



Southern District Health Board

Southern District Health Board Health Profile 2013



This report was developed and written by Health Partners Consulting Group on behalf of Southern DHB. The DHB's assistance in supporting the data acquisition, analysis and feeding back on the commentary has been invaluable. Data analysis has been carried out in good faith, assuming all data provided is as stated. No responsibility can be taken for any errors resulting, or actions taken as a result of those errors. The report may be freely used and copied for the purposes of improving the health of New Zealanders, providing the source is acknowledged.

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Key Findings

This health profile summarises key health data to reflect the current state of the health of people living in the Southern DHB area. It aims to underpin discussions on the Strategic Health Plan and the challenges and opportunities in the wider health care environment. It builds from previous work, concentrating on a quantitative analysis of health data, drawn mainly from utilisation of health care services. Analysis was primarily by locality, broadly based on local government areas, with analysis by deprivation where appropriate. Where communities typically use health services outside their local government area, however, (for example, Wanaka and Lake Hawea residents frequently use central Otago facilities) this has been taken into account during the analyses. Previous health documents have concentrated on Māori and non-Māori comparisons, and the gaps evident are such that those differences are again highlighted here. Health differences for Pacific residents are also noted where possible.

Southern District Health Board combines the previous Otago and Southland DHBs to cover the largest geographic region in New Zealand spanning a land area of over 62,356 square kilometres. Southern DHB serves an estimated resident population of 308,600 (2013 estimate), predominantly European and slightly older than the national average. Māori people make up 9.1% of the population in the Southern district, and Pacific 1.5%. Combined this is less than 11%, significantly lower than the New Zealand average of 22%. The average deprivation level is low - Southern DHB has only 13% of its total population living in quintile 5 (most deprived), much less than the national average of 20%. In contrast 24% live in quintile 1 areas (least deprived), above the national average of 20%. Queenstown-Lakes Territorial Authority has the second lowest deprivation ranking in New Zealand, followed by Southland District 4th and Central Otago 6th. Overall Southern DHB is the 6th out of 20 least deprived DHB in New Zealand.

Key differences noted by locality are summarised in the table below. Looking at Southern as a whole, notable findings include:

- Life expectancy at birth for people living in Southern DHB was 81 years for the years 2010 to 2012, slightly less than the New Zealand average of 81.2 years. Given the relatively low deprivation levels in Southern DHB a result higher than the New Zealand average might have been expected. (see Section 3.1)
- Males continue to lag females in life expectancy at birth - 3.9 years behind for Southern. While the gap has decreased over the last decade there remains a significant health shortfall for men in Southern DHB. (Section 3.1)
- If Māori living in Southern had a life expectancy similar to that of Māori nationally there would be a 7.4 year shortfall for males, and a 7.2 year shortfall for females. (Section 3.1)
- Amenable mortality rates are in line with the average deprivation level. Māori results for Southern are better than for Māori elsewhere in the country, but remain twice as high as their non-Māori counterparts (Section 3.3)
- The leading causes of avoidable mortality for Southern DHB residents aged 0-74 compared to the average for New Zealand were similar: ischaemic heart disease, suicide and self-inflicted injuries, lung cancer, and motor vehicle accidents. Colorectal cancer overall showed a significantly higher rate of mortality and hospitalisation for Southern residents compared with the New Zealand average. (Section 3.3)
- While the rate of tobacco smoking is falling in Southern DHB it is lagging the falls seen elsewhere in New Zealand. Census 2013 results suggest 15.6% of Southern DHB adults smoke tobacco daily compared to a New Zealand rate of 15.1%, with rates higher in Southland than Otago. Māori adults in Southern have nearly twice the smoking rate of their non-Māori counterparts at 29.9%, though this is lower than the 32.7% overall Māori result nationally. Useful falls in smoking rates were seen for Māori and Pacific adults in Southern.

Smoking remains the single largest cause of premature mortality and ill health in Southern DHB, but will soon be overtaken by obesity and nutrition-related conditions. (Section 4.1)

- The prevalence of obesity in Southern DHB was higher than the national average at 29.8% of all adults (aged 15+) for 2011/12, showing a 4% increase from 2006/07. There are estimated to be more than 13,000 morbidly obese people in Southern DHB - 6.6% of the adult population aged 15-64, less than the national rate estimated at 8.2%. (Section 4.3)
- Overall a quarter of adults (25.1%) in the Southern district population in 2011/12 were estimated to be hazardous drinkers, significantly higher than the national average of 17%, and higher than any of the other large DHBs. Hospitalisations for alcohol-attributable conditions rose significantly over the past five years. (Section 4.2)
- Two-thirds of Southern DHB adults (67%) reported meeting recommended physical exercise levels in 2011/12, significantly higher than the national average – the only major population risk factor to be better than the national average in the Health Survey data. (Section 4.4)
- Nationally Māori have higher proportions at risk of smoking, hazardous alcohol drinking, obesity and poor nutrition. This is likely to be reflected in Māori living in the Southern DHB area. (Section 4.5)
- Pacific peoples also have higher proportions at risk of smoking, hazardous alcohol drinking, obesity and poor nutrition for New Zealand as a whole. This will be reflected in Pacific living in the Southern DHB area. (Section 4.5)
- Rates of chronic disease in Southern DHB residents are similar to the national average – diabetes, cardiovascular disease, stroke, cancer, asthma and chronic obstructive respiratory disease. As obesity rates rise, diabetes prevalence will worsen – high rates of hospitalisation are already evident for people in quintile 5 areas and Māori people living in Southern DHB. (Sections 5.1, 5.2, 5.4)
- Cancer registration rates were similar for Southern DHB residents compared to national rates, apart from colorectal cancer which had a statistically significant higher rate. (Section 5.3)
- Primary care enrolments were relatively low in Southern DHB residents, and the proportion of the population attending a general practitioner in any one year has fallen over the last 5 years. Some 30.3% of Southern residents reported unmet for primary care in the past year, compared with a national average 26.6%. This is despite Southern district having more general practitioners than the national average approximately 1,000 patients compared with 1300 patients per full-time equivalent practitioner nationally. (Section 6.1)
- Primary care quality indicators generally compared well for Southern DHB practitioners compared to national averages. Southern DHB in 2011 had an average of 411 patients per 1000 aged 65 and over being dispensed five or more medicines per quarter – that is 41% of the population aged 65 and over. This placed the DHB second highest in the country, well over the national average of 37%. (Section 6.3)
- Overall planned and unplanned hospitalisation rates were similar to national averages. Southern had one of the lowest adult ambulatory sensitive (ASH) rates in the country – events that are more likely to be avoided through good preventive care. Low ASH rates are sometimes considered a marker of good primary care. Around 11% of all unplanned medical-surgical admissions were considered to be ASH in Southern, compared with 15% nationally. (Section 7)
- Child hospitalisation rates are consistent with the deprivation and ethnicity proportions in the DHB. (Section 7.4)
- Emergency department attendances for Southern residents have been rising faster than population growth, suggesting potential barriers in accessing primary care. (Section 8.5)

- Around 6% of the Southern population aged 65 and over are in Aged Residential Care (ARC – rest homes and hospitals) – significantly higher than the national average of 5.2%. This is the third highest rate of any DHB. Rates of utilisation rise sharply by age - at present around 10% of those aged 75 and over and 28% of those aged 85 and over living in Southern are in ARC, compared with 10.6% and 25.2% nationally respectively. (Section 9)
- Southern women have a relatively low fertility rate at 1.66 births per women, compared with the national average at just over 2. Maternity clinical outcome indicators compare well nationally for Southern mothers. The rate of teenage births is low at 16/1000 15-19 year olds, but conceals higher rates of around 30/1000 for Māori and Pacific teenagers, and teenagers living in Gore and Southland. Abortion rates are relatively low. (Section 10)
- Southern DHB respondents to the New Zealand Health Survey reported higher anxiety or depressive disorder results than the national average, 8% compared with 5.7% of the total population. An increase in the prevalence of psychological distress and common mental illnesses were also noted, but in part may be due to sampling variation and perhaps post-earthquake migration. Overall access to mental health services for Southern residents was high compared to the rest of New Zealand. Within Southern high mental health service use is apparent for Dunedin residents, but this may relate mainly to the residential location of the more severe mentally ill patients. There are relatively high suicide rates for the DHB. (Section 11)

As a final point, it is worth noting that this work focuses attention on the most important health issues, and areas where Southern DHB residents appear to differ from their counterparts elsewhere in New Zealand. As with most health profiles it will tend to appear to have a negative focus. Importantly we should note that overall the health of the population of Southern DHB compares very well with the rest of New Zealand – differences listed above notwithstanding. These differences tend to be of the variety “doing well, could do better”; with the relatively low levels of deprivation being a strong factor in arriving at this assessment. Southern DHB appears to be in a strong position to take its health services forward.

Locality (taking into account patient flows to health facilities)	Population	Chronic conditions	Primary care	Secondary care
Waitaki (Waitaki District less Palmerston and Nenthorn CAUs ¹)	20,100 estimated population in 2013, little growth in past 5 years, expected small reduction in future years. Low Māori and Pacific (8%). Moderate deprivation average – quintile 3.	Relatively low asthma hospitalisation rate.	Relatively high enrolment (96%). Moderate panel size (1240 patients per FTE GP)	Relatively low unplanned hospitalisation rates for adults and children, low outpatient rate.
Dunedin (Dunedin City plus Palmerston, Nenthorn, Bruce and Milton CAUs)	131,400 estimated population in 2013, little growth in past 5 years, expected small growth in future years. Low Māori and Pacific (8%). Moderate deprivation average – quintile 3.	High mental health service utilisation. High rate of alcohol-related ED presentations	Relatively low enrolment (88%). Small panel size (960 patients per FTE GP)	Moderately high ASH rate.
Clutha (Clutha District less Bruce and Milton)	10,600 estimated population in 2013, little growth in past 5 years, expected small reduction in future years. Relatively higher Māori and Pacific (14%). Moderate deprivation average – quintile 3.	Relatively low diabetes hospitalisation rate, but higher CVD rate. Lower asthma hospitalisation rate.	High enrolment with in-flows from other areas. Moderate panel size (1200 patients per FTE GP)	Relatively low unplanned hospitalisation rate, low ASH rate, low child hospitalisation rate, low outpatient rate.
Gore (Gore District less Kaweku CAU)	14,600 estimated population in 2013, reduced in past 5 years, expected further reduction in future years Low Māori and Pacific (8%). Moderate deprivation average – quintile 3.	Moderate to high diabetes hospitalisation rate. Moderate asthma hospitalisation rate.	High enrolment with in-flows from other areas. Large panel size (1700 patients per FTE GP)	Relatively high teen pregnancy rate, high fertility rate

¹ CAU – Census Area Unit

<p>Central (includes Central Otago District plus Wanaka and Hawea CAUs)</p>	<p>28,700 estimated population in 2013, significant growth in past 5 years, expected 20% increase in next 20 years. Low Māori and Pacific (9%). Low deprivation average – quintile 2.</p>	<p>Low diabetes hospitalisation rate. Low asthma hospitalisation rate.</p>	<p>Relatively high enrolment (96%). Small panel size (800 patients per FTE GP)</p>	<p>Low ASH rate, low child hospitalisation rate, low outpatient rate</p>
<p>Queenstown (Queenstown-Lakes District less Wanaka and Hawea CAUs)</p>	<p>19,400 estimated population in 2013, significant growth in past 5 years, expected 36% increase in next 20 years. Very low Māori and Pacific (6%). Very low deprivation average – quintile 1.</p>	<p>Low diabetes hospitalisation rate. Asthma and COPD hospitalisation rate higher than expected for deprivation level. High rate of alcohol-related ED presentations.</p>	<p>Relatively high enrolment (98%). Moderate panel size (1150 patients per FTE GP)</p>	<p>Relatively high unplanned hospitalisation rate for deprivation level of area, including a high injury hospitalisation rate. ASH rate OK. Low child hospitalisation rate, low outpatient rate.</p>
<p>Southland (Southland District, Invercargill City, and Kaweku CAU)</p>	<p>83,800 estimated population in 2013, little growth in past 5 years, expected small reduction in future years. Relatively higher Māori and Pacific (15%). Moderate deprivation average – quintile 3.</p>	<p>Moderate to high diabetes and CVD hospitalisation rate. Higher asthma and COPD hospitalisation rate.</p>	<p>Relatively low enrolment (88%). Moderate panel size (1400 patients per FTE GP)</p>	<p>Relatively high unplanned hospitalisation rate for adults and children, and higher ASH rate. Relatively high teen pregnancy rate, high fertility rate</p>

At a glance

Overall health for Southern DHB residents compares well with other New Zealanders. Given the relative deprivation levels one might have expected slightly better health outcomes, giving areas for the DHB to work on. Based on the finding of this report, and previous work, key areas for the health of Southern DHB residents that the DHB will need to address include:

- 1 Tobacco smoking
- 2 Obesity and nutrition
- 3 Hazardous alcohol consumption
- 4 Access and use of primary care – in-hours, after-hours
- 5 Māori health, particularly child health, chronic disease
- 6 Pacific health, particularly child health, chronic disease
- 7 Mental health service access
- 8 Chronic disease management – diabetes, CVD
- 9 High rates of aged residential care use

Introduction

The development of this health profile (also termed health needs assessment) comes at an important stage in the development of Southern DHB. It reflects the current state and the challenges and opportunities in the wider operating environment including:

- The need to develop a DHB-wide health strategic plan
- Priorities as outlined by Southern DHB's planning, and expectations from the Minister of Health
- The regional planning context
- The current performance of the DHB, and pressures upon it
- The potential for future growth differences in different areas of the DHB, including implications this may have for future capacity and capital planning
- The next stage of strategic development of Southern DHB following the merger in 2010

The aim is to develop an evidence base to support health services to identify areas for health improvement for people living in the Southern DHB area. It will form the foundation of a sustainable strategic approach to health care planning.

Health needs assessment is an ongoing process in DHB development – it is not a single document. Previous general health needs assessment work on Southern DHB (or its predecessors) includes:

- Marsters H, Shanthakumar M, Fyfe C, Borman B, Dayal S. (2012) [Health needs assessment Southern District Health Board](#). Wellington: Centre for Public Health Research. Report commissioned by Ministry of Health. Also available with tables at CPHROnline <http://cphronline.massey.ac.nz/>
- Southern DHB. [Southland Māori Health Profile 2011](#). Dunedin: Southern DHB, undated.
- Southern DHB. [Otago Māori Health Profile 2011](#). Dunedin: Southern DHB, undated.
- Craig E, Dell R, Reddington A, et al. (2012). The Determinants of health for children and young people in the Southern DHB. Auckland: NZ Child and Youth Epidemiology Service.
- Craig E, Adams J, Oben G, Reddington A et al. (2011). The Health status of children and young people in Otago and Southland. Auckland: NZ Child and Youth Epidemiology Service.
- Craig E, McDonald G, Adams J, Reddington A, Wicken A. (2010) The Health of children and young people with chronic conditions and disabilities in the Southern DHB. Auckland: New Zealand Child and Youth Epidemiology Service.
- Craig E, McDonald G, Reddington A and Wicken A. (2009). The Determinants of Health for Children and Young People in Otago. Auckland: NZ Child and Youth Epidemiology Service.
- Craig E, Anderson P and Jackson C. (2008). The Health status of children and young people in Southland. Auckland: NZ Child and Youth Epidemiology Service.
- Craig E, Anderson P and Jackson C. (2008). The Health Status of Children and Young People in Otago. Auckland: NZ Child and Youth Epidemiology Service.
- Health and Disability Intelligence Unit. (2008). Otago DHB Health Needs Assessment. Ministry of Health: Health and Disability Systems Strategy Directorate, Oct 2008.
- Health and Disability Intelligence Unit. (2008). Southland DHB Health Needs Assessment. Ministry of Health: Health and Disability Systems Strategy Directorate, Oct 2008.

- SISSAL. (2005) Health Profile: Otago District Health Board. Joint Initiative South Island District Health Boards, the Ministry of Health and the South Island Shared Service Agency.
- SISSAL. (2005) Health Profile: Southland District Health Board. Joint Initiative South Island District Health Boards, the Ministry of Health and the South Island Shared Service Agency.

A locality analysis is undertaken where possible in this report to highlight differences and similarities by geographic area. This covers residents wherever they have been treated in New Zealand. The parts that ethnicity and deprivation play in the social patterning and determination of health, illness and mortality are described and quantified for Southern DHB residents. Where possible the DHB is compared with others across New Zealand or the national average. Use of Southern DHB services by non-residents (either from other parts of New Zealand or overseas) are not included in this report – these volumes will need to be added to get a full service capacity picture for service planning purposes. The prime purpose of the DHB is to the health of the population it serves – that is the focus here.

Time restraints do not allow every aspect of the health system to be covered, or all in as much detail as might be possible. In particular we would note that tertiary services provision, other inter-District services, hospital site sustainability and details about service configurations are not covered to any great extent. Child health has been covered in much detail in previous reports, and is not extensively re-analysed here. Quality of healthcare provision is covered in separate annual reports.² Results from the 2013 Disability Survey were not available at the time of writing; prevalence information at the DHB level is otherwise not available.

This health profile quantitative analysis will be supplemented with engagement of local clinical and managerial leaders (including in primary care), and communications and consultation with public, staff and stakeholders as part of the strategic health plan development.

Methods

International and national literature relating to population health was reviewed to inform the analysis and interpretation of this report. This included academic and relevant grey literature (government, DHB and other online publications), concentrating on material specific to the Southern DHB area. The literature review was selective in scope; guided by the priorities outlined above.

Existing work was used where possible, avoiding duplication of effort and resource. New locality analyses were developed for this report, specifically to support the development of a health services plan for the DHB. The localities used are described in Chapter 1. Their development was mainly based on the current TA³ boundaries, as these are well-known to people, and reflect reasonable communities of interest. Some modifications were made to these to reflect the current patterns of health care flows and catchments for the local inpatient facilities. Specifically inpatient medicine use was used to model current healthcare flows, giving the areas shown in Figure 1, and described in Table 1. As the people living in Southland District use Southland Hospital in a similar manner to those living in Invercargill City, we chose to combine these two TAs for the purposes of this report.

Analysis of health care utilisation data sets is described in the appropriate chapters. To enable comparisons between localities we age-standardised utilisation to the Southern 2012 estimated resident population. We chose the local population as this creates the least distortion when comparing between areas, meaning crude rates do not vary too much from the age-standardised rates. If information quoted from other reports uses different age-standardised rates we note that –

² Southern DHB. *Quality Account 2012 – 2013*. Dunedin: Southern DHB, Nov2013. Available at www.hqsc.govt.nz/assets/Health-Quality-Evaluation/PR/Quality-account-Southern-DHB-Nov-2013.pdf

³ Territorial Authority

for example the New Zealand Health Survey data is age-standardised to the WHO standard population.

Another cause of variation across localities is the relative deprivation seen in each area (see Chapter 2). We chose not to 'deprivation-standardise' rates as this can obscure differences as much as enlighten. Instead we have shown the variation by deprivation quintile across the Southern DHB, and compare this to selected localities where these might be expected to differ from the Southern average due to their relative lack of deprivation. These figures then compare the overall deprivation pattern for Southern with the total for each specific locality at their average deprivation point.

Previous health needs assessments from the DHB and from Massey University have highlighted Māori inequities in health, and the present work also demonstrates this, with Māori comparisons made where possible.. Less has been reported on Pacific health in Southern, but the population numbers are too few to allow much in the way of specific quantitative analyses for this group. A number of national analyses on Pacific health, including a recent very detailed one for metro-Auckland looking at the different Pacific ethnicities provide many insights for use in developing services for Pacific people in Southern.⁴ The reader is referred to this report, available on the Ministry of Health website for more detail.

Where statistical testing has been undertaken to assess the likelihood that the differences seen were not due to a chance variation we display positive variation as green, and negative variation as red. That is the green indicates 'better' health, red 'worse' health. Some tables include indicators of "increase" or "decrease" – minor movements are not so tagged.

⁴ Health Partners Consulting Group 2013. Metro-Auckland Pacific Population Health Profile. Auckland: HPCG. <http://www.health.govt.nz/publication/metro-auckland-pacific-population-health-profile>

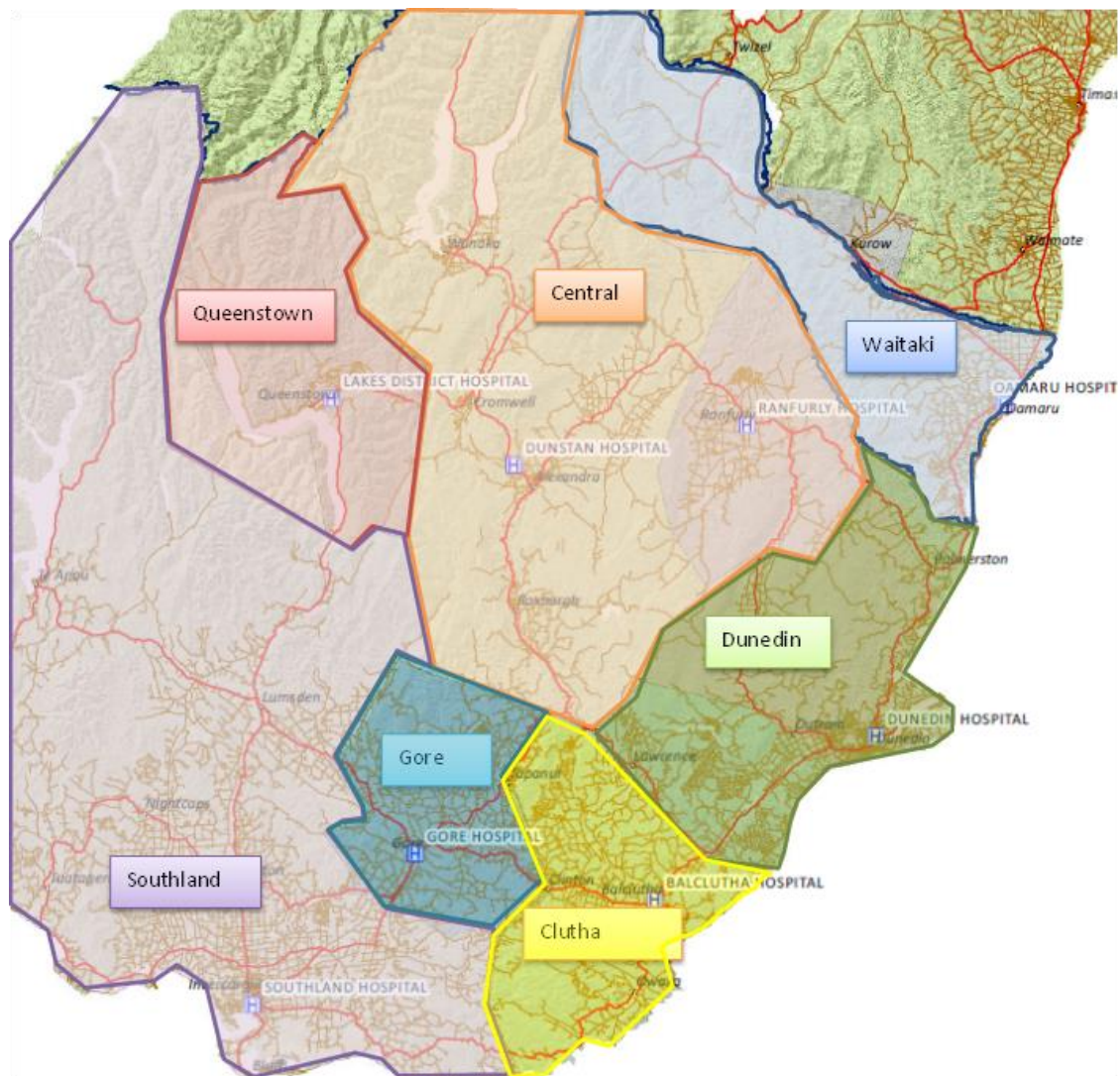
1. Southern DHB Population

1.1 Geographic coverage and division

Southern District Health Board (Southern DHB) is responsible for planning, funding and delivery of health and disability services to the largest geographic region in New Zealand spanning a land area of over 62, 356 square kilometres. Southern DHB serves an estimated resident population of 308,600 (2013 Statistics New Zealand estimate) with a catchment area that encompasses 8 territorial authorities (TAs) - Waitaki District, Dunedin City, Clutha District, Gore District, Central Otago District, Queenstown-Lakes District, Southland District, and Invercargill City.

These TAs have been grouped for the purposes of this report to produce seven geographically based localities aligned to current healthcare flows (Figure 1). These have been termed Waitaki, Dunedin, Clutha, Gore, Central, Queenstown and Southland, and differ slightly from the standard TAs (Table 1). As an example of the change, people living in Wanaka which is part of the Queenstown-Lakes TA, are separated from the hospital facility in Queenstown by the Crown Range, which can be closed at times by adverse weather conditions. The alternative main road goes via Cromwell, so that hospital facilities at Dunstan are more easily accessible than those at Lakes District Hospital, and the inpatient care flows reflect this.

Figure 1 Boundary map of the seven localities



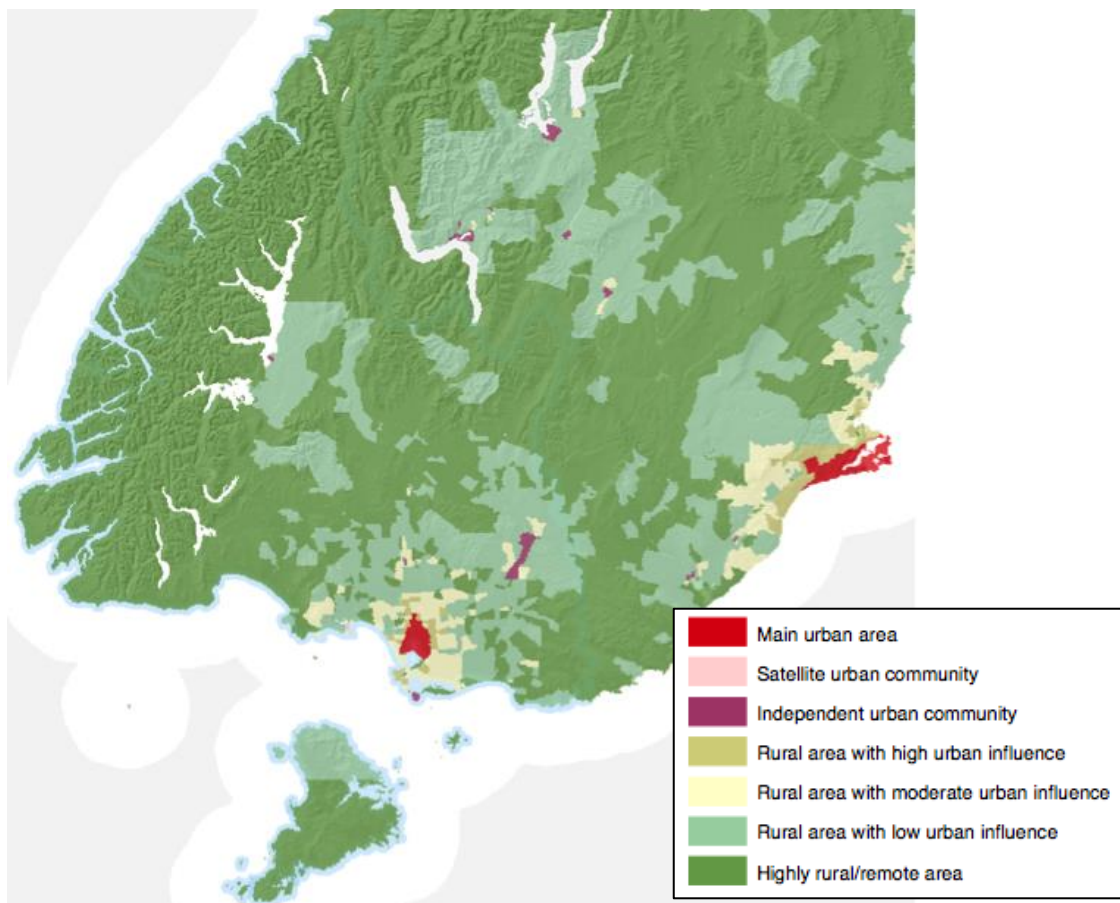
Note: Stewart Island and Fiordland included with Southland locality

Table 1 Locality as used for this report and TA differences

Locality	Changes
Waitaki	Waitaki District, apart from Palmerston, Waiheno and Nenthorn CAUs moved to Dunedin locality
Dunedin	Dunedin City - adding 3 CAUs from Waitaki District, 2 CAUs from Clutha District
Clutha	Clutha District, apart from Bruce and Milton CAUs moved to Dunedin locality
Gore	Gore District, apart from Kaweku CAU moved to Southland locality
Central	Central Otago District, adding Hawea, Wanaka, Matukituki, from Queenstown-Lakes District
Queenstown	Queenstown-Lakes District less 3 CAUs
Southland	Southland District and Invercargill City, adding 1 CAU from Gore

Notes: CAU = Census Area Unit, Statistics New Zealand unit of geography. Changes from Territorial Authority (TA) CAU distribution based on current healthcare flows as described in Methods .

Figure 2 Urban/rural profile of the Southern district



Source: Statistics NZ Census data 2001

The population residing in the Southern district is sparsely distributed hence measures of population density assume particular importance when planning services in this DHB. Figure 2 displays the level of rurality by mesh block for the Southern district. In this instance rurality is defined by comparing the

address of workplace with that of usual residence as a proxy for both distance from, and the need to travel to, an urban area for employment, which is a useful proxy for travel to health services (See Section 5, page 69). The high level of remoteness within the Southern district poses a significant challenge for the provision of safe and effective primary, secondary and tertiary services. This challenge will continue to mount as the size of the remote population gradually declines and costs per head of maintaining local services rise. Population size and growth is explored further in the following section.

1.2 Population size and growth

Southern's population tends to be slightly older than the national average, with a low proportion of Māori and Pacific people in comparison with the national average. Southern has a high proportion of people in the least deprived section of the population when compared with the national average and a low proportion in the most deprived section.

A recent report for Southern DHB by the National Institute of Demographic and Economic Analysis at the University of Waikato has described the population of Southern DHB in great detail.⁵ Here we précis this report, and note any updated information. In the absence of any official updated projections the current ERP⁶ and projections (based on the 2006 Census data) has been retained as the main source for the demographic analysis (see text box *Where is Census 2013 data?*).

Where is Census 2013 data?

In New Zealand the Estimated Resident Population (ERP), as calculated by Statistics New Zealand, is used as the official population for planning purposes by the Ministry of Health and District Health Boards. The recent Census 2013 has seen initial findings published, however the ERP data and projections is not due until August 2014. Rather confusingly there is another type of population descriptor used, the Usually Resident Population (URP). This differs from ERP in that it does not allow for any undercount in the census, nor for people temporarily overseas at the time of the census. Its main use in this context is to be able to be relatively quickly published after a census, and to give a general heading for population growth. A comparison between the change in URP from the 2006 and 2013 Census data with the ERP 2013 was made for the Southern district population was largely in line with projections. The largest difference appeared to be in Dunedin City, where the new URP figures suggest a lower growth than expected, by around 3,500 people (consistent with somewhat lower university student enrolment figures). Queenstown-Lakes and Central Otago growth appeared consistent with projections.

Table 2 shows the ERP by locality for 2013 and the expected change in population growth over the next 18 years, projected forward to 2031. These projections are important considerations for local and regional service planning as they are likely to have implications for future funding and service demand. For example, the populations of Central and Queenstown show large growth of 20% and 26% respectively, reflecting potentially greater demand for health care services in the future. However these are areas of relatively low health need. The population of Gore is projected to fall by 13% suggesting potentially reduced healthcare demand in years to come.

⁵ Pawar S, Jackson NO. (2013). Southern District Health Board area demographic profile 1996 - 2026. Commissioned report, University of Waikato. National Institute of Demographic and Economic Analysis. 26pp

⁶ Estimated resident population

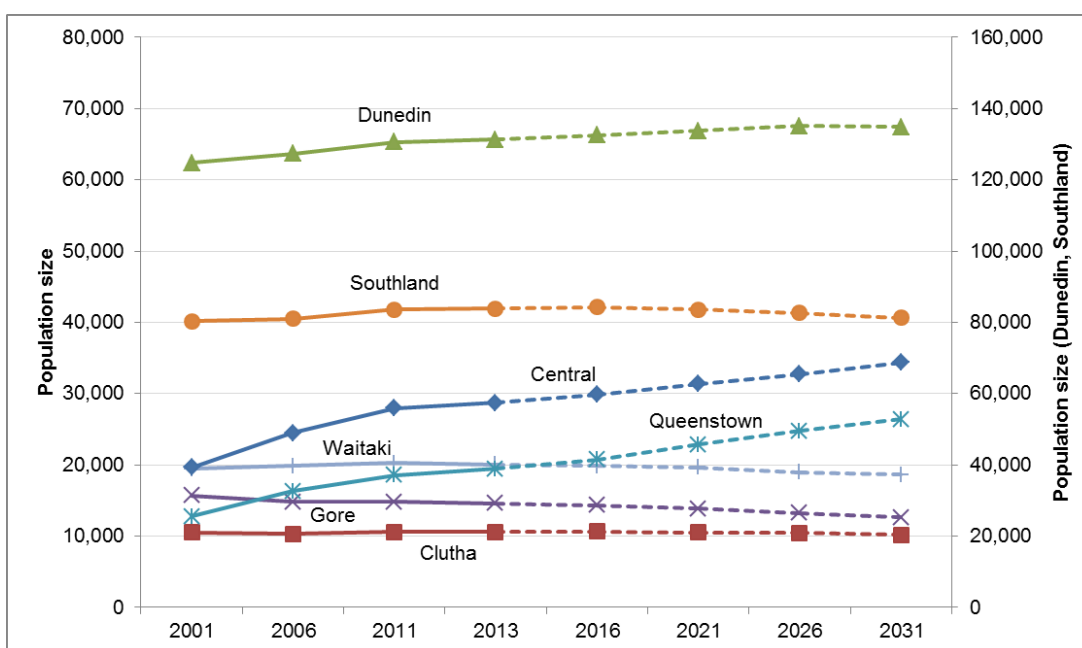
Table 2 2013 ERP and projections to 2031

Locality	ERP 2006	ERP 2013	Change 2006-2013	%pa	Projected ERP 2031	2013 to 2031	2013-2031 % change
Waitaki	19,900	20,100	200	0.14	18,600	-1,500	-7%
Dunedin	127,400	131,400	4,000	0.44	134,900	3,500	3%
Clutha	10,300	10,600	300	0.39	10,200	-400	-4%
Gore	14,800	14,600	-200	-0.23	12,600	-2,000	-13%
Central	24,500	28,700	4,200	2.30	34,400	5,700	20%
Queenstown	16,300	19,400	3,100	2.55	26,400	6,900	36%
Southland	81,000	83,800	2,800	0.49	81,300	-2,500	-3%
Total	294,200	308,600	14,400	0.68	318,400	9,700	3%

Note: ERP = estimated resident population. Projections based on Statistics New Zealand medium series.

Using percentages to portray population growth can over-emphasise the degree of change, particularly when dealing with smaller populations, as seen here. For example Queenstown is projected to grow 1.7% per annum over the next 18 years, but this represents ~7,000 people over that time, less than 2% of the DHB’s population. Figure 3 provides a longer term view of population trends for each locality illustrating how the population within each locality is changing. The dotted line shows the projected population growth from 2013 onwards.

Figure 3 Population trends by locality from 2001 to 2031



Note: Estimated resident population projections based on Statistics New Zealand medium series. The secondary vertical axis (at double the rate) is used for the for population sizes of Dunedin and Southland localities and the primary vertical axis for all other localities

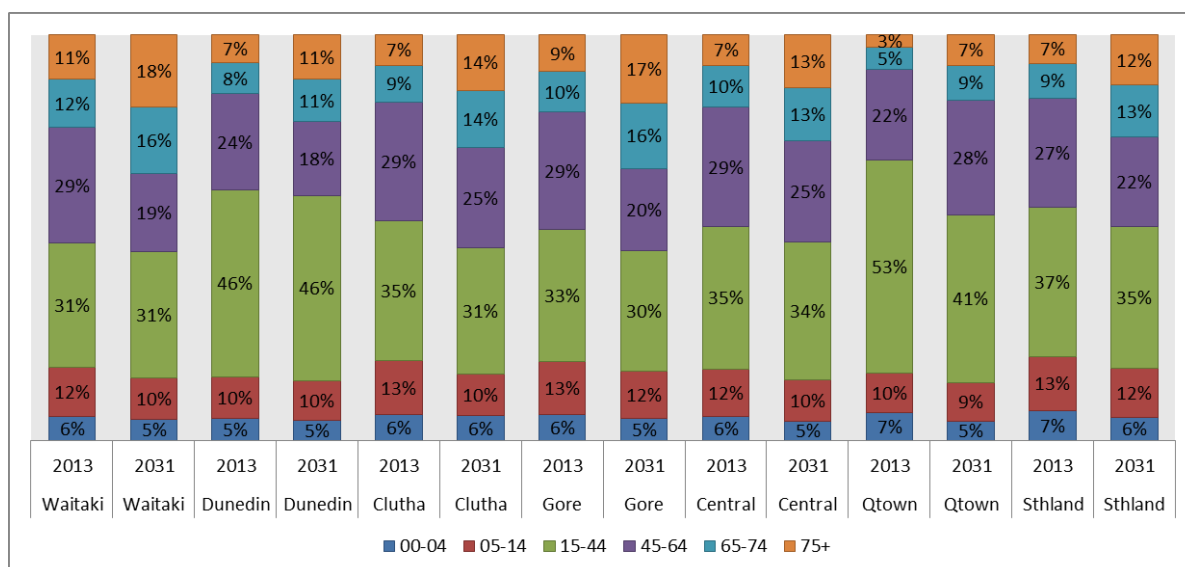
The strongest growth forecast is predicted to occur in the independent urban communities of Queenstown and Wanaka found in Queenstown and Central localities, respectively. The Dunedin locality is projecting small growth (3%) perhaps related to a growing number of tertiary education students attending the University of Otago. This is much lower growth than in previous years – from 4,000 people added in 7 years (2006 to 2013) to only 3,500 in 18 years (2013 to 2031). There are projected declines in the populations of Clutha (-4%) and Waitaki (-7%) localities, which may be attributed to the rural populations migrating towards more urban areas. A decline in population size is also projected for both Southland (-3%) and Gore (-13%) localities. The localities of growth in the DHB are not the same as areas of greatest need.

1.3 Population structure

The age structure of each locality in the Southern district is reasonably similar, apart from Dunedin and Queenstown (Figure 4 and Figure 5). These localities have the largest proportion of people between the ages of 0-44 years, equating to 62% and 69% of their populations respectively. This relates to the large tertiary education facilities in Otago and the high level of tourism service industry activity in Queenstown. As a consequence their proportions of populations of 65 years and over are smaller than other localities. In Queenstown, only 8% of the population is aged 65 years or more. Waitaki has the oldest population with 23% of people being 65 years and over, closely followed by Gore with 19% of the population in this age group.

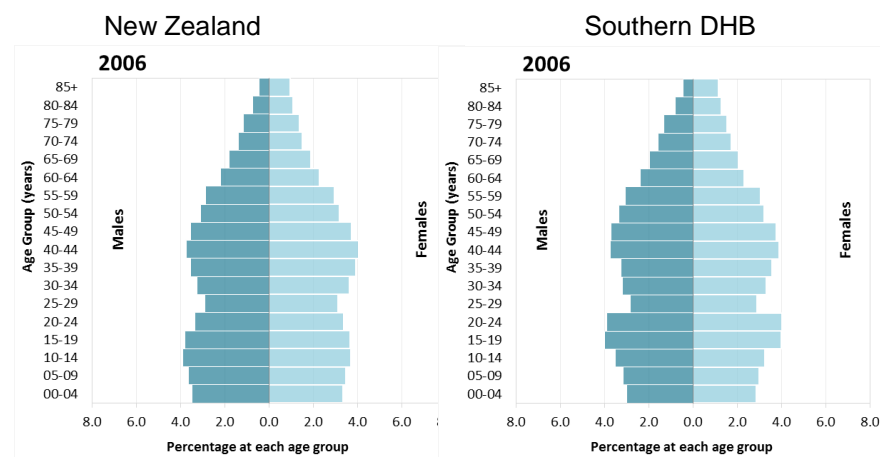
The proportion of 65+ year olds in all localities is expected to increase over time, with an average of 10 percentage points more people 65 years of age and over by 2031. What this means for health service demand will need consideration; the older population is generally becoming healthier compared with a generation ago and the age at which health services are most needed is rising, so overall demand will not be as much as in the past. However it is still likely to increase overall demand somewhat, higher than the otherwise modest population growth would suggest.

Figure 4 Age structure by localities comparing 2013 and 2031



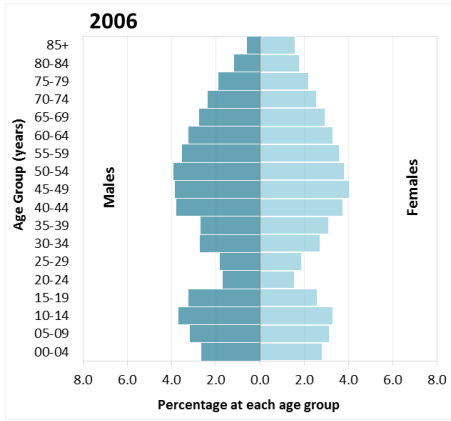
Note: Estimated resident population projections based on Statistics New Zealand medium series.

Figure 5 Age pyramids for New Zealand, Southern, and TAs, 2006

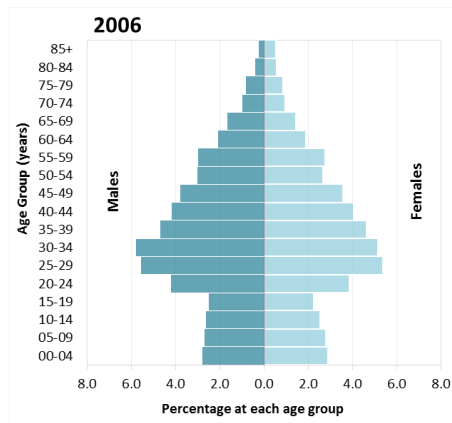


Source: Pawar S, Jackson NO. (2013). Southern District Health Board area demographic profile 1996 - 2026. Commissioned report, University of Waikato. National Institute of Demographic and Economic Analysis.

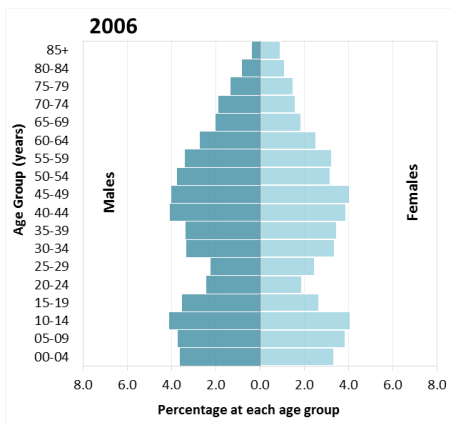
Waitaki District



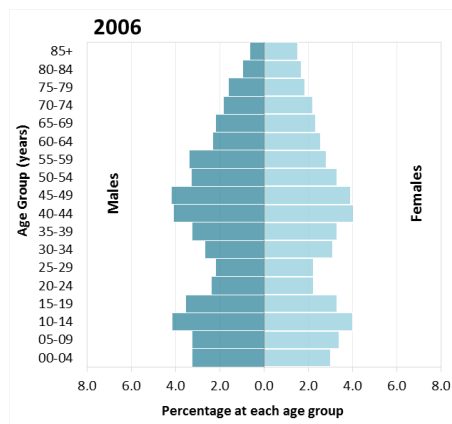
Dunedin City



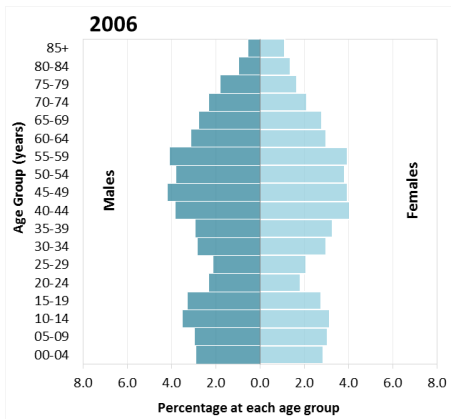
Clutha District



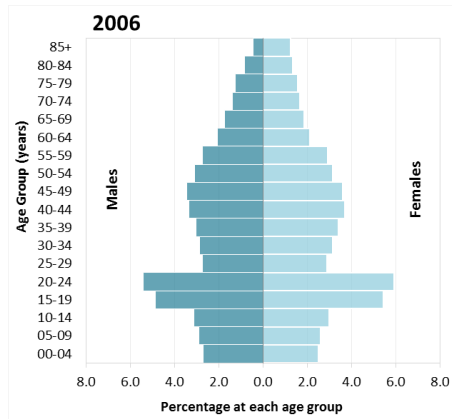
Gore District



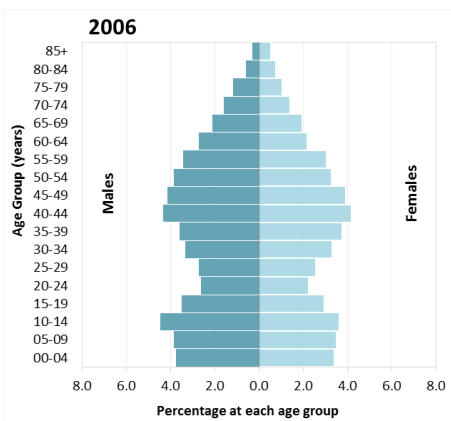
Central Otago



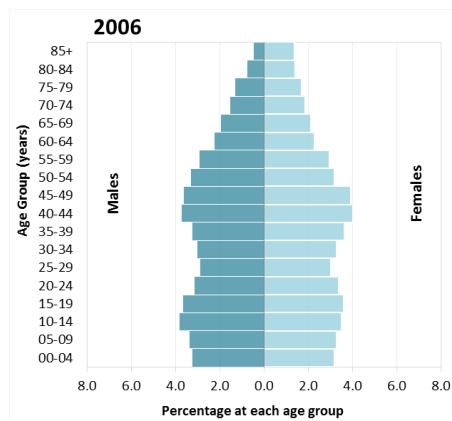
Queenstown-Lakes



Southland District



Invercargill City



The level of 'dependence' of a population can be considered when assessing health care need. This is traditionally determined by the size of the population at 14 years and below and 65 years and above.⁷ While in the present day many people aged 65+ carry on working and would not be considered dependent, it can still be a useful summary load measure for health service use. Table 3 provides a summary of the level of dependence by locality for 2013 and 2031. Total level of dependence in 2013 is highest in Waitaki (41%), closely followed by Gore (38%), and lowest in Queenstown (25%). In 2031 the ageing population projections of dependence reach the highest level at 50% in Waitaki and Gore populations and lowest level of 30% in Queenstown. The overall 33% dependence level for Southern DHB is below to the national average of 34% (range 27% to 39%), though higher for the 65 and older group and lower for 0-14. Southern ranks 17 out of 20 for dependency – that is 4th least-dependent population. By 2031 the Southern average is projected to reach 40%, slightly above the national average which is expected to be 39%. The Southern DHB ranking would then move to 15 out of 20 DHBs.

