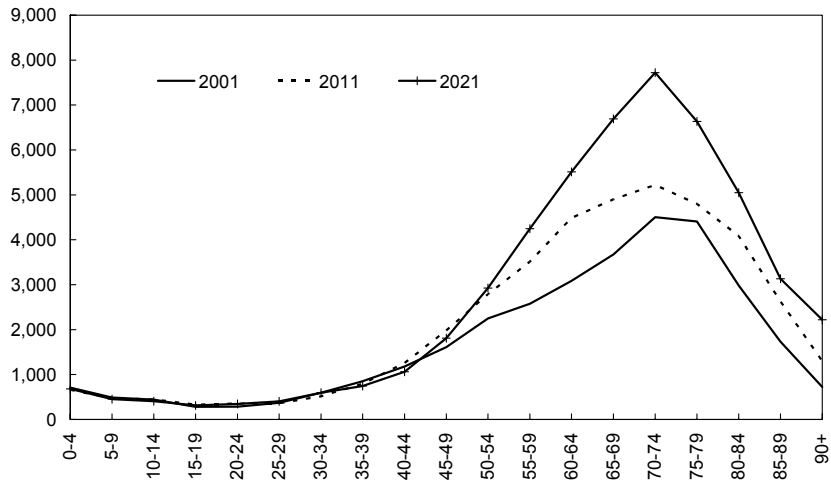
Stroke



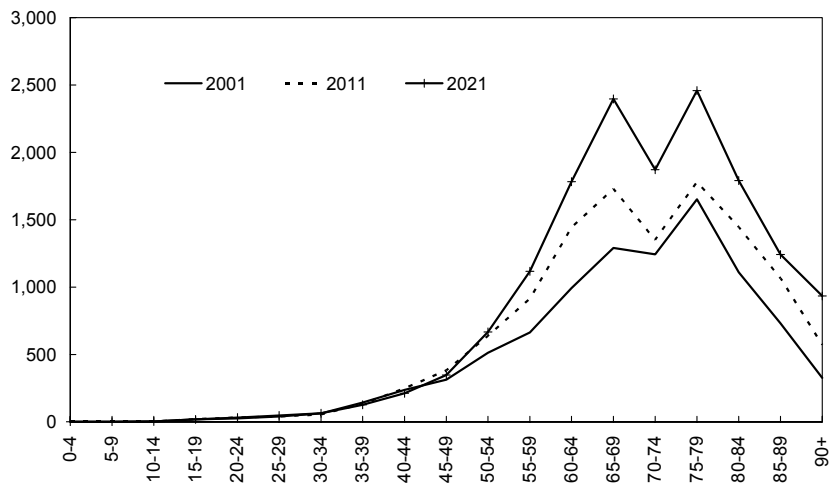
Lung cancer, trachea and bronchus



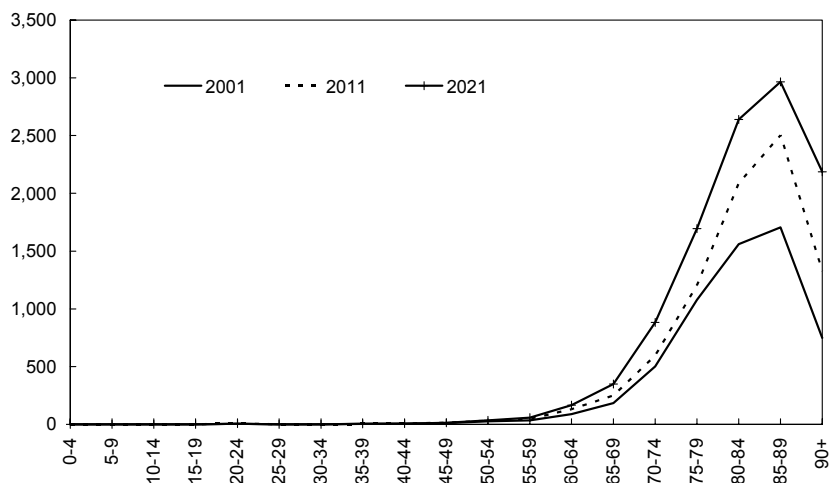
Other cancer



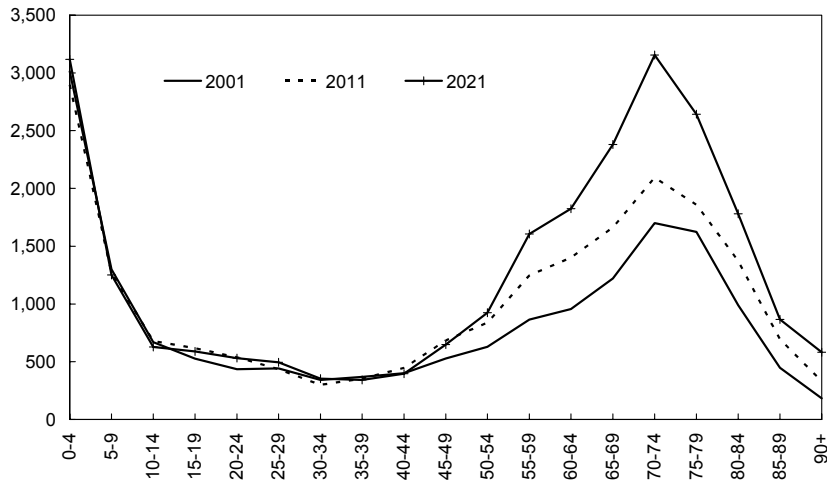
Osteoarthritis



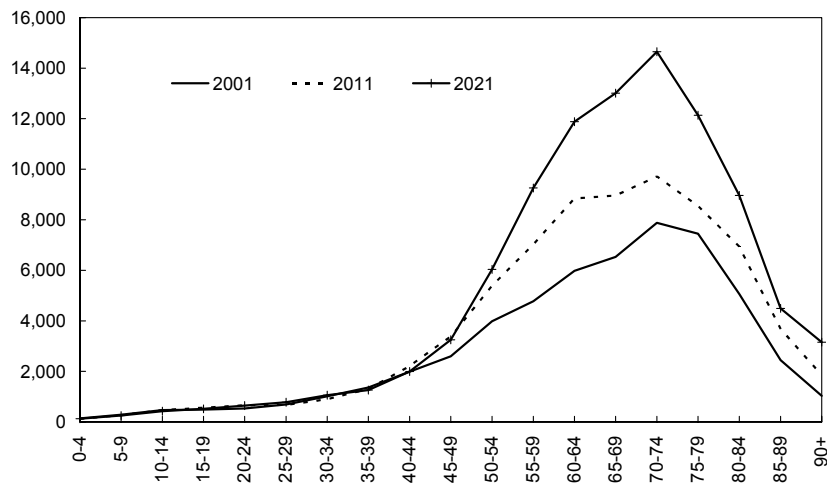