Table 3 Level of 'dependence' by locality for 2013 and compared with 2031

Locality	Year	<15 years	%	65+ years	%	Combined	Total dependency
Waitaki	2013	3,600	18%	4,600	23%	8,200	41%
	2031	2,900	16%	6,400	34%	9,200	50%
Dunedin	2013	20,600	16%	19,000	15%	39,700	30%
	2031	19,900	15%	28,800	21%	48,700	36%
Clutha	2013	2,100	20%	1,700	16%	3,800	36%
	2031	1,700	16%	2,800	28%	4,500	44%
Gore	2013	2,800	19%	2,800	19%	5,600	38%
	2031	2,100	17%	4,200	33%	6,300	50%
Central	2013	5,100	18%	5,100	18%	10,200	35%
	2031	5,100	15%	9,000	26%	14,100	41%
Queenstown	2013	3,200	17%	1,700	9%	4,900	25%
	2031	3,800	14%	4,200	16%	8,000	30%
Southland	2013	17,400	21%	13,100	16%	30,400	36%
	2031	14,500	18%	20,400	25%	35,000	43%
Total	2013	54,800	18%	48,000	16%	102,800	33%
	2031	50,000	16%	75,800	24%	125,800	40%

Note: Based on estimated resident population projections, Statistics New Zealand medium series.

1.4 Māori population

Māori make up approximately 9% of the population in the Southern district (Table 4). This is significantly lower than the New Zealand average of 16% - indeed Southern is 17th of 20 DHBs in the proportion of Māori population. Of the localities Southland has the highest percentage of Māori at 14% of the population (still below the New Zealand average), and Queenstown the lowest at only 6%. As described in previous health needs assessment work, and as shown in later chapters, Māori people in Southern DHB have significantly worse health outcomes. The uneven distribution across the localities suggests a greater level of health need and more significant challenge in lifting health outcomes for those localities with higher percentages of Māori in their population. Appropriate targeting of health need will be required as part of health service provision planning.

⁷ Increasing numbers of those aged 65+ are still working and would not be considered dependant. The metric remains useful as a simple reflector of the rate of health service use.

Table 4 Māori estimated resident population by locality, 2013

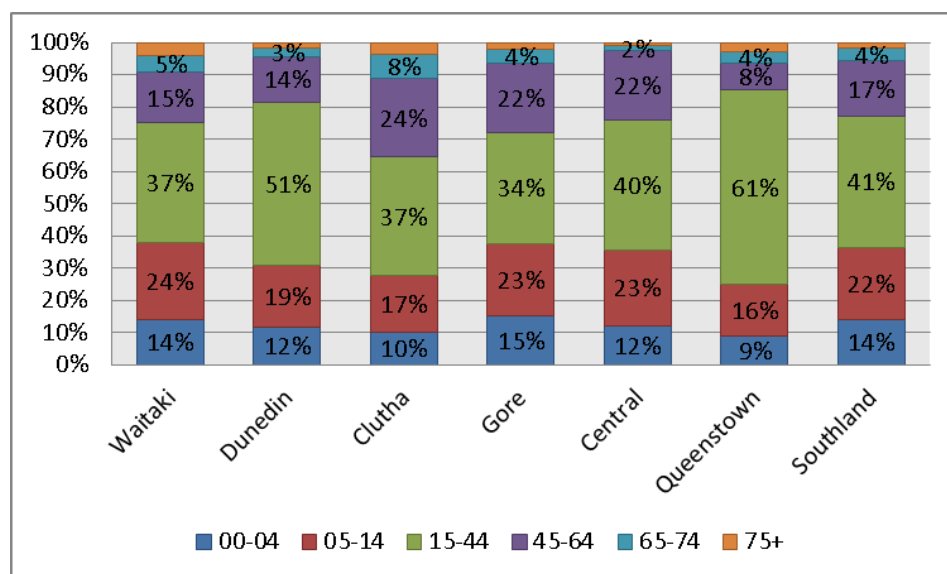
Locality	Māori population 2013	% of total pop	% of Māori in Southern
Waitaki	1,310	7%	5%
Dunedin	9,320	7%	33%
Clutha	1,290	12%	5%
Gore	1,140	8%	4%
Central	2,420	8%	9%
Queenstown	1,080	6%	4%
Southland	11,520	14%	41%
Total	28,060	9%	100%

Note: estimated resident population, Statistics New Zealand medium series (2012).

By 2031 35,000 Māori people are projected to be living in Southern DHB, an additional 7,000 from the 2013 estimate. At that point they would form 11% of the Southern population.

The age structure of Māori populations is significantly younger than non-Māori-non-Pacific (“Other”) with 75% being below 45 years and only 9% being over 65 years of age (Figure 6). Once again Dunedin and Queenstown localities have the youngest populations with 81% and 85% of their Māori populations being below 45 years, respectively. To enable comparisons between Māori and other populations where possible, we have age-standardised the analyses –older people tend to use more health services than younger people, so simple rate comparisons can be misleading.

Figure 6 Māori age structure by locality for 2013



Note: estimated resident population, Statistics New Zealand medium series.

1.5 Pacific population

Pacific make up a small proportion of the population in the Southern District at only 1.5% of the population (Table 5). This is significantly lower than the New Zealand average of 7% - indeed Southern has the second-lowest proportion of Māori and Pacific population combined of any DHB behind South Canterbury. The majority of the Pacific population reside in Dunedin and Southland making up 86% of the total Pacific population in Southern. The remaining 14% of the population are scattered across the Waitaki, Gore, Central and Queensland localities equating to less than 500

people in total. Like Māori, Pacific people in Southern DHB have significantly worse health outcomes. The uneven distribution across the localities suggests a greater level of health need and more significant challenge in lifting health outcomes for those localities with higher percentages of Pacific in their population. Appropriate targeting of health need will be required as part of health service planning.

Table 5 Pacific estimated resident population by locality, 2013

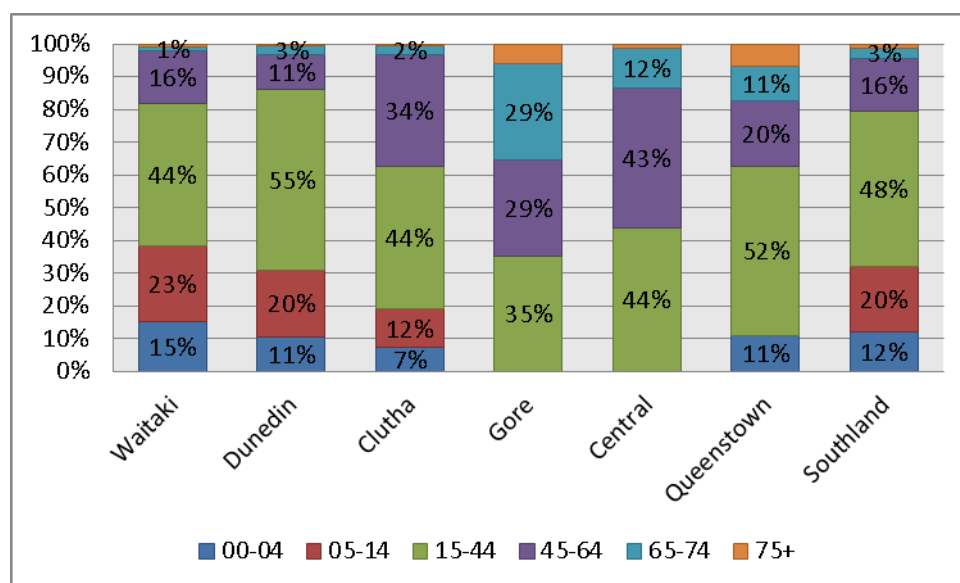
Locality	Pacific population 2013	% of total pop	% of Pacific in Southern
Waitaki	350	2%	8%
Dunedin	2,601	2%	56%
Clutha	175	2%	4%
Gore	<10	0%	0%
Central	50	0%	1%
Queenstown	73	0%	2%
Southland	1,396	2%	30%
Total	4,651	2%	100%

Note: estimated resident population, Statistics New Zealand medium series (2012).

By 2031 6,000 Pacific peoples are projected to be living in Southern DHB, an additional 1,300 from the 2013 estimate. However at this point they would still form less than 2% of the Southern population.

The age structure of Pacific populations, like Māori, is significantly younger than Other with 80% being below 45 years and only 4% being over 65 years of age (Figure 7). Waitaki and Dunedin localities appear to have the youngest Pacific Island populations with 82% and 86% being below 45 years respectively.

Figure 7 Pacific age structure by locality for 2013



Note: estimated resident population, Statistics New Zealand medium series.

2. Socioeconomic status and broader determinants of health

Southern has a high proportion of people in the least deprived section of the population when compared with the national average and a low proportion in the most deprived section.

It is possible to analyse many different socio-economic aspects of people's lives, with Census data providing many different strands. The detailed data from the 2013 data was not available at the time of preparing this report, and it was not thought useful to repeat views of 2006 data. Instead a summary based on a comparative analysis of the localities created in Chapter 1 is provided using the New Zealand Deprivation Index (NZDep2006). Based on the 2006 Census it combines measures of several different determinants of people's access to material and social resources, and their ability to participate in society. These social determinants also affect health either directly or through constraining choices available for individuals. For example, the level of economic resources impacts on a family's ability to afford healthy food, and this influences the nutrition of children.

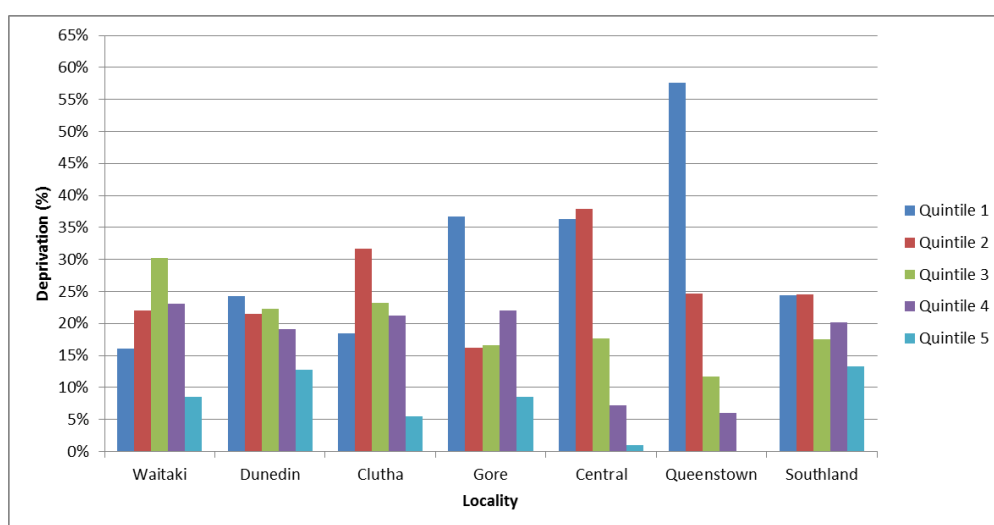
The indices used here are quintiles, ranging from quintile 1 through to quintile 5. A score of 1 indicates that people are living in the least deprived 20% of New Zealand while a score of 5 indicates that people are living in the most deprived 20% of New Zealand.

It is important to note that each index is based on data referring to the average socioeconomic circumstances of the whole population within a mesh block, not to individuals. As such, individuals' circumstances in an area can vary significantly from that area's average. Only 13% of Southern DHB's total population live in quintile 5, much less than the national average of 20%. In contrast 24% live in quintile 1 areas, above the national average of 20%. Queenstown-Lakes TA has the second lowest deprivation ranking in New Zealand out of 72 TAs, followed by Southland District 4th and Central Otago 6th.⁸ Overall Southern DHB is the 6th least deprived DHB out of 20; while ranked by proportion of the population living in quintile 5 areas it ranks 4th, behind Waitemata, Canterbury and South Canterbury.

New Zealand Deprivation Index 2006 measures

- car and telephone access
- receipt of means-tested benefits
- unemployment
- household income
- sole parenting
- educational qualifications
- home ownership
- home living space

Figure 8 Level of deprivation by locality 2013



Deprivation based on NZDep2006, as derived from PHO registers, Q2 2013.

⁸ New Zealand Atlas of Healthcare Variation. <http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/DepF/atlas.html> Accessed 1 Dec 2013.

The level of deprivation by locality across the Southern district is illustrated in Figure 8. Queenstown is clearly the least deprived locality among the district with over 50% of the population living in quintile 1 areas. In fact 83% of the population live in either quintile 1 or 2 areas and none of the population is living in a quintile 5 area. Central locality also has lower levels of deprivation with a total of 74% of the population living in either quintile 1 or 2 areas. This should have positive implications on the demand for acute health care services in each locality and contribute to a lower relative level of population health needs. Average deprivation for each locality is shown in Table 6.

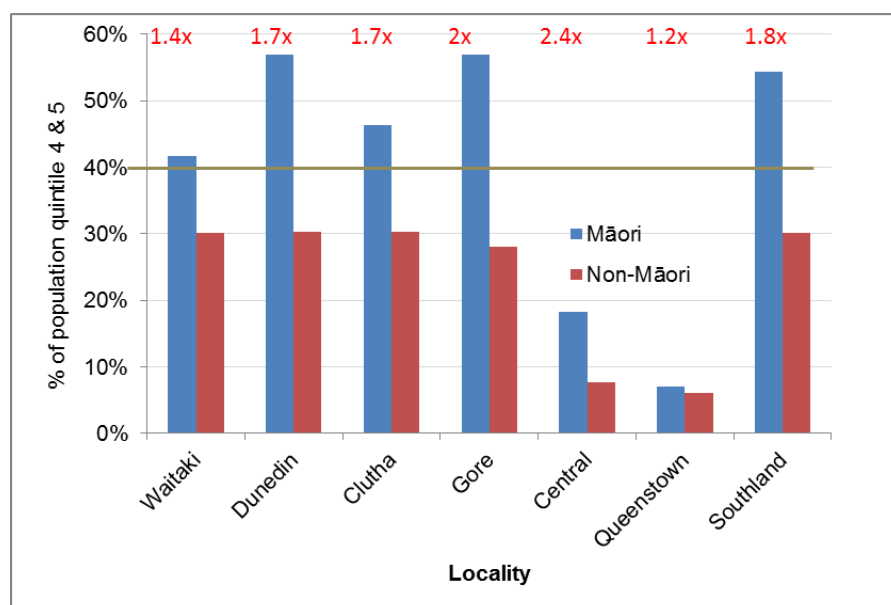
Table 6 NZDep06 deprivation by locality, 2013

Locality	Est. 2013 population	NZDep06	NZDep06 decile	NZDep06 quintile
Waitaki	19,750	981	6	3
Dunedin	131,110	989	6	3
Clutha	9,340	965	5	3
Gore	15,240	966	5	3
Central	27,820	937	3	2
Queenstown	19,680	926	2	1
Southland	82,840	982	6	3
Southern DHB	305,780	976	5	3

Source: Deprivation based on NZDep2006, as derived from PHO registers, Q2 2013.

The remaining localities have more distributed levels of deprivation among their populations with approximately 30% of their respective residents living in quintile 4 and 5 areas. Figure 9 further explores the ethnicities of those most deprived and assesses the level of ethnic disparity among those residing in these regions (quintile 4 & 5). Māori populations are significantly more likely to live in deprived areas than non-Māori with an average of 50% residing in quintile 4 and 5 areas in comparison with 25% of non-Māori – twice as much on average. Central, Gore and Southland localities show the highest proportionate differences.

Figure 9 Percentage of population residing in quintile 4 and 5 areas by locality and ethnicity 2013



Notes: Queenstown has only quintile 4 as there are no quintile 5 areas there; based on PHO enrolment data Q2 2013. The New Zealand average proportion living in quintiles 4 and 5 is 40% (horizontal bar). The number in red at the top of the graph is the multiple of Māori vs Other.

3. Population health outcomes

This chapter briefly examines some overall indicators of health – particularly mortality. Whilst quality of life is also extremely important, it is not possible without some quantity, so life expectancy and premature mortality are key health outcome measures. Infant and child deaths are covered in detail in the recent child epidemiology reports, so are summarised here.

3.1 Life expectancy at birth

Life expectancy at birth is defined as the average number of years that an individual would be expected to live if current mortality rates remain unchanged throughout their entire lifetime. Note that it is a synthetic estimate about the current state and does not indicate how long an individual is actually likely to live, as it does not account for future changes in the incidence and treatment of diseases.

Life expectancy at birth is one of the most useful summary measures of population health. It is reflective of current mortality across different age groups and allows comparison of groups with different population structures. Caution is needed in trying to assess life expectancy for smaller populations, so here we mainly look at the DHB as a whole or the previous DHB catchments.

Table 7 Life expectancy at birth 2010-2012 in years, Southern DHB and New Zealand

	Male	Female	Total	M/F difference	Difference to NZ
Southland	78.5	82.6	80.5	4.1	-0.7
Otago	79.5	83.3	81.4	3.8	0.2
Southern	79.1	83.0	81.0	3.9	-0.2
New Zealand	79.3	83.0	81.2	3.7	-
NZ Māori	72.8	76.5	74.7	3.7	-7.3*
NZ non- Māori	80.2	83.7	82.0	3.5	

Source: HQSC Atlas of Healthcare Variation (Southern, NZ), and Statistics New Zealand (NZ Māori). Based on the previous Southland and Otago DHB catchments, covers deaths registered in the 3 years 2010 to 2012.

* Māori difference as compared to Non-Māori, not NZ as a whole.

Life expectancy at birth for people living in Southern DHB was 81 years for the years 2010 to 2012, slightly less than the New Zealand average of 81.2 years (Table 7). The previous Otago DHB catchment (Waitaki, Dunedin, Clutha, Central localities) had a higher life expectancy at 81.4 years than the previous Southland DHB catchment (Southland, Gore and Queenstown localities) at 80.5 years. The Southland life expectancy was 0.7 years less than the national rate, nearly a year behind its Otago counterpart. Otago ranked 5th out of 21 DHBs, while Southland ranked 11th.

Males continue to lag females in life expectancy at birth, 3.7 years behind for all New Zealand, and 3.9 years behind for Southern. Southland showed a larger difference at 4.1 years. Causes of premature mortality contributing to this difference are discussed below – around a third of the difference in life expectancy is due to ischaemic heart disease.⁹ While the disparity has decreased over the last decade as cardiovascular deaths have fallen and smoking rates equalised, there is still a significant health shortfall for men in Southern DHB.

Numbers of Māori in Southern are a little small to calculate stable life expectancy figures, but if Māori living in Southern had a life expectancy similar to that of Māori nationally there would be a 7.4 year

⁹ Sandiford P. (2009) Gender inequality in New Zealand life expectancy: decomposition by age and cause. NZ Med J 122: 10-17.

shortfall for males, and a 7.2 year shortfall for Māori females. As with the male gap there has been a gradual narrowing of the gap between Māori and non-Māori, but for most commentators the improvements are too little and coming too slowly. The largest single cause of the mortality gap is tobacco smoking, with around one quarter of the difference being due to tobacco use.¹⁰ Smoking is discussed in more detail in section 4.1.

3.2 Life expectancy at age 65

Longevity continues to increase at older ages. Life expectancy at age 65 is defined as the average number of years that an individual who had survived to age 65 would be expected to live if current mortality rates remain unchanged throughout the rest of their lifetime. Southern DHB comes just below the average for New Zealand for life expectancy at age 65, with males expected to survive for a further 18.7 years (if mortality rates remain unchanged) and females 21.1 years (Table 8). If Otago were still a separate DHB it would lie 7th, while Southland would lie 16th out of 21 DHBs.

Table 8 Life expectancy at age 65 in years, 2010-2012, Southern DHB and New Zealand

	Male	Female	Total	M/F difference	Difference to NZ
Southland	18.5	20.7	19.5	2.2	-0.4
Otago	18.9	21.3	20.0	2.4	0.1
Southern	18.7	21.1	19.8	2.3	-0.1
New Zealand	18.8	21.2	19.9	2.4	-
NZ Māori	15.3	16.9	15.9	1.6	-4.0
NZ non- Māori	19.1	21.6	20.3	2.5	

Source: HQSC Atlas of Healthcare Variation (Southern, NZ), and Statistics New Zealand (NZ Māori). Based on the previous Southland and Otago DHB catchments, covers deaths registered in the 3 years 2010 to 2012.

* Māori difference as compared to Non-Māori, not NZ as a whole.

The male shortfall of life expectancy at birth is still apparent at age 65, with a 2.4 year gap for New Zealand males compared with females, and 2.3 years for Southern. Southland showed a smaller difference at 2.2 years, implying that the excess mortality for men is falling at younger ages – possibly through injury rates. If Māori living in Southern had a life expectancy at age 65 similar to that of Māori nationally there would be a 3.8 year shortfall for males, and a 4.7 year shortfall for Māori females.

3.3 Amenable mortality

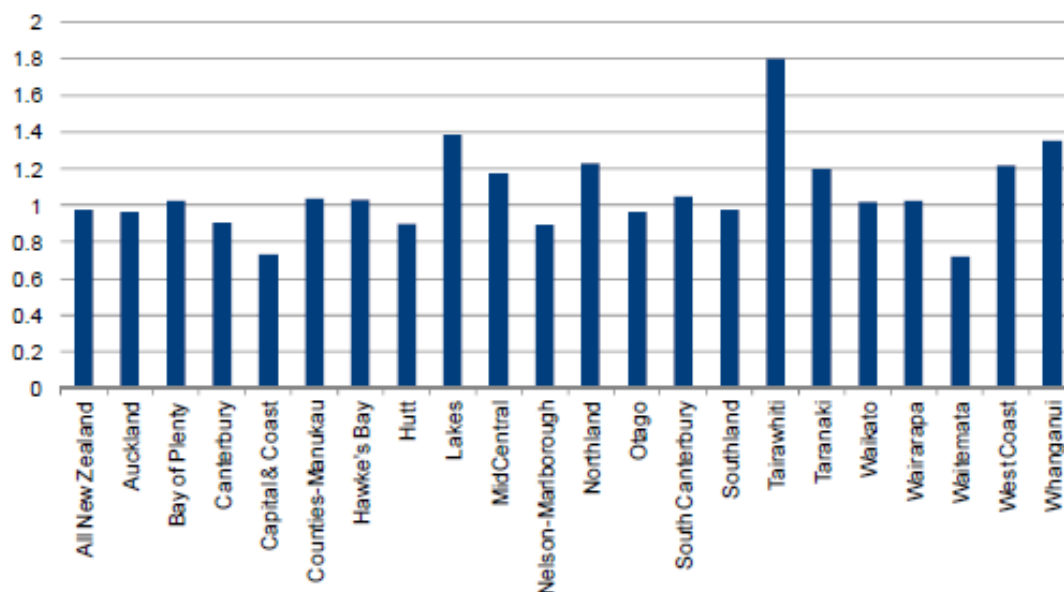
The concept of ‘amenable mortality’ refers to deaths that ‘should not have occurred given available health care services’.¹¹ In OECD countries in 2007, age-standardised amenable mortality rates ranged from 60 to 200 deaths per 100,000 people. New Zealand had 85 deaths per 100,000, which was slightly better than the OECD average of 95 deaths per 100,000.¹² Rates fell from 2000 to 2009 for all ethnicities, but Māori and Pacific rates remain well above other ethnic groups.

¹⁰ Blakely T, Carter K, Wilson N et al. (2010) If nobody smoked tobacco in New Zealand from 2020 onwards, what effect would this have on ethnic inequalities in life expectancy? *NZ Med J* 123: 26-36.

¹¹ Tobias, M., & Yeh, L. (2009). How much does health care contribute to health gain and to health inequality? Trends in amenable mortality in New Zealand 1981-2004. *Aust NZ J Pub Health*, 33(1), 70-78.

¹² New Zealand Treasury. (2013) *Health projections and policy options: Background paper for the 2013 statement on the long-term fiscal position*. Wellington: NZ Treasury Jul 2013

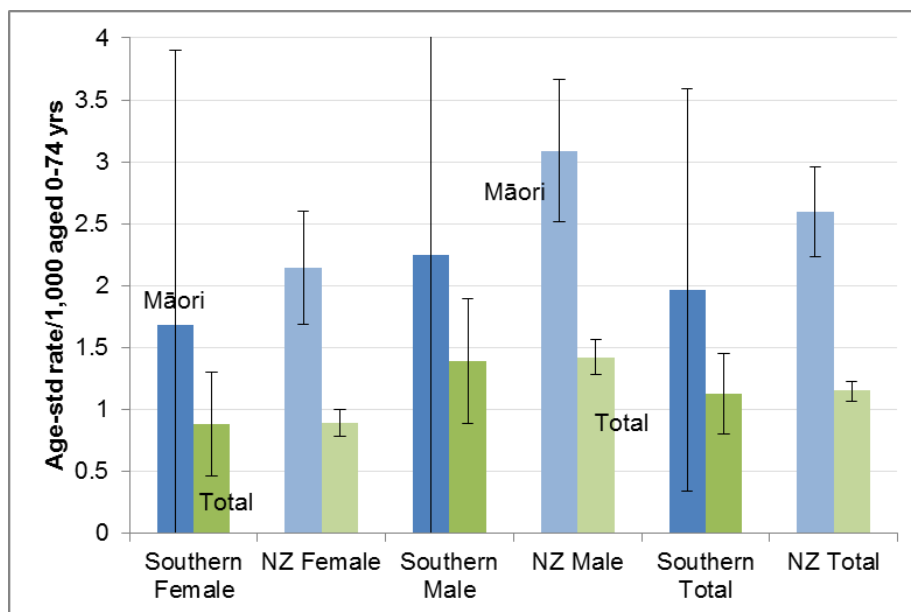
Figure 10 Amenable mortality, ages 0-74 years age-standardised rate per 1000 by DHB, 2009



Source: New Zealand Treasury. (2013) based on Ministry of Health provisional data. Data are presented for the former Otago and Southland DHBs

Amenable mortality by DHB shows the former DHB areas of Otago and Southland similar to or just below the New Zealand average, ranking at 7th and 8th respectively out of the 21 DHBs (Figure 10). Māori residents of Southern DHB had higher rates of amenable mortality, though there was no statistically significant difference between the Māori and non-Māori age-standardised rates (Figure 11). However with amenable mortality rates for Māori remaining almost three times as high as the rates for the non-Māori non-Pacific ethnic groups in New Zealand it is likely that the differences seen are not due to a chance finding, though Southern Māori rates are lower than their counterparts elsewhere in the country.

Figure 11 Amenable mortality, ages 0-74 years age-standardised rate per 1,000, Southern DHB, 2006-08 compared with New Zealand



Source: Marsters et al. (2012). Age-standardised to the 2001 Census Māori population. Blue = Māori, dark for Southern Māori, light for New Zealand Māori.

Figure 11 also shows the overall Southern rates for males and females to be very similar to the national rate for the years covered, as for the 2009 picture in Figure 10. The male rate is 60% higher than the female rate, signalling the higher premature mortality that leads to the life expectancy gap noted above.

The leading causes of avoidable mortality for Southern DHB residents aged 0-74 compared to the average for New Zealand were similar: ischaemic heart disease, suicide and self-inflicted injuries, lung cancer, and motor vehicle accidents (Table 9). For Māori in Southern DHB, diabetes was an additional leading cause, as was colorectal cancer for non-Māori, and overall. Colorectal cancer overall showed a significantly higher rate of mortality and hospitalisation for Southern residents compared with the New Zealand average.

Table 9 Amenable mortality main conditions, age 0-74, Southern DHB and New Zealand 2006-08

	Southern		New Zealand	
	Condition	ASR	Condition	ASR
Female	Breast cancer	9.7	Breast cancer	10.7
	Lung cancer	8.4	Lung cancer	9.3
	Colorectal cancer	8.4	Ischaemic heart disease	8.1
	Ischaemic heart disease	7.3	Colorectal cancer	5.9
	Complic of perinatal period	6.6	Diabetes	5.8
Male	Ischaemic heart disease	25.9	Ischaemic heart disease	27.3
	Suicide & self-inflicted injuries	18.4	Suicide & self-inflicted injuries	15.7
	Motor vehicle accidents	12.9	Motor vehicle accidents	12.3
	Colorectal cancer	10.2	Lung cancer	10.8
	Cerebrovascular diseases	5.9	Diabetes	8.3
Total	Ischaemic heart disease	16.5	Ischaemic heart disease	17.4
	Suicide & self-inflicted injuries	11.8	Suicide & self-inflicted injuries	10.4
	Lung cancer	10.4	Lung cancer	10
	Colorectal cancer	9.2	Motor vehicle accidents	8.6
	Motor vehicle accidents	8.7	Diabetes	7

Source: Marsters et al 2012. ASR = age-standardised rate per 100,000 0-74 year olds, standardised to the 2001 Census Māori population.

3.4 Self-assessed health status

A deceptively simple question “*In general would you say your health was excellent, very good, good, fair or poor*” has been found to be a powerful predictor of future ill health and health care use and even mortality.¹³ It has been used extensively internationally, and provides an alternative to the more traditional measures of ill-health such as hospitalisation rates. It can place more emphasis on quality of life and well-being.

For Southern DHB in 2006/07, 92.7% of the survey sample stated their health was excellent, very good, or good (Table 10). This was the second highest rate of the larger DHBs at that time, behind Capital and Coast. Southern was the only DHB to have a statistically significant decrease in the prevalence of self-reported excellent, very good or good health, falling to 88.6% in 2011/12. This leaves Southern the second lowest of the larger DHBs ahead of Counties Manukau.

¹³ Ministry of Health. (2008) *A Portrait of Health*. Wellington: Ministry of Health – p181.

Table 10 Prevalence of excellent, very good or good self-rated health by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Prevalence (%) 2006/07	95% Confidence Interval 2006/07	Prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
New Zealand	90.2	(89.5–90.9)	89.9	(89.2–90.6)	-
Waitemata DHB	88.8	(86.4–91.0)	91.5	(89.2–93.5)	Increase
Auckland DHB	89.8	(87.4–91.9)	92.0	(88.8–94.5)	Increase
Counties Manukau DHB	89.2	(86.6–91.5)	85.5	(81.5–88.8)	Decrease
Waikato DHB	88.0	(86.0–89.9)	89.8	(86.0–92.9)	Increase
Capital and Coast DHB	93.7	(91.7–95.4)	91.4	(88.4–93.9)	Decrease
Canterbury DHB	90.8	(88.5–92.8)	91.3	(88.3–93.8)	-
Southern DHB	92.7	(89.8–95.0)	88.6	(85.7–91.0)	Decrease

Source: New Zealand Health Survey. Adults aged 15+, prevalence age standardised to WHO world population. Red/green figures are statistically lower/higher than the national average.

This lower than average self-rated health status is consistent with the average findings for life expectancy and amenable mortality in the sections above. That is, for the relatively low deprivation seen for people living in the Southern DHB area one might have expected a higher health status than appears shown by these measures.

4. Population risk factors

In this chapter the main drivers for ill health are discussed. Non communicable diseases (NCDs) are largely preventable but still account for a significant proportion (80%) of disease burden for the total population. The main risk factors for the development of NCDs include smoking, obesity, poor diet, physical inactivity and harmful use of alcohol¹⁴. Each of these risk factors is explored in further detail below. The main source of data for population risk factors comes from the Census for smoking data, and from the New Zealand Health Survey. This Ministry of Health-funded survey has a large sample (over 15,000, 927 for Southern for 2011/12), which is able to provide estimates for the larger DHBs – extrapolations from the people sampled in the survey. The data is however suggestive rather than definitive, and should be cross-checked where possible with data from other sources. Data is not available to estimate rates at a locality level.

4.1 Tobacco smoking

The proportion of smokers among adults in New Zealand has shown a marked decline over the past twenty five years from 30.0% in 1985 to 15.1% in 2013. Much of this decline can be attributed to policies aimed at reducing tobacco consumption through public awareness campaigns, advertising bans and increased taxation¹⁵. However, smoking is a major cause of lung cancer and chronic obstructive pulmonary disease (COPD) amongst many other conditions.¹⁶ With the highly cost-effective and even cost-saving interventions available, high emphasis on reducing rates further is warranted.¹⁷

Initial results are presented here from Census 2013 and compared with Census 2006.¹⁸ Note that Health Survey data is also available for smoking rates, but for Southern appears to differ from the Census results. As the Census has the larger sample it is presumed to be more reliable, so is used here. Appendix 1 shows the Health Survey results for comparison. It is unclear why there is a difference for Southern but not for other DHBs or New Zealand as a whole.

Table 11 Daily smoking prevalence by district and all New Zealand, 2006 and 2013

District	Prevalence (%) 2006	Prevalence (%) 2013	Difference 2006 to 2013 (% points)	% change
Otago	19.5%	14.0%	-5.6%	-29%
Southland	24.3%	19.2%	-5.0%	-21%
Southern	21.0%	15.6%	-5.4%	-26%
All New Zealand	20.7%	15.1%	-5.6%	-27%

Source: New Zealand Census, crude rates based on usually resident population. Daily smoking defined as adults (age 15+) active smoking of one or more manufactured or hand rolled tobacco cigarettes per day.

Table 11 shows the age standardised prevalence of current smoking rates in New Zealand defined as adults who smoke daily, and the change from 2006 to 2013. Southern fell from 21% adults smoking in 2006 to 15.6% in 2013, a fall of 26%. Otago had a lower smoking rate at 14% in 2013, and a

¹⁴ Ministry of Health. 2012. *Briefing to the Incoming Minister of Health*. Wellington: Ministry of Health.

¹⁵ OECD Health Data. OECD Health Data 2013: How Does New Zealand Compare [Internet]. 2013 (cited 9 Oct 2013). Available from: www.oecd.org/nz

¹⁶ U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. Atlanta, GA: U.S. Dept of Health & Human Services, CDC, 2014.:

¹⁷ Vos T, Carter R, Barendregt J, et al. *Assessing Cost-Effectiveness in Prevention (ACE-Prevention): Final Report*. University of Queensland, Brisbane and Deakin University, Melbourne, 2010.

¹⁸ Only totals were available for this report, so age-standardising was not possible

higher drop at 29%. Southland rates of smoking are much higher at 19.2%, and have been falling more slowly.

Table 12 Daily smoking prevalence by gender and ethnicity, Southern DHB, 2006 and 2013

Ethnicity/gender	Prevalence (%) 2006	Prevalence (%) 2013	Difference 2006 to 2013 (% points)	% change
Māori	39.4%	29.9%	-9.5%	-24%
Pacific	32.5%	24.2%	-8.3%	-26%
European/Other	20.1%	15.1%	-5.0%	-25%
Total	21.0%	15.6%	-5.4%	-26%
Male	22.4%	17.1%	-5.3%	-24%
Female	20.1%	14.8%	-5.3%	-26%

Source: New Zealand Census, crude rates based on usually resident population, multiple ethnicity identification. Daily smoking defined as adults (age 15+) active smoking of one or more manufactured or hand rolled tobacco cigarettes per day.

Māori (29.9%) and Pacific (24.2%) rates of smoking were much higher than European and Other (15.1%) in Southern but showed a larger absolute fall, albeit a similar proportional fall, from 2006 to 2013 (Table 12). Male rates of smoking (17.1%) remain higher than female (14.8%).

4.2 Hazardous drinking

Alcohol misuse is a major risk factor for conditions such as liver disease, pancreatitis, diabetes and some types of cancer, and contributes to motor vehicle accidents, falls, burns and suicide. Alcohol is associated with social and emotional harms such as family violence, and can lead to community dysfunction and incarceration. Foetal alcohol spectrum disorders may occur when mothers have consumed alcohol during pregnancy. Highly cost-effective or even cost-saving interventions are available¹⁹. Data on population alcohol consumption comes from the New Zealand Health Survey, with the two latest surveys, 2006/07 and 2011/12 providing a consistent measure over time. Alcohol consumption is self-reported in the survey, and as such, is likely to underestimate the amount of alcohol actually consumed. Hazardous drinking in this instance is defined as an established drinking pattern that carries a risk of harming physical or mental health or having harmful social effects to the drinker or others. This is determined through a 10 question Alcohol Use Disorders Identification Test (AUDIT) where a score of 8 or more is defined as hazardous drinking.

Table 13 Age standardised prevalence of hazardous drinking by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	19.9	(19.0–20.9)	17.0	(15.9–18.0)	Decrease
Waitemata	17.7	(14.7–21.1)	16.6	(14.1–19.5)	Decrease
Auckland	17.3	(14.1–20.8)	18.3	(14.1–23.2)	Increase
Counties Manukau	14.3	(12.3–16.5)	14.9	(11.5–18.9)	Increase
Waikato	22.5	(19.6–25.6)	14.2	(11.6–17.2)	Decrease
Capital and Coast	20.0	(15.9–24.7)	18.6	(14.4–23.5)	Decrease
Canterbury	21.6	(18.5–25.0)	11.0	(8.5–13.9)	Decrease
Southern	25.3	(19.6–31.6)	25.1	(19.9–30.8)	-

Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Hazardous drinking is defined as an AUDIT score of 8 or more. Red/green figures are statistically higher/lower than the national average.

¹⁹ Vos T, Carter R, Barendregt J, et al. *Assessing Cost-Effectiveness in Prevention (ACE-Prevention): Final Report*. University of Queensland, Brisbane and Deakin University, Melbourne, 2010.

Overall a quarter of adults (25.1%) in the Southern district population in 2011/12 were estimated to be hazardous drinkers, which is similar to that of 2006/07, and shows no significant decrease in the prevalence of hazardous drinking over the 5 year period. This is significantly higher than the national average of 17%, and higher than any of the other large DHBs, suggesting further efforts are needed to address the hazardous use of alcohol in the district. Note that the results are age-standardised, so any effect of a higher proportion of students in the district should be controlled.

A recent study corroborates the high rate of harm likely to be being caused by excess alcohol consumption.²⁰ *“We extracted alcohol-related hospital discharge data for the 2008–2012 financial years from the Dunedin, Southland, Lakes District and Wakari hospitals to examine trends in the number of patient episodes including conditions wholly attributable to alcohol use. There were 6628 discharge records for that period that contained a diagnosis for a condition wholly attributable to alcohol. The number of patient episodes including alcohol-attributable conditions increased steadily and substantially over the five-year period, beyond what we might expect from population growth.”*

A further study in 2012 examined emergency department presentations in Southern.²¹ Patients presenting to the EDs of Dunedin, Southland and Lakes District hospitals were asked if alcohol contributed to their presentation. 2579 presentations were identified as being alcohol-related. The highest overall prevalence of alcohol-related presentations was observed at Lakes District Hospital (Lakes District 12%; Dunedin 6%; Southland 5%). All hospitals saw people under the legal age for purchasing alcohol present with an alcohol-related condition - 11% of all alcohol related presentations at Southland Hospital, 7% at Dunedin Hospital and 5% at Lakes District Hospital.

It is worth quoting the conclusion of the recent DHB report in full. *“[This Report] identifies the very significant role that alcohol plays in causing harm to the health of our residents and the impact that this has on our health services. We confirm that alcohol-related harm to health is indeed well and truly present within our own population. It is a major concern to us that this harm is often accepted and normalised, and sometimes even glamorised. Despite alcohol’s widespread use and appreciation, the fact remains that alcohol has inherent dangers as a psychotropic drug, addictive substance, toxin and carcinogen. For this reason, regulations controlling its availability, accessibility and promotion are well justified—particularly in light of the strong commercial imperatives driving its sale and supply.”* The impact of alcohol on the health of Southern communities. p iv.

4.3 Obesity

Rates of obesity have risen sharply in recent decades in all OECD countries. New Zealand is unfortunately no exception, with obesity rates – those with BMI >30 - reaching 28.4% in 2012²². This is higher than the average of the 15 OECD countries at 22.8%. The Body Mass Index (BMI) is used to classify obesity in adults, and is defined as a person’s weight in kilograms divided by the square of his/her height in metres (kg/m²). At a population level there is a strong association between BMI and health risk. The growing prevalence of obesity foreshadows increases in the occurrence of chronic diseases such as diabetes and cardiovascular diseases, and is therefore likely to be associated with higher health care costs. It should be noted that the data comes from measured weight and height from the New Zealand Health Survey, unlike many countries which use self-reported weight and height and as such are likely to be an underestimate of the size of their problem. This may affect New Zealand’s ranking on the world stage a place or two, but with more than a quarter of the population obese there is a clear health risk present.

The prevalence of obesity in Southern DHB was estimated to be marginally higher than the national average at 29.8% for 2011/12, and shows a 4 percentage point increase from 2006/07 (Table 14) –

²⁰ Public Health South. *The Impact of alcohol on the health of Southern communities*. Southern DHB, July 2013

²¹ Ibid

²² OECD Health Data. OECD Health Data 2013: How Does New Zealand Compare [Internet]. 2013 (cited 9 Oct 2013). Available from www.oecd.org/nz

that is an 18% increase in five years. Although not statistically significant, the growth is in line with the general national trend of increasing obesity. Obesity follows a strong deprivation gradient, with people living in higher deprivation areas tending to have higher obesity rates. Southern DHB's obesity rates are higher than one might have expected compared with other DHBs of similar deprivation level, for example Waitemata or Capital and Coast. Indeed a rate lower than the national average might have been expected.

Table 14 Age standardised prevalence of obesity by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	25.6	(24.7–26.6)	27.9	(26.7–29.1)	Increase
Waitemata	20.0	(16.9–23.4)	22.2	(18.6–26.2)	Increase
Auckland	21.6	(18.3–25.1)	20.7	(17.2–24.6)	Decrease
Counties Manukau	32.9	(29.2–36.8)	39.3	(34.1–44.6)	Increase
Waikato	28.9	(25.8–32.1)	34.3	(30.6–38.1)	Increase
Capital and Coast	21.9	(17.9–26.3)	25.7	(19.9–32.3)	Increase
Canterbury	22.3	(19.8–25.1)	23.1	(19.8–26.8)	Increase
Southern	25.3	(21.2–29.8)	29.8	(24.8–35.3)	Increase

Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Obesity defined as BMI 30 or higher, weight and height are directly measured (ie not self-reported). Red/green figures are statistically higher/lower than the national average.

An estimate was derived from the 2006/07 Health Survey of the number of people in each DHB suffering from morbid obesity and who might benefit from bariatric surgery (weight-loss surgery such as gastric banding).²³ In this setting morbid obesity was defined as a BMI of 40 or more or a BMI from 35-39 with obesity-related comorbidities such as diabetes. For Southern DHB an estimated 6.6% of the adult population aged 15-64 would be morbidly obese compared with the national average estimated at 8.2%. Although lower than the average, this still means an estimated 13,200 morbidly obese people: 8,600 females and 4,600 males. Māori were estimated at 1,500, and Pacific 700 morbidly obese – 13% and 29% respectively of the 15-64 year old population.

4.4 Physical activity

An adequate level of physical activity requires 150 minutes weekly, which equates to 30 minutes of activity five-times a week or some variation thereof - but any level of activity is better than none at all. Regular physical activity can be protective against the development of health conditions such as obesity, diabetes, heart disease and hypertension, and also mental health conditions such as depression and anxiety. Data on population exercise levels comes from self-reported activity from the New Zealand Health Survey, and as such is likely to overestimate the amount of exercise actually performed.

Table 15 shows the age standardised rate of physical activity in New Zealand, defined as adults (15 years and over) who have done at least 30 minutes of moderate-intensity physical activity (or equivalent) on at least five of the past seven days. Two-thirds of Southern DHB adults (67%) reported meeting recommended physical exercise levels in 2011/12. Southern DHB had the highest self-reported rate of physical activity in 2006/07 and the second highest rate following Canterbury DHB in 2011/12 (which had a huge increase following on from the earthquakes in that area).

²³ Ministry of Health (2008). Assessment of the business case for the management of adult morbid obesity in New Zealand. Wellington: Ministry of Health.

Although the difference between 2006/07 and 2011/12 is not a statistically significant, Southern has a significantly higher rate of physical activity than the national average (p-value >0.01).

Table 15 Age standardised prevalence of physical activity by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	53.0	(51.7–54.4)	55.5	(53.0–58.0)	Increase
Waitemata	48.5	(44.1–53.0)	45.9	(41.4–50.4)	Decrease
Auckland	42.1	(37.6–46.8)	46.3	(41.6–51.1)	Increase
Counties Manukau	55.5	(51.6–59.5)	40.6	(36.2–45.1)	Decrease
Waikato	54.7	(51.3–58.1)	57.8	(51.0–64.5)	Increase
Capital and Coast	46.3	(41.1–51.5)	41.8	(36.9–46.9)	Decrease
Canterbury	53.5	(49.2–57.7)	83.9	(80.0–87.4)	Increase
Southern	63.2	(57.2–69.0)	67.4	(61.4–73.0)	Increase

Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Physical activity defined as the equivalent of at least 30 minutes of moderate-intensity physical activity (or equivalent) on at least five of the past seven days. Red/green figures are statistically lower/higher than the national average.

4.5 Nutrition

Nutrition is an important aspect of maintaining good health status and quality of life and an unhealthy diet is a risk factor for chronic disease independent of obesity and physical exercise. Useful proxies for overall healthy nutrition are fruit and vegetables intake. Fruit and vegetables are an important part of the human diet, packed with valuable nutrients, fibre and essential vitamins and minerals that provide numerous health benefits. A healthy intake of fruit and vegetables helps to protect against chronic diseases like CVD and cancer. The New Zealand Health Survey reports on the number of people who meet the recommended intake of fruit (2 or more servings) and vegetables (3 or more servings) per day. Table 16 and Table 17 show the number of residents in the Southern district who met the recommended intake of fruit and vegetables respectively. Southern residents eat less fruit and vegetables than the national average, and rates have dropped slightly over the past 5 years. Although neither of these differences appears to be statistically significant, the falling trend is a concern.

Table 16 Age standardised prevalence of recommended fruit intake (2+ servings per day) by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
New Zealand	59.0	(57.7–60.3)	57.5	(56.4–58.7)	Decrease
Waitemata	60.7	(57.6–63.7)	56.4	(52.7–59.9)	Decrease
Auckland	62.0	(58.1–65.7)	55.8	(51.6–60.0)	Decrease
Counties Manukau	57.2	(53.1–61.3)	51.0	(45.9–56.0)	Decrease
Waikato	54.9	(51.1–58.7)	55.0	(50.9–59.0)	-
Capital and Coast	63.1	(57.4–68.5)	65.7	(61.2–70.0)	Increase
Canterbury	59.6	(55.3–63.8)	65.0	(59.8–70.0)	Increase
Southern	56.4	(50.8–61.8)	55.9	(51.7–60.0)	Decrease

Notes: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Red/green figures are statistically lower/higher than the national average.

Table 17 Age standardised prevalence of recommended vegetable intake (3+ servings per day) by DHB for 2006/07 and 2011/12

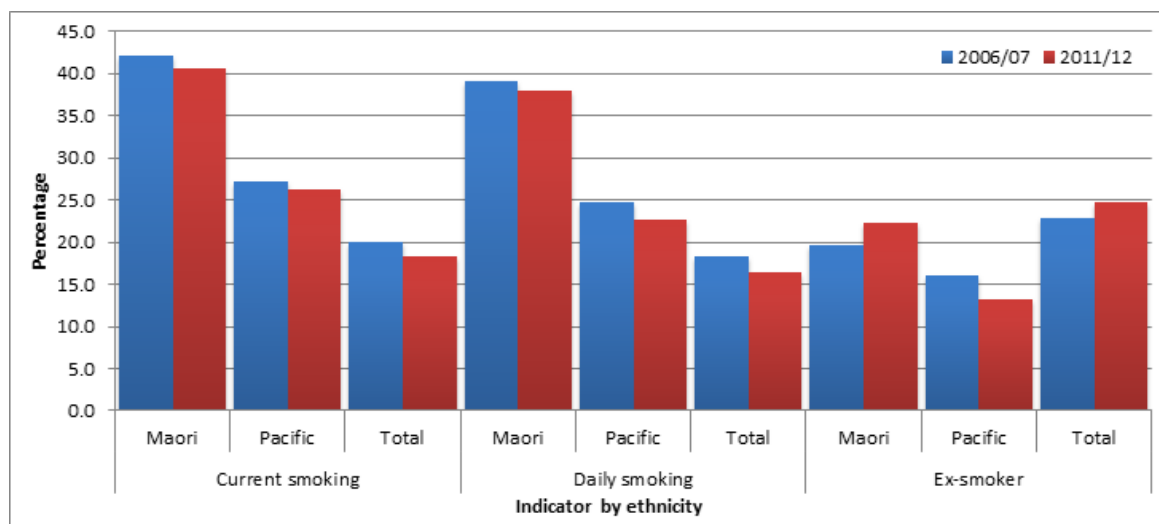
Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
New Zealand	62.5	(61.2–63.8)	66.8	(64.6–69.0)	Increase
Waitemata	54.6	(49.9–59.2)	55.5	(50.0–60.9)	Increase
Auckland	55.8	(51.2–60.4)	56.5	(49.1–63.7)	Increase
Counties Manukau	50.7	(46.3–55.1)	41.2	(36.6–46.0)	Decrease
Waikato	70.1	(66.4–73.6)	67.5	(63.2–71.7)	Decrease
Capital and Coast	64.9	(59.3–70.2)	65.7	(60.8–70.3)	Increase
Canterbury	66.9	(62.2–71.3)	86.0	(82.3–89.1)	Increase
Southern	71.8	(67.4–76.0)	71.0	(64.9–76.6)	Decrease

Notes: As Table 16

4.6 Māori and Pacific risk factors

Limitations in the availability of data have prevented the analysis of each population risk factor by ethnicity for Southern DHB residents. However comparisons are able to be made at a national level. Māori and Pacific peoples have a disproportionately higher prevalence of smoking, and lower rates of ex-smoking than the national average (Figure 12). This leads to higher rates of long term conditions such as cardiovascular disease, diabetes and cancer (discussed further in chapter 5). The number of ex-smokers appear to be showing a positive trend for Māori with 22.4% of the population of smokers quitting in 2011/12, further work is however required for the Pacific population.

Figure 12 Smoking rates by ethnicity for New Zealand 2006/07 and 2011/12



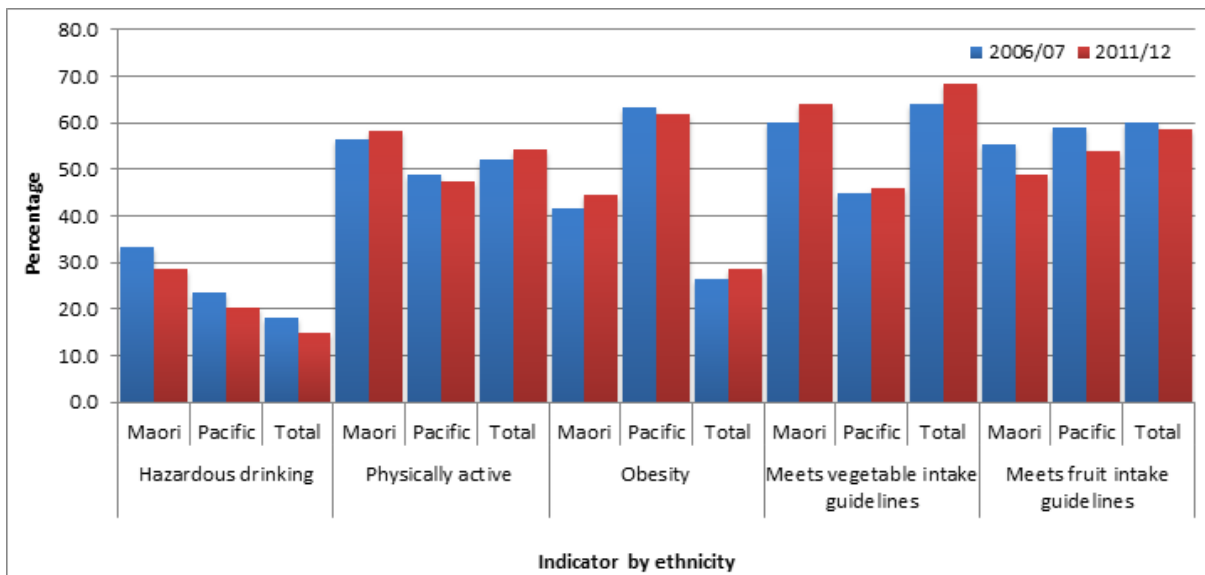
Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Current smoking defined as smoking at least monthly and have smoked more than 100 cigarettes in their life time., daily smoking same but smoke at least once a day.

Hazardous drinking, nutrition and obesity rates also appear to be poorer for Māori and Pacific people (Figure 13). It is only with self-reported physical activity that Māori appear to do well, being more physically active than the population as a whole with 58% meeting the physical activity guidelines in comparison with 45% of the total population.

Obesity rates for Māori and Pacific, in particular Pacific populations, are of particular concern with 45% and 62% respectively falling within this category. If these results were extrapolated to the Māori and Pacific population in the Southern district there would be 12,600 obese adult Māori and 2,900 obese adult Pacific peoples residing in the area. Morbid obesity estimates for Pacific and Māori in Southern DHB are noted in the obesity section above.

Diet appears to be another area where disparity among Māori and Pacific ethnicities is evident compared with the whole population. More (4%) Māori are now eating 3+ servings of vegetables per day, which is statistically significant and reduces the gap to only 4% lower than the total populations' intake. However the Māori population has appeared to reduce fruit intake between 2006/07 and 2011/12 with a statistically significant 6% drop in the number of Māori eating 2+ servings of fruit per day. Pacific peoples also appear to have reduced fruit intake between 2006/07 and 2011/12, although this is not statistically significant. It does however, increase the gap to approximately 4% lower than the total populations' intake. The Pacific population also perform rather poorly on vegetable intake with less than half the population meeting the vegetable intake guidelines in 2011/12.

Figure 13 Population risk factors by ethnicity for New Zealand 2011/12



Source: New Zealand Health Survey. Adults (age 15+) age standardised to WHO world population. Definitions as noted in the tables above.

5. Long term conditions

This chapter examines key long term conditions affecting people living in the Southern region. The long term conditions covered include:

- Diabetes
- Cardiovascular disease
- Cerebrovascular disease
- Cancer
- Respiratory disease – asthma and COPD

These conditions are non-infectious and non-transmittable and are often termed non-communicable diseases. The risk factors including high blood pressure, high blood cholesterol and high blood glucose increase the risk of developing these conditions, or contribute to their severity.

Conditions such as diabetes, cardiovascular and cerebrovascular disease, cancer and respiratory disease are largely avoidable yet still account for 80 percent of early deaths. These conditions continue to have a disproportionate effect on Māori, Pacific and those people on low incomes, with Māori sustaining greater health loss in most condition groups. Health loss in this context is defined as the difference between the population's current state of health and that of an ideal population in which everyone experiences long lives free from ill health or disability. The New Zealand Burden of Disease Study estimated health loss using the DALY (disability-adjusted life year). The DALY combines information on both fatal outcomes (early death) and non-fatal outcomes (illness or disability) in a way that makes it possible to compare the effects of different diseases and injuries across population groups and over time. In 2006 the level of burden experienced by Māori for the leading causes of health loss was 26% higher for vascular disorders (coronary heart disease and stroke) 15% higher for cancers, 12% higher for mental illness (discussed further in chapter 11), and 9% higher for diabetes and other endocrine disorders. These leading causes of health loss are projected to remain consistent through till 2016. Although it was noted that relative inequalities in the burden of respiratory disease exist between Māori and non-Māori, absolute figures were not provided²⁴.

The estimated prevalence of the long term conditions discussed below has been taken from the 2011/12 New Zealand Health Survey and therefore provides suggestive rather than definitive rates. This information is not available at the locality level and therefore efforts have been made to analyse rates of hospitalisation for each disease by locality and where possible by ethnicity. Hospitalisation rates for specific conditions provide insight into the health of the population and may provide some indication on prevalence of disease or barriers to access to effective primary care.

5.1 Diabetes

Diabetes is a major contributor to the loss of health among the Southern population. There are two main types of diabetes (with some crossover). Type 1 is caused by destruction of insulin producing cells in the pancreas, usually develops in childhood and requires daily insulin injections in order to sustain life. Type 2 diabetes is caused by the body's tissues becoming resistant to the action of insulin and usually develops in adulthood.

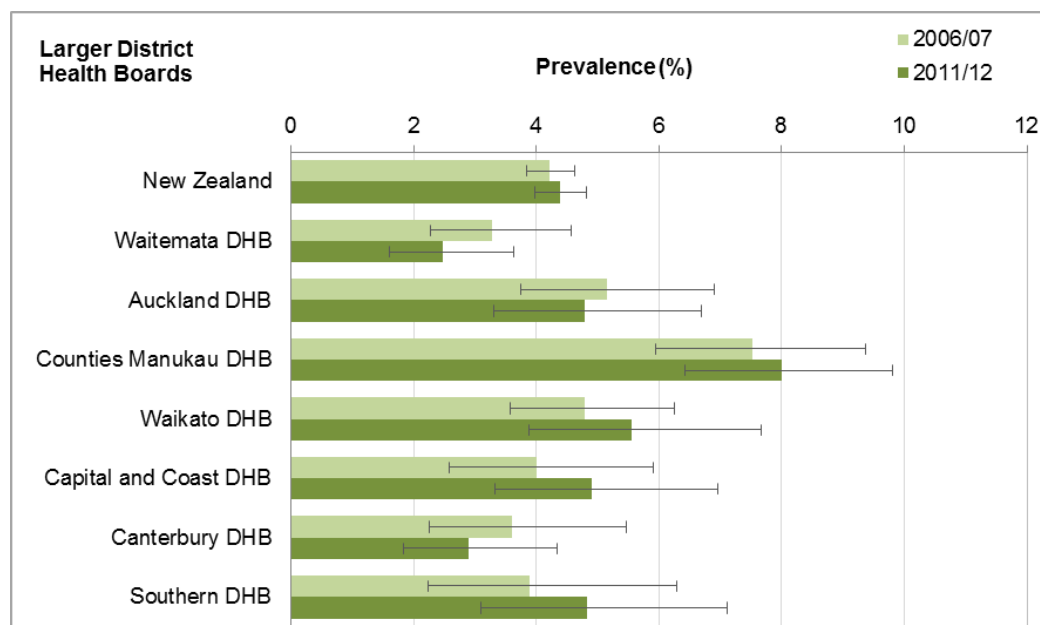
The prevalence of Type 2 diabetes has been increasing, and makes up more than 90% of today's diabetes burden. The increasing obesity rate is the single largest driver of the increase in Type 2

²⁴ Ministry of Health. 2013. Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016. Wellington: Ministry of Health.

diabetes, along with physical inactivity²⁵. Type 2 diabetes can be prevented through diet and weight control; in fact there is a growing body of evidence to suggest that it can be managed or completely reversed with significant weight loss. Other management treatments include tablets and insulin, either alone or in combination, and for appropriate patients, bariatric surgery may be a potential management option²⁶.

Despite having a higher than average rate of physical activity the Southern district has still seen an 18% growth in obesity over the past five years. This links with the growing number of residents with Type 2 diabetes. Figure 14 shows the age standardised prevalence of diabetes in the Southern district to be 4.8%, which equates to approximately 14,700 people living with diabetes (using Statistics NZ estimated resident population 2011). This is a 23% increase from 2006 where 11,475 (3.9%) residents were estimated to be living with diabetes, although this is not statistically significant (p value 0.45). When compared to the national average (4.4%) the Southern district has slightly higher prevalence of diabetes, however this is once again not statistically significant (p value 0.65).

Figure 14 Prevalence of diabetes by DHB for 2006/07 and 2011/12



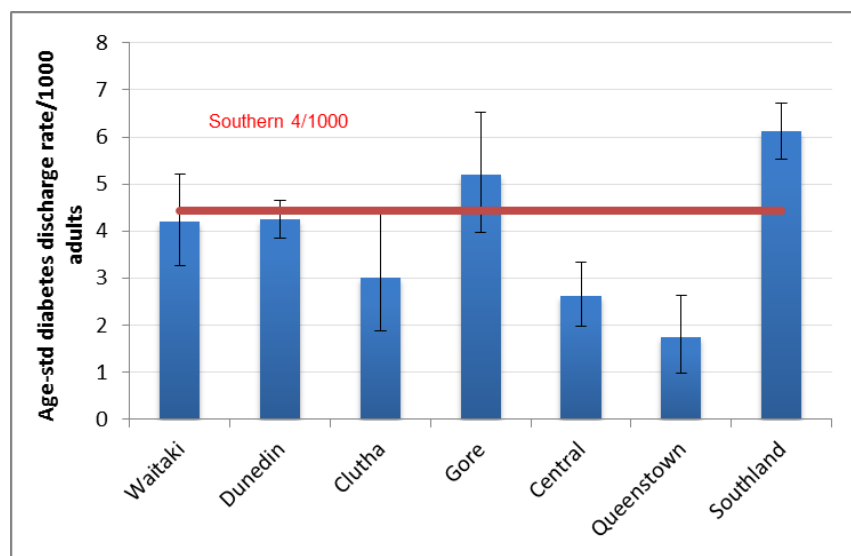
Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population.

At the locality level Figure 15 shows the diabetes related hospitalisations for their respective residents between 2010/11 and 2012/2013 (three years). The overall average rate of diabetes related admissions for the Southern district is 4 hospitalisations per 1000 residents per year. Rates appeared to vary across the localities with Southland having a higher rate of 6 hospitalisations per 1000 and Central and Queenstown having lower rates of approximately 3 and 2 hospitalisations per 1000 people, respectively. Clutha also appears to have a moderately low rate of hospitalisations (3 per 1000), however this is not statistically different from the Southern average.

²⁵ Hu, FB. (2003) Sedentary lifestyle and risk of obesity and type 2 diabetes *Lipids* ;38(2):103-108

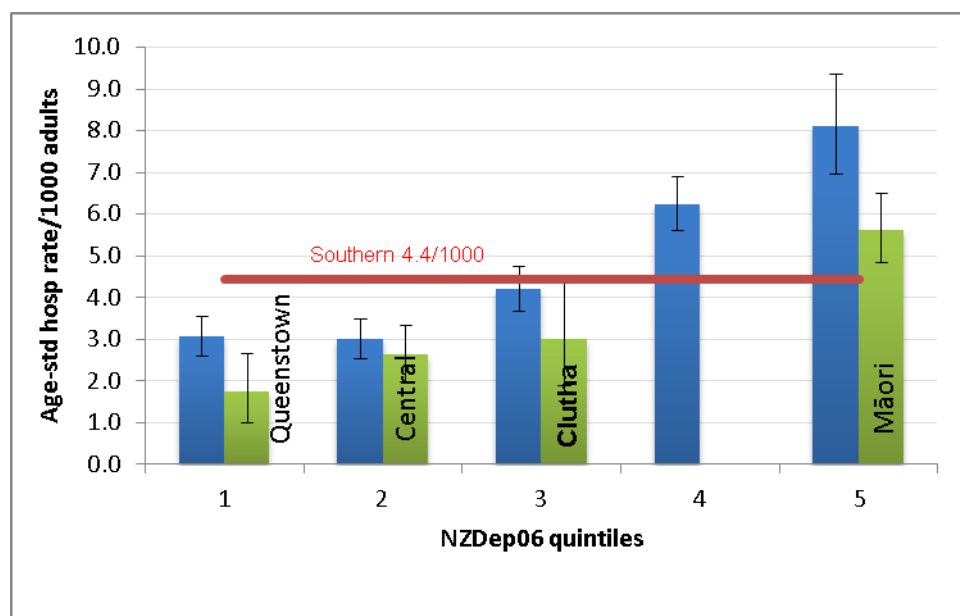
²⁶ M. Johnson, R. Jones, C. Freeman et al. Can diabetes prevention programmes be translated effectively into real-world settings and still deliver improved outcomes? A synthesis of evidence. *Diabet. Med.* 2013; 30, 3–15

Figure 15 Diabetes related hospitalisations by locality 2011-2013



Source: NMDS – all adult publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of diabetes (ICD 10AM E10-E14, O24). Annual rates per 1000 population for the 3 years 2010/11 to 2012/13, age-standardised to the Southern 2011 population.

Figure 16 Diabetes related hospitalisations by NZDep06 deprivation quintile 2011-2013 and compared to selected localities



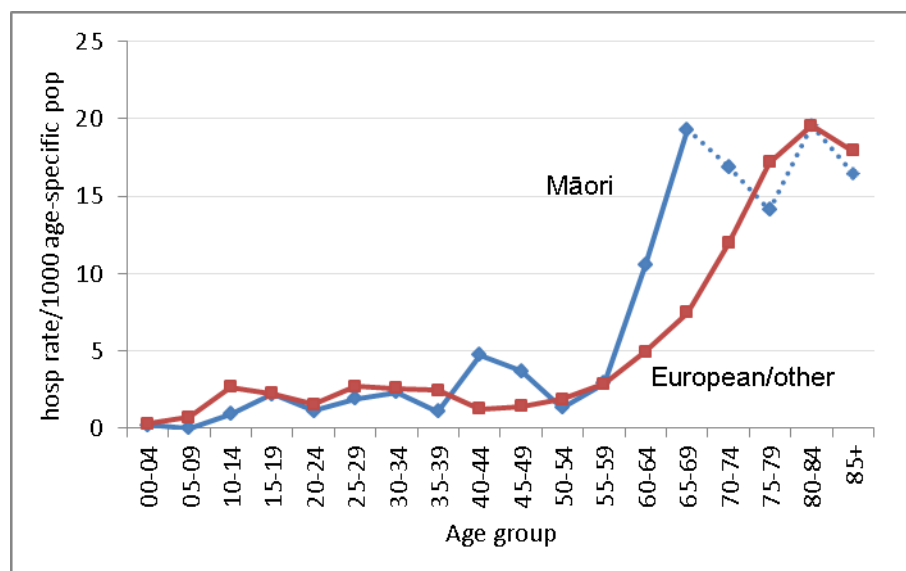
Source: NMDS – hospitalisations as per Figure 15. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

Rates of hospitalisation vary significantly by deprivation due to the poorer health status of people residing in lower socioeconomic areas. As the localities vary significantly by deprivation (see for example Table 6, page 20) a further analysis of the localities that might be expected to vary is compared at their average deprivation level (Figure 16). Also shown for comparison are rates for Māori at their comparable average quintile level. People in Southern DHB living in areas considered to be in the 20% most deprived areas of New Zealand (NZDep06 deprivation quintile 5) have more than five times the diabetes related hospitalisation rate as those living in the 20% least deprived areas (quintile 1) like Queenstown. Māori populations have a rate slightly below that seen for people living in quintile 5 areas. While overall Southern does not have a high quintile 5 population the differential in

disease rates is striking and important to address. Clutha and Queenstown appear to have lower rates of diabetes hospitalisation than might be expected from their average deprivation levels.

Diabetes is a major factor in the excess burden of disease among Māori people, and in the health gap between Māori and non-Māori people. On a national scale health loss attributed to diabetes for Māori people is at least 2.5 times higher than non-Māori with diabetes ranking as the fourth leading specific condition causing health loss to Māori.²⁷ Additionally, the onset of diabetes occurs earlier among Māori both nationally and also in the Southern district, and can be seen with hospitalisations due to diabetes rising steeply at an earlier age for Māori people (Figure 17). There is an initial onset spike for Māori of 5 diabetes related hospitalisations per 1000 people between the ages of 40-44 years rising to 20 diabetes hospitalisations per 1000 people for by age 64. This is associated with greater burden of illness from complications including kidney damage leading to renal failure and dialysis, loss of vision, peripheral nerve damage, cardiovascular disease, and peripheral vascular disease. Māori residing in the Southern district are admitted to hospital for diabetes 1.26 times more than non-Māori (age-standardised). Pacific in Southern are admitted at an even higher rate commensurate with their high diabetes prevalence, approximately 3 times as much, though this only represents 30 hospitalisation per year.

Figure 17 Diabetes related hospitalisations per year by age and ethnicity, Southern DHB 2011-2013



Source: NMDS – hospitalisations as per Figure 15. Māori/Pacific 80-84 and 85+ age groups have very low numbers, hence unstable rates and are shown as dotted lines. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

The annual per person direct additional cost to the public health system of diabetes has been estimated at \$4080 based on 2009 expenditure by all DHBs in the Northern region.²⁸ Costs were substantially higher in people with diabetes and both micro- and macro-vascular complications compared to people of the same age without diabetes. Extrapolating this to the number of people with diabetes in Southern DHB in 2011/12 results in an approximate excess cost of \$60m due to diabetes. That is, if those people had been helped to avoid type 2 diabetes there would have been \$60m less expenditure by the DHB – giving an idea of the potential for investing in more preventive health.

²⁷ Ministry of Health. (2013). *Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016*. Wellington: Ministry of Health.

²⁸ Chan WC, Jackson G, Papa D. *The cost of cardiovascular disease and diabetes in CMDHB in 2008*. Manukau: CMDHB Jan 2010

5.2 Cardiovascular disease

Cardiovascular disease (CVD) is a non-specific term used to describe all diseases affecting the heart and blood vessels. For the purposes of this report CVD includes ischaemic heart disease (coronary heart disease), peripheral vascular disease, congestive heart failure, rheumatic fever and rheumatic heart disease, but we will consider cerebrovascular disease (stroke) separately. CVD is the leading cause of death in New Zealand and in Southern DHB, and the most important cause of preventable mortality and illness.

The New Zealand Health Survey has self-reported data on the prevalence of ischaemic heart disease (IHD) – a subset of our CVD grouping. This can be defined as narrowing or blocking of the coronary arteries responsible for supplying blood and oxygen to the heart. The consequences of this can be chest pain (otherwise known as angina), a heart attack and potentially heart failure. The New Zealand Burden of Disease report released in August 2013 found IHD to be the single leading cause of health loss in New Zealand in 2006 accounting for 9.3% of DALYs.²⁹ This was almost twice the burden of the second ranked cause of health loss. This is similar for Māori, with IHD being responsible for 8.8% of total DALYS.

The major preventable risk factors for CVD include tobacco, poor diet, hazardous drinking, physical inactivity and obesity (discussed in Chapter 4 above). Additional physiological risk factors include high blood pressure, high blood cholesterol and high blood glucose, which together with low bone mineral density account for 13.7% of DALYs.

Given the relative rise in the prevalence of preventable risk factors in the Southern district noted in Chapter 4, one might expect the total CVD burden to be increasing. Additionally with the expected increase in the number of patients with the physiological risk factors mentioned above one would anticipate improved rates of primary and secondary preventive treatment for CVD. However according to Health Survey data, a comparison between 2006/07 and 2011/12 reveals a reduction in the number of patients who are medicated for high blood pressure and a minor increase in the number of patients who are medicated for high blood cholesterol. Neither of these differences was statistically significant.

Table 18 People taking medication for either high blood pressure or high blood cholesterol, Southern DHB 2006/07 and 2011/12

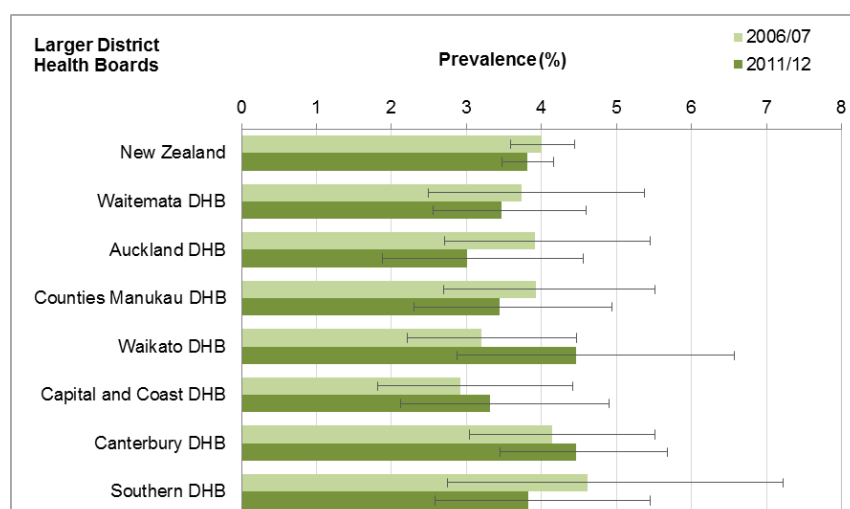
Indicator	Age-standardised prevalence (%) 2006/07	Age-standardised prevalence (%) 2011/12
Medicated high blood pressure	12.9	12.5
Medicated high blood cholesterol	8.0	9.5

Source: New Zealand Health Survey. Adults (age 15+) age standardised to WHO world population.

Despite this the 2011/12 New Zealand Health Survey reported a reduction in the prevalence of IHD in the Southern District, although this is not statistically significant (p value 0.51). Figure 18 shows the age standardised prevalence of IHD within the Southern district for 2006/07 and 2011/12. Here we see a decrease from 4.6% in 2006/07 to 3.8%, which is in line with the national average.

²⁹ Ministry of Health. (2013) *Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016*. Wellington: Ministry of Health.

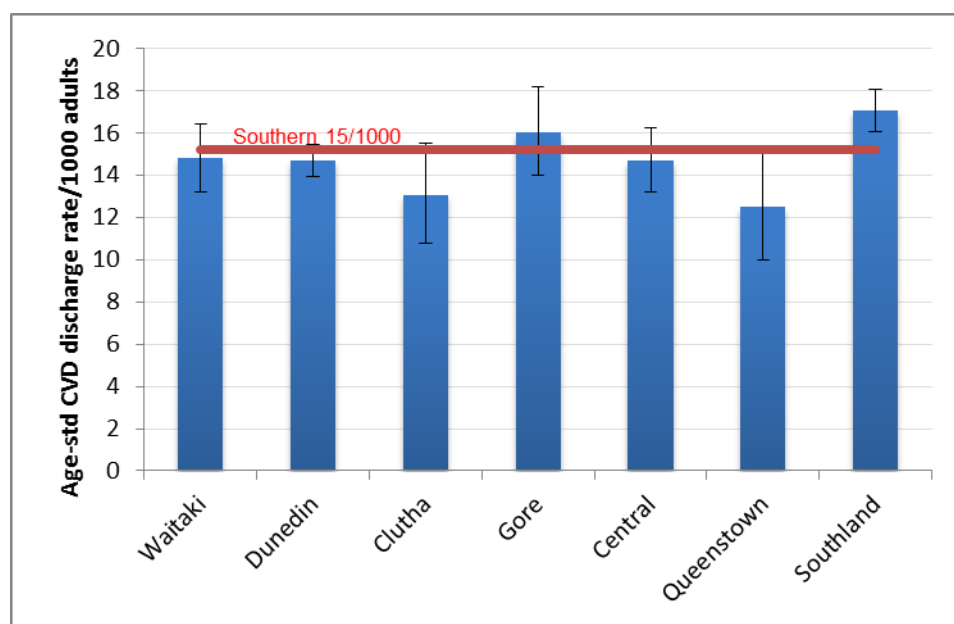
Figure 18 Prevalence of ischaemic heart disease by DHB for 2006/07 and 2011/12



Source: New Zealand Health Survey. Adults (age 15+) age standardised to WHO world population.

At the locality level, Figure 19 shows the CVD related hospitalisations for their respective residents between 2010 and 2013. The overall average rate of CVD related hospitalisation for the Southern district is 15 hospitalisations per 1000 residents. Rates remained consistent among the majority of localities with the only statistically significant outlier from the district average being Southland with a higher rate of 17 hospitalisations per 1000. Queenstown and Clutha show a non-significant lower rate of approximately 13 hospitalisations per 1000 people.

Figure 19 CVD related hospitalisations by locality 2011-2013

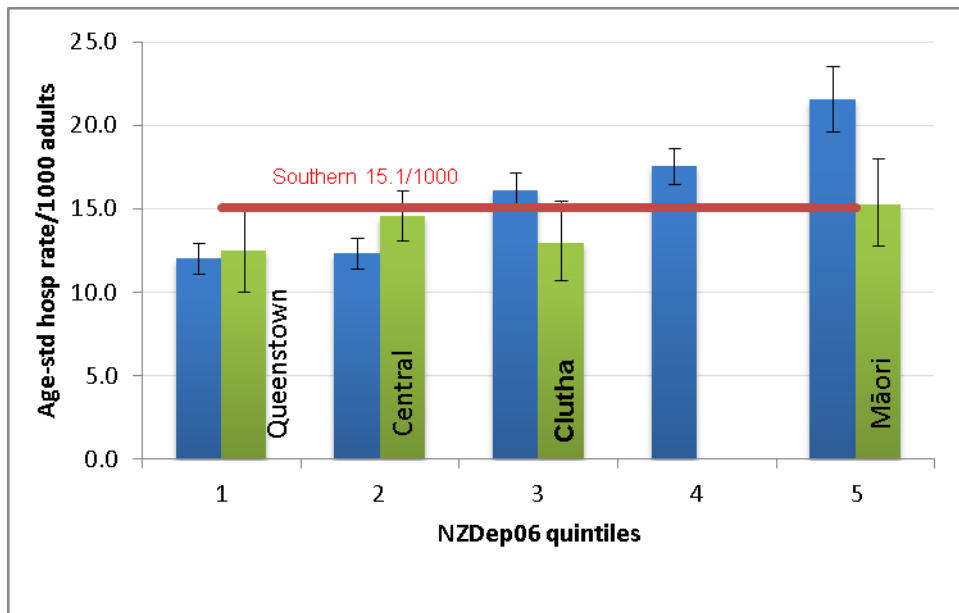


Source: NMDS – all adult publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of cardiovascular disease (ICD 10AM I00 - I59). Annual rates per 1000 population for the 3 years 2010/11 to 2012/13, age-standardised to the Southern 2011 population.

Exploring the rates of CVD related hospitalisation against deprivation, there were no statistically significant differences between any of the localities and the respective quintiles. Queenstown and Central appear to have a higher rate of CVD related hospitalisations than their relative quintiles. Clutha had a lower than expected rate of hospitalisation (on par with Queenstown) for the average

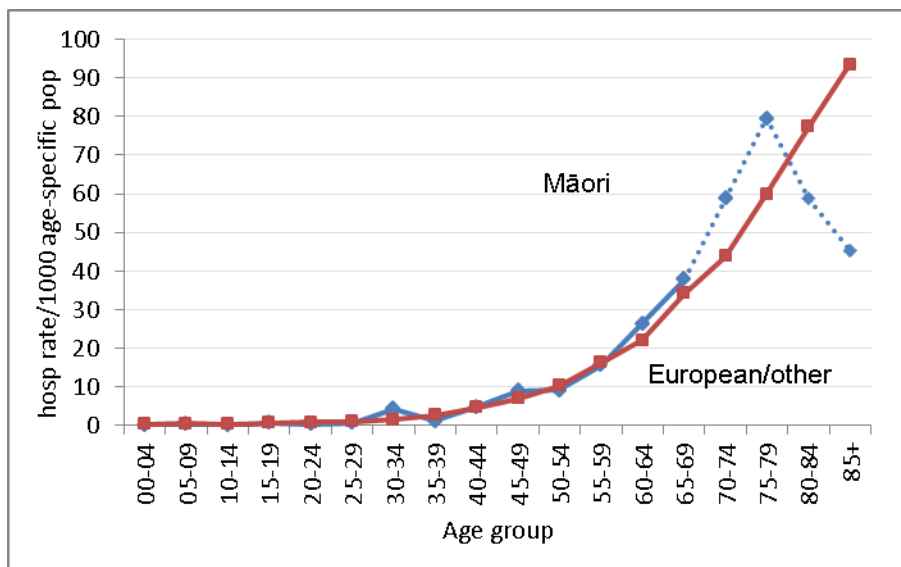
deprivation level in the locality. Māori people have a lower rate of hospitalisation when compared to those living in the quintile 5 most deprived areas of the Southern district.

Figure 20 CVD related hospitalisations by NZDep06 deprivation quintile 2011-2013 and compared to selected localities



Source: NMDS – hospitalisations as per Figure 19. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

Figure 21 CVD related hospitalisations per year by age and ethnicity, Southern DHB 2011-2013



Source: NMDS – hospitalisations as per Figure 19. Māori older age groups have low numbers, hence unstable rates and are shown as dotted lines. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

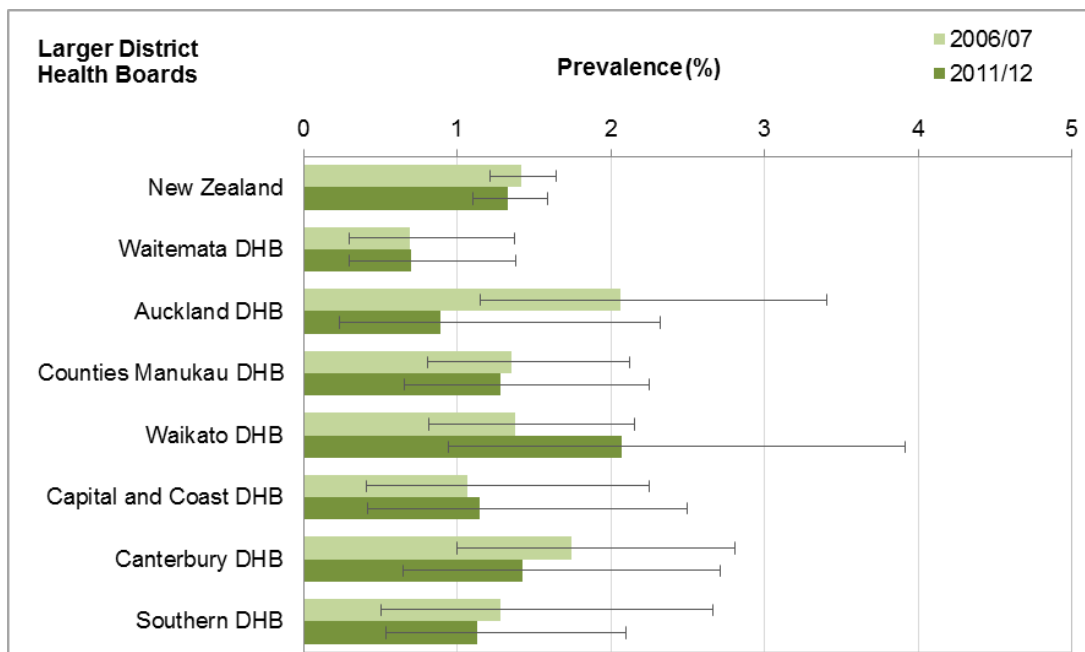
Figure 21 compares rates of CVD related hospitalisation for Māori and non-Māori non-Pacific in the Southern district. At a national level, the largest gap in CVD burden between Māori and non-Māori exists for rheumatic fever and rheumatic heart disease, cardiomyopathies and hypertensive heart

disease. While further research could be undertaken to establish this at a district and locality level, it is likely that similar patterns will exist.

5.3 Cerebrovascular disease

Cerebrovascular disease is the scientific term used to describe the disease of blood vessels in the brain, more generally termed “stroke”, though some prefer the term “brain attack”, in analogy to heart attack. High blood pressure (otherwise known as hypertension) is the single largest risk factor for stroke, in turn potentiated by smoking, obesity and lack of exercise. Hypertension can lead to changes in the blood vessels of the brain that either prevent blood from reaching the brain (ischaemic stroke) or can increase the chances of one of these vessels tearing and bleeding into the brain (haemorrhagic stroke). In 2006 stroke was the third leading cause of health loss in New Zealand accounting for a total of 3.9% DALYs.³⁰ Figure 22 shows the age standardised prevalence of stroke (not including TIA³¹s or ‘mini strokes’) in the Southern district. This shows a decline in the percentage of residents who had had a stroke, falling from 1.3% in 2006/07 to 1.1% in 2011/12. This has taken the prevalence of stroke in Southern below that of the national average (1.3%), although neither of these figures are statistically significant.

Figure 22 Prevalence of stroke by DHB for 2006/07 and 2011/12



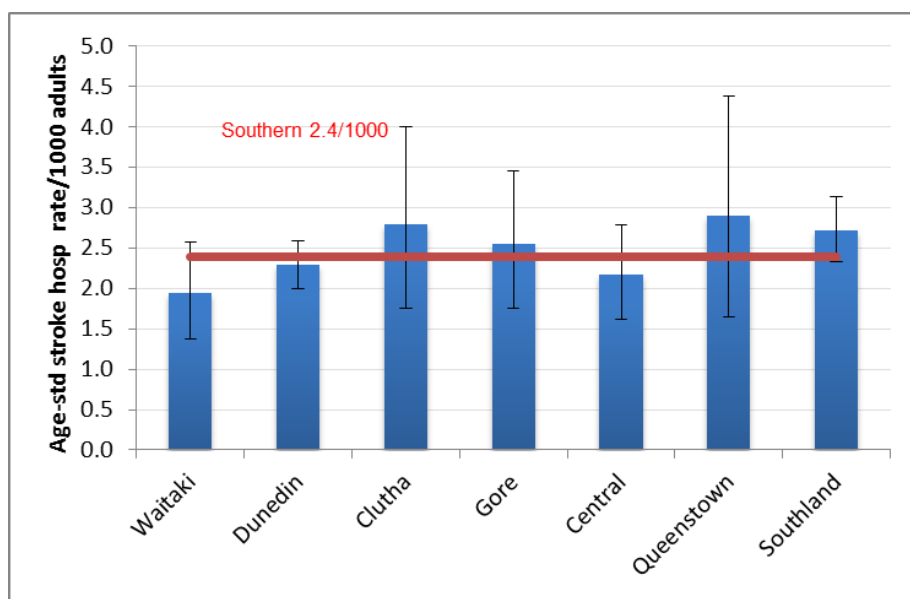
Source: New Zealand Health Survey. Adults (age 15+) age standardised to WHO world population.

Figure 23 shows the rate of stroke related hospitalisations for each locality in the Southern district from 2010/11 to 2012/13. The overall average rate of hospitalisations due to stroke in the Southern district is 2.4 hospitalisations per 1000 residents. There are no statistically significant differences across the localities, with all falling within the confidence intervals of the district average. The slightly higher rate of hospitalisation in Queenstown is different from other conditions, and Waitaki is trending towards a lower rate of hospitalisation.

³⁰ Ministry of Health. (2013) *Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016*. Wellington: Ministry of Health.

³¹ Transient ischaemic attack

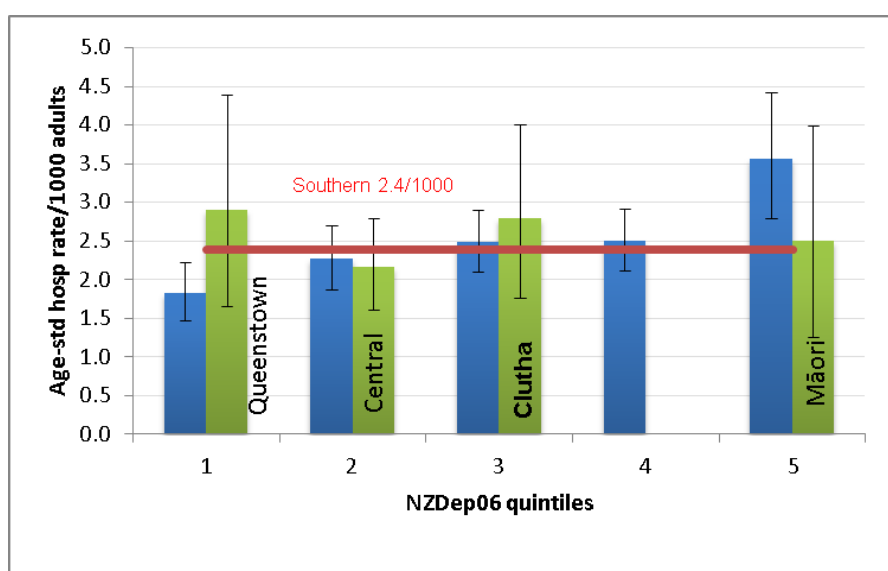
Figure 23 Stroke related hospitalisations by locality 2011-2013



Source: NMDS – all adult publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of cerebrovascular disease (ICD 10AM I60 – I69). Annual rates per 1000 population for the 3 years 2010/11 to 2012/13, age-standardised to the Southern population.

Further investigation of this trend, relative to the deprivation of the two localities mentioned, shows a higher rate of stroke related hospitalisation against the average deprivation level for Queenstown and lower rate for Waitaki (Figure 24). There is a lower rate of hospitalisation for Māori (albeit non-significant) when compared to the quintile 5 most deprived of the Southern district.

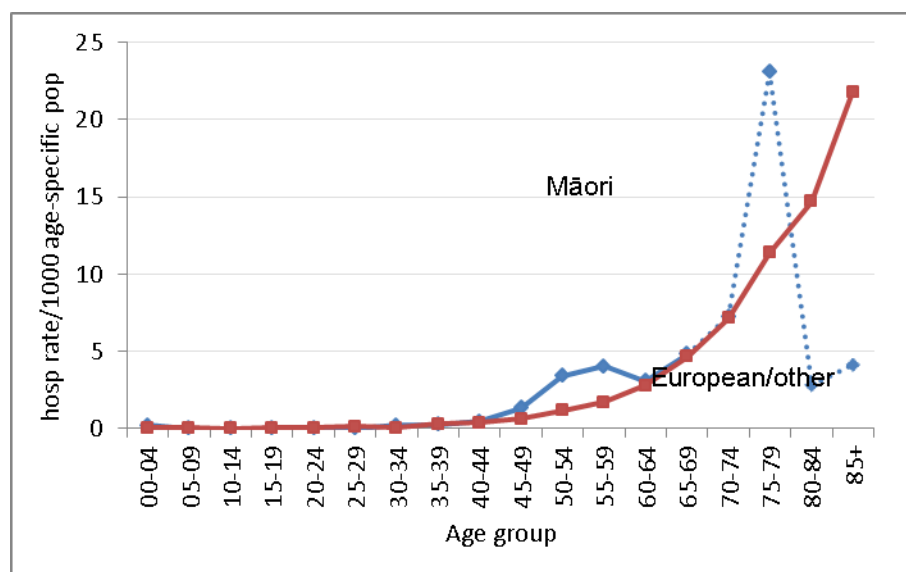
Figure 24 Stroke related hospitalisations by NZDep06 deprivation quintile 2011-2013 and compared to selected localities



Source: NMDS – hospitalisations as per Figure 23. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

Figure 25 compares rates of stroke related hospitalisation for Māori and non-Māori non-Pacific in the Southern district, showing relatively similar rates.

Figure 25 Stroke related hospitalisations per year by age and ethnicity, Southern DHB 2011-2013



Source: NMDS – hospitalisations as per Figure 23. Māori in older age groups have low numbers, hence unstable rates and are shown as dotted lines. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

5.4 Cancer

Cancer is a major cause of illness, with a significant impact on individuals, families and health systems. Despite a decline in cancer mortality and an increase in cancer survival over time, this still remains the most important cause of preventable mortality and illness alongside CVD. In 2006, cancers were reported as the leading cause of health loss at the condition group level, accounting for 17.5% of health loss in New Zealand.³²

The Southern Cancer Plan notes that in 2007, 676 people had cancer recorded as their underlying cause of death.³³ Of these deaths, 54.3 percent were males and 47.3 percent were females (compared to 53.2 and 46.8 percent nationally). Most cancer deaths were among those aged 65 and over. For the period 2003-2007 lung cancer accounted for the most deaths from cancer for the Southern DHB population (18.2 percent), followed by colorectal cancer (17.4 percent) and prostate cancer (7.7 percent). For 2003-2007 colorectal cancer caused the highest number of deaths among women (18.6 percent) followed by breast cancer (15.3 percent) and then lung cancer (14.7 percent). The most common cause of death from cancer for men was lung cancer (21.3 percent) followed by colorectal cancer (16.3 percent) and then prostate cancer (14.4 percent).

In this section cancer registration rates for different cancer types are explored at a district level and cancer related hospitalisation rates are utilised for further analysis at the locality level.

Figure 26 through to Figure 31 explore the age standardised rates (per 1000) of cancer registration for three years combined (2005-2007). Analysis is by gender and ethnicity for the Southern district compared to the national average for the most common cancer types including:

- Lung cancer
- Breast cancer
- Cervical cancer

³² Ministry of Health. (2013) *Health Loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016*. Wellington: Ministry of Health.

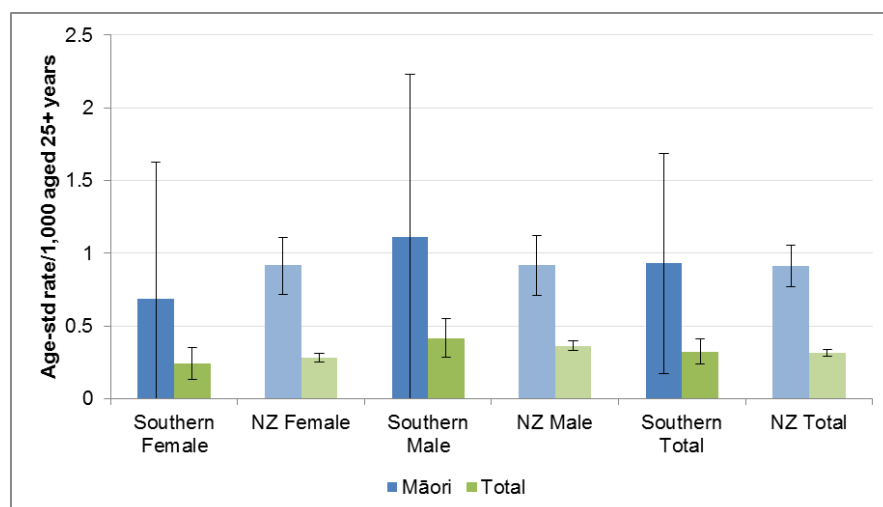
³³ Southern DHB. (2010) *Otago/Southland Local Cancer Plan 2010-2013*. Dunedin: Southern DHB.

- Prostate cancer
- Colorectal cancer
- Melanoma

Key points to note include:

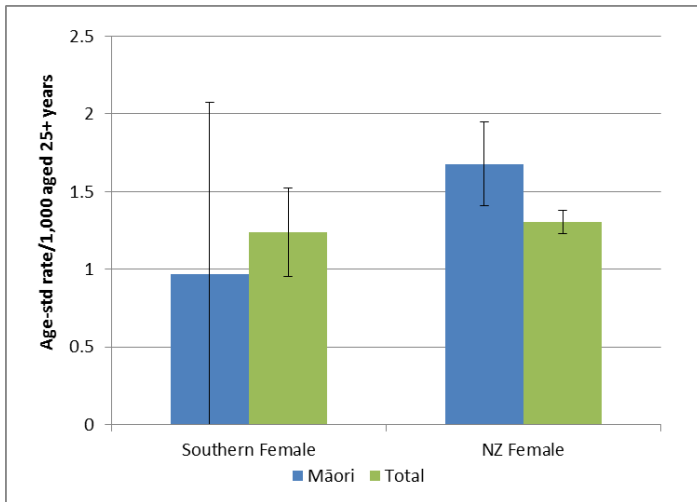
- Lung cancer registrations appear to show no statistically significant difference between the Southern district and national average. However rates of registration for lung cancer are significantly higher for Māori than non-Māori at the national level, consistent with the higher smoking rates (Figure 26)
- Breast cancer registration rates appear to be lower for women in the Southern district, in particular Māori women (Figure 27). However neither of these figures is statistically significant.
- No Māori women in the Southern district were registered for cervical cancer from 2005 to 2007 which is positive. (Figure 28) The low finding is unlikely to be due to differential screening rates.
- Registration for prostate cancer appears to be consistent across the board with no statistically significant difference in the rate of registration between Southern and the national average (Figure 29)
- Registration rates for colorectal cancer show a statistically significant difference, with the Southern district having higher rates than the national average (Figure 30). This is consistent with the amenable mortality causes noted in Section 3.3.
- Registration rates for melanoma are significantly lower for Māori across both the Southern district and national average (Figure 31).