Dementia



Chronic obstructive pulmonary disease and asthma



Diabetes

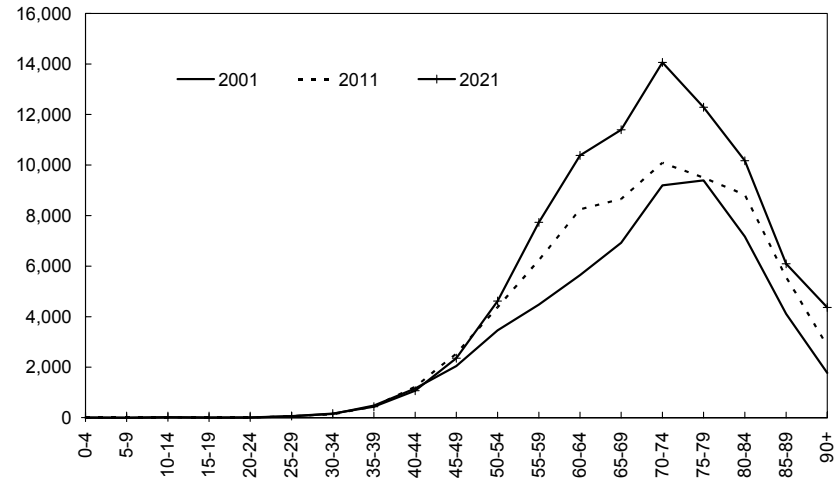


Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

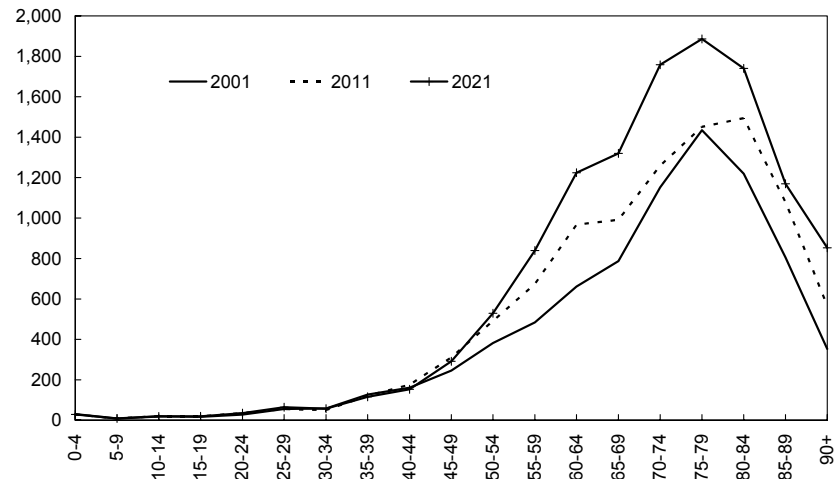
Figure 9: Acute and sub-acute hospitalisations for scenario 2