Figure 26 Lung cancer registrations by ethnicity for Southern and New Zealand, 2005-07



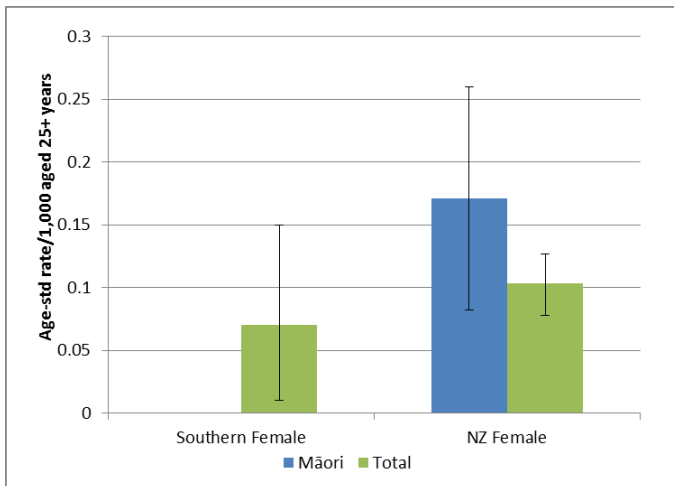
Source: Marsters et al. (2012). Ages 25+, age-standardised to the 2001 Census Māori population.

Figure 27 Breast cancer registrations by ethnicity for Southern and New Zealand, 2005-07



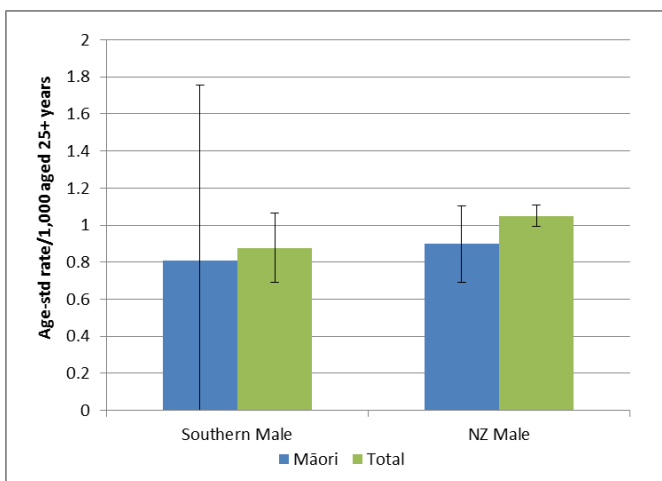
Source: Marsters et al. (2012). Ages 25+, females only, age-standardised to the 2001 Census Māori population.

Figure 28 Cervical cancer registrations by ethnicity for Southern and New Zealand, 2005-07



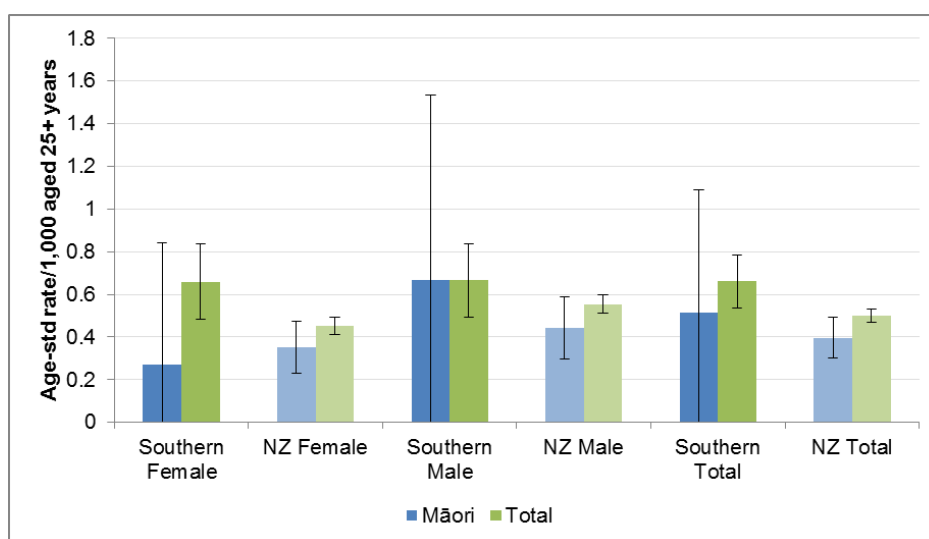
Source: Marsters et al. (2012). Ages 25+, females only, age-standardised to the 2001 Census Māori population.

Figure 29 Prostate cancer registrations by ethnicity for Southern and New Zealand, 2005-07



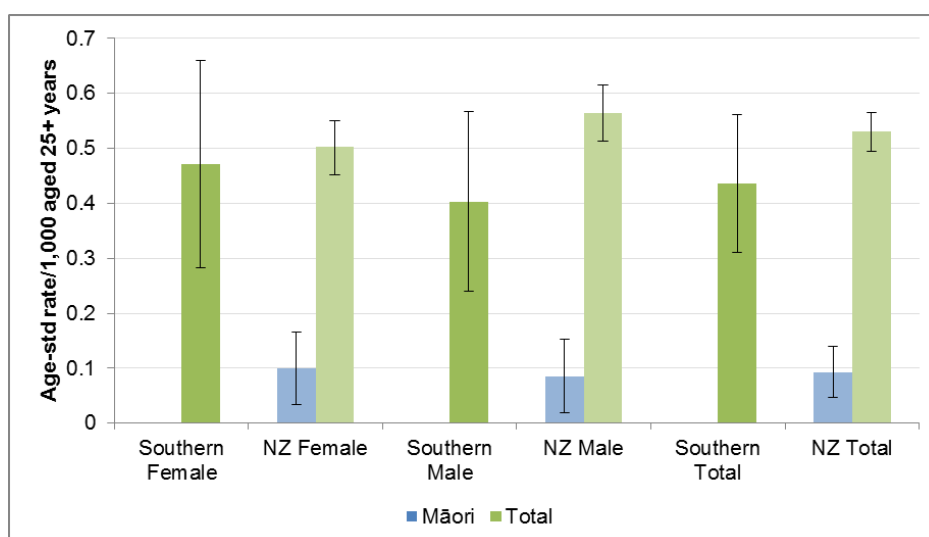
Source: Marsters et al. (2012). Ages 25+, males only, age-standardised to the 2001 Census Māori population.

Figure 30 Colorectal cancer registrations by ethnicity for Southern and New Zealand, 2005-07



Source: Marsters et al. (2012). Ages 25+, age-standardised to the 2001 Census Māori population.

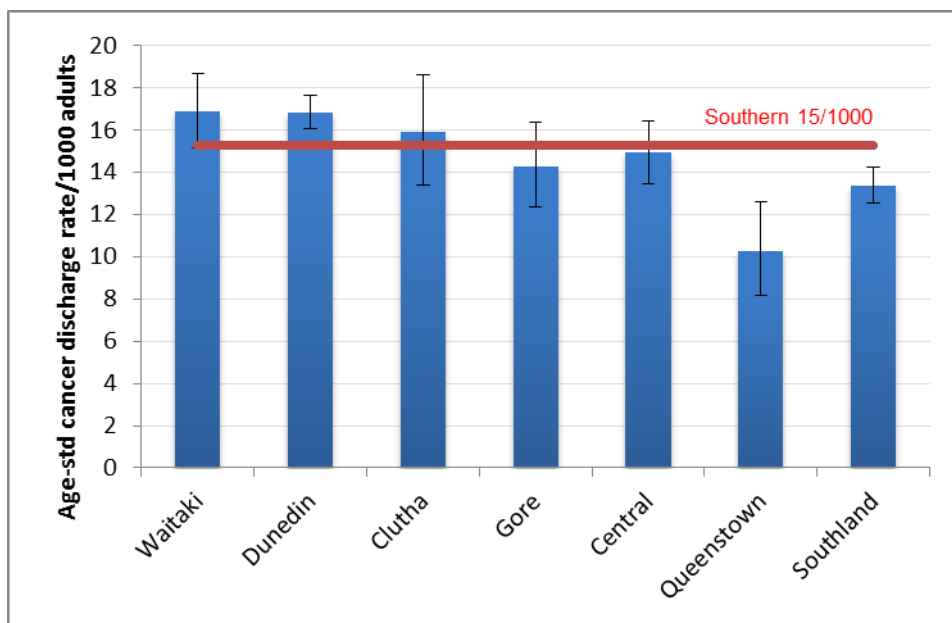
Figure 31 Melanoma registrations by ethnicity for Southern and New Zealand, 2005-07



Source: Marsters et al. (2012). Ages 25+, age-standardised to the 2001 Census Māori population.

Figure 32 shows the cancer related hospitalisations for residents in each locality between 2010 and 2013. The overall average rate of cancer related hospitalisation for the Southern district is 15 hospitalisations per 1000 residents. Rates remained consistent among the majority of localities apart from Queenstown with a lower rate of 10.3 hospitalisations per 1000 residents, and Southland at 13.3. The Queenstown rate is however consistent with the hospitalisation rate of people living in quintile 1 least deprived areas of the Southern district (Figure 33). Both may reflect a different model of care being employed given the distance away from the main oncology service at Dunedin hospital.

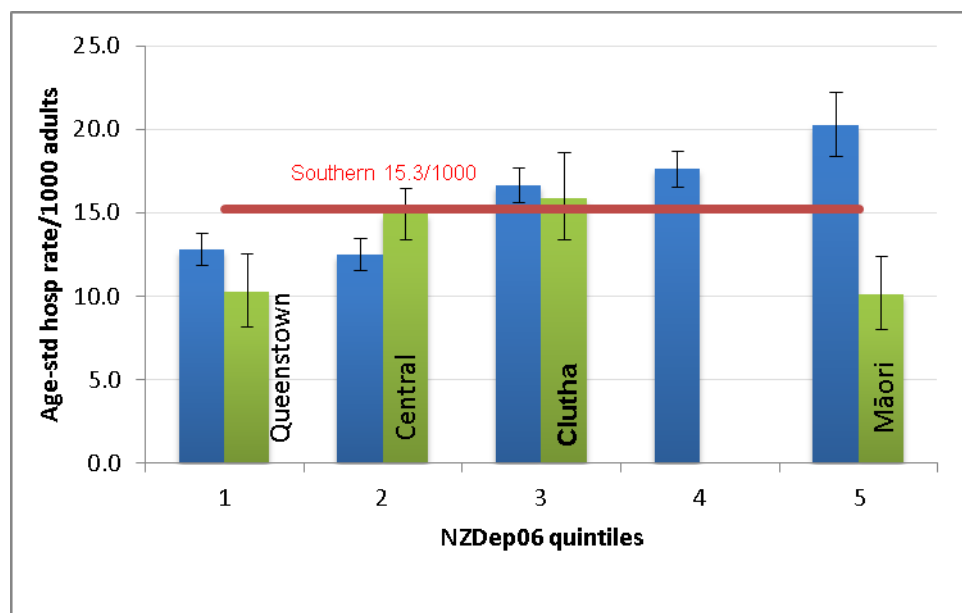
Figure 32 Cancer related hospitalisations by locality 2011-2013



Source: NMDS – all adult publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of cancer (ICD 10AM C00 - D48). Annual rates per 1000 population for the 3 years 2010/11 to 2012/13, age-standardised to the Southern 2011 population.

Māori populations show a statistically significant lower rate of hospitalisation for cancer than those living in the quintile 5 most deprived areas of the Southern district. This raises a concern about whether appropriate access to and use of services is occurring.

Figure 33 Cancer related hospitalisations by NZDep06 deprivation quintile 2011-2013 and compared to selected localities



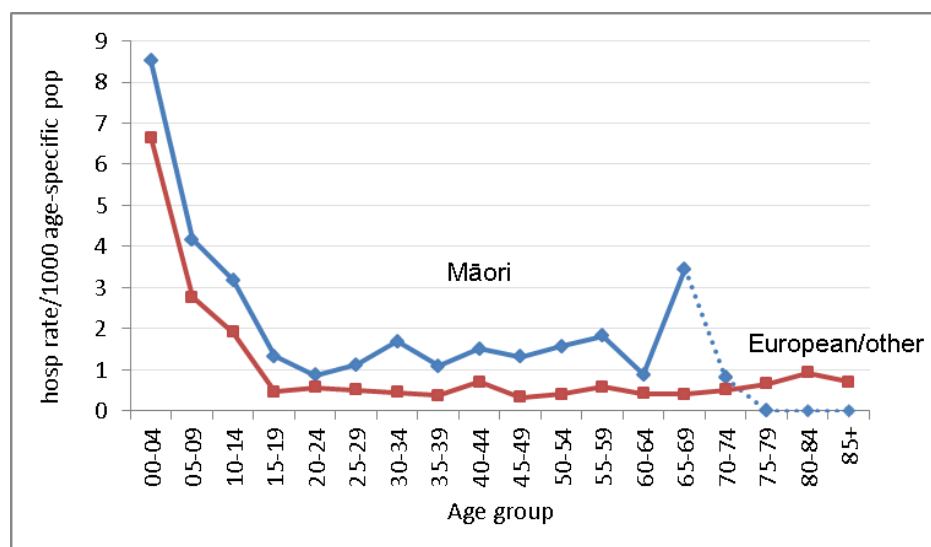
Source: NMDS – hospitalisations as per Figure 32. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

5.5 Respiratory diseases

5.5.1 Asthma

Asthma is a chronic inflammatory disorder of the airways in the lower respiratory tract which results in recurring symptoms of shortness of breath, wheezing, prolonged expiration and coughing. The prevalence of asthma on a national scale is highest among Māori children and significant disparities in rates of disease exist. This can be seen in Figure 34 which shows the asthma related hospitalisations for the Southern district by age and ethnicity. This shows a higher hospitalisation rate for Māori children and a persistently higher rate of hospitalisation for all ages up to 69 years.

Figure 34 Asthma related hospitalisations per year by age and ethnicity, Southern DHB 2011-2013

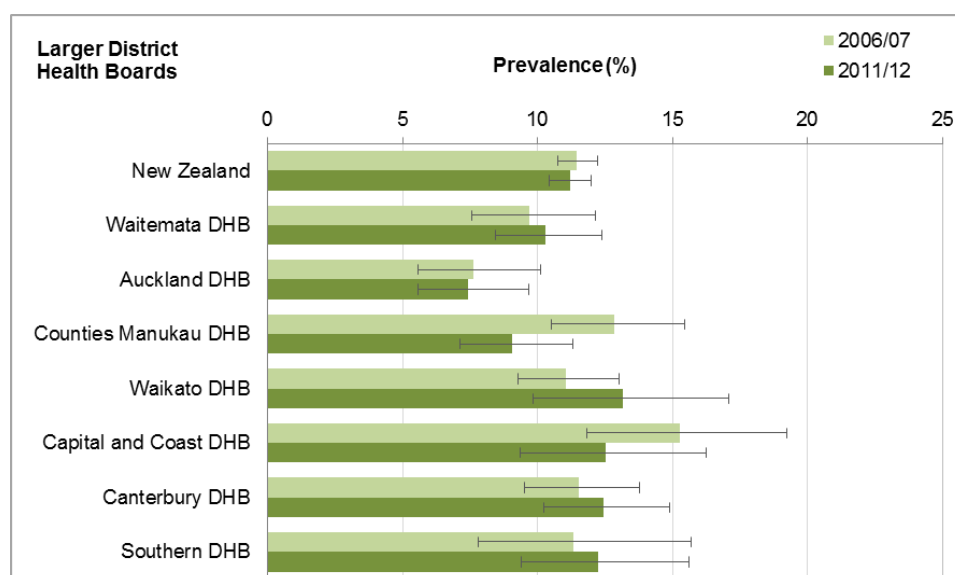


Source: NMDS – hospitalisations with a principal diagnosis of asthma (ICD 10AM J45 - J46). Low population numbers and hence unstable rates are denoted by dotted lines. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13. Note that the diagnosis of asthma becomes intermingled with obstructive respiratory disease at older ages - Figure 36 restricts the upper age to 59.

Figure 35 shows the age standardised prevalence of asthma for the Southern district for 2006/07 and 2011/12 based on self-report from the Health Survey. This shows the prevalence in the district (12.3%) to in fact be higher than the national average (11.2%), although this is not statistically significant. Given the proportionally lower numbers of Māori in the Southern district one might have expected a reduced prevalence of disease in the district.

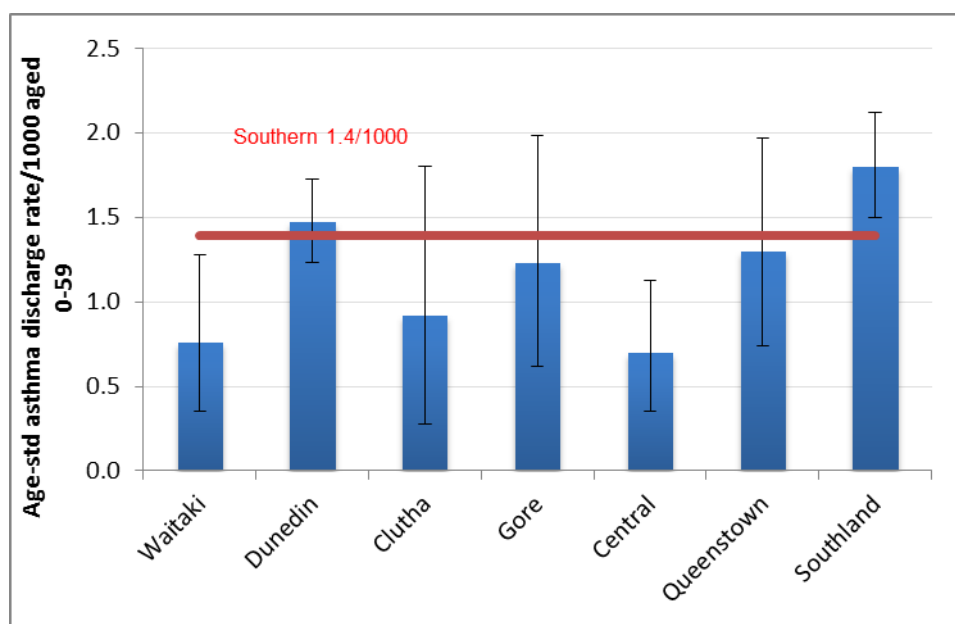
At the locality level, Figure 36 shows the asthma-related hospitalisations for their respective residents from 2010/11 to 2012/13. The overall average rate of asthma related hospitalisation for the Southern district is 1.4 per 1000 residents aged under 60. Southland residents had a higher rate of hospitalisation while Waitaki and Central had half the rate of hospitalisations per 1000 residents. These rates also change in parallel with the proportion of Māori residing in each locality with the highest proportion residing in Southland at 15%, followed by 8% for Waitaki and 9% for Central.

Figure 35 Prevalence of asthma by DHB for 2006/07 and 2011/12



Source: New Zealand Health Survey. Adults (age 15+) age standardised to WHO world population.

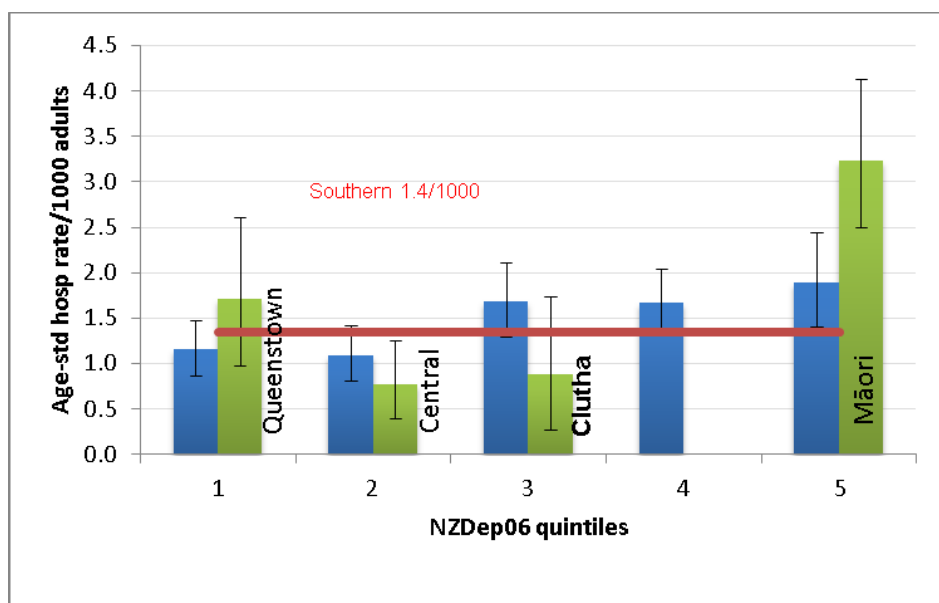
Figure 36 Asthma related hospitalisations up to age 59 by locality 2011-2013



Source: NMDS – all publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of asthma (ICD 10AM J45 - J46). Annual rates per 1000 population aged 0-59 for the 3 years 2010/11 to 2012/13, age-standardised to the Southern 2011 population.

There is a 3-fold variation in asthma hospitalisation rates by deprivation (Figure 37). Comparing Central and Waitaki asthma hospitalisation rates with rates of those living in quintile 2 and quintile 3 respectively shows that although lower they were not statistically significantly lower. The most dramatic difference in Figure 37 is the high Māori rate.

Figure 37 Asthma related hospitalisations up to age 59 by NZDep06 deprivation quintile 2011-2013 and compared to selected localities

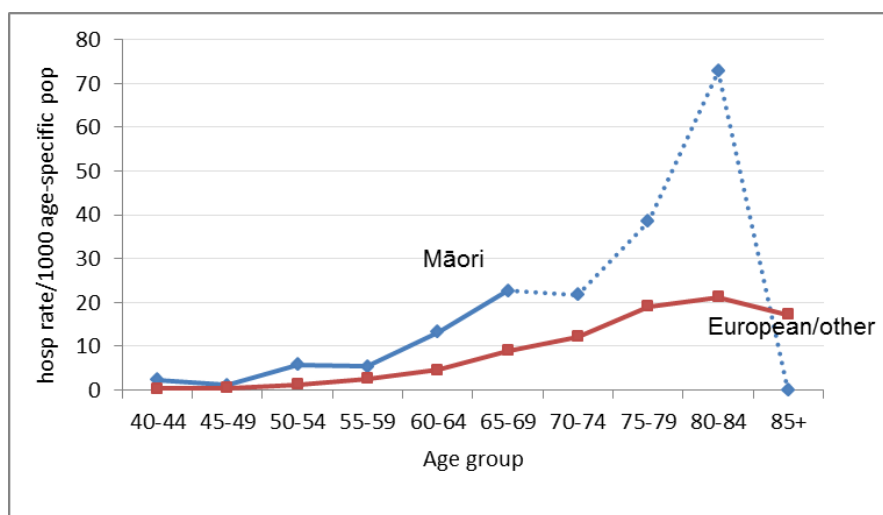


Source: NMDS – hospitalisations as per Figure 36. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

5.5.2 Chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease (COPD) is a progressive lung disease that is responsible for 3.7% of health loss in the New Zealand population (NZ Burden of Disease Study). Cigarette smoking is the main risk factor for COPD resulting in permanent air-flow restriction into and out of the lungs that is largely irreversible. The two main forms of COPD are emphysema and chronic bronchitis, with the main symptoms being coughing and breathlessness.

Figure 38 COPD related hospitalisations per year by age and ethnicity, Southern DHB 2011-2013



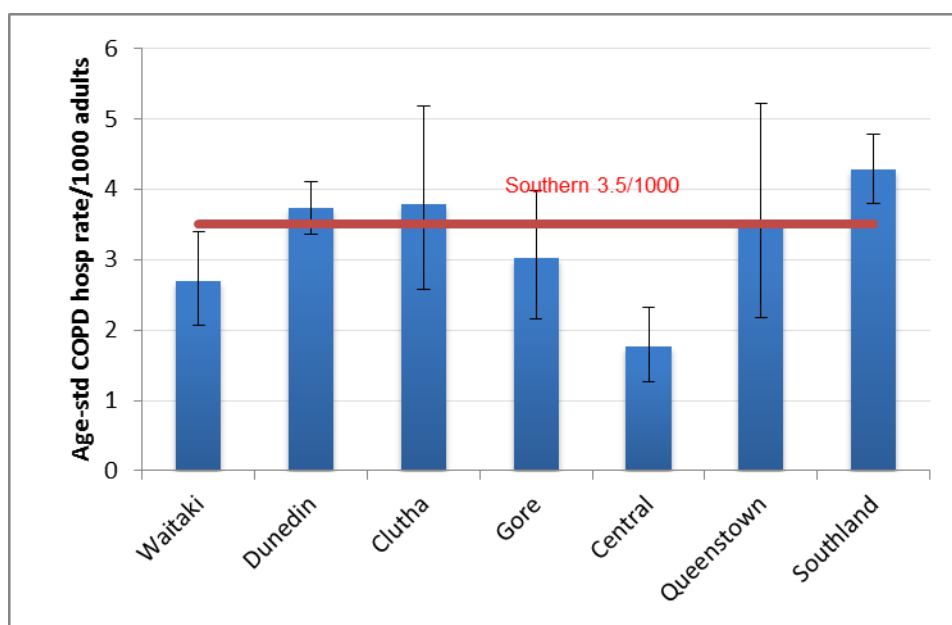
Source: NMDS – hospitalisations as per Figure 39, ages 40+ shown. Low population numbers and hence unstable rates are denoted by dotted lines. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

The rate of COPD has been slowly declining with the fall in smoking prevalence around New Zealand. However, due to the higher prevalence of smoking in Māori they are also disproportionately affected

by COPD. This can be seen in Figure 38, which shows a large increase in rates of COPD related hospitalisations for Southern residents at increasing age, with an average rate for Māori twice that of non-Māori non-Pacific over the age of 50 years.

At the locality level, Figure 39 shows the unplanned COPD related hospitalisations for their respective residents between 2010 and 2013. The overall average rate of COPD related hospitalisation for the Southern district is 3.5 hospitalisations per 1000 residents. Southland residents had a marginal but statistically significant higher hospitalisation rate (4.3/1000) than the district average, while Waitaki and Central had 2.7 and 1.8 hospitalisations per 1000 residents in their respective localities. Furthermore we can see average rates of COPD related hospitalisation in Queenstown, which is perhaps unexpected – as we might have anticipated a lower rate.

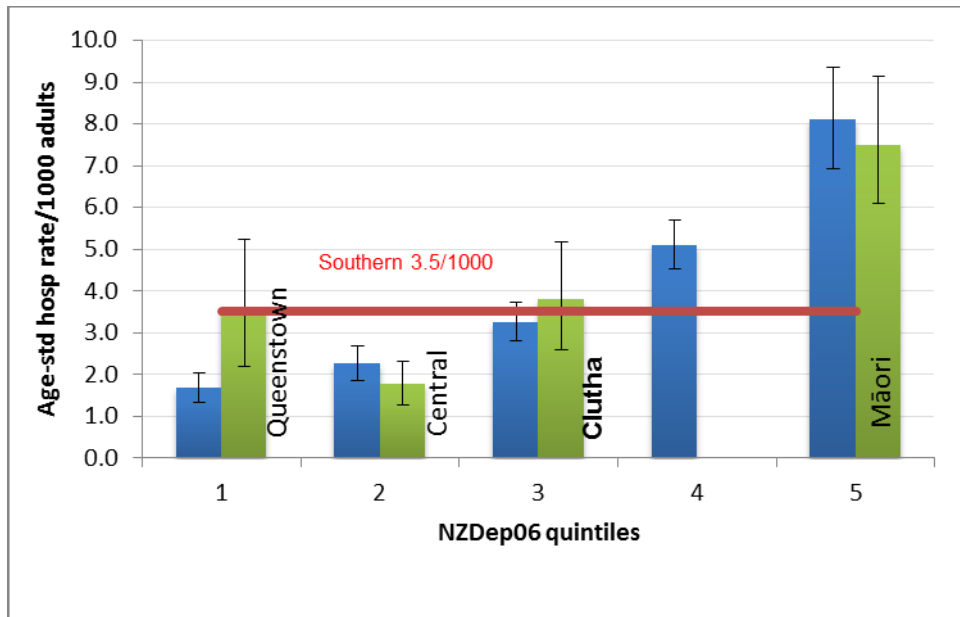
Figure 39 COPD related hospitalisations by locality 2011-2013



Source: NMDS – all adult publicly funded hospitalisations for Southern DHB residents with a principal diagnosis of COPD (ICD 10AM J40 - J44). Annual rates per 1000 population for the 3 years 2010/11 to 2012/13, age-standardised to the Southern 2011 population.

Further analysis of this, comparing the localities against deprivation, highlights increased rates of COPD related hospitalisations in Queenstown when compared with quintile 1 residents in the Southern district, which is statistically significant (Figure 40). The Central and Waitaki differences are not statistically significant from their respective quintile averages. Māori rates are similar to the average of quintile 5 residents.

Figure 40 COPD related hospitalisations by NZDep06 deprivation quintile 2011-2013 and compared to selected localities



Source: NMDS – hospitalisations as per Figure 39. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels. Age-standardised to the Southern 2011 population.

6. Primary care access and utilisation

Primary health care is the cornerstone of any health system, providing a comprehensive, collective organisational approach to health improvement. Definitions usually emphasise that primary care is delivered through the use of locally based, first contact health services that are coordinated, comprehensive and continuous over time. General practice is an important and vital part of this system, but is not the whole system. A health system strongly oriented to primary care improves overall health outcomes, reduces health inequalities, and reduces the overall health system cost.

The health sector alone cannot reduce health inequalities, but it is important for primary care to be able to identify and highlight these and provide the intersectoral links and advocacy that are needed for the population served. Multiple, linked strategies targeting different levels of the health care system are essential in improving access to best practice primary health care³⁴.

6.1 Access to primary care

Primary health organisations (PHOs) are funded by district health boards to support the provision of essential primary health care services through general practices to those people who are enrolled with the PHO. Enrolment brings advantages to the patient, including subsidised visits. A single PHO, Southern PHO, serves Southern DHB. A proxy measure for assessing level of access to primary care services is the comparison of total PHO enrolment with estimated resident population. This is to establish the number of people in the population who have enrolled with a general practice (Table 19).

Table 19 Percentage of PHO enrolment relative to estimated resident population for 2013

Locality	2013 PHO enrolment	2013 population	% enrolled
Waitaki	19,290	20,080	96%
Dunedin	115,270	131,350	88%
Clutha	14,610	10,590	138%*
Gore	16,330	14,600	112%*
Central	27,590	28,750	96%
Queenstown	18,980	19,440	98%
Southland	73,850	83,810	88%
Grand Total	285,910	308,620	93%

PHO enrolment based on Q2 2013 register for Southern PHO. Population is the estimated resident population by locality in 2013.

*Where the enrolled population is greater than the estimated resident population there are likely to be inter-locality flows to primary care services

By way of comparison the New Zealand average enrolment is 95%, and closest neighbour South Canterbury has 99% enrolment. Although the Southern district at 93% appears to have relatively high levels of access to primary care services it in fact has the lowest enrolment of any DHB. Other DHBs with relatively low enrolment rates, Auckland, Waitemata, Capital and Coast are also of relatively high socio-economic status.

Recently published Health Survey data has shown a reduction in the number of adults making a GP visit during a year within the Southern district, falling from 80% in 2006/07 to 76% in 2011/12 (albeit a

³⁴ Comino EJ, Davies GP, Krastov Y, et al. A systematic review of interventions to enhance access to best practice primary health care for chronic disease management, prevention and episodic care. BMC Health Services Research 2012, 12:415

statistically insignificant change - p-value 0.11). Practice nurse visits also fell, from 33% in 2006/07 to 28% in 2011/12 (p-value 0.15). These figures are consistently less than the national average. Use of after-hours medical centres is also significantly lower than nationally at nearly half the national rate (Table 20).

Table 20 Primary Care utilisation (Health Survey data)

Type of service	Southern DHB	National average
Visited a GP in the past 12 months	75.9%	78.5%
Visited a practice nurse (without seeing a GP at the same time) in the past 12 months	27.5%	30.2%
Visited after-hours medical centre in the past 12 months	7.1%	12.8%

Source: New Zealand Health Survey 2011/12.

For Quarter 2 2013 there were a total of 210,533 GP consults for Southern PHO for the Southern district equating to 2.7 consults per head of population per year. By consultations here we are referring to primary capitation consultations – thus ACC, immunisation, and maternity visits would not be included. Table 21 shows the total number of GP and nurse consults by locality extrapolated for 2013.

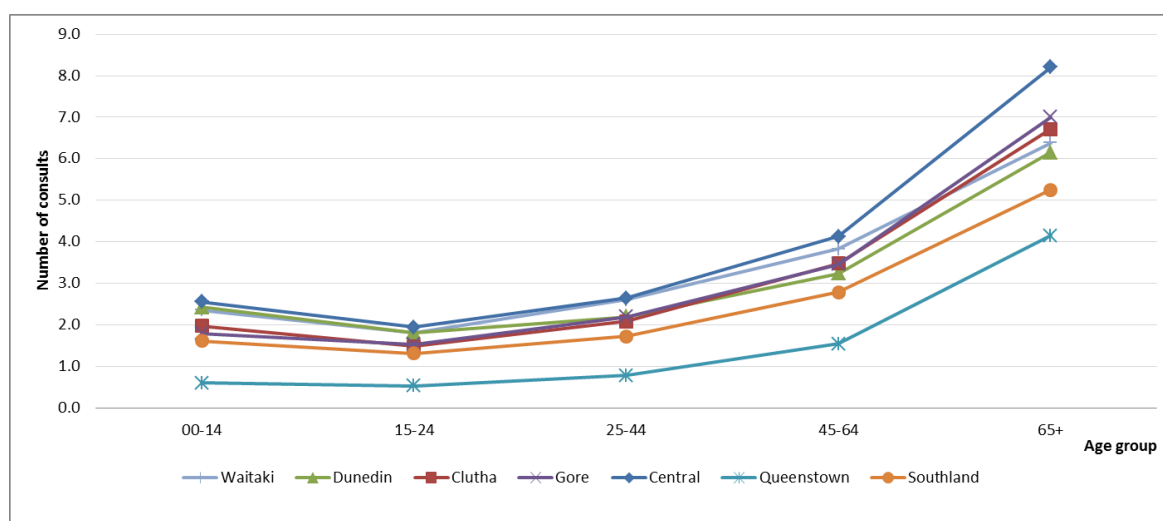
Table 21 Number of GP and nurse consults by locality for 2013

Locality	GP consults	Nurse consults	Total
Waitaki	69,600	2,280	71,880
Dunedin	359,500	50,810	410,310
Clutha	45,360	16,720	62,080
Gore	51,460	17,740	69,200
Central	110,640	15,200	125,840
Queenstown	22,350	12,620	34,980
Southland	183,420	20,640	204,060
Total	842,330	136,010	978,340

Source: Southern PHO, Q2 2013 x4, primary capitation consultations only – excludes ACC, immunisations, maternity.

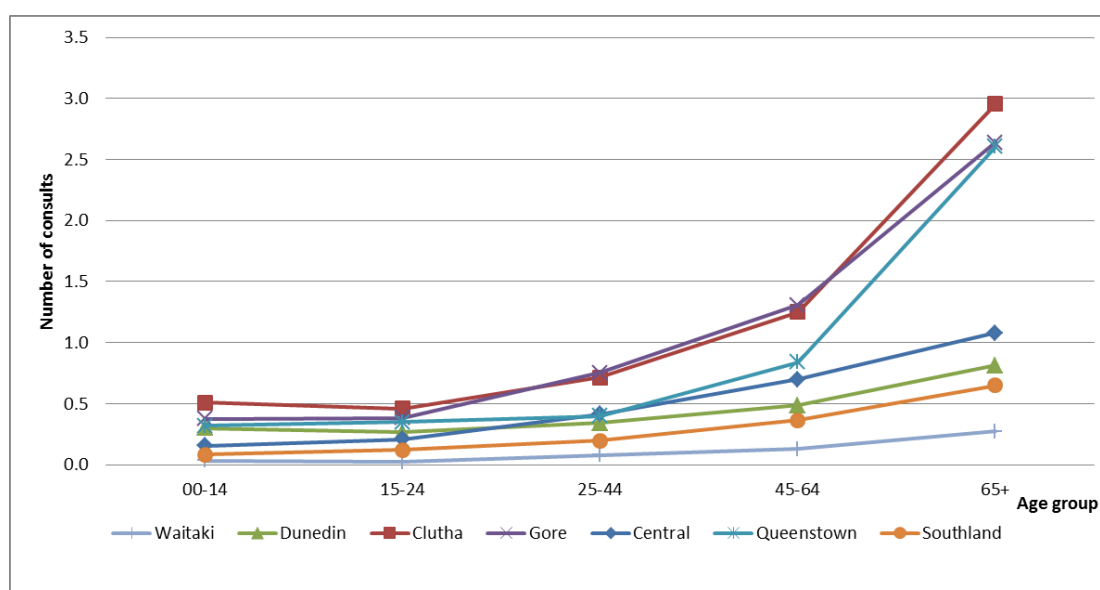
This is further explored through disaggregating consult rates by age, locality and type of consult per head of population (Figure 41 and Figure 42). All localities demonstrate higher volumes of GP and nurse consults per capita for those patients who are over 65 years of age. Interestingly Queenstown has a consistently lower GP consult rate than all other localities, while Central has the highest rates. Clutha, Gore and Queenstown have the highest nurse consult rate per capita, which peaks for patients over 65 years. The recording of nurse consults can vary from practice to practice, so nursing rate comparisons should be made with caution. For example, Waitaki practices likely carry out more nurse consultations than this data would indicate. A higher rate may point to the use of more contemporary models of care such as nurse led chronic disease management services.

Figure 41 Estimated number of GP consults per capita per year by age and locality, Southern PHO 2013



Source: Southern PHO, Q2, primary capitation consultations only – excludes ACC, immunisations, maternity. Rates calculated based on enrolled population.

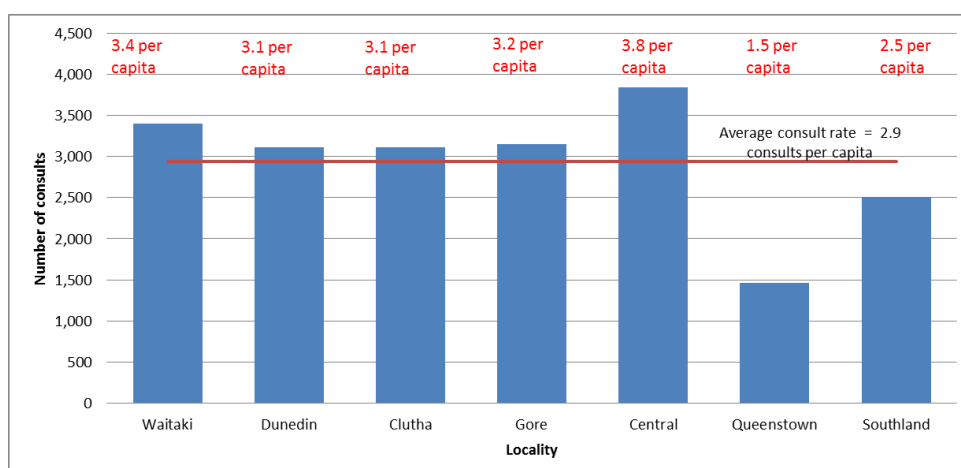
Figure 42 Estimated number of nurse consults per capita per year by age and locality, Southern PHO 2013



Source: Southern PHO, Q2 2013. Nurse consults can be variably entered across practices; results indicative only. Rates calculated based on enrolled population.

To enable more accurate comparisons between utilisation of primary care services among the localities, Figure 43 and Figure 44 have been controlled for variances in age structure, using age standardisation. The two graphs illustrate age standardised GP and nurse consult rates by locality, respectively. The majority of the localities have an age standardised GP consult rate per 1000 people in Southern, equivalent to 3 or more consults per person per year. The outliers include Southland and Queenstown localities at 2.5 and 1.5 consults per person per year, respectively.

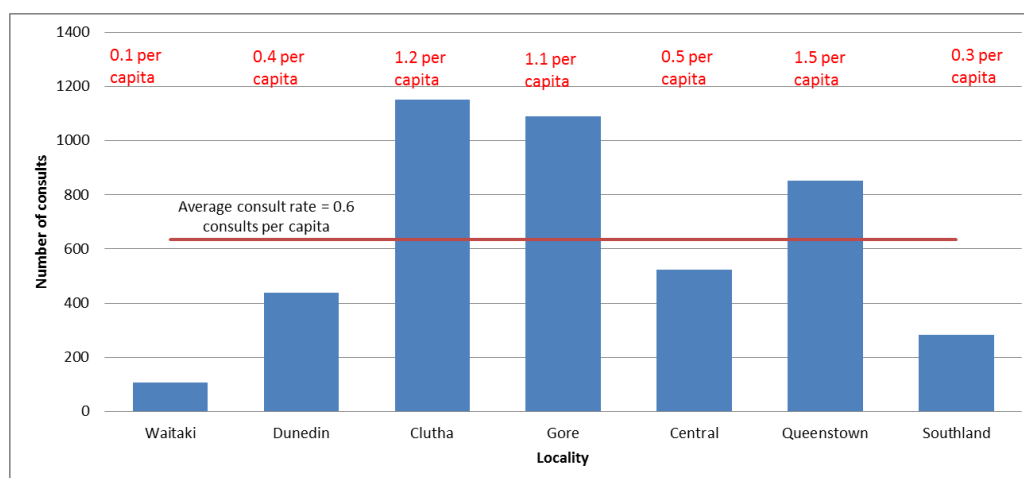
Figure 43 Age standardised GP consults per 1000 people per year by locality, Southern PHO 2013



Source: Southern PHO Q2 2013; age-standardised to the Southern DHB population. Primary capitation consultations only, rates based on enrolled population.

Age standardised recorded nurse consults are significantly lower than GP consults with an average consult rate per 1000 people in Southern, of 0.6 consults per person per year. The exceptions here include Queenstown at 1.5 consults per capita as well as Clutha and Gore at 1.1 and 1.2 consults per capita per year, respectively.

Figure 44 Age standardised nurse consults per 1000 people per year by locality, Southern PHO 2013



Source: Southern PHO Q2 2013; age-standardised to the Southern DHB population. Rates calculated based on enrolled population. Nurse consults can be variably entered across practices; results indicative only.

General practitioner panel sizes were explored to identify possible correlation between panel size and GP consult rate. Panel sizes are the number of registered patients per GP full-time equivalent (FTE), where an FTE is considered a 40 hour work week (10 sessions). Table 22 displays GP head count, FTE and implied panel size by locality. Please note FTEs were calculated based on a ratio of head count to FTE from Medical Council workforce data (2013). Central locality has the smallest GP panel size which may explain the high consult rate per capita. However, panel size does not explain the low consult rates in Queenstown which was only slightly over the average sized panel at 1,157 patients per GP versus the average of 1,104. The overall Southern load is well below the average for New Zealand of 1300 in 2012 (Medical Council Workforce Survey 2013), with Southern having the third lowest panel size of any DHB, behind the urban DHBs Auckland and Capital and Coast.

Table 22 General practitioner panel size by locality for 2013

Locality	Enrolled population	GP head count	Estimated FTE	Implied panel size
Waitaki	19,287	18	16	1,241
Dunedin	115,265	139	120	961
Clutha	14,609	14	12	1,209
Gore	16,334	11	9	1,720
Central	27,587	39	34	819
Queenstown	18,978	19	16	1,157
Southland	73,853	60	52	1,426
Total	285,913	300	259	1,104

Source – Southern PHO, Q2 2013. The full-time equivalent (FTE) numbers have been estimated based on the ratio of head count to FTE from Medical Council data for the 2012 calendar year (Medical Council 2013).

The Southland locality, despite perhaps having the population in most need of primary care services, had the one of the largest panel size per GP, next to Gore.

The PHO enrolment registers note the location of the residence of the person enrolled, and assign them to rural rankings. As expected Southern has a strongly rural lean (Table 23), with 5% highly rural or remote, and a further 17% rural, compared to the national average of 1% and 11% respectively.

Table 23 Patient enrolment by rurality, 2013

Rurality	National average	Southern
Area outside urban/rural profile	0%	0%
Highly rural/remote area	1%	5%
Independent Urban Area	10%	21%
Main urban area	69%	50%
Non-assigned	5%	6%
Rural area with high urban influence	3%	3%
Rural area with low urban influence	5%	10%
Rural area with moderate urban influence	3%	4%
Satellite Urban Area	3%	1%

Source: MOH PHO enrolment register Q4 2013.

The registers also record deprivation (based on NZDep2006 – see Chapter 2) and classify people as being of ‘high need’ or not, where this is defined as those who are either quintile 5, Māori or Pacific. Overall 10% of the total number of enrolled patients in the Southern district were identified as most deprived (quintile 5) compared with the national average of 18%; consistent with the pattern seen in Chapter 2. Likewise 17% of the total number of enrolled patients were identified as high need in Southern district compared with the national average of 30%, low as would be expected.

6.2 Barriers to accessing primary care services

Primary care outcomes are influenced by a combination of the quality of care (Section 6.3), and the barriers that prevent access to care. The 2011/12 New Zealand Health Survey collected self-reported data on adult patients who had experienced unmet need for primary health care in the past 12 months. In this context unmet need is defined as having experienced any of the following:

- Unable to get appointment at their usual medical centre within 24 hours
- Unmet need for GP services due to cost
- Unmet need for GP services due to a lack of transport
- Unmet need for after-hours services due to cost
- Unmet need for after-hours services due to a lack of transport
- Unfilled prescriptions due to cost

Table 24 provides insight into how the Southern district compares to New Zealand overall with regards to the accessibility of primary care services. Given the relative affluence of the Southern communities, and the higher than average number of GPs one might have expected a different pattern than is in fact seen.

While none of the differences between Southern DHB and the national average is statistically significant, overall a higher proportion of Southern DHB respondents to the survey had experienced unmet for primary care in the past 12 months than the average for New Zealand (30.3% compared with 26.6%). Interestingly despite the distances involved across the district transport appears to pose minimal impact on access to primary care services in the Southern district. A possible explanation for this could be the strong correlation between the availability of primary care providers in the local community, expressed as population per full-time equivalent (FTE) practitioner, and utilisation of services. In the Southern district there are approximately 1,000 patients per FTE practitioner versus the national average of 1300 patients per FTE practitioner.

Table 24 Unmet need for primary care, Southern district compared to New Zealand 2011/12

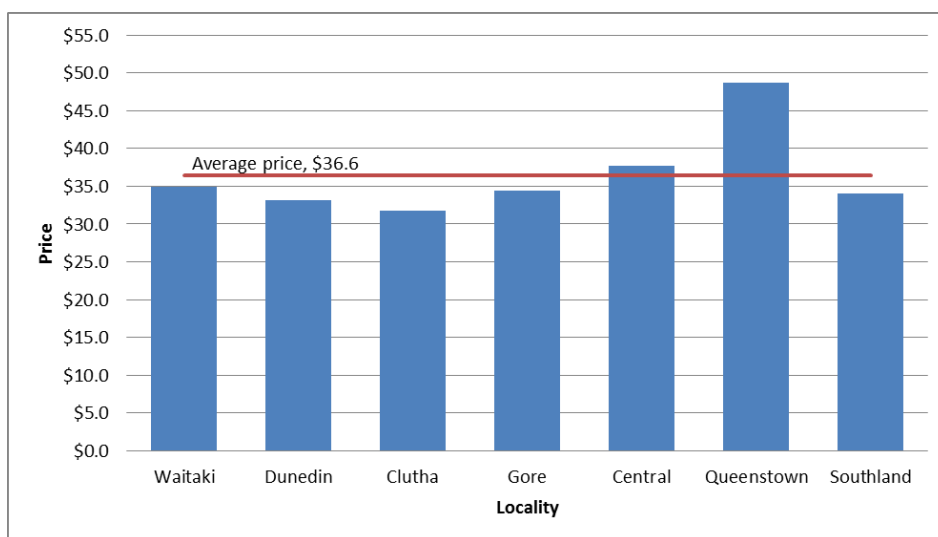
Reason	Southern DHB	National average	P-value
Experienced unmet need for primary health care in the past 12 months (any of the following)	30.3%	26.6%	0.06
- Unable to get appointment at usual medical centre within 24 hours in the past 12 months	16.7%	15.4%	0.50
- Unmet need for GP services due to cost in the past 12 months	16.7%	13.8%	0.15
- Unmet need for GP services due to lack of transport in the past 12 months	2.5%	3.4%	0.19
- Unmet need for after-hours services due to cost in the past 12 months	7.5%	6.9%	0.57
- Unmet need for after-hours services due to lack of transport in the past 12 months	1.3%	1.7%	0.38
Unfilled prescription due to cost in the past 12 months	5.7%	7.4%	0.09

Source: MOH, New Zealand Health Survey 2011/12.

On the contrary cost appears to be a large barrier for access to primary care services in the Southern district. In 2011/12 the national average price of a GP consult was \$32, a practice nurse consult \$10 and an after-hours consult \$56. Using available information an indirect comparison of GP consultation prices can be made, with Southern DHB prices appearing to be over \$4 higher than the

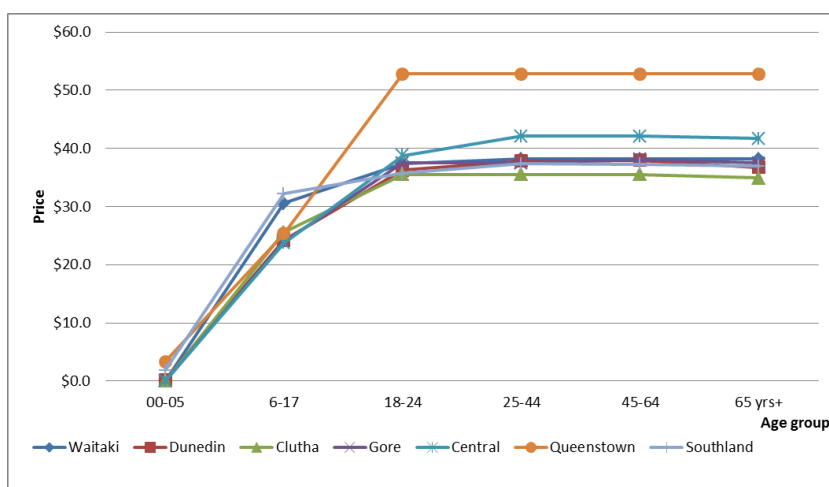
national average. Figure 45 provides a graphical display of the weighted average price for a GP consult and Figure 46 disaggregates this further by age group.

Figure 45 Weighted average price for a GP consult by locality, Southern PHO 2013



Source: Derived from Southern PHO published prices, averaged by locality. Southern average price estimated at \$36.60, compared with \$32 nationally.

Figure 46 Average price for a GP consult by age group and locality, Southern PHO 2013



Source: Derived from Southern PHO published prices, averaged by locality.

The average price for a GP consult in the Southern district is approximately \$4 higher than the national average at \$36.60. Queenstown appears to be a clear outlier charging anywhere between \$10-18 higher per consult than the other localities. This may be the expectation given the relatively low levels of deprivation found in the locality. Adjusting for differences in age, sex and ethnicity, people living in the most deprived areas were, at a national level, 1.4 times more likely to have experienced unmet need than those living in the least deprived areas. Those living in Waitaki, Gore and Southland maybe affected more than those residing in the other localities.

Several primary health care initiatives have been established over the years to improve access to primary care and reduce the cost of services for high need and/or deprived health care users. These include, inter alia, CarePlus for chronic disease, High User Health Card (HUHC) and the Community Services Card (CSC). Table 25 displays the percentage of the PHO population enrolled in these initiatives.

Table 25 Percentage of PHO population enrolled in CarePlus, HUHC and CSC 2013

Locality	CSC holders	HUHC holders	CarePlus
Waitaki	26%	1.0%	5.7%
Dunedin	24%	1.0%	3.8%
Clutha	22%	0.0%	5.2%
Gore	21%	0.1%	7.5%
Central	13%	0.5%	2.0%
Queenstown	6%	0.0%	3.1%
Southland	19%	0.1%	4.8%
Total	20%	0.6%	4.2%
NZ average	21%	0.6%	3.8%

Source: Southern PHO enrolment Q2 2013. CSC - Community Services Card, HUHC - High User Health Card

Community services cards appear to be well utilised among the localities, particularly those which are relatively more deprived such as Waitaki, Gore and Southland. The overall rate of CSC card holding is only just under the national average, despite the average deprivation and dependency of the Southern population being significantly lower, implying good awareness and take-up. The CarePlus enrolment also appears high given the low proportion of Māori and Pacific and deprived people in Southern, again implying a strong take-up of this funding stream. Gore, Waitaki and Clutha have the highest percentage of CarePlus patient funding within Southern.

6.3 Primary care quality measures

The PHO performance programme (PPP) is a national primary care initiative developed to improve the quality of primary care services and reduce health inequalities. PHOs are encouraged and appropriately rewarded for meeting a series of evidence-based indicators of quality. Table 26 displays the indicators being measured for the period of April to June 2013 and the corresponding performance of Southern PHO alongside the national average.

Of the 10 indicators listed, Southern PHO has met five of the target goals and has improved on seven indicators from the previous period. However, cardiovascular risk assessment, diabetes follow up after detection and smoking status recorded and brief advice and cessation support appear to be four indicators which require attention. In the initial two indicators mentioned above Southern PHO is performing at a level below the target goal and the national average. However, is equal to the national average but well below the target goal on the final indicator, with a reduction in performance from the previous period. The Southern district has comparatively lower levels of deprivation than other regions in New Zealand, and the third highest ratio of GPs to patients in the country. This suggests higher expected performance in primary care on quality measures like PPP.

Table 26 PHO Performance Programme results comparing Southern PHO with historical trends and national average, 2013

Indicators	Goal	Southern PHO performance	Trend from previous period	National average performance	Southern relative to national
Breast cancer screening coverage	≥ 70%	77%	Decreased	73%	Higher
Cervical cancer screening coverage	≥ 75%	80%	Same	77%	Higher
Ischaemic cardiovascular disease detection	≥ 90%	99%	Increased	102%	Same
Cardiovascular disease risk assessment	≥ 90%	63%	Increased	67%	Lower
Diabetes detection	≥ 90%	103%	Increased	113%	Same
Diabetes follow up after detection	≥ 90%	63%	Increased	68%	Lower
65 years + influenza vaccination coverage	≥ 75%	69%	Increased	66%	Higher
Age appropriate vaccinations for 2 year olds	≥ 95%	95%	Increased	93%	Higher
Smoking status recorded	≥ 90%	77%	Increased	86%	Lower
Smoking brief advice and cessation support	≥ 90%	55%	Decreased	55%	Same

Source: Ministry of Health - Southern PHO Q2 2013 PHO Performance Programme (PPP) results

Given the low result for cardiovascular risk assessment in Southland, further analysis was undertaken using the Health Quality and Safety Commission (HQSC) Atlas of Healthcare Variation. Figure 23 displays the percentage of the Southern district population with ischaemic cardiovascular disease (CVD) that were consistently dispensed the triple therapy (statin, blood pressure lowering medication and antiplatelet or anticoagulant agent) in 2011.

Figure 47 Percentage of CVD patients consistently dispensed triple therapy by DHB in 2011

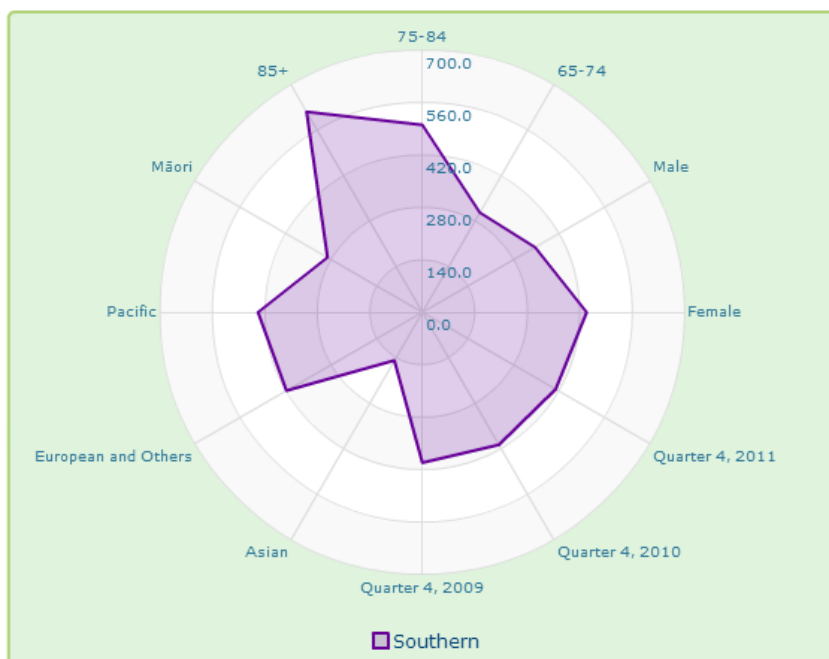


Source: HQSC Atlas of Healthcare Variation. Note that the Atlas has the DHB data as prior to the merger of Southland and Otago DHBs.

Based on the prior DHB boundaries, 62% Otago and 57% of Southland CVD patients were on the triple therapy regimen for CVD, placing Southland residents in the lower third of the country. The national average rate was 58.6%. This suggests a significant gap between best practice evidence and clinical practice in 2011. Southland is particularly low in the younger age groups (up to age 59), but is similar to the national average at older age groups. Although there is evidence to suggest that dispensing rates for Māori are still suboptimal due to significantly greater burden of disease, the rate for Māori triple therapy in the previous Southland DHB was low.

Given the current demography of the Southern population and the projected changes in the age structure of the population, a further measure of potential medicine related morbidity and mortality is the prevalence of polypharmacy in the elderly. Polypharmacy can refer to the prescribing of multiple medications or the addition of inappropriate medication to an existing regimen (HQSC). The frequency of an adverse event increases exponentially with the number of medicines taken, from 13% chance when taking two medications to 58% when taking 5 medications and 82% when taking 7 or more medications. Polypharmacy can lead to urinary incontinence, cognitive impairment and impaired balance leading to falls.³⁵ Figure 48 shows the rate of patients per 1000 over the age of 65, in the Southern district, that are on five or more medications disaggregated by year, age, ethnicity and gender.

Figure 48 Radar chart of rate of patients per 1000 in the Southern district aged 65 and over dispensed 5 or more medications in same quarter, by year, age, ethnicity and gender



Source: HQSC Atlas of Healthcare Variation 2013.

Southern DHB in 2011 had an average of 411 patients per 1000 aged 65 and over being dispensed five or more medicines per quarter – that is 41% of the population aged 65 and over. This placed the DHB second highest in the country behind South Canterbury, both DHBs well over the national average of 37%. The rate of polypharmacy remained reasonably consistent between 2009 and 2011, and climbed sharply by age – from 31% of 65-74 year olds to 50% of 75-84 and 62% of those aged 85 and over. This appears to place a large number of patients at risk of medication related harm

³⁵ Hajar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. Am J Geriatr Pharmacother. 2007 Dec;5(4):345-51.

which will only continue to grow as the population ages. This will be of concern to prescribing clinicians looking to maximise benefit while minimising harm to their patients, to ensure polypharmacy is avoided to the best possible extent for all patients; and the elderly in particular.

The Atlas also examined rates of prescribing for antipsychotics, (used for dementia behavioural control) and benzodiazepines (used for anxiety and sedation). Both classes of drugs are associated with an increased risk of death, and are rated “strong” recommendations for avoidance in the American Geriatrics Society updated Beers Criteria³⁶ and for stopping in the STOPP/START criteria.³⁷ Southern DHB had the fourth highest rate of antipsychotic dispensing among the 20 DHBs – 1290 people aged 65 and over giving a rate of 28 per 1000 people in 2011. This was significantly higher than the national average of 24 per 1000. In contrast, benzodiazepine prescribing was significantly lower than the national average - 94/1000 compared with 109/1000 aged 65 and over – the third lowest DHB rate in the country. However this still means that at any one time nearly 10% of those aged 65 and over are receiving a medication that can increase in the risk of dementia and death.^{38 39}

6.4 Demand forecasts

Utilisation of primary care services has been projected forward by age and locality in order to provide guidance around the type of services required to meet the potential growing demand of an ageing population. Growth in demand of GP and nurse consults have been estimated using Statistics NZ medium projections of population growth, assuming current utilisation rates will maintain the same path as a base case scenario.

Table 27 shows projected GP consults for the Southern district in 5 year increments by age group, and Table 28 shows the same for nurse consults. There is projected to be a continued reduction in child and youth consultations and a significant increase in consultations for the elderly population. Young adult numbers are nearly flat while those between the ages of 45-64 years look set to have fewer consultations. By 2031 it is projected, based on current utilisation rates per person in each age group, that half of all primary care consultations will be for the 65 and over population. This has the effect of inflating the otherwise relatively low population growth to increase the projected need for general practitioners (Table 29) and nurses. The projected 17% increase in consultations, if current rates of consultation continued would imply the need for more staff – or around 43 additional GPs.

³⁶ American Geriatrics Society. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2012; 60: 616–31.

³⁷ Gallagher P, Ryan C, Byrne S, Kennedy J, O'Mahony D. STOPP (Screening Tool of Older Persons' Prescriptions) and START (Screening Tool to Alert Doctors to Right Treatment): Consensus Validation. *Int J Clin Pharmacol Ther.* 2008; 46: 72–83.

³⁸ Billioti de Gage S, Bégaud B, Bazin F, et al. Benzodiazepine use and risk of dementia: prospective population based study. *BMJ* 2012;345:e6231.

³⁹ Kripke DF, Langer KD, Kline LE. Hypnotics' association with mortality or cancer: a matched cohort study. *BMJ Open* 2012;2.

Table 27 General practitioner consult forecasts for the Southern district by age group to 2031

Age (years)	2013	2016	2021	2026	2031	% change	
						2013 - 2031	Chart
00-14	110,300	110,200	109,900	106,300	100,900	-9%	
15-24	56,600	54,600	49,400	50,600	50,800	-10%	
25-44	142,700	143,700	147,000	147,800	148,500	4%	
45-64	248,600	247,500	239,200	223,000	204,800	-18%	
65+	284,200	310,900	375,900	425,900	478,200	68%	
Total	842,300	866,800	921,500	953,500	983,300	17%	
% of consults 65+	34%	36%	41%	45%	49%	-	

Note: Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections.

Table 28 Nurse consult forecasts for the Southern district by age group to 2031

Age (years)	2013	2016	2021	2026	2031	% change	
						2013 - 2031	Chart
00-14	12,300	12,400	12,400	12,100	11,500	-7%	
15-24	8,200	8,000	7,300	7,500	7,600	-7%	
25-44	24,400	24,500	25,000	25,100	25,000	2%	
45-64	43,600	43,700	43,300	41,200	38,500	-12%	
65+	47,400	52,200	64,400	74,000	84,200	78%	
Total	136,000	140,800	152,500	159,900	166,800	23%	
% of consults 65+	35%	37%	42%	46%	50%	-	

Note: Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections. Nurse consults can be variably entered across practices; results indicative only – forecasting has not been carried through to replicate Table 29 and Figure 49; proportionate rises will be similar as shown in Table 28 compared to Table 27

Table 29 General practitioner consult forecasts for the Southern district by locality to 2031

Locality	2013	2016	2021	2026	2031	% change	
						2013 - 2031	Implied added GPs
Waitaki	69,600	69,900	71,500	70,400	70,600	1%	0
Dunedin	359,500	368,300	387,100	400,200	409,200	14%	17
Clutha	45,360	46,400	49,700	50,600	51,800	14%	2
Gore	51,460	51,600	52,400	52,300	52,000	1%	0
Central	110,640	118,000	133,800	143,800	154,500	40%	13
Queenstown	22,350	24,800	31,200	36,800	41,700	86%	14
Southland	183,420	187,800	195,700	199,500	203,600	11%	6
Total	842,330	866,800	921,500	953,500	983,300	17%	43

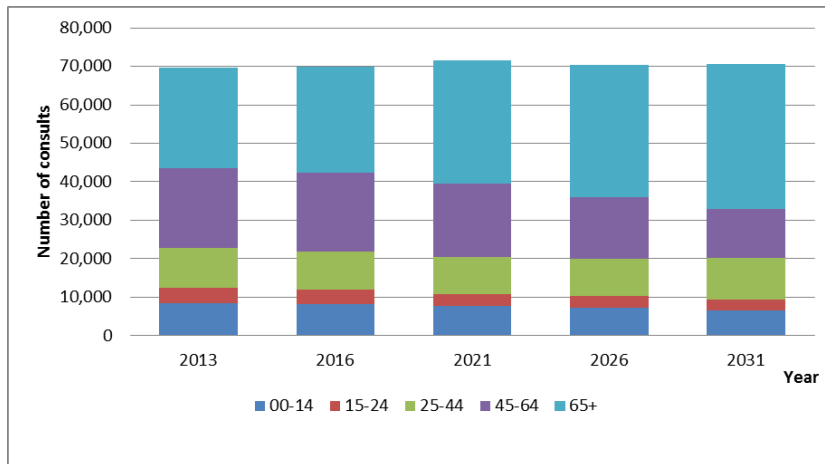
Note: Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections. "Implied added GPs" only if no change in consult rates or models of care.

The forecasts assume no change in the model of care, but there is likely to be significant change over the coming years, particularly with improved chronic disease management and increasing roles for nurses and allied health care workers. One might expect then not to see much growth in the GP workforce in reality, but some rearranging of existing practitioner locations, and Southern DHB overall moving to a patient/GP ratio closer to the national average.

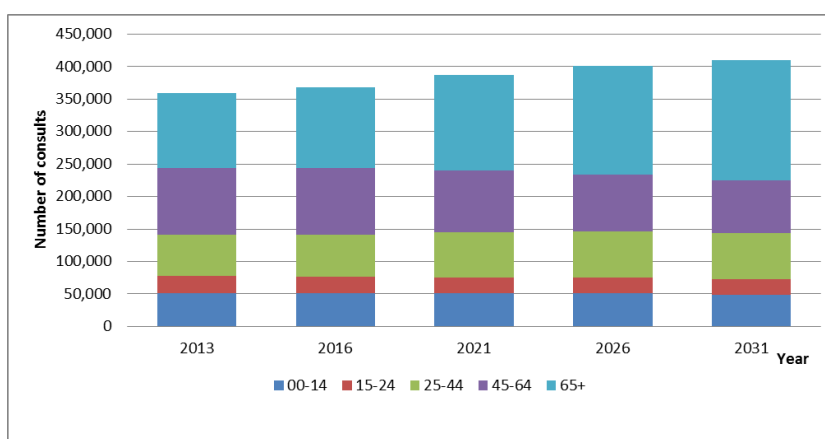
More detail at the locality level is shown in the following graphs (Figure 49). Similar trends in GP consults can be seen alongside projected growth of the population. For localities declining in population size, demand still shifts towards an aging population with the total number of patients remaining stagnant but volume of demand moving towards older age groups. This is particularly prominent in Waitaki, Clutha and Gore. Note that although Queenstown has the largest percentage growth, it is the smallest locality and even by 2031 will have less projected GP consultations than any other locality.

Figure 49 GP consult forecasts by age group in 5 yearly increments by locality, Southern PHO 2013

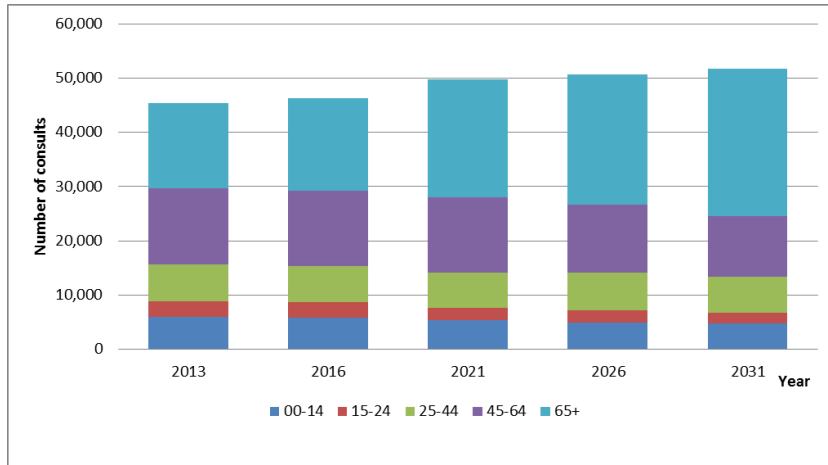
Waitaki locality



Dunedin locality

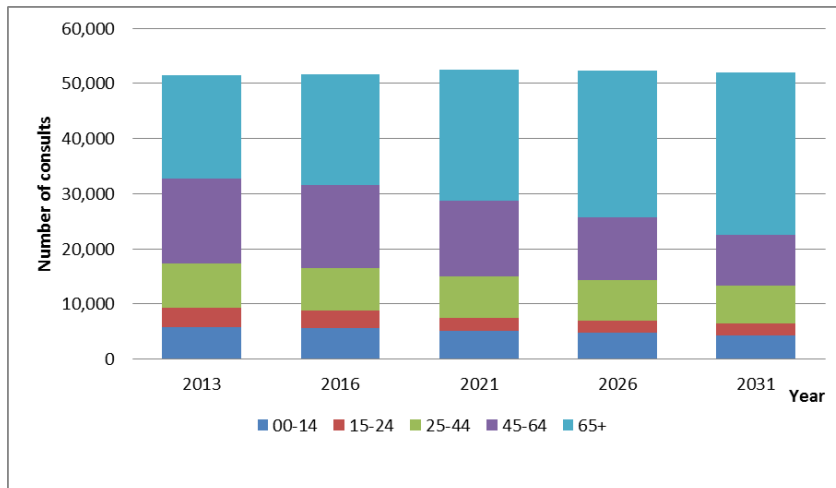


Clutha locality

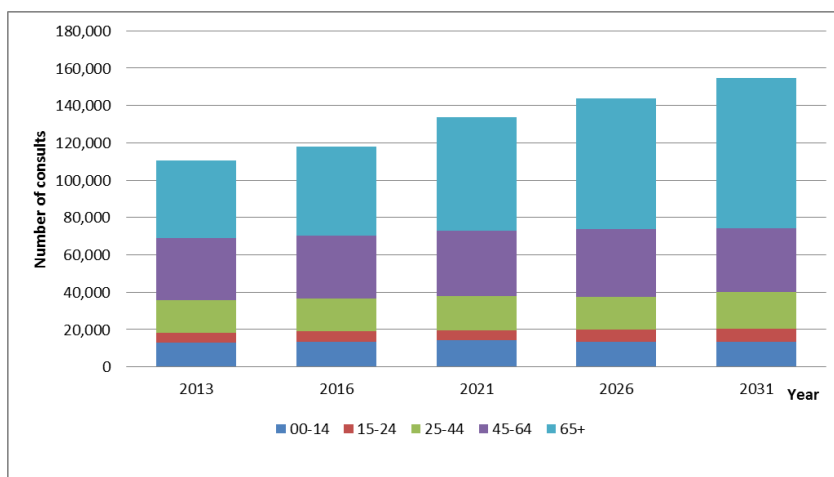


Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections. Note differing vertical axis scales.

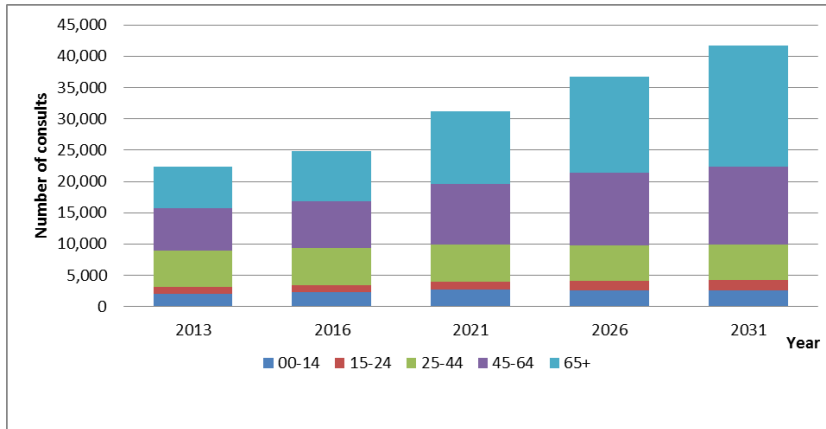
Gore locality



Central locality

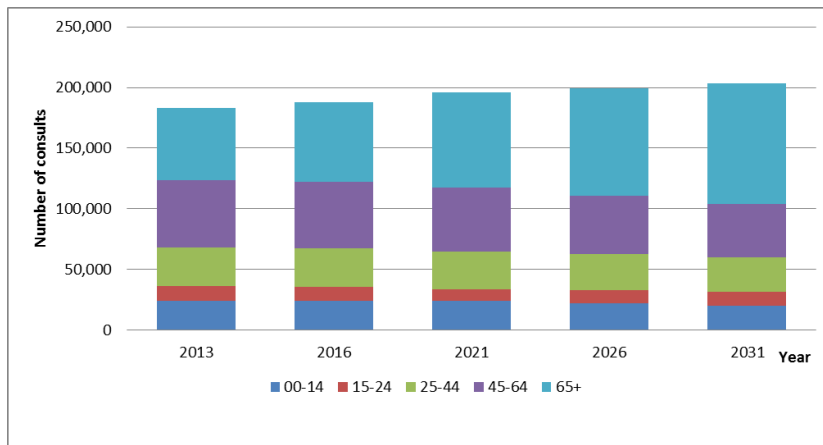


Queenstown locality



Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections. Note differing vertical axis scales.

Southland locality



Southern PHO consult rates for primary capitation Q2 2013, projected at same rate/age group based on Statistics New Zealand medium projections. Note differing vertical axis scales.

7. Hospitalisation

Southern DHB has a network of facilities covering the hospital care requirements of its population (Table 30). Dunedin Hospital with its associated medical school is the main referral hospital for Southern DHB, covering some tertiary specialties and all secondary services including a range of sub specialties. It provides some niche national –level services such as stereotactic radiosurgery. The other major general hospital is the Southland Hospital in Invercargill, providing a large range of secondary care services. A network of smaller hospitals provide some inpatient medical care – Lakes in Queenstown owned by the DHB, and others managed by local community trusts in Gore, Balclutha, Oamaru and Ranfurly. Specialist mental health services are provided at Wakari Hospital in Dunedin. Two community hospices in Dunedin and Invercargill provide palliative care in community settings with a small number of inpatient beds for symptom management and control. Private hospitals include maternity units, mental health and surgical as noted.

Table 30 Southern DHB Hospitals

Hospital	Localities served	RDL	Operator	Size	Notes
DHB owned and operated					
Dunedin	All	4/5	DHB	388 beds	Main referral hospital for Southern DHB, some tertiary, all secondary services
Wakari	All	n/a	DHB	150 beds	Specialised psychiatric hospital services and services for people with intellectual or physical disabilities
Southland	Southland, Gore, Queenstown	3/4	DHB	181 beds	Secondary level base hospital, supports Gore and Lakes Hospitals
Lakes	Queenstown	2	DHB	21 beds	Maternity, acute medical and elderly, ED 24/7. 181km (2hrs 10) to Southland Hospital
DHB owned					
Dunstan	Central	2	Central Otago Health Services Ltd (community trust)	24 beds	Acute medical and elderly. 199km from Dunedin Hospital (2 hrs 45). Facility and land owned by DHB.
Locally owned and operated					
Clutha	Clutha	2	Clutha Health First (community trust)	17 beds	Acute medical, maternity and elderly. GP surgery onsite. 80km from Dunedin Hospital (1 hr).
Gore	Gore	2	Gore Health Ltd (community trust)	17 beds	Acute medical, maternity and elderly. ED 24/7. GP surgery onsite. 65km (55 min) to Southland Hospital.
Maniototo, Ranfurly	Central	1	Maniototo Health Services Ltd (community trust)	15 beds	Acute medical, maternity and elderly. GP surgery onsite. 132km from Dunedin Hospital (1 hr 45).
Oamaru	Waitaki	2	Waitaki District Health Services Ltd, (owned by	35 beds	Acute medical, maternity and elderly, ED 24/7. 113km from Dunedin Hospital (1 hr 30).

			local Council)		
Otago Community Hospice	Dunedin	n/a	Otago Community Hospice	12 beds	Hospice
Hospice Southland	Southland	n/a	Hospice Southland Charitable Trust	8 beds	Hospice
Privately owned					
Ashburn Clinic	n/a	n/a	Ashburn Hall Charitable Trust	64 beds	Privately run inpatient, day patient and outpatient mental health services, addiction, eating disorders.
Charlotte Jean	Central	n/a	Charlotte Jean Maternity Hospital Ltd	4 beds	Maternity birthing unit in Alexandra
Lumsden Maternity Centre	Southland	n/a	Northern Southland Medical Trust	5 beds	Maternity birthing unit in Lumsden
Mercy Hospital Dunedin	n/a	n/a	Mercy Hospital Dunedin Ltd	66 beds	Private surgical hospital
Southern Cross Hospital Invercargill	n/a	n/a	Southern Cross Hospitals Ltd	26 beds	Private surgical hospital
Tuatapere Maternity Unit	Southland	n/a	Waiau Health Trust Limited	4 beds	Maternity birthing unit in Tuatapere, western Southland
Winton Maternity Centre	Southland	n/a	Central Southland Hospital Charitable Trust	6 beds	Maternity birthing unit in Winton

Note: Includes all facilities with hospital beds, excluding aged care facilities. Further detail is available in the *South Island DHB rural stocktake update report* July 2013 from the South Island Alliance. RDL = Role Delineation Level, range 1 to 6, where 6 is the highest complexity tertiary facility.

Approximate average travel times to get to Southland and Dunedin Hospitals are shown in Figure 50. Around three-quarters of the population (74%) live within one hour's drive of either Southland (inner blue line) or Dunedin hospitals (inner red line), with a further 14% within two hours. The remaining 11% or around 36,000 people are more than two hours from a major hospital, mainly in the Queenstown and Central localities. There are no direct regular provincial air flights between Queenstown and Dunedin or Invercargill – the closest common destination is Christchurch.

Figure 50 Map of approximate travel times to Southland and Dunedin hospitals



Approximate travelling times by road in maroon to Dunedin hospital and in blue/black to Southland Hospital. Each isocline represents 1 hour travel. Times from SDHB website and Google Maps. Stewart Island 1 hour ferry trip to Bluff.

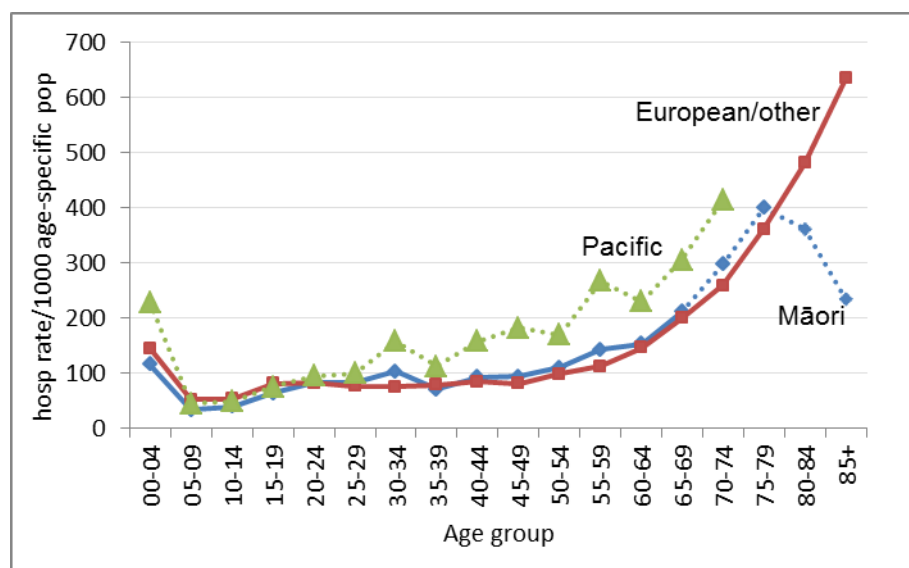
7.1 Unplanned hospitalisations

Having an illness of sufficient severity to warrant hospital admission is an important (negative) marker of health. While hospital admission thresholds can vary, with so-called supplier-induced demand creating variation independent of population health, some reasonable inferences can be drawn on the health of the population from hospital utilisation data. Here we concentrate on unplanned (also known as “acute”) medical and surgical hospitalisations across all age ranges. This excludes planned (elective) admissions, and maternity, care of the elderly and mental health. For the purposes of this report medicine and surgery are considered together as they have similar requirements for acute care delivery, and need for clinical support services (eg, imaging/laboratory diagnostics, intensive care), and “arranged” admissions, those where a person needs admission within a week of presentation are also considered as part of the unplanned workload. The analysis is to examine the health of the Southern DHB population, so only Southern DHB residents are included in the analysis – visitors and tourists are excluded.

Children are briefly covered separately (section 7.4), but for in depth analysis the reader is referred to the [Health Status of Children and Young People in Otago and Southland](#) and *Determinants of Health* reports.

For the whole population there were an average of 38,600 unplanned medical and surgical hospitalisations per year to Southern residents for the three years from 2010/11 to 2012/13, a rate of 126 per 1000 people per year. This is the equivalent of 12.6% of the population being hospitalised in any one year. This rate is similar to the New Zealand average (HQSC Atlas of Healthcare Variation). Rates varied markedly by age as one would expect (Figure 51). Pacific residents had an apparent higher hospitalisation rate at most ages, however the small numbers of this population make it difficult to be definitive. The rate difference is more noticeable at the middle ages, widening from age 45 onwards as the consequences of higher chronic disease rates start to impact on general health for Pacific people. One might have expected a similar pattern for Māori, but this did not show in the analysis.

Figure 51 Unplanned medical-surgical hospitalisations per year by age and ethnicity, Southern DHB residents 2010-13



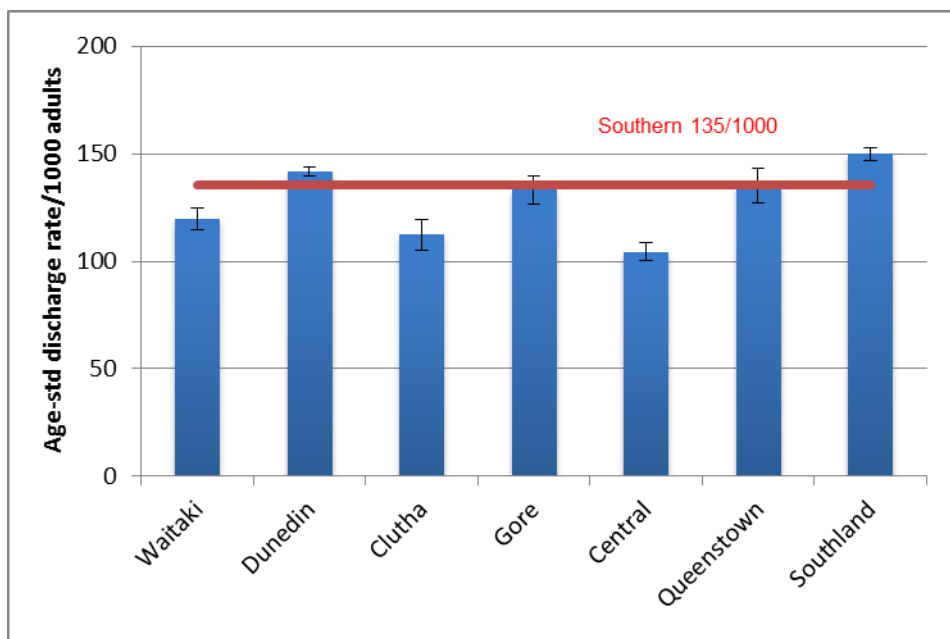
Notes: All publicly-funded unplanned (acute) hospitalisations to Southern DHB residents wherever admitted in NZ. Excludes electives, mental health, maternity, AT&R, palliative care. Casemix only, does include day cases and emergency department admissions. Pacific have low numbers, hence unstable rates and are shown as dotted lines (up to age 74), as are the older Māori age groups. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

7.1.1 Adult unplanned hospitalisations

For adults aged 15 and over there were an average of 34,100 unplanned medical and surgical hospitalisations per year to Southern residents for the three years from 2010/11 to 2012/13, a rate of 135 per 1000 people per year. Hospitalisation rates varied significantly by locality (age-standardised), with Waitaki, Clutha and Central having rates lower than the Southern average and Southland having a higher rate (Figure 52). However the localities vary by deprivation level (Table 6, page 20), and hospitalisation rates vary significantly by deprivation (Figure 53). People in Southern DHB living in areas considered to be in the 20% most deprived areas of New Zealand (NZDep06 deprivation quintile 5) have nearly twice the hospitalisation rate as those living in the 20% least deprived areas (quintile 1) - 196 v 109 /1000 adults/ year. As noted in Chapter 2 this will relate to increased prevalence of conditions through the impacts of the social determinants of health as well as possible difficulties in accessing care, including affordable primary care.

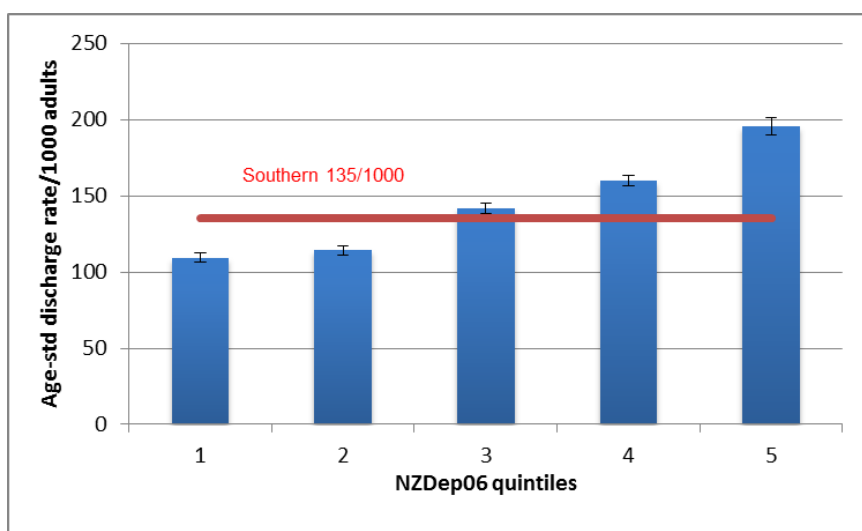
Figure 54 adds some of the locality figures to the deprivation graph – Central looks to match its deprivation level, while Queenstown appears to have a higher hospitalisation rate than expected, and Waitaki and Clutha lower rates. The high Queenstown rate is due in part to a high hospitalisation rate for injuries – see Section 7.5. Also inserted in Figure 54 is the age-standardised rate of adult Māori unplanned hospitalisations – similar to the average rate, and significantly lower than people living in quintile 5 areas.

Figure 52 Adult unplanned medical and surgical hospitalisation rate, Southern DHB localities 2010-13



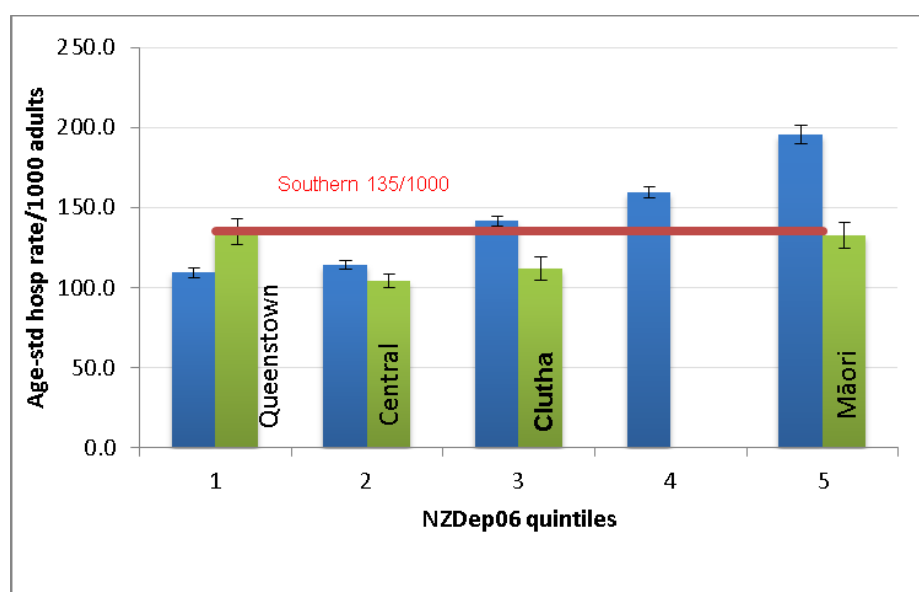
Notes: Ages 15+, excludes planned (electives), mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13

Figure 53 Adult unplanned medical and surgical hospitalisations rate by NZDep06 deprivation quintile, Southern DHB 2010-13



Notes: as per Figure 52. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived.

Figure 54 Adult acute medical and surgical hospitalisations rate by NZDep06 deprivation quintile, Southern DHB 2010-13 compared to selected localities



Notes as per Figure 52. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels.

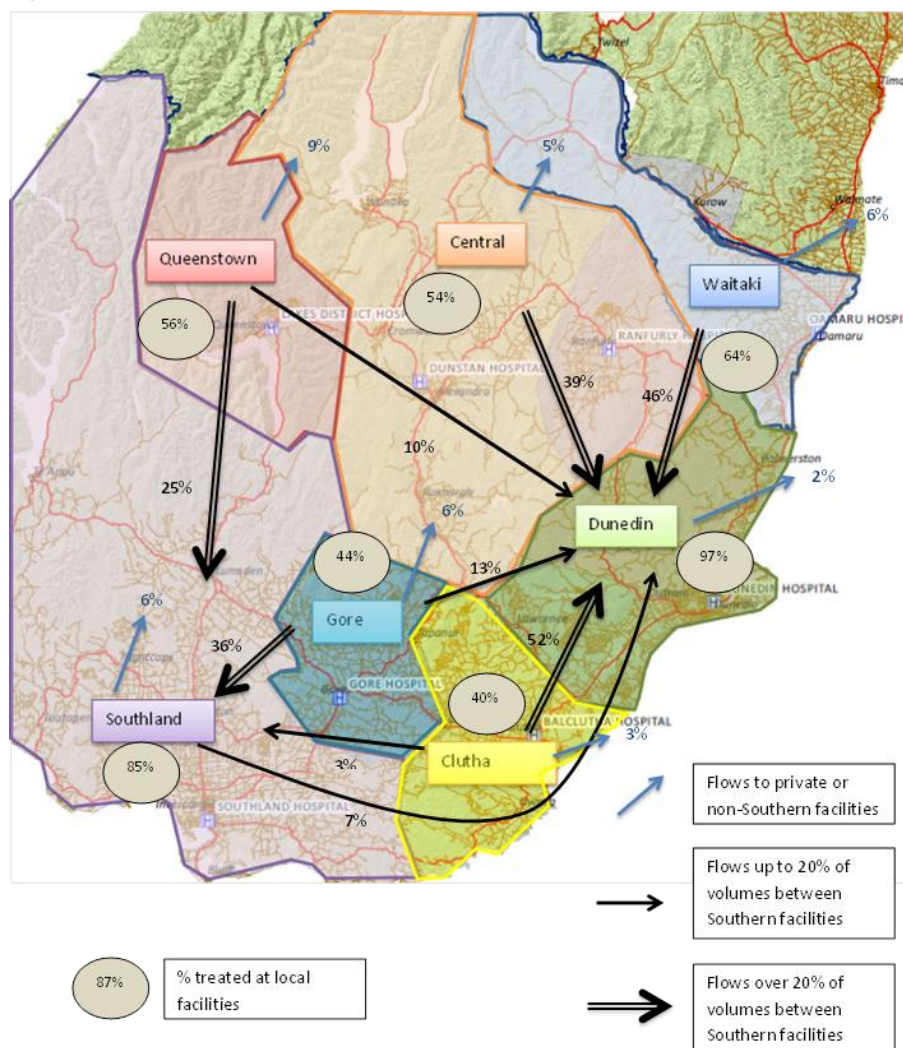
For the more rural localities of Southern between a third and two-thirds of all unplanned hospitalisations occur locally (Table 31). For Waitaki 64% of hospitalisations are at Oamaru hospital, the rest mainly at Dunedin, with the next highest local provision occurring for the Queenstown locality with 56% at Lakes Hospital, 25% at Southland and 10% at Dunedin. Queenstown has the highest proportion of hospitalisations out of district at 9%. Overall only 4.3% of hospitalisations occur outside the DHB facilities listed – and some of these will be for holiday-makers and the like, injured or falling ill out of area. Flows by locality are shown in map form in Figure 55.

Table 31 Adult unplanned medical and surgical hospitalisations proportion by facility, Southern DHB 2010-13

Locality	Facility of treatment							South-land	IDF	Total
	Clutha	Dunedin	Dunstan	Gore	Lakes	Ran-furly	Oamaru			
Waitaki		30%					64%		6%	100%
Dunedin		97%							2%	100%
Clutha	40%	52%		2%				2%	3%	100%
Gore		13%		44%				36%	6%	100%
Central		39%	48%			6%			5%	100%
Queens-town		10%			56%			25%	9%	100%
Southland		7%						85%	6%	100%
Total	1%	52%	4%	3%	3%	0.5%	5%	28%	4%	100%

Notes: Ages 15+, excludes electives, mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ - those outside Southern termed “IDF” where IDF stands for “inter-district flow”, meaning DHBs other than Southern.