By condition and age group

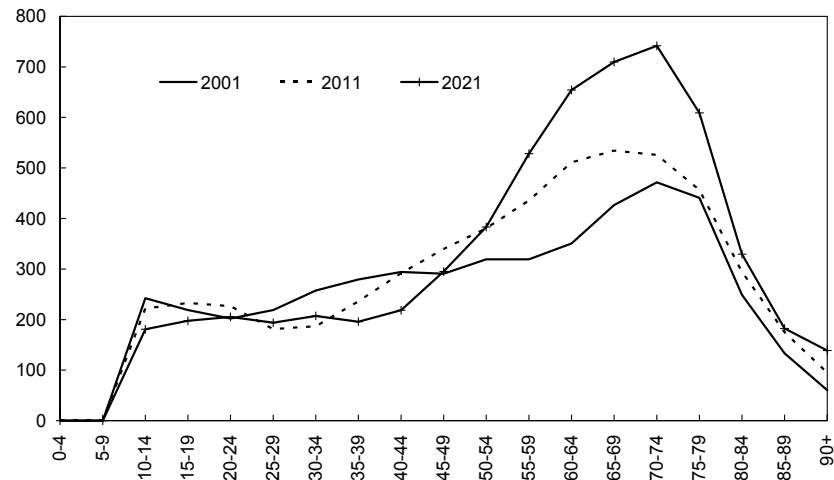
Ischaemic heart disease



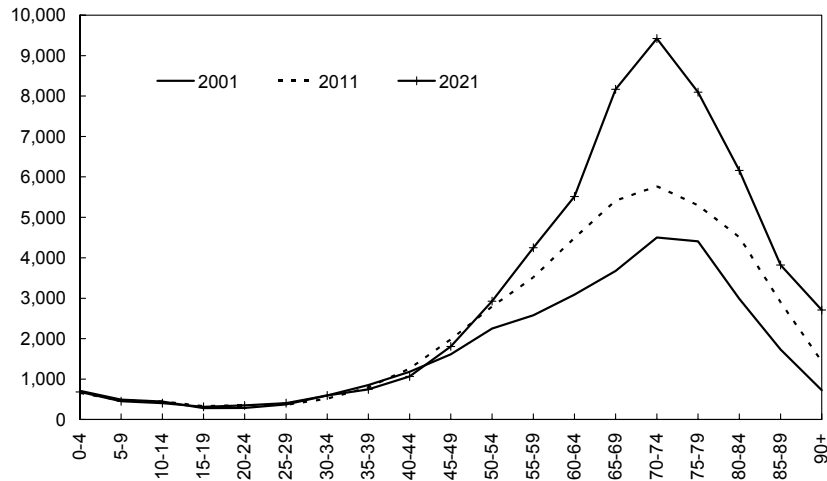
Stroke



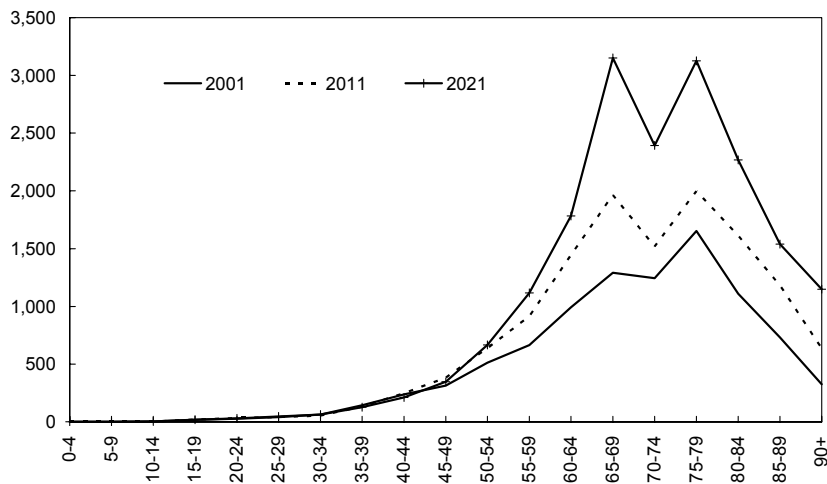
Lung cancer, trachea and bronchus