Figure 55 Adult hospitalisation flows, Southern DHB 2010-13



Source: HPCG analysis of NMDS data. Unplanned publicly-funded hospitalisations to Southern DHB residents aged 15+, wherever admitted in NZ. Excludes electives, mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions.

Table 32 Unplanned medical and surgical average length of stay and caseweight by facility 2010 to 2013

Facility	Hosps/ year	% of total	ALOS	Average caseweight
Oamaru	1,535	5%	3.1	-
Dunedin	17,763	52%	3.3	1.1
Clutha Health First	463	1%	4.2	-
Gore Health Centre	866	3%	3.0	-
Maniototo Health	156	0.5%	6.6	-
Dunstan	1,240	4%	3.4	-
Lakes District	951	3%	1.6	0.5
Southland	9,639	28%	2.7	0.8
IDF	1,472	4%	2.6	1.4
Total	34,085	100%	3.0	1.0

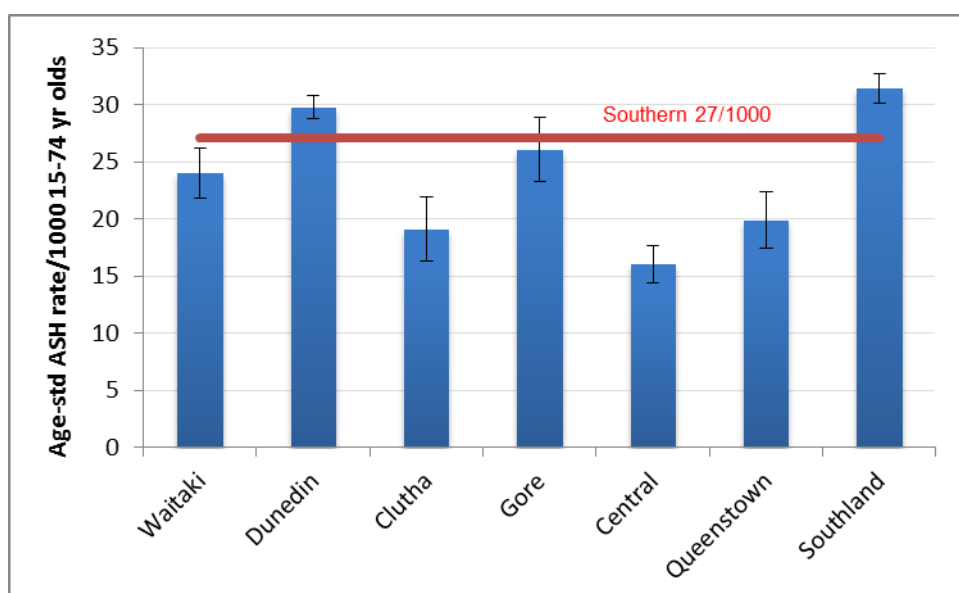
Notes: Unplanned publicly-funded hospitalisations to Southern DHB residents aged 15+ wherever admitted in NZ as per Table 31. All outside Southern termed "IDF" where IDF stands for "inter-district flow". ALOS = average length of stay, 0 = same day. The average complexity hospitalisation for NZ = 1 caseweight – higher is more complex. Average for the three years 2010/11 to 2012/13. Caseweights not shown for the rural hospitals as they are not so useful for analysing the wider mix of patients seen in smaller facilities.

Of the two larger inpatient facilities Dunedin Hospital (RDL 5) dealt with 52% of unplanned medical and surgical hospitalisations with an average length of stay (ALOS) of 3.3 days, and an average caseweight⁴⁰ of 1.1 (Table 32). In comparison the lower RDL hospital Southland has an ALOS of 2.7 days and average caseweight of 0.8. This is the expected pattern given the RDL levels and range of specialties present at Dunedin Hospital. The ALOS at the smaller facilities ranged from 1.6 days at Lakes to 6.6 days at Maniototo Health in Ranfurly, being confounded by longer stay rehabilitation patients.

7.2 Ambulatory Sensitive Hospitalisations (ASH)

Ambulatory sensitive hospitalisations (ASH) are described as unplanned hospital admissions that have the potential to be prevented by effective delivery of services in a primary care or community setting. This saves the patient the risks and inconveniences of a hospital admission, and allows the health system to make better use of its resources. These admissions can be influenced by a range of factors including access to high quality affordable primary health care⁴¹; people's income, age and ethnicity; deprivation; and their housing and social circumstances. As a measure ASH is usually restricted to ages 0-74 years, as it becomes more difficult to attribute avoidability at older age groups.

Figure 56 Adults aged 15-74 ASH rate by locality, Southern DHB 2010-13



Notes: Ages 15-74, casemix only, includes day cases and emergency department admissions. Publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13. Rates do not include the angina halving, so differ from the MOH version.

ASH was a DHB Health Target in 2007/08 and 2008/09, and has since then been a DHB Performance Measure. The indicator is intended as a system measure of access to effective primary health care services and how these services operate alongside those delivered within hospital settings. When examined recently by the HQSC Atlas of Healthcare Variation, Southern had one of the lowest adult ASH rates in the country – in 2011/12 the rate was 14/1000 aged 15-74 (95% CI

⁴⁰ Caseweights are a method of assessing the complexity of a hospitalisation for costing purposes. The New Zealand average hospitalisation is set at 1.00 caseweight.

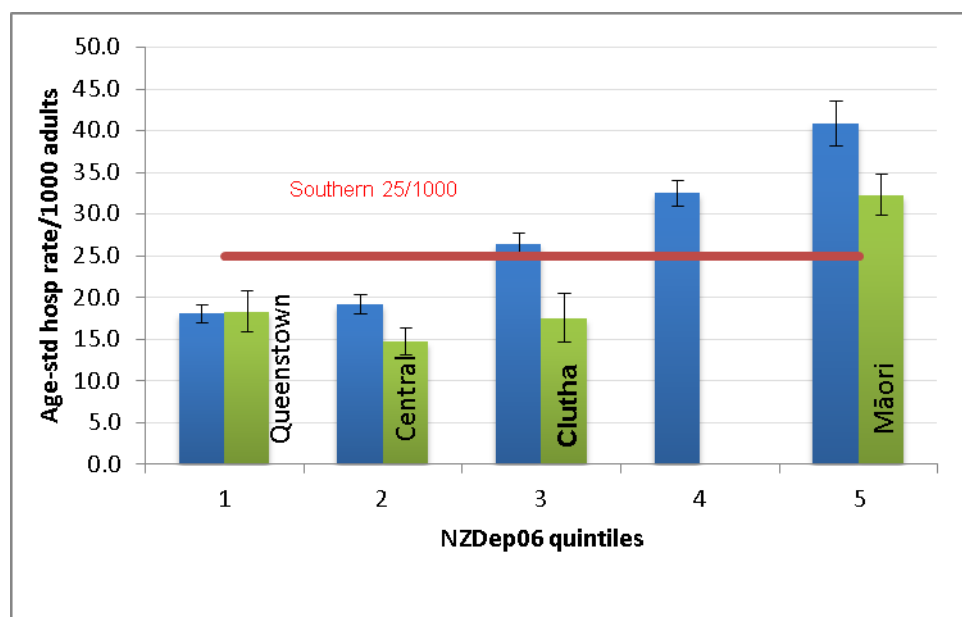
⁴¹ Gibson OR, Segal L, McDermott RA. (2013) A systematic review of evidence on the association between hospitalisation for chronic disease related ambulatory care sensitive conditions and primary health care resourcing. *BMC Health Services Research* 2013, 13:336.

13.5-14.5) compared to the national average of 19/1000⁴². Around 11% of all unplanned medical-surgical admissions were considered to be ASH in Southern, compared with 15% nationally. A similar pattern was shown in a separate analysis for the 75-84 age group, with the Southern rate of 72.4 ASH hospitalisations per 1000 75-84 year old significantly lower than the 92/1000 national rate.⁴³

Figure 56 shows the age-standardised ASH rates per 1,000 15-74 year olds by locality. Here we include emergency department admissions and all angina cases, so rates appear higher than the MOH measure quoted above. Residents of the Dunedin and Southland localities have significantly higher ASH rates than the Southern average. If they were able to be reduced to the average around 500 hospitalisations per year would be avoided. Queenstown, Central and Clutha residents all had low ASH rates – when compared with their average deprivation level Central and Clutha still looked relatively low (Figure 57).

ASH rates show a stronger deprivation gradient than overall unplanned hospitalisations (Figure 57), with people living in quintile 5 areas having more than twice the hospitalisation rate of those living in quintile 1 (47 cf 21/1000 15-74 year olds). The Māori rate is higher on an age-adjusted basis than the average at 32/1000, implying an excess of around 200 hospitalisations compared to the Southern average. The low ASH rates seen in Southern may relate as much to low deprivation levels and a rural population less inclined to hospital services if they can be avoided as to the effects or otherwise of primary care.

Figure 57 Adult aged 15-74 ASH rate by deprivation quintile, Southern DHB 2010-13



Notes: As for Figure 56. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels.

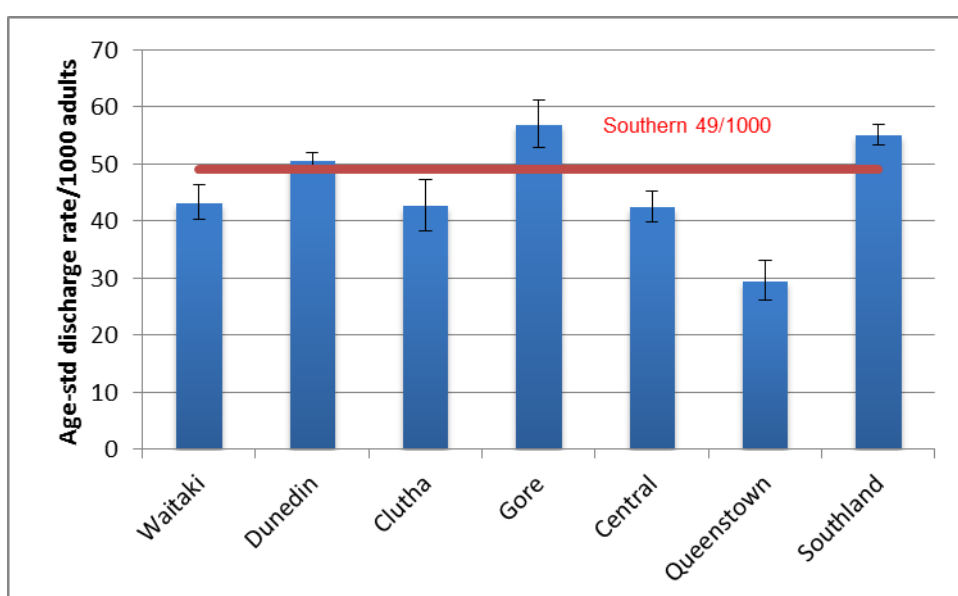
⁴² <http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/adult-ambulatory-sensitive-hospitalisations/> This is based on the MoH definition, excluding emergency department admissions, halving angina. For some diagnoses such as angina only half were deemed to be ASH.

⁴³ <http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/older-adult-ambulatory-sensitive-hospitalisations/>

7.3 Planned (elective) hospitalisations

The Southern area has had relatively high publicly-funded planned (also termed “elective”) surgery rates in the past compared to other DHBs.⁴⁴ In recent years it has met all its surgical National Health Targets. Over the three years 2010/11 to 2012/13 there were an average 12,400 elective medical-surgical hospitalisations a year, 10,700 if restricted to surgical specialties. Rates varied significantly by locality (Figure 58), however there is a strong gradient by deprivation as expected, such that when adjusted for, localities look a lot closer in planned procedural rates (Figure 59). Residents of Waitaki, Clutha and Queenstown localities appear to have lower publicly-funded planned hospitalisations than the Southern average. Māori residents of Southern have a lower rate of publicly-funded planned hospitalisations than non-Māori (41 cf 49 per 1000 adults, age-standardised), despite similar unplanned hospitalisation rates. Note that privately-funded private surgery is not included in these population rates. This will be one of the drivers for low deprivation areas having lower publicly-funded planned surgery rates, along with differing rates of illness and injury.

Figure 58 Adult planned hospitalisation rate by locality, Southern DHB 2010-13



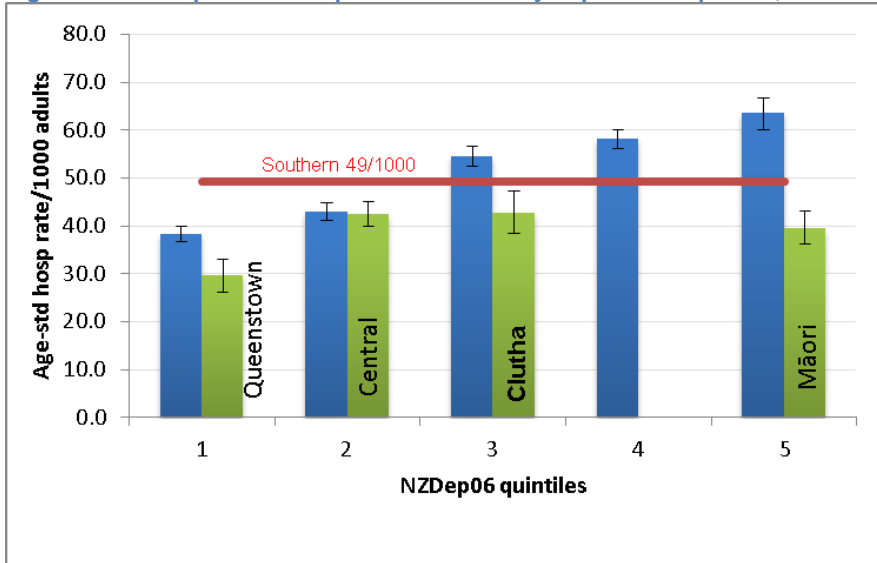
Notes: Adults (ages 15+), casemix elective “WN” cases only, including day cases, ACC-funded in public hospitals. Publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

The majority of publicly funded planned hospitalisations for Southern residents are carried out at Dunedin Hospital (64%) and Southland Hospital (30%), while 5% were carried out in private facilities or in other DHBs. For the Queenstown locality 17% of planned hospitalisations were in private or other DHB facilities, higher than any other locality. Most of the remainder were carried out in the Mobile Surgical Unit (around 170 cases a year, 1.4% of volumes). Flows by locality are shown in Figure 60.

The planned cases managed at Dunedin Hospital had an average length of stay (ALOS) of 1.5 days, and an average caseweight of 1.3 (Table 33). In comparison Southland Hospital had an ALOS of 1.0 days and average caseweight of 1.0. This lower complexity level at Southland Hospital links with the lower RDL rating noted above (Section 7.1). The Mobile Surgical Unit carried out less complex day surgery procedures – so an ALOS of 0 and with an average caseweight of 0.6. Some planned hospitalisations were publicly funded in private facilities, or at Christchurch or other tertiary hospitals – amounting to 5% of cases, with an ALOS of 2.3 days and average caseweight of 2.1 days.

⁴⁴ Raymont A. Hospital discharges in New Zealand 1991–2005: changes over time and variation between districts. *NZ Med J* 2008; 212: 66-74

Figure 59 Adult planned hospitalisation rate by deprivation quintile, Southern DHB 2010-13



Notes: As per Figure 58. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation levels.

Figure 60 Adult planned (elective) hospitalisation flows, Southern DHB 2010-13

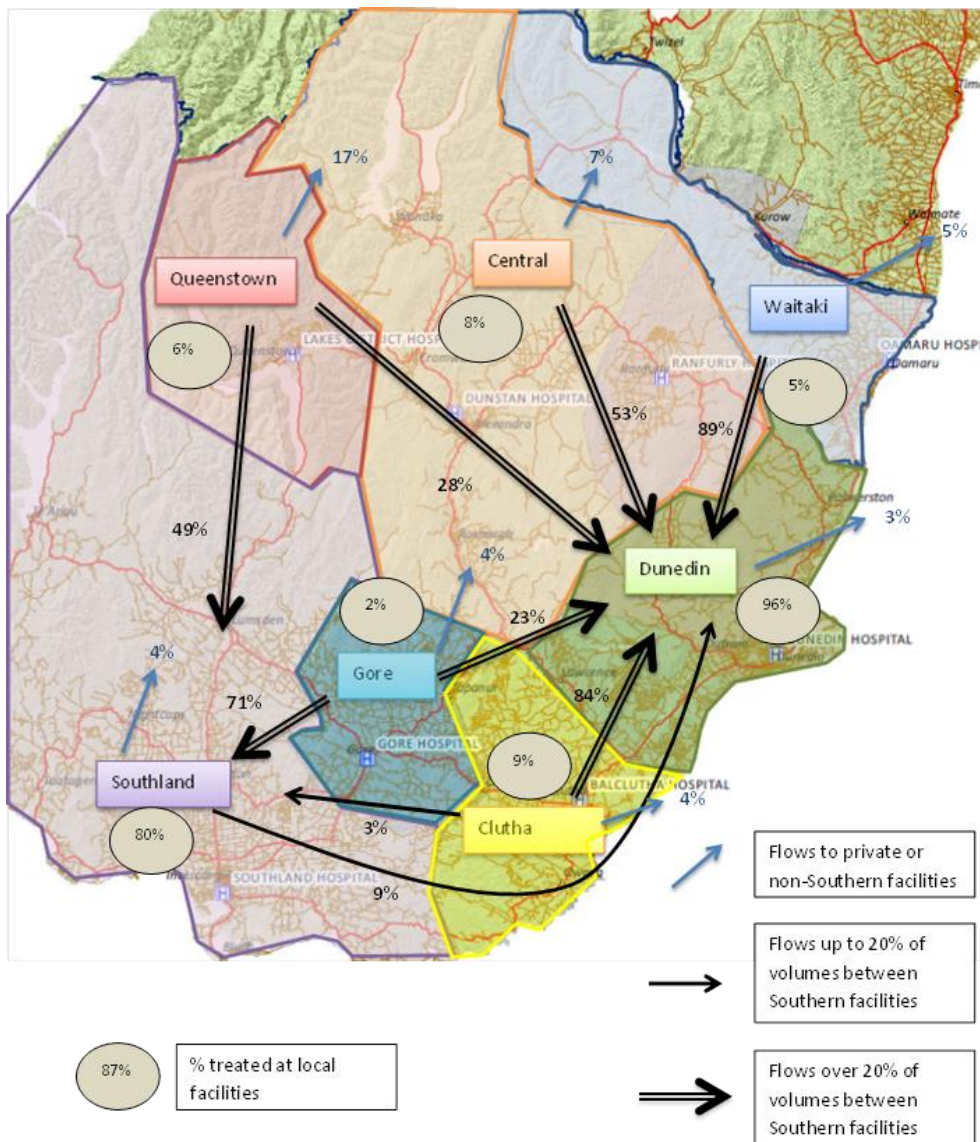


Table 33 Planned medical-surgical average length of stay and caseweight by facility 2010 to 2013

	Hosps/ year	% of total	ALOS	Average cwt
Dunedin	7,857	64%	1.5	1.3
Mobile Surgical Unit	173	1%	0	0.6
Southland	3,742	30%	1.0	1.0
Private/IDF	569	5%	2.3	2.1
Total	12,341	100%	1.4	1.3

Notes: As per Figure 58. All outside Southern DHB facilities termed “private/IDF” where IDF stands for “inter-district flow”. ALOS = average length of stay, 0 = day case. The average complexity hospitalisation for NZ = 1 cwt (caseweight) – higher is more complex.

Examining standardised intervention rates is a common way for DHBs to assess where they stand nationally. The national average is not necessarily the right rate for an individual DHB with its own mix of population and past history of interventions, but provides a benchmark when assessing waiting times, treatment thresholds and so on. High rates are not necessarily better – see discussion on tonsillectomy and ventilation tube (grommet) insertion below (page 81). It appears some additional health gain may be possible in general surgery, gynaecology, plastics and vascular surgery.

Table 34 Planned surgical standardised discharge rates 2012/13, Southern DHB compared to the national average

Speciality	Hosps 2012/13	SDR/ 10,000 pop	Rank/ 20 DHBs	Variance
Cardiac surgery	220	7.1	6	NS
Cardiology	182	5.5	9	NS
Cardiothoracic	186	6.1	13	NS
ENT	1,241	43.5	6	High
Ophthalmology	1,919	60.7	10	NS
General surgery	1,913	59.7	20	Low
Gynaecology	954	32.2	16	Low
Neurosurgery	81	2.7	5	NS
Orthopaedics	1,670	52.7	9	High
Plastics	533	15.8	19	Low
Urology	562	17.6	15	NS
Vascular surgery	177	5.9	15	Low
All surgical DRGs	9,665	309	19	Low

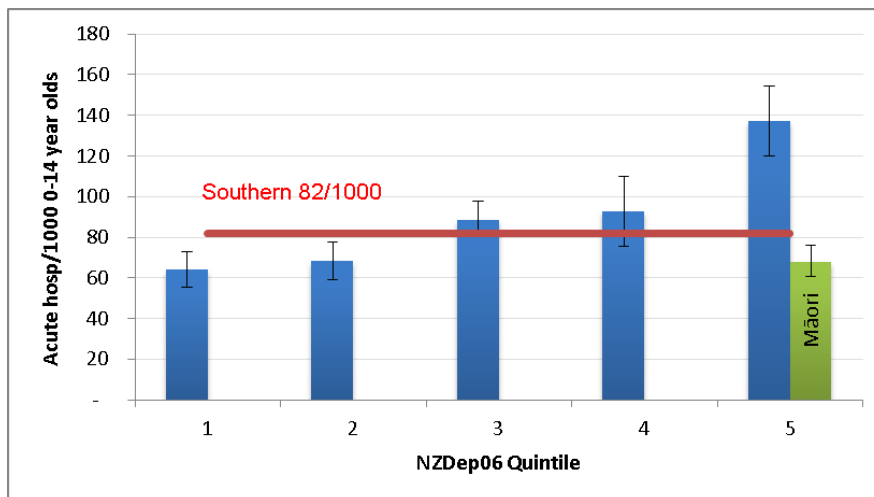
Source: Ministry of Health electives programme, based on a set of specific DRGs. Hosps = hospitalisations for planned procedures, SDR = standardised discharge rate per 10,000 population, standardising for age, sex, ethnicity and deprivation; rank is out of 20 DHBs 1 = highest rate of surgery, 20 = lowest rate, variance if statistically significant. Specialities assigned by DRG rather than by the discharge speciality.

7.4 Child unplanned hospitalisations

For children aged 0-14, there was an average of 4,500 unplanned (“acute”) medical-surgical hospitalisations per year to Southern residents for the three years from 2010/11 to 2012/13, a rate of 82 per 1000 children per year – the equivalent of 8% of children being admitted each year. Note that this excludes birth and neonatal hospitalisations. Similar rates were shown in the HQSC Atlas of Healthcare Variation, where Southern rates were consistently below the New Zealand average for 2009/10, 2010/11 and 2011/12. However when adjusted by ethnicity, Southern rates were similar to the national rates.

Hospitalisation rates vary significantly by deprivation and ethnicity (Figure 61). Children in Southern DHB living in areas considered to be in the 20% most deprived areas of New Zealand (NZDep06 deprivation quintile 5) have over twice the hospitalisation rate as those living in the 20% least deprived areas (quintile 1) - 137 v 64 /1000/year. Māori children in Southern have hospitalisation rates similar to the average, but much lower than those living in quintile 5 areas (Figure 61).

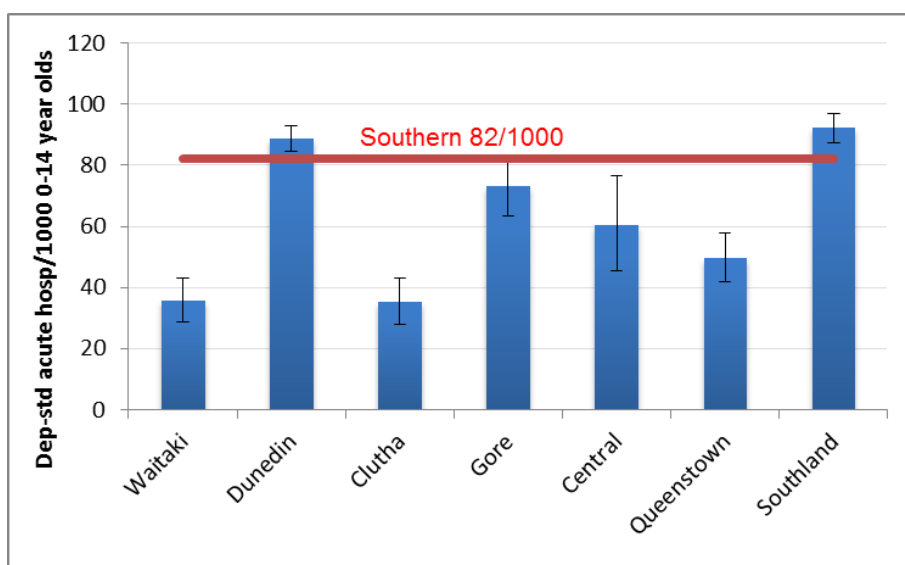
Figure 61 Child unplanned medical and surgical hospitalisation rate by deprivation quintile, Southern DHB 2010/11-12/13



Notes: Ages 0-14, excludes electives, mental health, maternity, neonates. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in New Zealand. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, including Māori, the green bar shows Māori children at their average deprivation level.

Hospitalisation rates varied significantly by locality, even standardising by deprivation (Figure 62). Waitaki, Clutha, Central and Queenstown children had rates lower than the Southern average and Southland children had a higher rate.

Figure 62 Child unplanned medical and surgical hospitalisation rate by locality, deprivation standardised, Southern DHB 2010-13



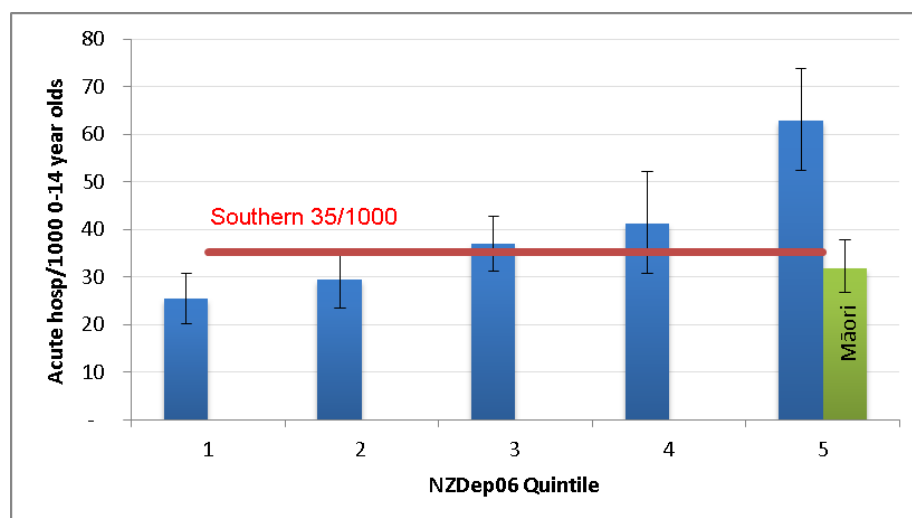
Notes: As for Figure 61 but deprivation-standardised (using quintiles) to the Southern 2011 distribution. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

Some children were cared for locally at Oamaru (29% of Waitaki child hospitalisations), Dunstan (40% of Central's) and Lakes (43%), but the majority were hospitalised at Dunedin (47% of the overall volume) and Southland Hospitals (40%). Around 7% were treated outside Southern, with the rate as high as 17% for Queenstown children – representing around 35 a year or nearly 3 a month.

The Child Epidemiology Service reports show that during 2006–2010, injury/poisoning, acute upper respiratory tract infections and gastroenteritis were the most frequent reasons for an acute hospital admission in children aged 0–14 years. Injuries presented at twice the rate of the next highest cause.

Ambulatory sensitive hospitalisations for Southern children were around the national average for 2009/10 to 2011/12 by the HQSC Atlas of Healthcare Variation.⁴⁵ As for overall unplanned hospitalisation, rates varied significantly by deprivation and ethnicity (Figure 63). Children in Southern DHB living in areas considered to be in the 20% most deprived areas of New Zealand (NZDep06 deprivation quintile 5) have over twice the ASH rate as those living in the 20% least deprived areas (quintile 1) - 63 v 25 /1000/year. Māori children in Southern have similar ASH rates as the average, but significantly lower than those living in quintile 5 areas. ASH rates varied significantly by locality (deprivation-standardised), with Waitaki, Clutha, Central and Queenstown children having rates lower than the Southern average and Southland children having a higher rate (Figure 62).

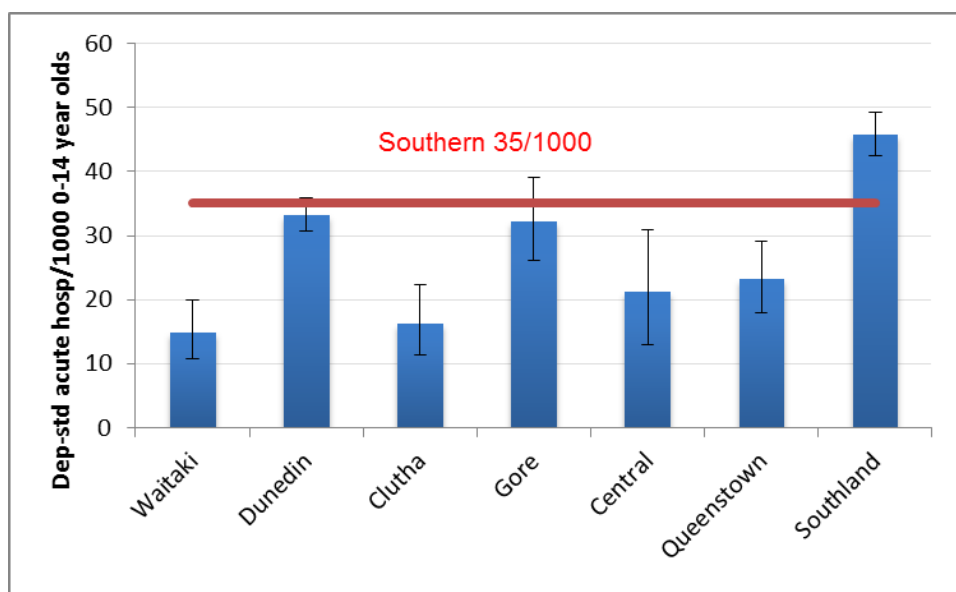
Figure 63 Child ASH rate by deprivation quintile, Southern DHB 2010-13



Notes: Ages 0-14, ambulatory sensitive hospitalisations including day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, including Māori, the green bar shows Māori children at their average deprivation level.

⁴⁵ <http://www.hqsc.govt.nz/our-programmes/health-quality-evaluation/projects/atlas-of-healthcare-variation/childhood-ambulatory-sensitive-hospitalisations/>

Figure 64 Child ASH rate by locality, deprivation standardised, Southern DHB 2010-13



Notes: Ages 0-14, ambulatory sensitive hospitalisations including day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, deprivation-standardised (using quintiles) to the Southern 2011 distribution. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

Around 32% of Southern child unplanned hospitalisations were considered to be ambulatory sensitive, compared with 30% nationally.

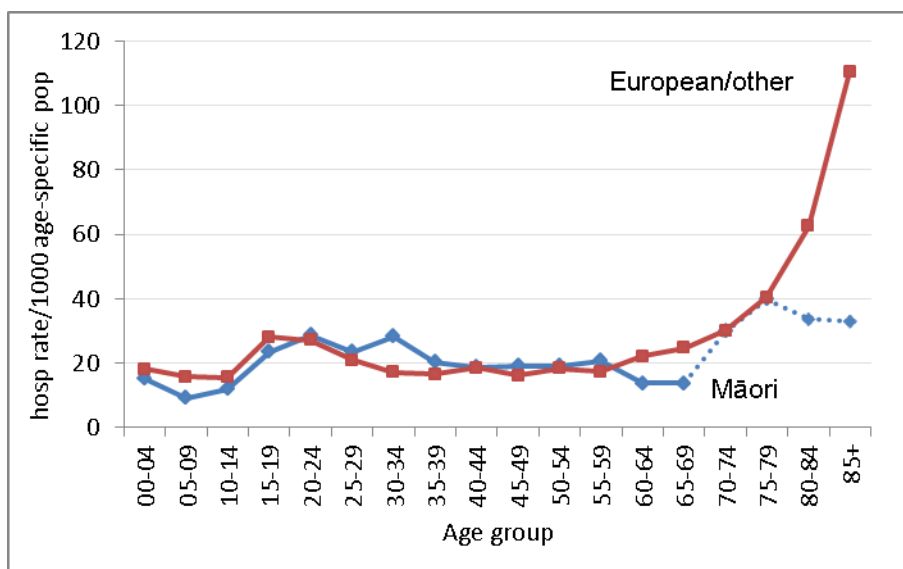
Child planned (elective) hospitalisations made up around 31% of all child hospitalisations, around 660 per year. The hospitalisation rates were proportionately similar to the unplanned rates by deprivation and by locality.

The Health Quality and Safety Commission’s (HQSC) Atlas of Healthcare Variation examined surgical intervention rates for tonsillectomy and ventilation tube (grommet) insertion, amid concern that these procedures were being overused in some areas. While elective surgery rate increases are often portrayed in a positive light, this only holds true if the procedures are of benefit – as rates of surgery increase and the cases with the most benefit get operated on first, the marginal benefit to harm ratio per case will drop. Southern had the highest or near highest rates for these procedures, significantly higher than other DHBs. Rates for European children were higher than for Māori and Pacific, implying that the reasons for the procedure were likely to be more culturally-based than disease-based.

7.5 Injury hospitalisations

Injuries are the single largest cause of admission to hospital in New Zealand. Rates rise at older ages with fractures due to falls one of the largest contributors (Figure 65). The increase at age 15-19 related to motor vehicles is less pronounced than in the past but remains significant.

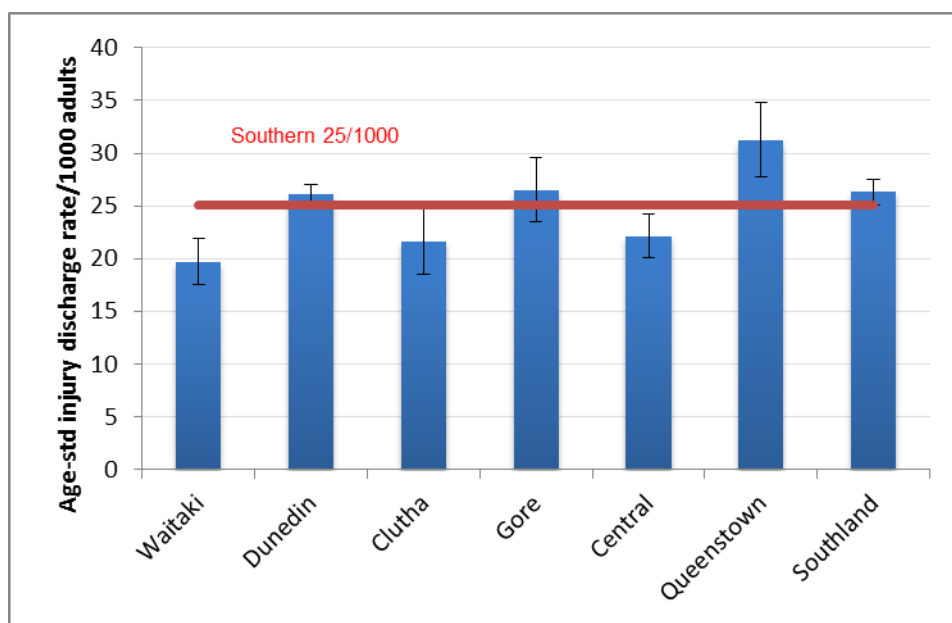
Figure 65 Unplanned injury-related hospitalisations per year by age, Southern DHB residents 2010-13



Notes: Principal diagnosis of injury, excludes planned admissions (electives), mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13. Māori at older age groups have low numbers, hence unstable rates and are shown as dotted lines.

Residents of the Queenstown locality have a significantly higher rate of unplanned injury hospitalisation than others in Southern DHB (Figure 66), even more noticeable when compared with the relevant deprivation quintile (Figure 67). Waitaki and Central residents have low age-standardised injury hospitalisation rates, with Waitaki's significantly low compared with its average deprivation level.

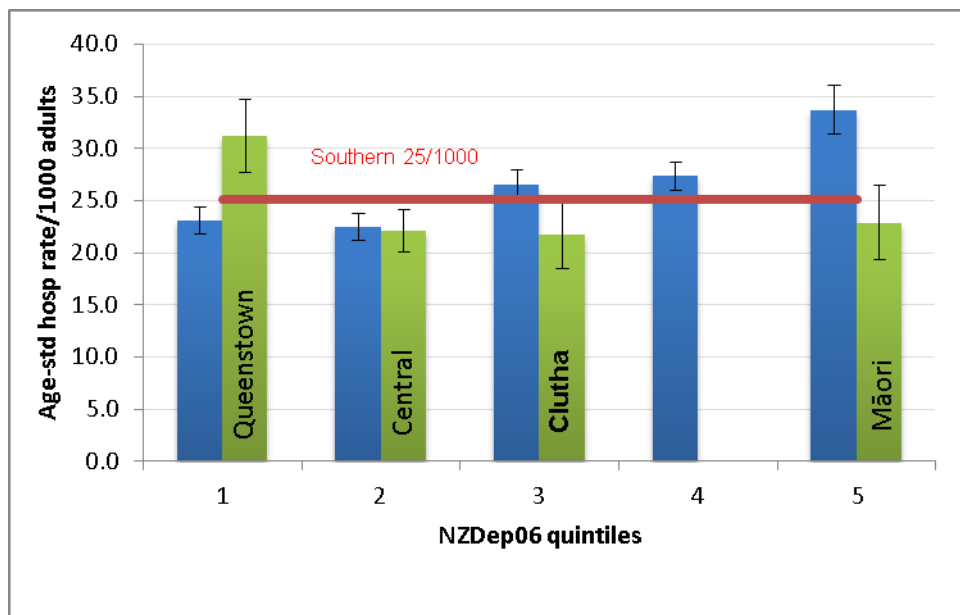
Figure 66 Adult injury hospitalisation rate, Southern DHB localities 2010-13



Notes: Principal diagnosis of injury, ages 15+, excludes planned admissions (electives), mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations of Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13.

The higher rates of injury hospitalisation for people living in quintile 5 areas are noticeable in Figure 67. The NZ Burden of Disease study notes a doubled rates of injury in the Māori population, with the major determinants being motor vehicle accidents and self-inflicted injury – not apparent for Southern. Alcohol was a significant contributor nationally, ⁴⁶ but did not seem to be contributing to the higher rates of injury ED attendance at Lakes hospital.⁴⁷

Figure 67 Adult injury hospitalisation rate by deprivation quintile, Southern DHB 2010-13



Notes: Principal diagnosis of injury, ages 15+, excludes planned admissions (electives), mental health, maternity, AT&R, palliative care. Casemix only, does include day cases, emergency department admissions. All publicly-funded hospitalisations to Southern DHB residents wherever admitted in NZ, age-standardised to the Southern 2011 population. Annual rates per 1000 population for the 3 years 2010/11 to 2012/13. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation level.

The New Zealand Atlas of Healthcare Variation has also examined injury hospitalisations (<http://www.hqsc.govt.nz/assets/Health-Quality-Evaluation/trauma-single/atlas.html>). Here they concentrate on more severe trauma, so exclude day cases and low impact trauma like fractured neck of femur. Southern has an average rate of trauma hospitalisations, with a rate of 5.9 per 1000 population lying just below the national average of 6.25/1000. It has the 11th highest rate. For Māori it had the 2nd lowest rate, while for Pacific Southern was around the average of Pacific people in each DHB.

⁴⁶ Ministry of Health and Accident Compensation Corporation. 2013. *Injury-related Health Loss: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study 2006–2016*. Wellington: Ministry of Health.

⁴⁷ Public Health South. *The Impact of alcohol on the health of Southern communities*. Southern DHB, July 2013 p13.

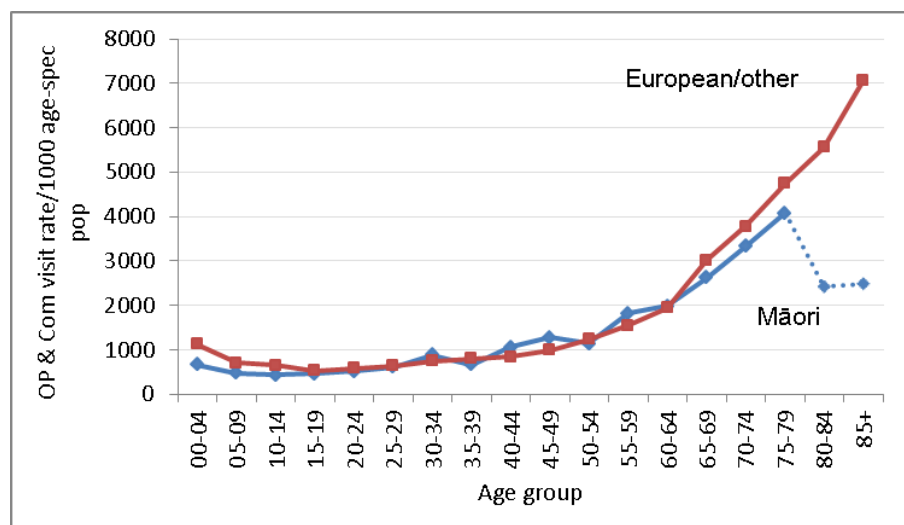
8. Outpatient utilisation

Access to specialist knowledge and expertise outside the general practice and inpatient settings is an important part of the health system. Data from medical outpatient clinics to allied health domiciliary visits are captured through the NNPAC data set (**N**ational **N**on-Admitted **P**Atients **C**ollection). Other things being equal one would expect that the rate of use of these services would be proportional to the rate of ill-health in the community concerned. However there has been much work in recent years in delineating the role that primary care can play in extended patient care, and therefore the potential for reducing outpatient load. Diabetes care would be an example of this, with the increasing prevalence requiring and enabling primary care teams to take on much wider roles than they formerly did. To the extent that the rates do not follow the expected patient illness patterns may indicate differences in primary care and specialist approaches as much as it raises concerns about adequate access to services. It should also be noted that privately-funded consultations are not included here – to the extent that a community is a higher user of private medical care, it may appear a low user of public services.

8.1 All outpatients and domiciliary care

The first view shown is the overall pattern of all services collected in the NNPAC data set (Figure 68). A similar age distribution is seen as for the inpatient data, with rates rising steeply at older ages, with Māori rates of use being similar across the age groups.

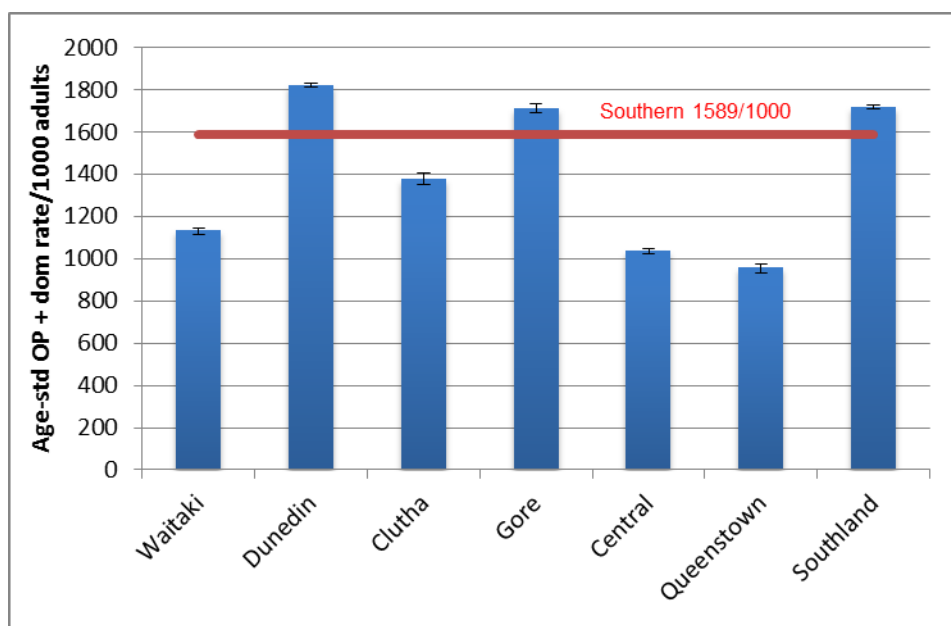
Figure 68 All outpatient and domiciliary visits per 1000 population by age and ethnicity, Southern DHB residents 2012/13



Notes: All publicly-funded outpatient (OP) and domiciliary visits (as recorded in NNPAC) to Southern DHB residents wherever attended in NZ. Excluding emergency department (ED) attendances. Age-specific rates per 1000 population. Ethnicity as recorded in NNPAC, Māori compared to non-Māori non-Pacific, line dotted where numbers are small.

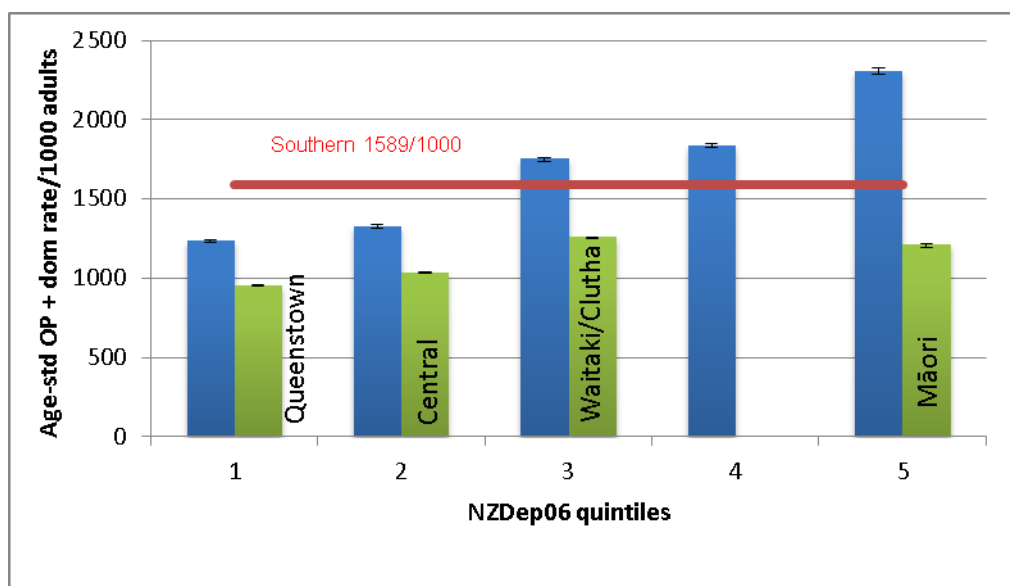
Looking at adults, again for all services (Figure 69), we see that the more rural residents (Waitaki, Clutha, Central, Queenstown) tend to have lower utilisation rates than those living closer to the main hospitals. This lower rate holds even adjusting for deprivation (Figure 70) – that is effectively adjusting for the better health of people living in less deprived areas. This may reflect differing provision patterns in urban versus rural areas.

Figure 69 All outpatient and domiciliary visits per 1000 population by locality, Southern DHB residents aged 15 and over, 2012/13



Notes: Ages 15+. All publicly-funded outpatient (OP) and domiciliary visits (as recorded in NNPA) to Southern DHB residents wherever attended in NZ. Excluding emergency department (ED) attendances, age-standardised to the Southern 2011 population.

Figure 70 All outpatient and domiciliary visits per 1000 population by deprivation quintile, Southern DHB residents 2012/13



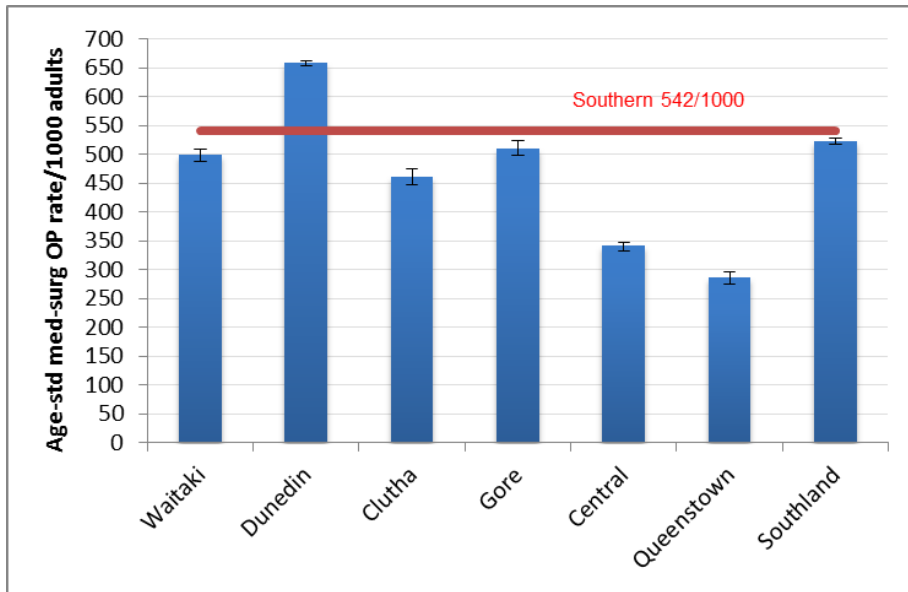
Notes: Adults (ages 15+), all publicly-funded outpatient (OP) and domiciliary visits (as recorded in NNPA) to Southern DHB residents wherever attended in NZ, age-standardised to the Southern 2011 population. Excludes emergency department (ED) attendances. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation level.

8.2 Medical and surgical outpatients

Taking as a subset all medical and surgical outpatient visits and procedures, a similar pattern remains, though Waitaki and Clutha residents are closer to the average than before (Figure 71 and Figure 72). There is no particular evidence that patients are not being referred appropriately, or that

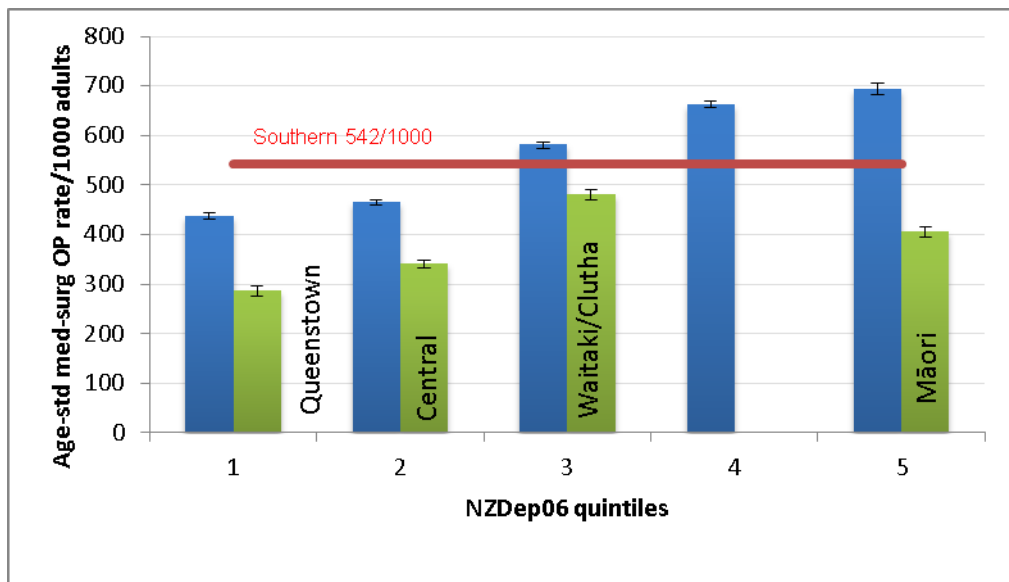
there is unmet in these areas – it is likely that either primary care in the rural areas is covering a wider ambit than those in the more urban localities, or that there is greater use of private specialists. It may also be the case that there is relative over-utilisation in the more urban localities.

Figure 71 All medical and surgical outpatient visits per 1000 population by locality, Southern DHB residents 2012/13



Notes: Ages 15+. Publicly-funded medical and surgical outpatient visits (as recorded in NNPA) to Southern DHB residents wherever attended in NZ age-standardised to the Southern 2011 population.

Figure 72 Medical-surgical outpatient visits per 1000 population by deprivation quintile, Southern DHB residents 2012/13

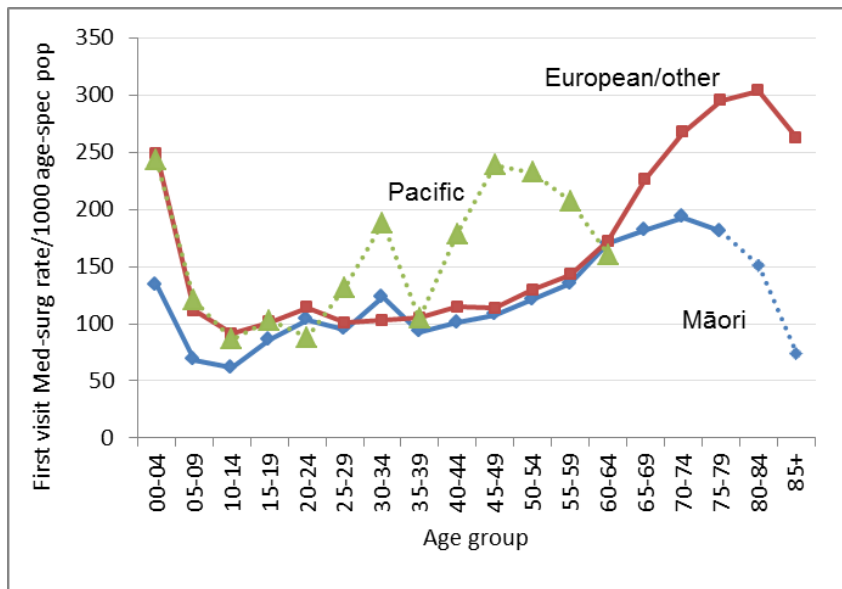


Notes: Adults (ages 15+), Publicly-funded medical and surgical outpatient visits (as recorded in NNPA) to Southern DHB residents wherever attended in NZ, age-standardised to the Southern 2011 population. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation level.

8.3 Medical and surgical FSAs

Perhaps more important is access to first specialist assessments – or “FSA”s as they are termed. These outpatient attendances are normally occasioned by referral from the patient’s general practitioner or after an ED presentation or hospitalisation event. A similar age and ethnicity pattern compared to overall outpatient and domiciliary visits is evident for Southern residents (Figure 73). Pacific residents appear to have a higher rate of use in the 40-59 age groups, possibly relating to the higher rate of diabetes in the population.

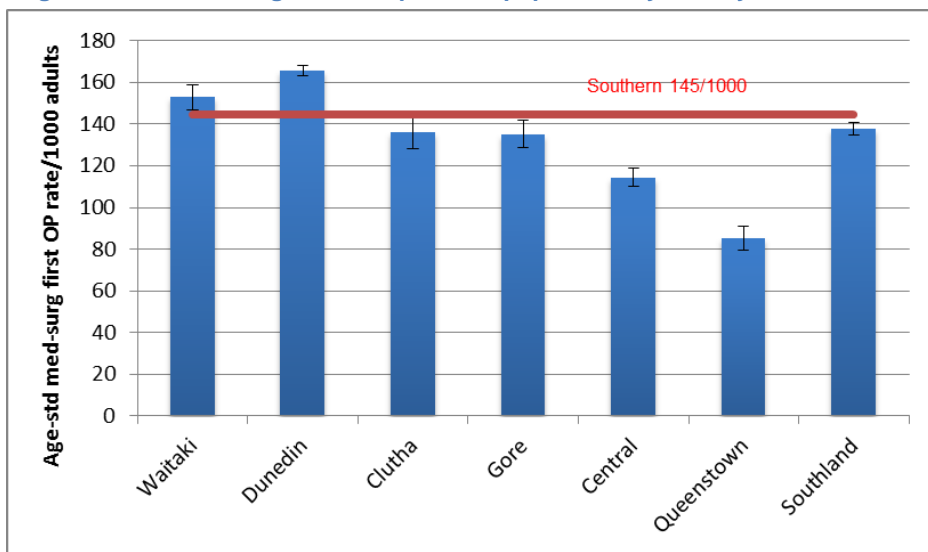
Figure 73 Medical and surgical FSAs per 1000 pop by age and ethnicity, Southern DHB residents 2012/13



Notes: Publicly-funded medical and surgical first specialist assessments (FSAs) to Southern DHB residents wherever attended in NZ. Age-specific rates per 1000 population. Ethnicity as recorded in NNPA, line dotted where numbers are small.

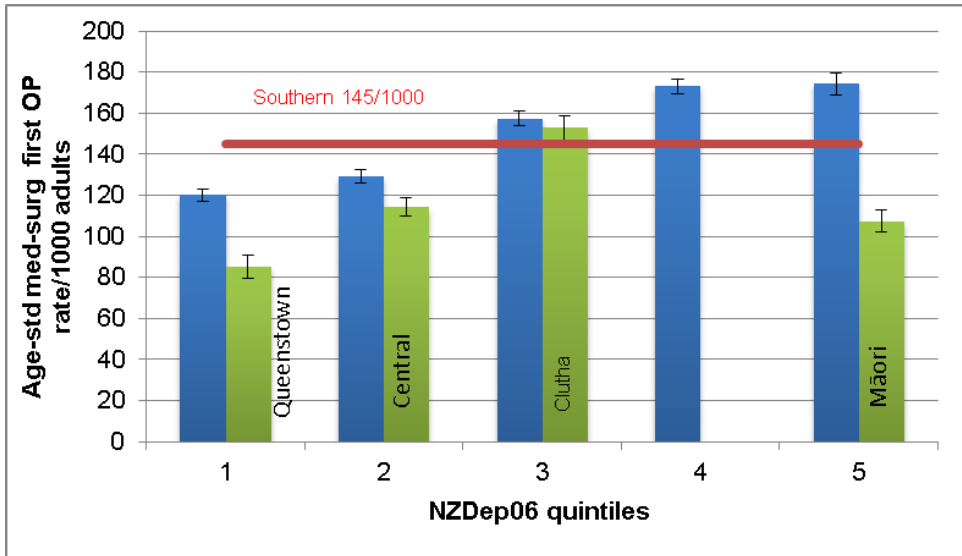
Residents of Central and Queenstown localities show lower age-standardised rates of adult medical and surgical FSAs (Figure 74), but once the average deprivation level of each locality is taken into account only Queenstown still has a relatively low publicly-funded FSA rate (Figure 75). Māori rates are lower than might be expected.

Figure 74 Medical-surgical FSAs per 1000 population by locality, Southern DHB residents 2012/13



Notes: Ages 15+. Publicly-funded medical and surgical first specialist assessments (FSAs) (as recorded in NNPA) to Southern DHB residents wherever attended in NZ age-standardised to the Southern 2011 population.

Figure 75 Medical/surgical FSAs per 1000 pop by deprivation quintile, Southern DHB residents 2012/13

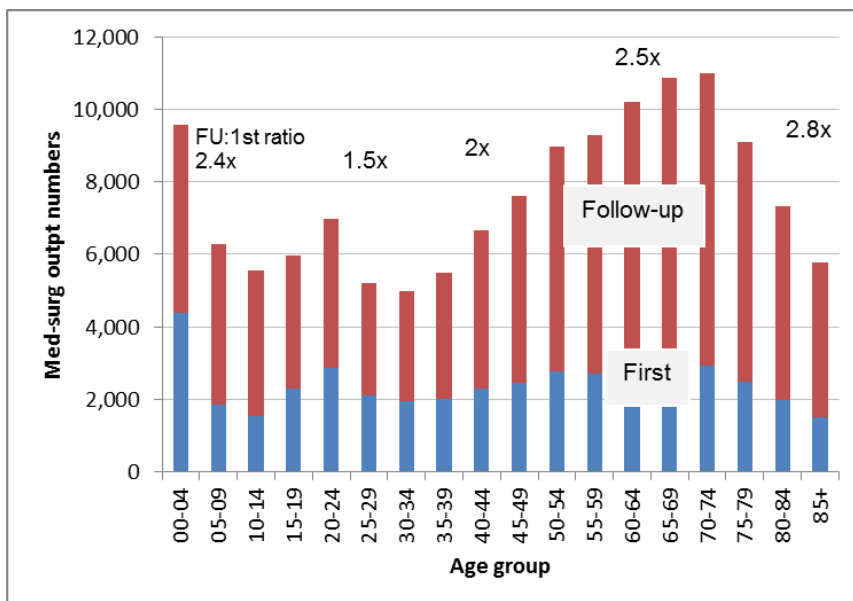


Notes: Adults (ages 15+), publicly-funded medical and surgical first specialist assessments (FSAs) (as recorded in NNPA) to Southern DHB residents wherever attended in NZ, age-standardised to the Southern 2011 population. NZDep2006 quintiles based on CAU, 1 is in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation level.

8.4 Medical and surgical follow-up attendances

In most cases the FSA is all that is required from the specialist. In some cases follow-up visits are needed, though most are managed in the primary care setting. The ratio of follow-up visits to FSAs is sometimes used as a performance measure by DHBs, seeking to have as low a ratio as possible (there is no specific national target level). In Southern the ratio varies by age group and localities. Children have 2-2.4 follow-up visits per FSA, dropping to 1.5 in young adulthood, and then rising again to over 2.5 at older ages (Figure 76).

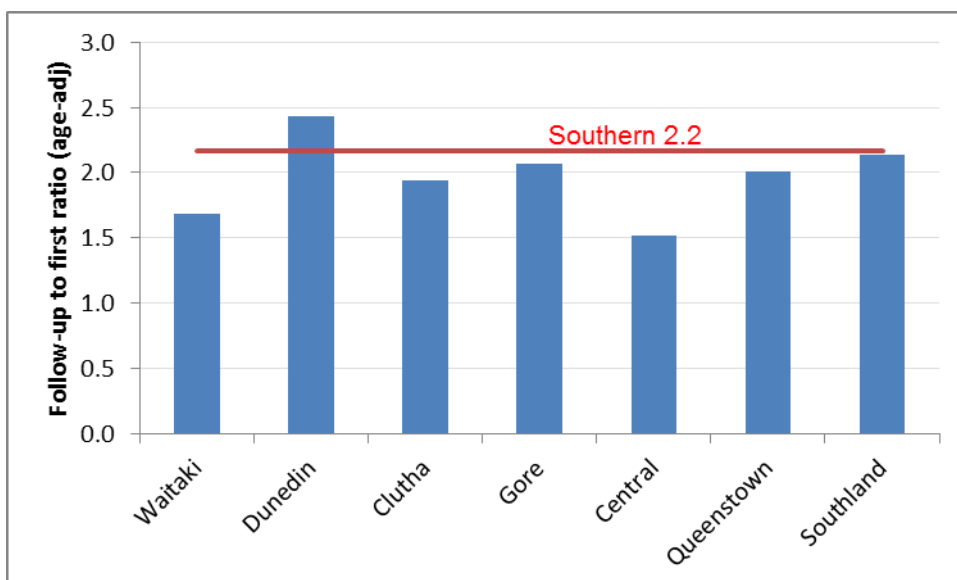
Figure 76 Medical-surgical outpatients – FSAs and follow-ups by age, Southern DHB residents 2012/13



Notes: Ages 15+. Publicly-funded medical and surgical first specialist assessments (FSAs) and follow-up visits (as recorded in NNPA) to Southern DHB residents wherever attended in NZ. Ratios shown (eg 2x) are the average number of follow-up visits for every first.

Dunedin area residents seem to have more follow-ups than those in other localities (2.4 for every FSA on average) which may relate more to proximity to clinics rather than need for the attendance. Waitaki and Central residents have a more efficient-seeming pattern of visits (Figure 77).

Figure 77 Medical and surgical outpatient visits – follow-ups to FSA ratio by locality, Southern DHB residents 2012/13



Notes: Ages 15+. Ratio of publicly-funded medical and surgical follow-up visits to first specialist assessments (FSAs) (as recorded in NNPAAC) to Southern DHB residents wherever attended in NZ.

8.5 Colonoscopies and gastroscopies

A number of diagnostic procedures are delivered mainly on an outpatient basis. Here we concentrate on colonoscopies and gastroscopies. These involve endoscopic examination of the digestive tract, allowing investigating of symptoms, eg for the diagnosis of cancer, and treatments such as biopsies and polyp removal. Those recorded as day stay inpatients (mainly in the mobile surgical bus) have been combined with the outpatient-recorded procedures. The patterns of use of the two procedures are similar so they are presented as a combined total.

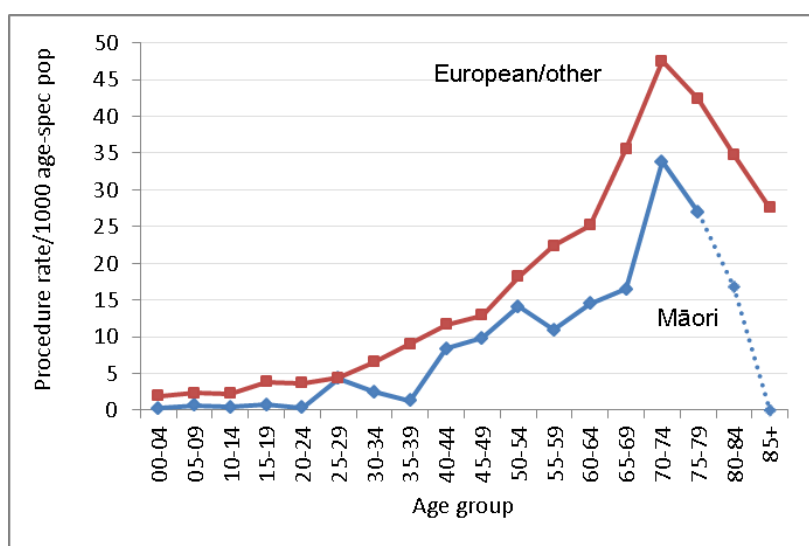
Table 35 Colonoscopy and gastroscopy procedures by facility 2012/13

Locality	Facility of treatment							Southland	Total
	Clutha	Dunedin	Dunstan	Lakes District	Mobile Surgical	Oamaru	Other		
Waitaki	0	195	0	2	0	157	10	0	362
Dunedin	0	1,819	0	5	0	1	16	0	1,836
Clutha	0	97	0	0	0	0	0	6	103
Gore	0	24	27	1	27	0	2	175	228
Central	0	159	53	1	0	0	5	5	223
Queenstown	0	8	22	43	21	0	2	62	137
Southland	0	25	13	3	13	0	12	1,140	1,190
Total	0	2,327	115	55	61	158	47	1,388	4,079

All publicly-funded outpatient and day patient gastroscopies and colonoscopies to Southern residents, wherever treated in New Zealand. Other = private facilities, or DHBs other than Southern.

For Waitaki and Queenstown localities nearly half the procedures were carried out locally (45% and 47% respectively (Table 35). Around 25% of Central residents were treated at Dunstan, the rest mainly in Dunedin. Most Clutha residents were treated at Dunedin, while Gore residents went mainly to Southland. The procedures are most performed in the older age groups, with Māori rates generally lower than European/other (Figure 78). The overall procedure rate for Māori appears lower than expected (Figure 80).

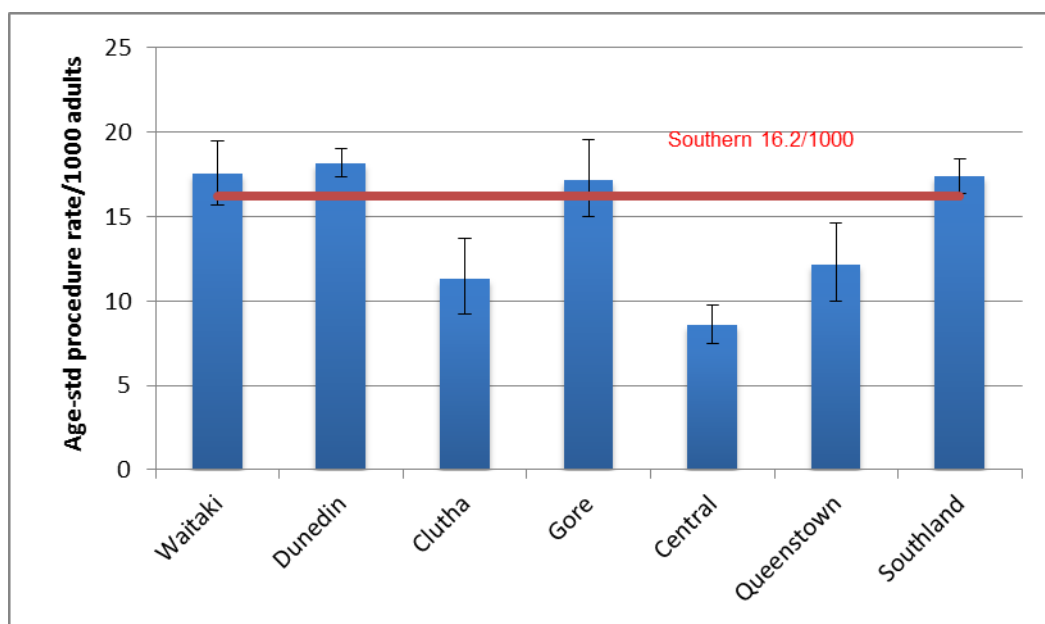
Figure 78 Colonoscopy and gastroscopy per 1000 population, Southern DHB residents 2012/13



Publicly-funded outpatient and day patient gastroscopies and colonoscopies to Southern residents, wherever treated in New Zealand. Māori age-specific rates per 1000 population compared with non-Māori non-Pacific.

Clutha, Central and Queenstown localities had colonoscopy and gastroscopy rates below the average for Southern (Figure 79). When compared with the average deprivation levels of the areas Clutha and Central remained on the low side, while Queenstown appeared consistent with other quintile 1 areas (Figure 80).

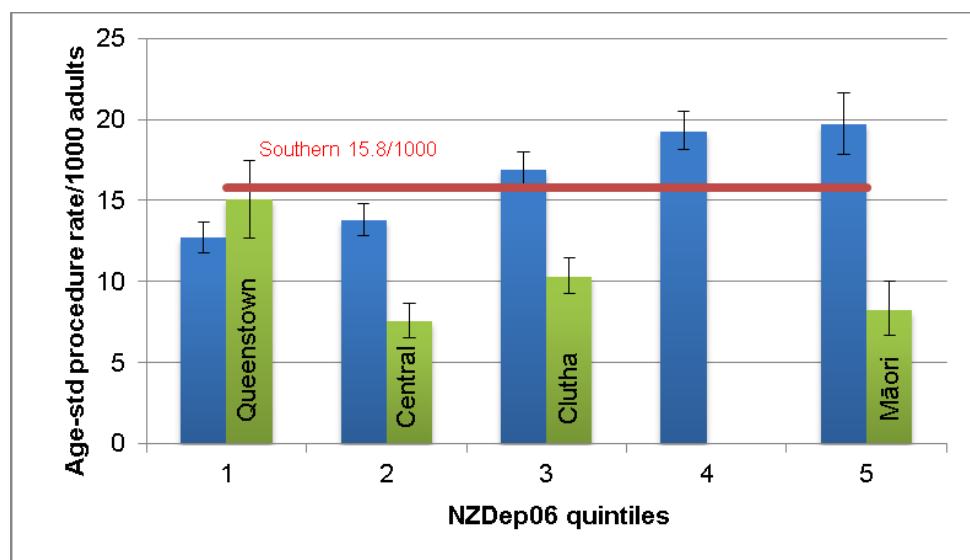
Figure 79 Colonoscopy and gastroscopy per 1000 pop by locality, Southern DHB residents 2012/13



Notes: Ages 15+. Publicly-funded outpatient and day patient gastroscopies and colonoscopies to Southern DHB residents wherever attended in NZ, age-standardised to the Southern 2011 population.

The age-standardised procedure rate for people living in NZDep2006 quintile 5 areas is lower than for quintile 4 people, where it might have been expected to be higher (Figure 80). There may be access issues for these people, and Māori and Pacific people, to get referred to these procedures compared with others in Southern. This is a particular concern given the apparently high colon cancer registration rates and mortality noted in Sections 3.3 and 5.3.

Figure 80 Colonoscopy and gastroscopy procedures per 1000 population by deprivation quintile, Southern DHB residents 2012/13



Notes: Adults (ages 15+), publicly-funded outpatient and day patient gastroscopies and colonoscopies to Southern DHB residents wherever attended in NZ, age-standardised to the Southern 2011 population. NZDep2006 quintiles based on CAU, 1 = in least deprived 20% of areas in NZ, 5 most deprived. Blue bars are total Southern DHB, green bars are selected localities or ethnicities shown at their average deprivation level.

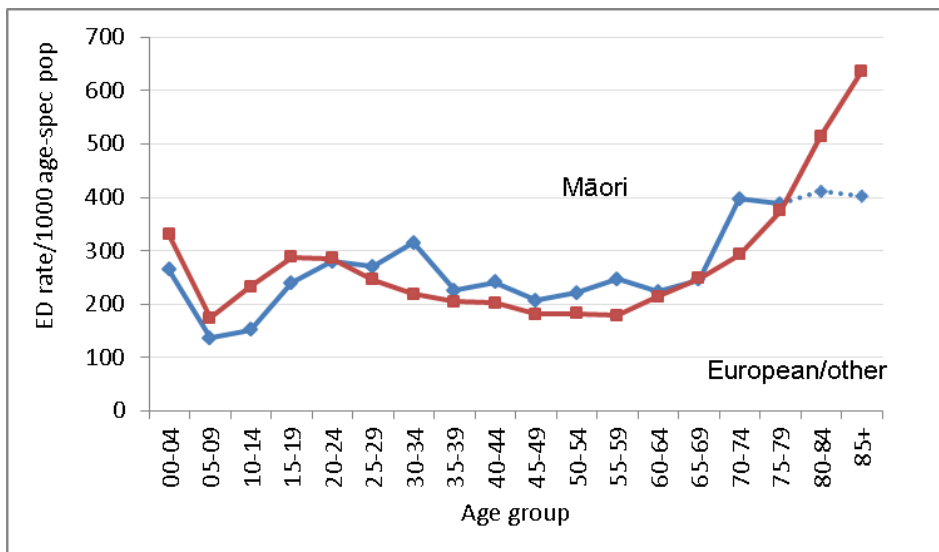
8.6 Emergency Department (ED) Attendances

Emergency care attendances can be used as a marker of ill-health; however they are more closely intertwined with supply-side issues that make interpretation difficult. Emergency Department (ED) attendances are captured in the same NNPAAC data set noted above. In the case of Southern DHB six local facilities are included, along with other DHBs. However importantly the Oamaru facility with a 24/7 ED does not appear to have its data collected, while the Gore facility seems to have very high counts. Dunstan and Clutha facilities do not have a walk-in ED as defined, so are not included in this data set. This makes it difficult to compare localities, so that analysis has not been attempted here.

Attendances at ED by Southern residents vary by age as expected, with Māori people having similar attendance rates across the age ranges (Figure 81).

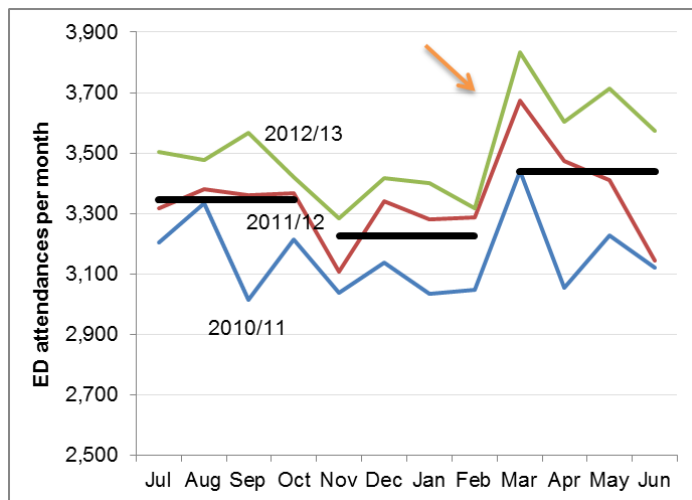
There is a clear seasonal pattern in the EDs at Dunedin and Queenstown. In Dunedin it is quieter out of term (Nov-Feb), and there is a distinct step change in March likely due to the influx of students for the next academic year, and associated orientation activities (Figure 82). For Queenstown there are two distinct increases, one in December/January associated with the summer tourist season, and one in July/August for the winter tourist and skiing season (Figure 83). No particular pattern is evident at Invercargill (Figure 84).

Figure 81 ED attendances per 1000 population, Southern DHB residents 2012



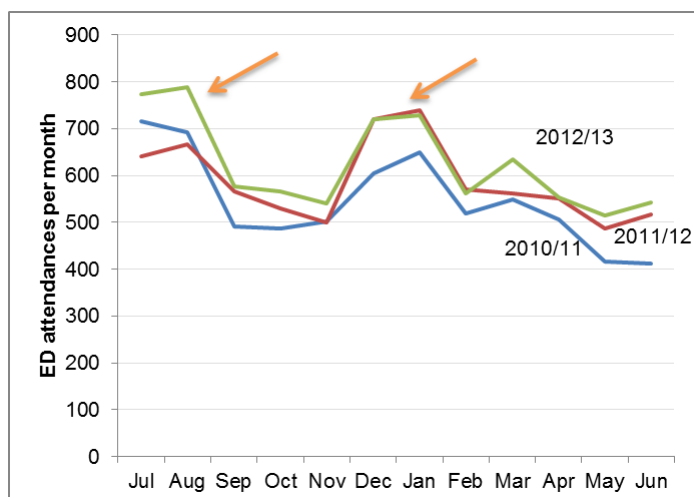
Notes: Emergency department (ED) attendances to Southern DHB residents wherever attended in NZ, as recorded in the NNPAC dataset. Age-specific rates per 1000 population. Ethnicity as recorded in NNPAC, Māori line dotted where population numbers are small giving unstable rates.

Figure 82 ED attendances per month at Dunedin Hospital 2010 - 2013



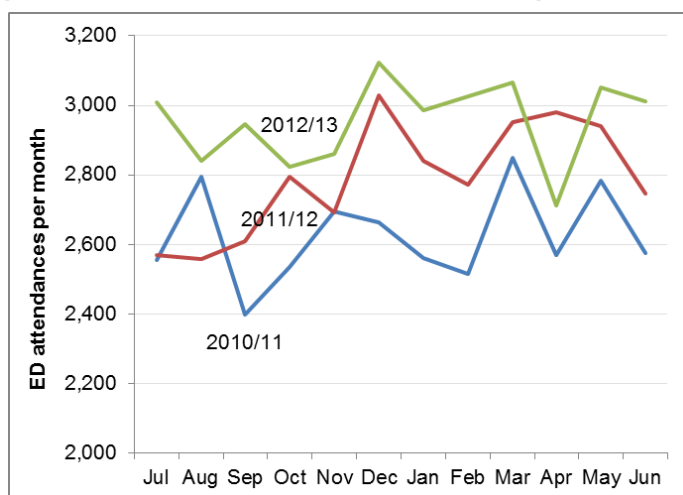
Note: All attendances including non-Southern residents, all ages. Black lines show average attendances Jul-Oct, Nov-Feb and Mar to Jun. The large increase at start of term is arrowed.

Figure 83 ED attendances per month at Lakes District Hospital 2010 - 2013



Note: All attendances including non-Southern residents, all ages.. The large increases Jul/Aug and Jan/Feb arrowed.

Figure 84 ED attendances per month at Invercargill Hospital 2010 - 2013



Note: All attendances including non-Southern residents, all ages.

Interestingly there has been a significant increase in volumes over the past three years – 11% at Dunedin, 15% at Lakes and 13% at Invercargill. Most of this increase comes from local residents, despite population growth only being around 0.2%, 3% and 0.6% per annum respectively in the local areas. Overseas tourists make up less than 1% of the ED volumes for Dunedin and Invercargill, but 13% of Lakes ED attendances. If anything, overseas attendances have fallen slightly at Lakes over the past three years. Likewise residents from elsewhere in New Zealand have shown little change – they make up 7% of Dunedin ED volumes, 4% of Invercargill and 14% of Lakes ED attendances. The recent increase in volumes may reflect some of the access barriers to primary care noted in Section 6.2.

9. Health of the elderly

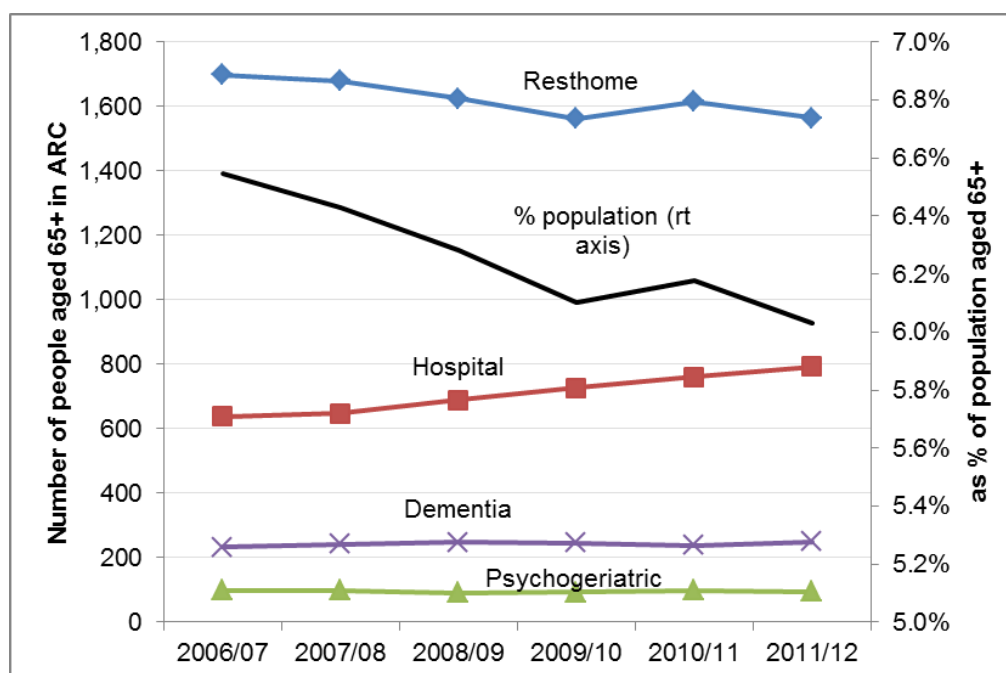
Older people are making up a larger and larger proportion of the Southern population as discussed in Chapter 1. Currently 14.7% are aged 65 and over, and this is expected to rise to 23.8% by 2031. The vast majority of those aged 65 and over are of European extraction – only 1.7% were of Māori or Pacific ethnicity. Much of the discussion in Chapter 5 on chronic disease, and Chapter 7 on hospitalisations pertains to older people. This chapter covers residential care, assessment, treatment and rehabilitation (AT&R) services in public hospitals, and home-based support provision for older people.

9.1 Residential care

Around 6% of the Southern population aged 65 and over are in Aged Residential Care⁴⁸ (ARC) – significantly higher than the national average of 5.2%⁴⁹. The number of people in ARC has remained stable over the past 5 years (Figure 85), while the 65 and over population is estimated to have been increasing at 1.9% pa. This has led to a gradual fall in the proportion of the population aged 65 and over in ARC from 6.5% in 2006/07 to 6.0% in 2011/12 (Figure 85). Only Auckland and Midcentral DHBs have higher ARC utilisation rates than Southern. Almost all ARC bed days for Southern residents are within the Southern area (99.4%).

Also worth noting is the fall in rest home level care and concomitant rise in hospital level care. A combination of better ‘ageing in place’ and home-based support services, along with a generally healthier cohort of older people is seeing a lowering demand for rest home level care around New Zealand which is likely being reflected here.

Figure 85 ARC residents per 1000 65 and over population Southern DHB 2006-12

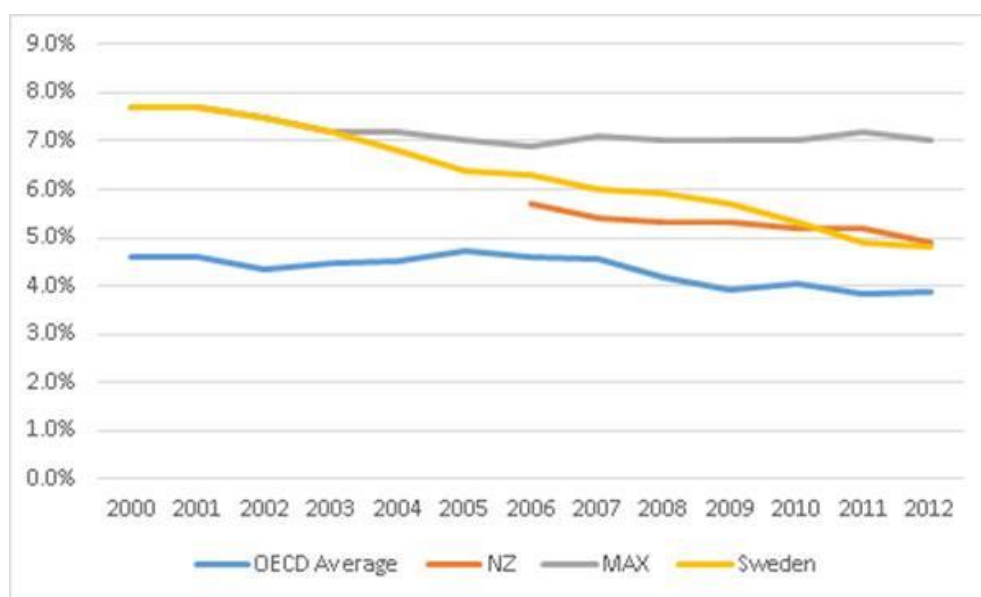


Notes: From DHB Shared Services ARC Model. All aged 65 and over in ARC, whether self-paying or DHB or MOH-funded.

⁴⁸ Defined as including all rest home, hospital, psychogeriatric and dementia beds within aged residential care facilities, whether funded publically or by users themselves.

⁴⁹ Data on aged residential care comes from the ARC Planning Model, DHB Shared Services, 2013.

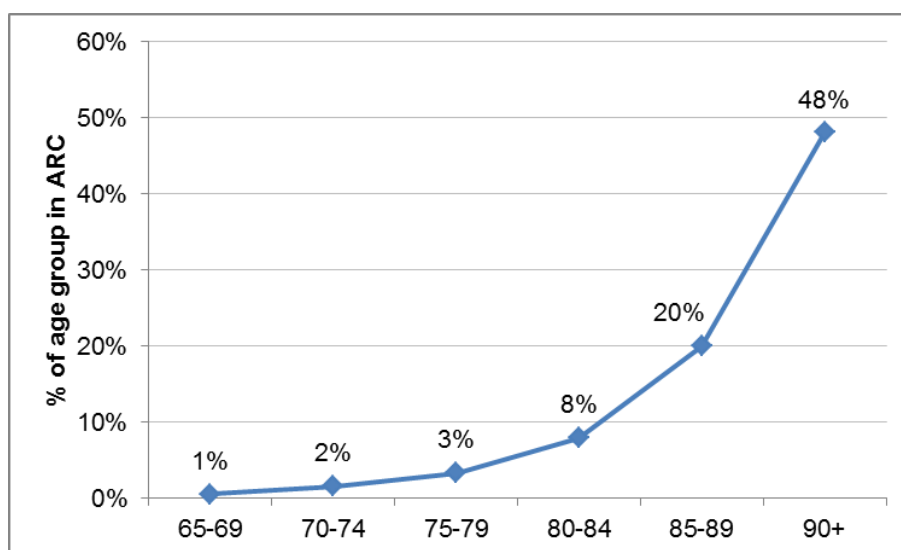
Figure 86 Percentage of population aged 65 and over in institutional care, OECD 2000-2012



Note: OECD 2013. "Max" is the highest in the available OECD data - in later years is Australia.

Rates of utilisation rise sharply by age - at present around 10% of those aged 75 and over and 28% of those aged 85 and over living in Southern are in ARC (Figure 87). Nearly half those aged 90 and over are in ARC. By way of comparison national rates are 10.6% for 75+ and 25.2% for 85+.

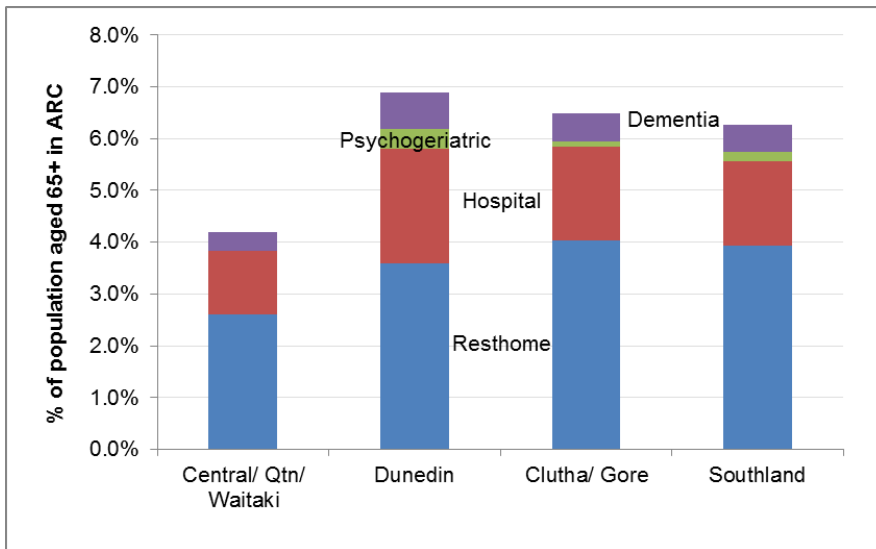
Figure 87 Age-specific population proportion in ARC, Southern DHB 2011/12



Notes: From DHB Shared Services ARC Model. All aged 65 and over in ARC, whether self-paying or DHB or MOH-funded.

The DHB Shared Services Model also examines ARC utilisation by (combined) local authority areas. Waitaki, Central Otago and Queenstown-Lakes were combined, but otherwise the areas used correspond reasonably well to the areas used in this report. Utilisation of ARC was similar across the areas apart from the combined Waitaki, Central Otago and Queenstown-Lakes areas which had a distinctly lower rate of ARC occupancy (Figure 88). Proportions of the different types of care were similar across the areas.

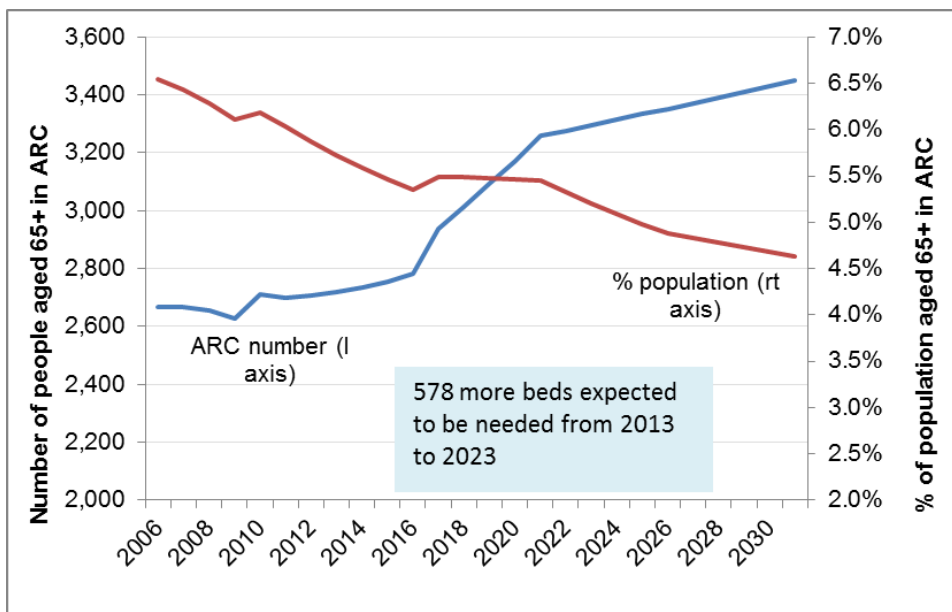
Figure 88 Age-specific population proportion in ARC, Southern DHB 2011/12



Notes: From DHB Shared Services ARC Model. All aged 65 and over in ARC, whether self-paying or DHB or MOH-funded.

Given the expected growth in the older population of Southern there is expected to be an increase in the need for ARC beds, moderated by the expected reduction in rest home beds required (Figure 89). The increase in beds measured on the left axis compares with the expected reduction in the proportion of the older population expected to need those places (right axis). If Southern were able to reduce its utilisation of ARC closer to the New Zealand average then much of this growth could be avoided. A recent paper for Southern DHB suggested savings of \$10m a year in costs if the current high ARC utilisation rate were able to be reduced to the national average.⁵⁰

Figure 89 Projected growth in ARC residents aged 65 and over, Southern DHB 2011/12



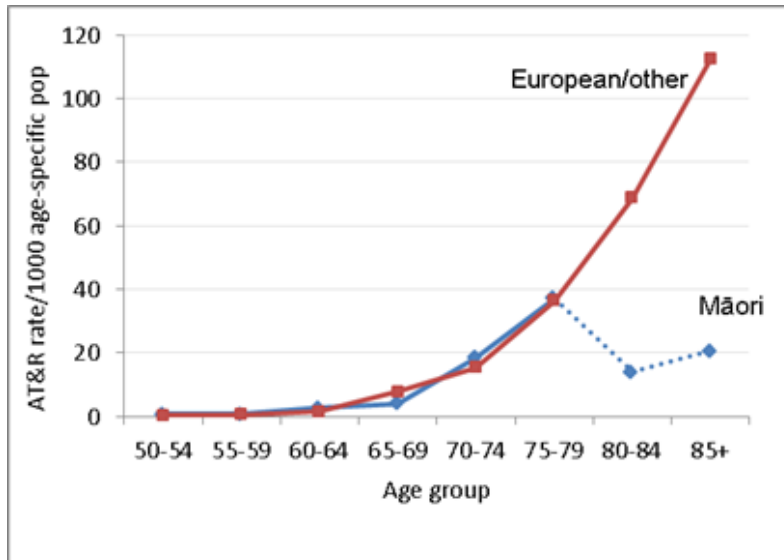
Notes: From DHB Shared Services ARC Model. All aged 65 and over in ARC, whether self-paying or DHB or MOH-funded. Scenario shown continues national incidence trend (over past 6 years) for next 5 years, overlain on Statistics New Zealand medium population change projections.