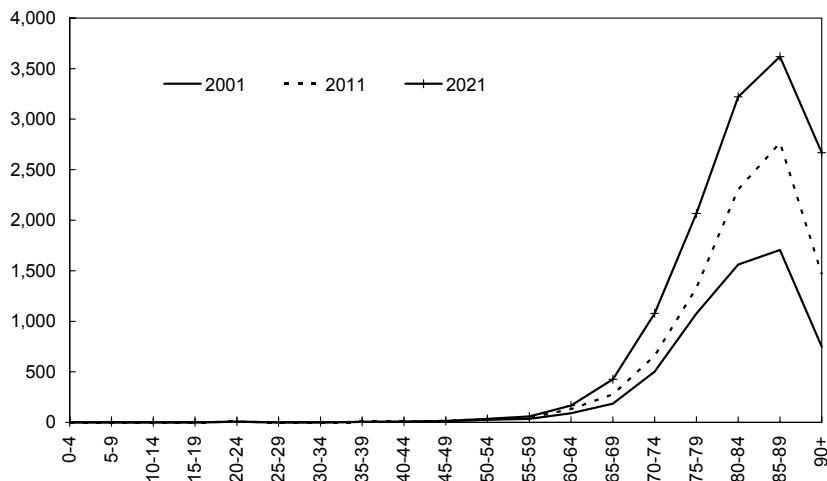
Other cancer



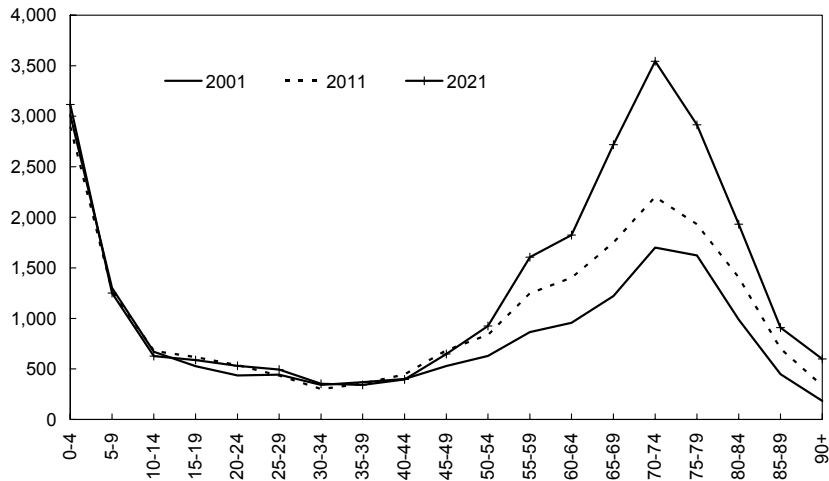
Osteoarthritis



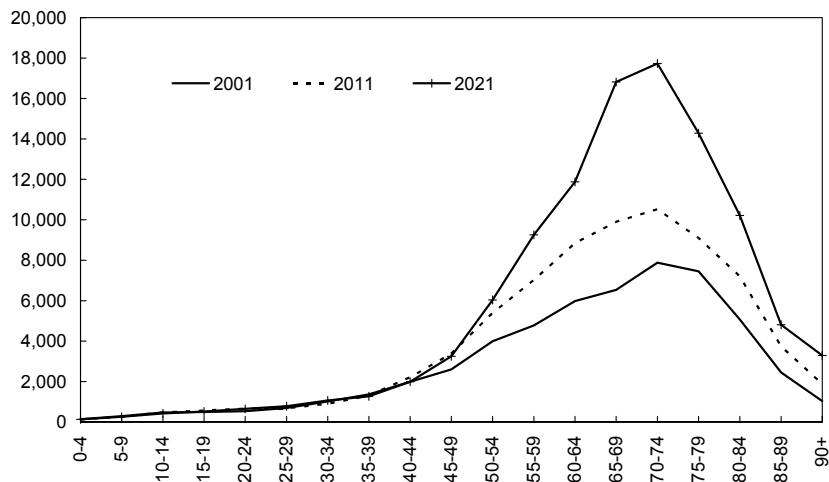
Dementia



Chronic obstructive pulmonary disease and asthma



Diabetes

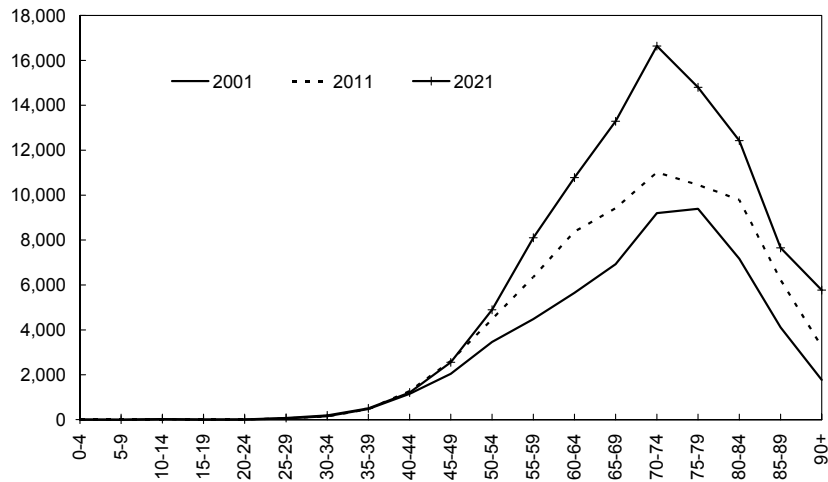


Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

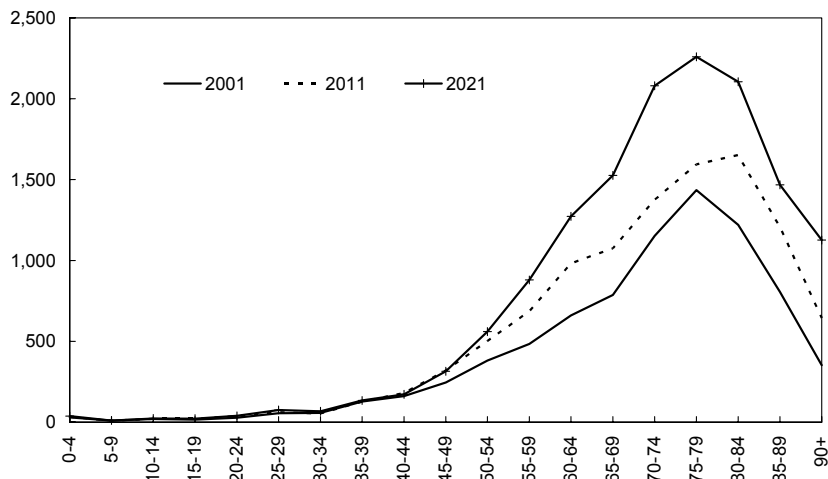
Figure 10: Acute and sub-acute hospitalisations for scenario 3

By condition and age group

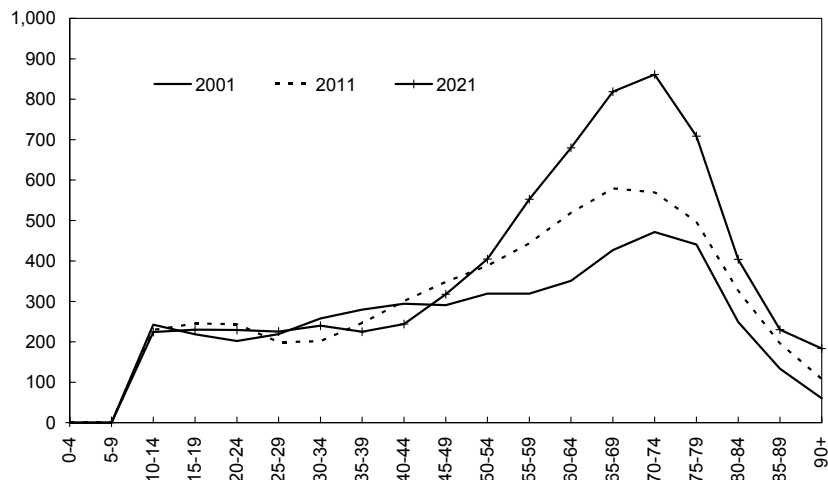
Ischaemic heart disease



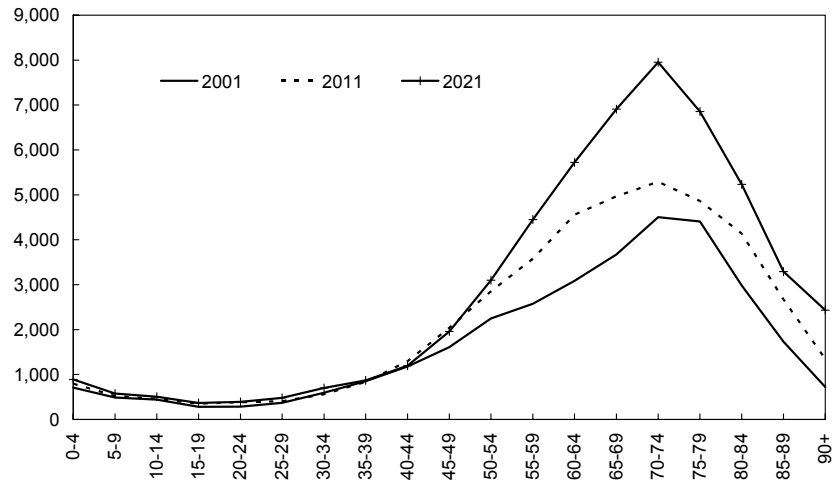
Stroke



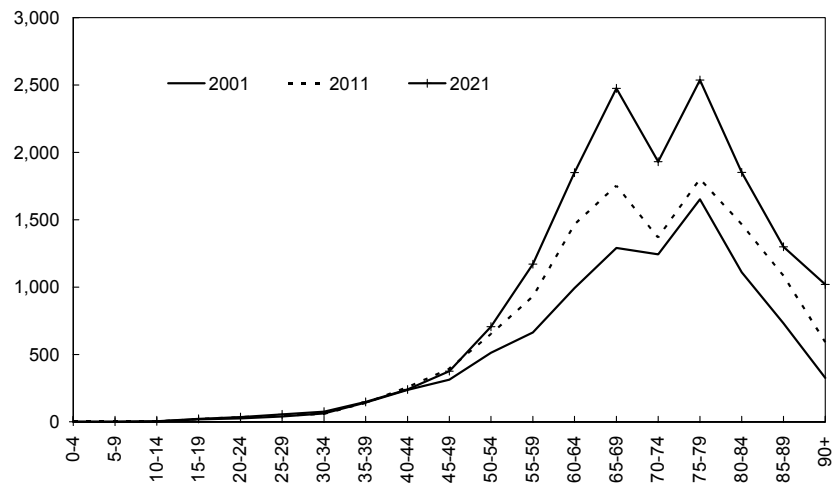
Lung cancer, trachea and bronchus



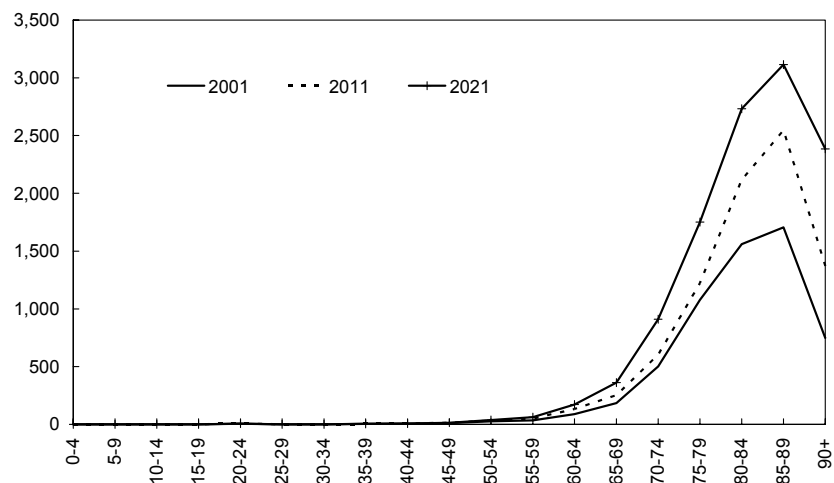
Other cancer



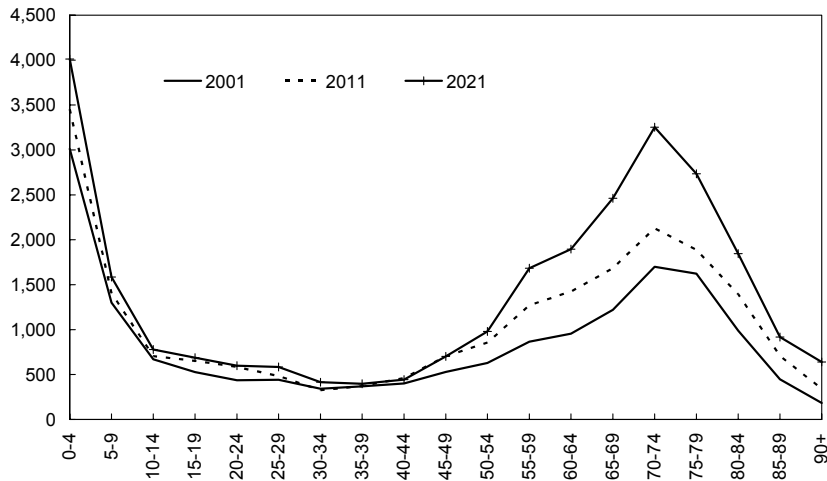
Osteoarthritis



Dementia



Chronic obstructive pulmonary disease and asthma



Diabetes



Source: NZIER, generated from Ministry of Health NMDS and Statistics New Zealand population data

Appendix B: Consultees

Round 1

Name	Organisation
Marilyn Rimmer	DHBNZ
Dwayne Crombie	Waitemata DHB
Robin Youngson	Waitemata DHB
Margot Mains	Capital & Coast DHB
Stuart Henderson	Wellington Hospital, Capital & Coast DHB
Jan White	Waikato DHB
Maree Pierce	Waikato DHB
Nigel Millar	Canterbury DHB
Carl Hanger	The Princess Margaret Hospital, Canterbury DHB
Matthew Parsons	The University of Auckland
Janice Wilson	Ministry of Health
John Marwick	Ministry of Health
Jim Primrose	Ministry of Health
John Baird	Presbyterian Support Services (Northern)
Jill Calveley	Northern DHB Support Agency

Round 2

Name	Organisation
Marilyn Rimmer	DHBNZ
Dwayne Crombie	Waitemata DHB
Robin Youngson	Waitemata DHB
Stuart Henderson	Wellington Hospital, Capital & Coast DHB
Nigel Millar	Canterbury DHB
Carl Hanger	The Princess Margaret Hospital, Canterbury DHB
John Marwick	Ministry of Health
John Baird	Presbyterian Support (Northern)
Philip Patston	Diversity Works, Auckland
Claire Austin	Royal New Zealand College of General Practitioners
Sue Ineson	Medical Council of New Zealand
Marion Clark	Nursing Council of New Zealand
Geoff Annals	New Zealand Nurses Organisation
Cameron McIver	New Zealand Medical Association
Gail Leach	Allied Health Professional Associations' Forum
Jan Dowland	Mental Health Commission
JB Byrne	New Zealand Council of Trade Unions
Michal Boyd	Auckland University of Technology

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