⁵⁰ Jacobs S, Baird J, Parsons M, Sheridan N. *Southern District Health Board: a model of care that integrates health and support services in the community for the older person*. Auckland University June 2011; p65

9.2 AT&R

Health of the Elderly inpatient care, also known as assessment, treatment and rehabilitation or (AT&R) or geriatric care, refers to the care that normally follows an acute hospitalisation when an elderly person need more treatment and recuperation before being able to return home. Such inpatient stays have become much shorter in recent year as the dangers of prolonged bed occupancy have become apparent, and active rehabilitation is able to be moved to a community setting. Almost all AT&R hospitalisations for Southern residents occur within the Southern area (99.6%).

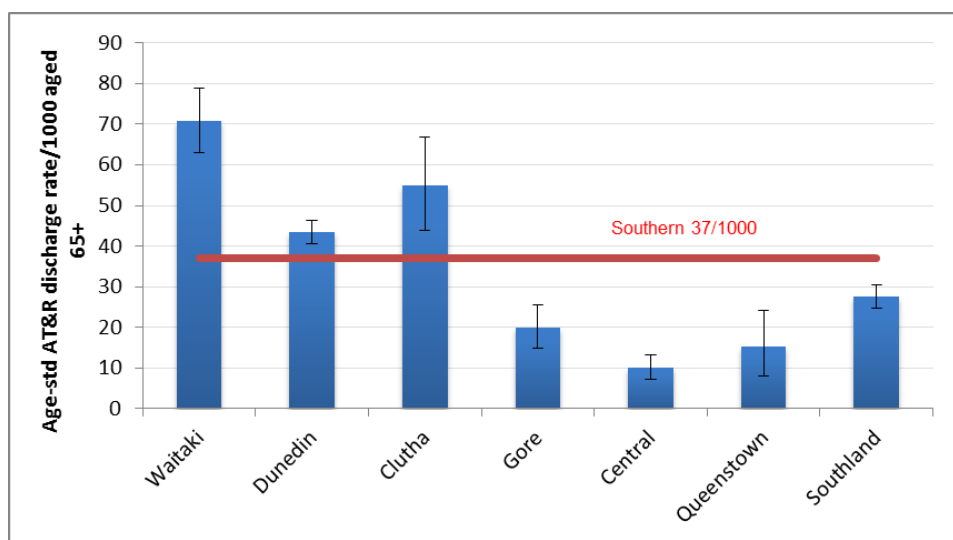
Figure 90 Age-specific AT&R hospitalisations, Southern DHB residents 2010/13



Notes: All publicly-funded AT&R hospitalisations (health specialties D00-D02, D55) to any facility in New Zealand. Age-specific annual rates per 1000 population for the 3 years 2010/11 to 2012/13. Ethnicity as recorded in NMDS, Māori line dotted where numbers are small.

Rates of utilisation of AT&R services rise steeply with age, with the equivalent of more than 10% of the 85 and over population using the service each year (Figure 90). Māori elderly have similar rates of use of AT&R beds at each age group with large enough numbers to compare.

Figure 91 AT&R hospitalisations by locality, Southern DHB residents 2010/13



Notes: As per Figure 90.

Residents of Waitaki, Clutha and Dunedin have significantly higher rates of use of AT&R services than other localities (Figure 91). Almost all such services are locally provided (98%, 91% and 96% respectively). The difference in rates is likely to reflect differing models of care rather than make any statement about the underlying health of the respective populations. This difference in models also reflects the variance in average length of stay seen (Table 36). For efficient AT&R services in larger hospitals ALOS is tending towards the 10-12 day mark as community rehabilitation and support improves.

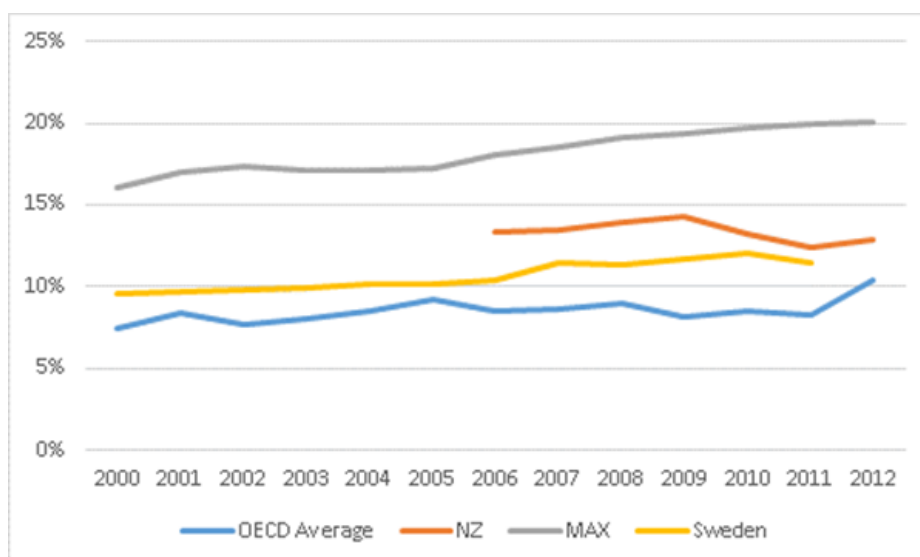
Table 36 AT&R hospitalisations and average length of stay by locality 2012/13

Locality	Number	Bed days	ALOS
Waitaki	263	1,360	5
Dunedin	774	12,223	16
Clutha	46	607	13
Gore	60	784	13
Central	51	1,897	37
Queenstown	16	218	14
Southland	297	4,845	16
Total	1,507	21,934	15

9.3 Home-based support services

Southern DHB has recently made significant changes in the way it contracts for home and community support services, with a reduced number of providers and a stronger focus on care coordination. These services are important in assisting people to manage at home, offering support with personal care needs, such as dressing or showering, and providing assistance to participate in the community. Increasing case coordination is well supported in the literature⁵¹, with most people preferring to live in their own home. This also avoids the large cost of institutional care. Rates of home-based support service (HBSS) use in New Zealand are above the OECD average (Figure 92), but have dropped slightly in recent years with the push for more restorative models of care reducing some of the smaller household management tasks being offered.

Figure 92 Percentage of population aged 65 and over receiving home care, OECD 2000-2012



Note: OECD 2013. "Max" is the highest in the available OECD data.

⁵¹ You E, Dunt DR, Doyle C. (2013) Case managed community aged care: what is the evidence for effects on service use and costs? *J Aging Health* 25(7) 1204-1242

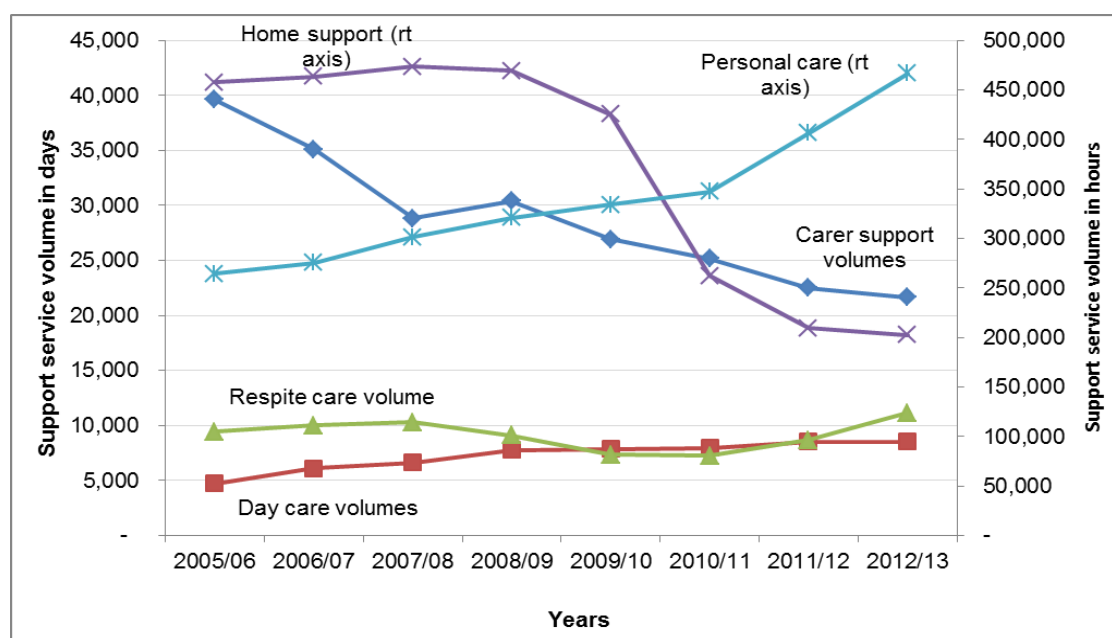
In Southern DHB the number of hours of household management has been falling in line with other DHBs, while personal care hours have continued to rise⁵². The average time per month per client for household management was around 6 hours, while for personal care activity was 16 hours. For the subset of clients receiving household management or personal care prior to residential care entry the amount of care received was unchanged. This suggests that household management has not been removed from clients at risk of residential care, so appropriate targeting of resources is occurring. Appropriate use of home-based support services will assist Southern DHB in reducing its per capita ARC expenditure and moving to a more sustainable health care system.

A combination of better 'ageing in place' and home-based support services, along with a generally healthier cohort of older people is seeing a lowering demand for rest home level care around New Zealand which is likely being reflected here.

Home based support services include personal care, home support, carer support, respite care and day care services. Figure 93 shows the volume of home based support services in days and hours from 2005 through to 2012 in Southern DHB. This shows a significant decline in the provision of home support services, which incorporates a variety of housework based activities such as cleaning and vacuuming. This is consistent with changes in DHB policy following recent evidence of the benefits of restorative care. This type of care focuses on restoring and maintaining patients' functional and physical status at the highest possible level, given underlying conditions. Hence, further emphasis has been placed on the provision of personal care services, which has seen a surge in the volume of hours provided by carers' year on year. Services here focus on assistance with activities of daily living in order to maintain or improve independence.

Interestingly carer support services appear to have halved in the Southern district between 2005/06 and 2012/13. However, respite care volumes have remained reasonably consistent and day care volumes have seen a moderate increase in days of service provision.

Figure 93. Volume of home based support services in days/ hours by service, Southern DHB, 2005-2012



⁵² Jacobs S, Baird J, Parsons M, Sheridan N. *Southern District Health Board: a model of care that integrates health and support services in the community for the older person*. Auckland University June 2011; p67

9.4 Health assessments

The Needs Assessment and Service Coordination (NASC) service for Southern DHB assesses all people who might need home-based support or other health needs met. From 2012 a clinical assessment tool termed InterRAI has been used to develop comprehensive clinical assessment of medical, rehabilitation and support needs and abilities such as mobility and self-care. Developed by the interRAI network of health researchers the tool assists clinical workers to develop tailor-made care plans for community and residential dwelling elderly.

The data included here covers assessments completed in the period 10/09/2012 to 17/12/2013 - approximately 5200 assessments in total, including 3300 Home Care assessments. It does not include assessments for clients transferred out of the home care system into residential care, nor assessments of folk already in long term care. The majority of assessments are for the population 75 and over - to December 2013 around 28% of the non-residential care-dwelling 75+ population have been assessed with the InterRAI tool (Table 37). Gore residents had the highest rate of assessment at 37%, followed by Southland at 32% of all 75+ year olds.

Table 37 InterRAI assessments by locality, Southern DHB 2012/13

Locality	Assessments	Est 75+ not in ARC	% Assessed
Waitaki	440	1,900	23%
Dunedin	2,020	7,600	26%
Clutha	150	700	23%
Gore	400	1,100	37%
Central	470	1,800	27%
Queenstown	100	400	23%
Southland	1,560	4,800	32%
Total	5,140	18,300	28%

Source: SDHB NASC; those assessments with domicile codes recorded

Rates of assessment varied by the deprivation area people lived in, ranging from 18% in the least deprived areas to 44% in the most deprived areas, presumably reflecting the greater need for services in the less affluent areas. There were 117 assessments for Māori residents, a rate of around 28% of the 75+ population – around the DHB average. One might have expected that to be higher. While Pacific numbers are low, the 13 assessments noted would approximate a 45% referral rate, more in line with the quintile 5 assessment rate.

Table 38 InterRAI assessments by NZDep06 area, Southern DHB 2012/13

Deprivation quintiles	Assessments	Est 75+ not in ARC	% Assessed
1 (least)	570	3,200	18%
2	760	3,600	21%
3	1,570	5,000	31%
4	1,520	4,800	31%
5 (most)	710	1,600	44%
Total	5,140	18,300	28%

Source: SDHB NASC; those assessments with domicile codes recorded, 1 = least deprived, 5 = most deprived neighbourhoods.

The following tables show summary scores that can be derived from the InterRAI assessment. As these assessments are related to referral for care they relate to the less-healthy proportion of the elderly community-living population, so should not be taken as a description of the whole elderly population in Southern.

The self-perception of health is similar to that used in the Health Survey (Table 10, page 25). Overall 47% of people assessed rated their health good or excellent, while a similar number (43%) felt their health was fair or poor (Table 39).

Table 39 InterRAI assessment - self-reported health, Southern DHB 2012/13

Description	Number	%
Self-rated health - Excellent	148	3%
Self-rated health - Good	2,297	44%
Self-rated health - Fair	1,709	32%
Self-rated health - Poor	597	11%
Self-rated health - no response	513	10%
Grand Total	5,264	100%

Source: SDHB NASC. No response is either could not or would not respond.

The Activities of Daily Living (ADL) scale attempts to quantify disablement. The ADL Hierarchy Scale groups activities of daily living according to the stage of the disablement process in which they occur. Four main areas are assessed – personal hygiene, toilet transfer, locomotion and eating. Early loss ADLs (e.g. dressing) are assigned lower scores than late loss ADLs (e.g. eating). The scale ranges from 0 (no ADL impairment) to 6 (total dependence in ADLs). ADLs are assessed for those already receiving home-based support care – so Table 40 shows the results for 3319 assessments. Nearly half those assessed were considered able to function independently in the 4 ADL areas, while at the other extreme 11% were dependent or wholly dependent (levels 5 and 6), and presumably would be likely to be heading for residential care.

Table 40 InterRAI assessments of ADL levels, Southern DHB 2012/13

ADL level	Description	Number	%
0	Independent	1487	45%
1	Supervision needed	445	13%
2	Limited assistance	423	13%
3	Extensive assistance	345	10%
4	Near maximal	264	8%
5	Dependent	291	9%
6	Totally dependent	64	2%
Total		3319	100%

Source: SDHB NASC; home care assessments only

The Changes in Health, End-Stage Disease, Signs, and Symptoms Scale (CHESS) was designed to identify individuals at risk of serious decline. It detects frailty and health instability - higher scores are associated with adverse outcomes such as mortality, hospitalisation, pain, caregiver stress and poor self-rated health. The scale ranges from 0 - no health instability - to 5 - very high health instability. Overall 33% of Southern residents having a NASC assessment had no or minimal health instability assessed, while 15% had high or very high instability (Table 41).

Table 41 InterRAI assessments of CHESS levels, Southern DHB 2012/13

Level	Description	Total	%
0	No health instability	367	11%
1	Minimal health instability	721	22%
2	Low health instability	933	28%
3	Moderate health instability	808	24%
4	High health instability	416	13%
5	Very high health instability	74	2%
Total		3,319	100%

Source: SDHB NASC; home care assessments only

The Cognitive Performance Scale (CPS) combines information on memory impairment, level of consciousness, and decision-making, with scores ranging from 0 (intact) to 6 (very severe impairment). The CPS has been shown to be highly correlated with the other mental state inventories such as the Mini Mental Status Examination and the Test for Severe Impairment in validation studies. Around 44% of those assessed had no or little cognitive impairment, while 26% had moderate or severe cognitive impairment, for example through Alzheimer's dementia (Table 42).

Table 42 InterRAI assessments of CPS levels, Southern DHB 2012/13

Level	Description	Number	%
0	Intact cognition	977	29%
1	Borderline impairment	506	15%
2	Mild cognitive impairment	999	30%
3	Moderate	490	15%
4	Moderate severe	40	1%
5	Severe impairment	251	8%
6	Very severe	64	2%
Total		3,327	100%

Source: SDHB NASC; home care assessments only. CPS = Cognitive Performance Scale

The Depression Rating Scale (DRS) is used as a clinical screen for depression. Validation studies were based on a comparison of the DRS with the Hamilton Depression Rating Scale and the Cornell Scale for Depression. Scores over 3 on the 14 point scale indicate depression or potential risk of depression. Overall 21% of people who underwent assessment were assessed as having some risk for depression (Table 43).

Table 43 InterRAI assessments of the Depression Rating Scale, Southern DHB 2012/13

Level	Description	Number	%
0-2	Depression unlikely	2,635	79%
3-4	Risk of depression	410	12%
5-7	Moderate risk	203	6%
8-10	Likely	65	2%
11-14	Very likely	14	0.4%
Total		3,327	100%

Source: SDHB NASC; home care assessments only.

The Pain Scale summarises the presence and intensity of pain using a visual analogue scale methodology. The scale ranges from 0 (no pain) to 4 (severe daily pain which is horrible or

excruciating). Of those assessed 39% had some form of daily pain, with 5% suffering severe daily pain.

Table 44 InterRAI assessments of the Pain Scale, Southern DHB 2012/13

Level	Description	Number	%
0	No pain	1,306	39%
1	less than daily pain	726	22%
2	Daily pain - mild	757	23%
3	Daily pain - moderate	359	11%
4	Daily pain - severe	179	5%
Total		3,327	100%

Source: SDHB NASC; home care assessments only.

10. Maternity

This chapter briefly examines childbirth and the use of maternity services by Southern DHB residents. Information for analysis generally uses the National Minimum Data Set (NMDS) so will only include deliveries occurring at a hospital. Home birth figures are difficult to estimate but in 2010 were thought to cover around 3% of births - ~130 per year for Southern. Using the National Immunisation Register suggested 93 homes births in 2013.

10.1 Southern DHB

In the past three years 2010/11 to 2012/13 there have been around 3,420 in-hospital deliveries per year for women living in the Southern DHB area (Table 45). Of these 289 mothers (8%) were Māori and 90 Pacific (3%). Overall 5% of deliveries were for mothers aged under 20 and 4% for mothers aged 40 or more. Māori mothers were most likely to be under the age of 20 – 15% of all deliveries to Māori women were in this age group. The overall Caesarean rate was relatively high at 29% of all deliveries (NZ average in 2010 was 24%⁵³), but when standardising for clinical indications it was similar to the New Zealand average as discussed further below.

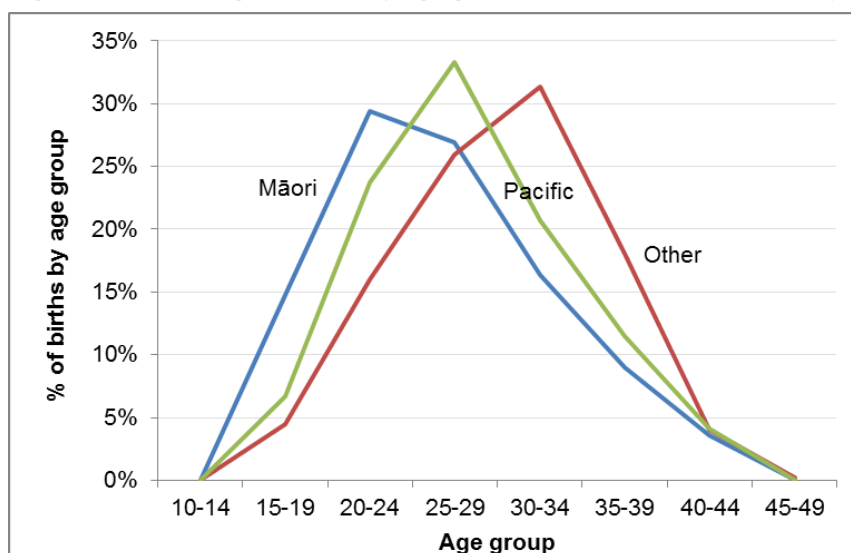
Table 45 Hospital deliveries by ethnicity of mother, 2010/11 to 2012/13

	Deliveries per year	% aged <20	% aged 40+	% Caesar
Māori	289	15%	4%	25%
Other	3,041	4%	4%	29%
Pacific	90	7%	4%	29%
Total	3,420	5%	4%	29%

Source: NMDS, so deliveries in hospital facilities only. Average figures for the three years.

The modal age group for Māori women to deliver was 20-24 years, younger than for Pacific (25-29) and other ethnic groups (30-34) – as shown in Figure 94. This age distribution is similar to that seen for New Zealand.⁵³

Figure 94 Percentage of births by age group of mother for each ethnicity Southern DHB



Source: NMDS, so deliveries in hospital facilities only. Years 2010/11 to 2012/13.

⁵³ Ministry of Health. (2012) *Report on Maternity, 2010*. Wellington: Ministry of Health Nov 2012.

The New Zealand Maternity Clinical Indicators provide a method of comparing DHBs using standardised definitions.⁵⁴ It allows the separate assessment of a group of women termed “standard primiparae” - women undergoing their first delivery who have no other illnesses or complications such as breech presentation - for whom interventions and outcomes should be similar. Twelve indicators are used, as shown in Table 46.

Table 46 New Zealand Maternity Clinical Indicators 2011

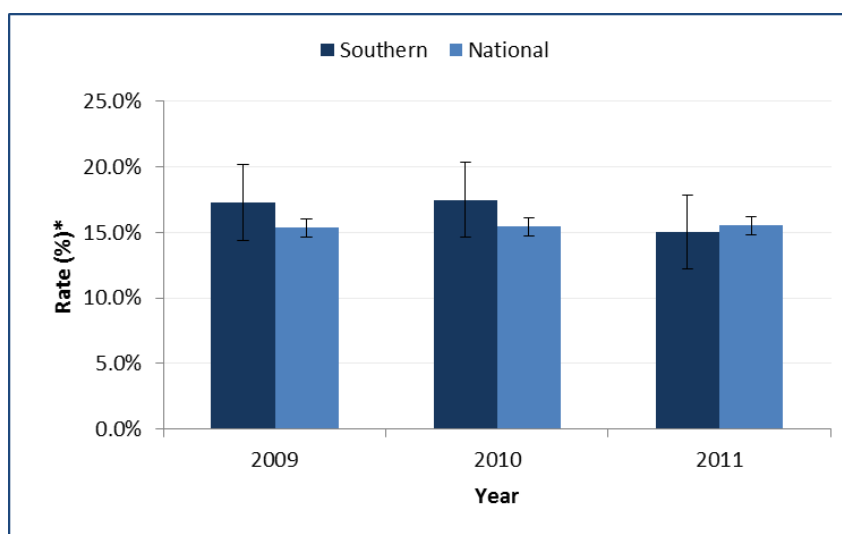
No	Indicator	Southern DHB	New Zealand	Significantly different?
1	Standard primiparae who have a spontaneous vaginal birth	72.6	70.0	
2	Standard primiparae who undergo an instrumental vaginal birth	12.0	13.9	
3	Standard primiparae who undergo Caesarean section	15.0	15.5	
4	Standard primiparae who undergo induction of labour	5.4	4.3	
5	Standard primiparae with an intact lower genital tract (no 1st–4th-degree tear or episiotomy)	39.6	33.1	
6	Standard primiparae undergoing episiotomy and no 3rd- or 4th-degree perineal tear	16.2	19.1	
7	Standard primiparae sustaining a 3rd- or 4th-degree perineal tear and no episiotomy	3.6	3.2	
8	Standard primiparae undergoing episiotomy and sustaining a 3rd- or 4th-degree perineal tear	1.1	1.1	
9	General anaesthesia for Caesarean section	6.1	8.4	Low
10	Blood transfusion with Caesarean section	2.1	3.3	Low
11	Blood transfusion with vaginal birth	0.7	1.6	Low
12	Premature births (between 32 and 36 weeks gestation)	7.0	6.1	

Source: New Zealand Maternity Clinical Indicators 2011 (2013). Calendar year 2011, by DHB of domicile, all figures are per 100 (%). Three indicators are statistically significant, with Southern lower than the national average. Full definitions for each indicator and ‘standard primiparae’ are given in the source document on the www.moh.govt.nz website.

Looking at more detail for indicator 3, generally one is looking to achieve as low as possible a Caesarean rate - *“the aim is to reduce the risks associated with an unnecessary Caesarean section, reduce the number of women at risk of a subsequent Caesarean section and reduce the number of women who experience difficulties with their second and subsequent births as a consequence of a primary Caesarean section”*. New Zealand Maternity Clinical Indicators 2011 p5. Figure 95 shows the Southern Caesarean rate dropping from 17% to 15% rates for standard primiparae over the past 3 years to sit at the New Zealand average for 2011. DHBs ranged from 9.3% at Waikato to 25% at Wairarapa - Southern ranked 10th of 20 DHBs for this indicator.

⁵⁴ Ministry of Health. (2013). New Zealand Maternity Clinical Indicators 2011. Wellington: Ministry of Health May 2013.

Figure 95 Percentage of standard primiparae who undergo Caesarean section Southern DHB, 2011



Source: New Zealand Maternity Clinical Indicators 2011. Calendar years, by DHB of domicile.

Over half the deliveries for Southern mothers were at Dunedin Hospital, with a further third at Southland (Table 47). A range of primary maternity facilities provide services throughout the Southern area, and can accept mothers from anywhere – though naturally most are from the local area.

Table 47 Hospital deliveries by facility, 2010/11 to 2012/13

	Deliveries per year	% of total
Charlotte Jean Maternity Unit	64	1.9%
Clutha Health First	28	0.8%
Dunedin	1,744	51.0%
Gore Health Centre	80	2.3%
Lakes District	50	1.5%
Maniototo Health Services Ltd	2	0.1%
Northern Southland Birthing Centre	22	0.7%
Oamaru	90	2.6%
Southland	1,258	36.8%
Tuatapere Maternity Hospital	20	0.6%
Winton Birthing Centre	34	1.0%
Elsewhere in New Zealand	27	0.8%
Total	3,420	100%

Source: All deliveries recorded in NMDS

10.2 By locality

Details of hospital deliveries by the locality of domicile of the mother are shown in Table 48. Caesarean section rates were highest in Clutha and Queenstown residents, lowest in Waitaki and Southland. The proportion birthing in primary centres (ie not Dunedin or Southland Hospitals) was highest for Waitaki (44%), followed by Gore (38%), Clutha and Central (both 24%). The proportion of births for teen mothers (aged less than 20) was highest for Clutha, Gore and Southland (all 7%), and lowest for Queenstown (1%). Clutha and Gore look quite different though when teen births are calculated as a rate – around 3% of the 15-19 year olds in Gore would have a baby each year,

compared with Clutha, where it would be only 1%. Southland had the highest rate at 31/1000 or 3.1% of all 15-19 year olds.

Table 48 Hospital deliveries by locality, 2010/11 to 2012/13

Locality of residence	Deliveries per year	% Caesar	% primary	% aged <20	teen rate/ 1000/ yr	TFR	% LMC	% <2500 g
Waitaki	204	24%	44%	5%	16	2.02	38%	5.5%
Dunedin	1,328	30%	1%	5%	11	1.43	97%	6.2%
Clutha	101	34%	24%	7%	12	1.41	94%	7.6%
Gore	181	28%	38%	7%	30	2.88	95%	7.1%
Central	266	30%	24%	3%	13	1.67	96%	4.5%
Queenstown	256	33%	22%	1%	4	1.37	83%	5.3%
Southland	1,085	27%	7%	7%	31	2.12	96%	6.5%
Total	3,420	29%	12%	5%	16	1.66	92%	6.1%

Source: NMDS, so deliveries in hospital facilities only. Average for years 2010/11 to 2012/13. If one counts Dunedin and Southland as secondary facilities the remainder are termed primary. TFR – Total fertility rate. % LMC – deliveries noted as being with a community LMC. % <2500 g, of the live births, % less than 2500g birth weight.

Women living in Gore had the highest total fertility rate (TFR). This is an estimate of the number of babies⁵⁵ a women would have over her life if the current age-specific rates applied. Gore women had the highest fertility at 2.9 babies per women, followed by Southland (2.1) and Waitaki (2). The New Zealand average for 2011/12 was 2.04 babies per woman, down from 2.12 births in 2011. Southern is well below this rate at 1.66, with Queenstown and Dunedin residents particularly low. Across all the DHBs in 2010, Southern ranked 18 out of 20 (considering the previous DHB boundaries would have placed Southland at 15th and Otago at 21st out of 21), with the range from 2.95 in Northland to 1.63 in Capital and Coast.

Overall 92% of hospital deliveries were recorded as being under the care of a community-based lead maternity carer (LMC). Even if care has been transferred to the hospital, for example if a Caesarean section is needed, the delivery record will still show the community LMC as being the lead. Women living in the Waitaki locality had the main deviation from the largely community LMC-led services in Southern, with only 38% of deliveries being recorded as having a community-based LMC. This may be a data issue as almost all deliveries at Oamaru Hospital were recorded as having no community LMC.

Table 49 Antenatal hospitalisations by locality, 2010/11 to 2012/13

Locality	Deliveries per year	Antenatal hosps per year	1 antenatal hosp per x deliveries
Waitaki	204	62	3.3
Dunedin	1,328	467	2.8
Clutha	101	37	2.7
Gore	181	48	3.8
Central	266	65	4.1
Queenstown	256	53	4.8
Southland	1,085	300	3.6
Total	3,420	1,032	3.3

Source: NMDS, so deliveries in hospital facilities only. Years 2010/11 to 2012/13. Antenatal hospital stays excluding abortions/miscarriages prior to 20 weeks. Interpreting the last column, for example, for Waitaki women there is one antenatal hospital stay for every 3.3 deliveries.

⁵⁵ Technically here it is the number of hospital deliveries calculated rather than babies, but the numbers will be very similar (eg twins tending to cancel out stillbirths).

Southern women have just over 1000 antenatal hospitalisations a year, around one for every 3.3 deliveries occurring (Table 49). Clutha and Dunedin women had the highest rate of antenatal visits (1 to 2.7 and 2.8 deliveries respectively) while Queenstown and Central women had the least (1 to 4.8 and 4.1 respectively). Antenatal hospitalisations tended to be linked to the age of the mother, with younger mothers being more like to have a hospital stay during their pregnancy – 1 stay to 1.7 deliveries for 15-19 year olds and 1 to 2.3 for 20-24 year olds.

Overall 14% of Southern births required some assistance with level II or level III neonatal care (Table 50). Rates were highest for Gore and Southland babies, and lowest for Waitaki and Central. Māori and Pacific babies had a higher rate of assistance given. The rate of use of neonatal care appears high (the equivalent rate for the Auckland metro area was around 6.6%), but this may relate to nomenclature (and subsequent speciality coding) around Level I and Level II care.

Table 50 Admissions to neonatal intensive care by locality, 2010/11 to 2012/13

Locality	NICU	As % of deliveries
Waitaki	53	9%
Dunedin	550	14%
Clutha	39	13%
Gore	95	17%
Central	77	10%
Queenstown	98	13%
Southland	542	17%
Southern	1,454	14%
Ethnicity		
Māori	156	18%
Pacific	65	24%
European/Other	1,233	14%

Source: NMDS. All with a discharge speciality of Level II or Level III neonatal care.

Induced terminations of pregnancy (induced abortions) for Southern women mainly took place in Dunedin Hospital for the 2010/11 to 2012/13 period, but increasingly at Southland Hospital from 2012 onwards. The Southland volumes are not currently recorded in the NMDS, but the procedures at Dunedin and Christchurch Hospitals are, and match closely the figures given in the Abortion Supervisory Committee Report.⁵⁶ For this analysis we restrict the time period to 2010/11 and 2011/12 to ensure full coverage of volumes.

Table 51 Induced terminations of pregnancy by locality, 2010/11 to 2011/12

Locality of residence	Terminations per year	Per 1000 15-44 women
Waitaki	44	12.5
Dunedin	407	13.3
Clutha	20	8.1
Gore	27	12.8
Central	62	12.7
Queenstown	66	14.0
Southland	225	14.3
Southern	850	13.3
New Zealand (2011)		17.5

Source: NMDS. All with ICD10AM principal diagnosis of O04. New Zealand rate calendar year 2011.

There were on average 850 induced terminations a year for those two years, a rate of 13.3 per 1000 15-44 year old women, much lower than the New Zealand rate of 17.3,⁵⁶ consistent with the generally lower fertility rate for Southern women. Rates did not vary overly by locality (Table 51). The switch to providing services in Southland in 2012 will provide a better service for Southland, Queenstown and Gore women, and may increase the rates there.

Rates of abortion by age group followed the national trend in being higher at younger age groups as a proportion of known pregnancies (Table 52). Māori women in Southern had an overall higher rate, slightly higher than their counterparts elsewhere in New Zealand, though Māori rates were lower for teenagers. Overall Southern a similar rate of pregnancies ending in abortion, 19.9%, compared to the national average of 20.4%.⁵⁷

Table 52 Induced terminations of pregnancy by age as a percentage of known pregnancies, 2010/11 to 2011/12

	Māori	Pacific	Other	Total
<19 yrs	31%	37%	49%	45%
20-29 yrs	29%	25%	23%	24%
30-39 yrs	21%	11%	10%	11%
40+ yrs	13%	-	24%	23%
Total	27%	21%	19%	20%
NZ (2011)	22%	21%	18%	20%

Source: Southern data from NMDS - all with ICD10AM principal diagnosis of O04. The New Zealand rate is for calendar year 2011.⁵⁷ "Known pregnancies" here are defined as deliveries plus induced terminations, the same as used for the Abortion Supervisory Committee figures.

⁵⁶ NZ Parliament. Report of the Abortion Supervisory Committee 2012. Graph 1.3, p8.

⁵⁷ Ibid, Graph 6.3, p16

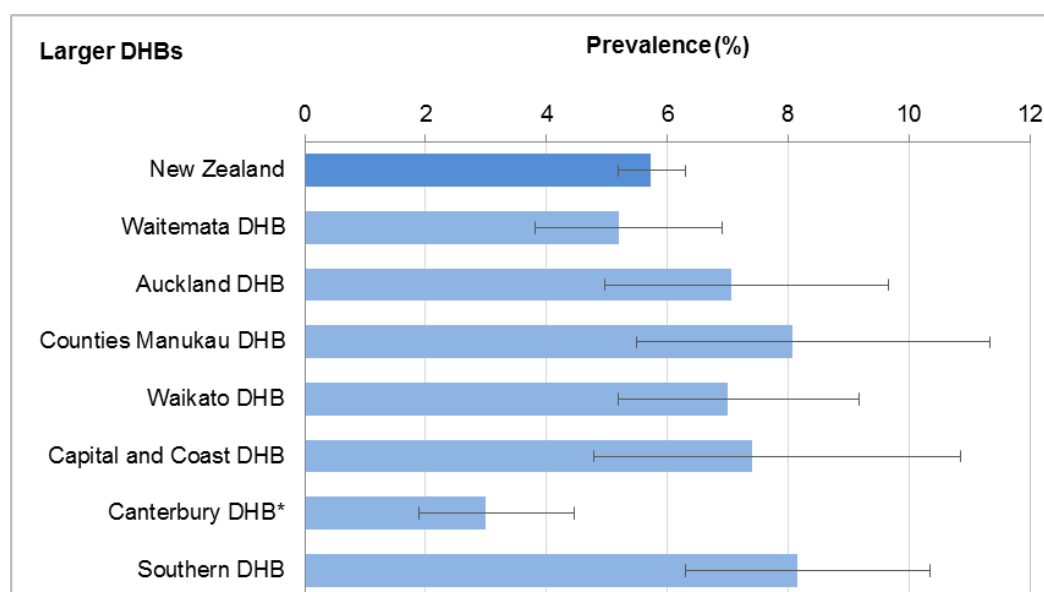
11. Mental Health

This chapter presents an overview of the prevalence of mental health disorders and corresponding services available for the population in the Southern district. In 2006 mental health (specifically anxiety and depressive disorders) was the second highest cause of health loss in New Zealand accounting for 5.3% of total DALYs. This is almost identical for Māori people with mental health disorders also ranking as the second leading cause of health loss at 5.0% of total DALYs.

6.1 Mental wellness

The 2011/12 New Zealand Health Survey includes questions on self-reported psychological distress. This is measured using a 10-item Kessler questionnaire to ascertain levels of anxiety, depression, agitation and psychological fatigue in the most recent 4-week period. Respondents are deemed to have a high or very high probability of anxiety or depressive disorder if they reach a score of 12 or more on the questionnaire. Figure 96 shows this cohort of people as a percentage of the total population, by district and New Zealand as a whole, in 2011/12. Southern DHB has a significantly higher prevalence of this when compared with the national average. Approximately 8% of Southern district residents have a high or very high probability of experiencing or developing anxiety or depressive disorders compared with 5.7% of the total population (p value 0.04).

Figure 96 Age standardised prevalence of psychological distress by district for 2011/12

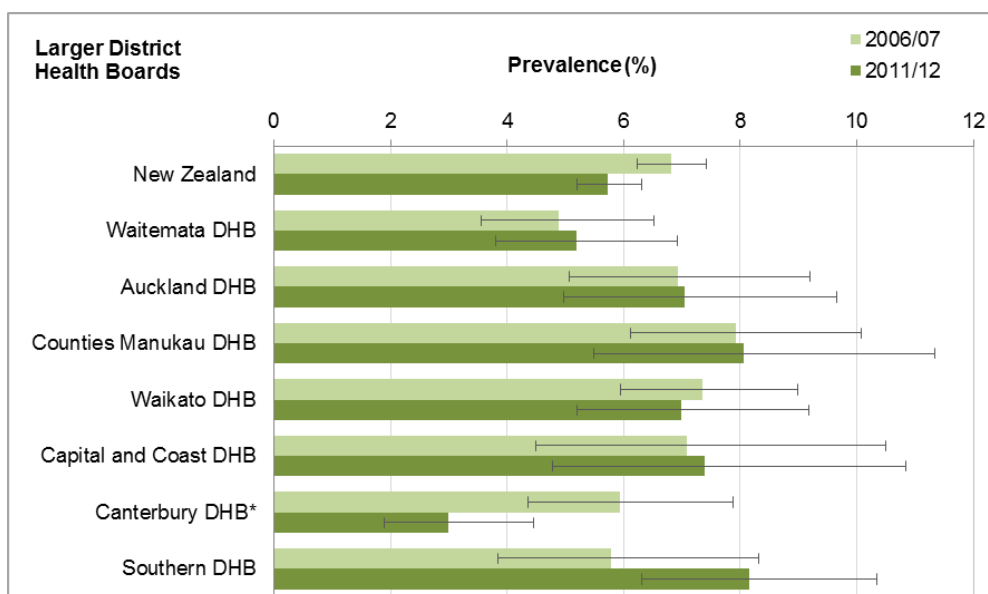


Source: NZ Health Survey

Women in the Southern district are almost twice as likely to be under psychological distress as males, putting them at higher risk of experiencing or developing anxiety or depressive disorders. Approximately 10% of women residing in Southern scored 12 or more on the questionnaire in comparison with 5% of males residing in the district.

Comparing Health Survey results for 2006/07 with 2011/12, Southern DHB shows a 2.4 percentage point increase in the prevalence of psychological distress. Southern DHB is the only district portraying an increase greater than 1%, although this was not statistically significant (Figure 97). One possibility raised is post-earthquake migration of more stressed people from Christchurch – increasing apparent distress prevalence in Southern, while decreasing it in Canterbury.

Figure 97 Age standardised prevalence of psychological distress by district for 2006/07 and 2011/12

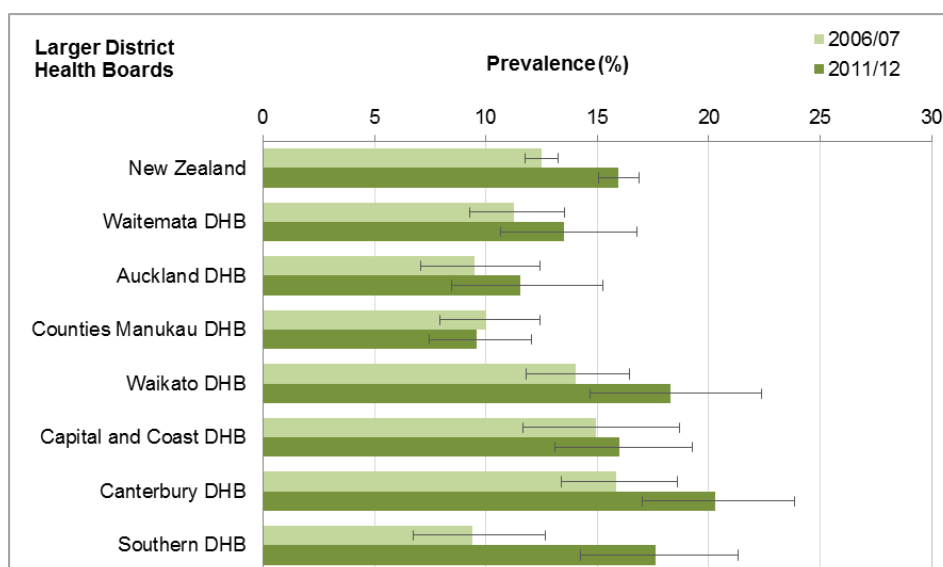


Source: NZ Health Survey

6.2 Diagnosed common mental disorders

The 2011/12 New Zealand Health Survey collected self-reported data on the diagnosis of common mental disorders, defined as having a diagnosis of depression, bipolar disorder and or anxiety disorder confirmed by a doctor. Figure 98 shows the age-standardised prevalence of residents by district who have had a diagnosis of a common mental disorder in 2006/07 and 2011/12. Prevalence of diagnosed common mental disorders has seen a significant increase across the nation with approximately 3.5% growth over the past five years (p value <0.001). This pulls the percentage of the total population with a diagnosis of a common mental disorder up to 15.9%. Southern district is the only district showing a statistically significant increase in the prevalence of common mental disorders with the percentage rate almost doubling in the past 5 years from 9.4% in 2006/07 to 17.6% in 2011/12 (p value <0.01). It is difficult to know how to interpret this - as it appears unlikely that there could be a genuine doubling in mental illness prevalence in a five year period some form of sampling variation between the two surveys may be at issue.

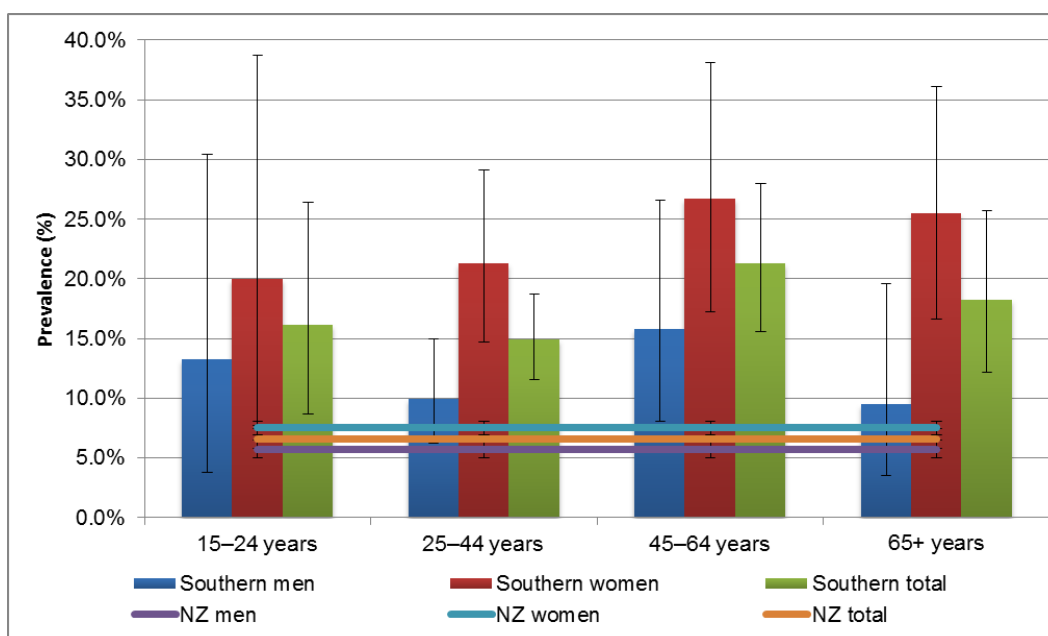
Figure 98 Age standardised prevalence of diagnosed common mental disorders by district for 2011/12



Source: NZ Health Survey

The prevalence of diagnosed common mental disorders is on average higher in New Zealand women and particularly high in female residents of Southern district. Figure 99 shows the prevalence of diagnosed common mental disorders for the Southern district and the whole of New Zealand, disaggregated by age and gender. Southern women have a statistically significant higher prevalence of diagnosed common mental disorders when compared with the New Zealand average for all age groups except those aged between 15-24 years. Just over one quarter of women (26.7%) residing in the Southern district between the ages of 45-64 years are affected by common mental disorders. This is almost 3 times higher than the average prevalence rate for women across New Zealand. Similarly for men residing in Southern between the ages of 45-64 years, 15.8% are affected by common mental disorders in comparison to 5.7% of men across New Zealand. The average prevalence rate of common mental disorders in the Southern district is 17.7%, which is 11.1% higher than the national average at 6.6%.

Figure 99 Prevalence of common mental disorders by age and gender, national average and Southern district for 2011/12



Source: NZ Health Survey

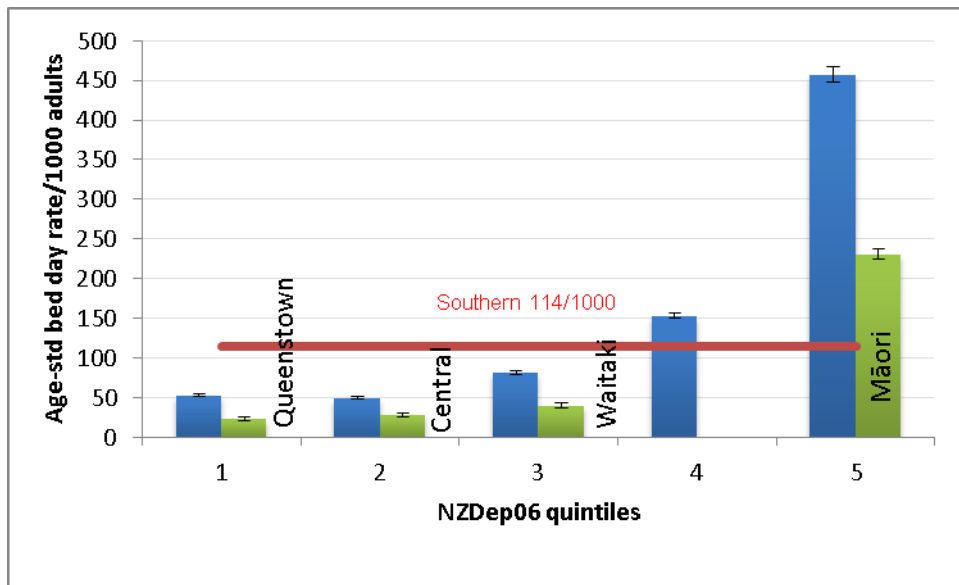
The *Raise HOPE – Hapaia te Tumanako Background Paper* provides a further analysis on the overall prevalence of mental health disorders in the Southern district.⁵⁸ Te Rau Hinengaro, the National Health Survey results have been extrapolated to provide absolute figures on the prevalence of any mental health disorder in the Southern district, disaggregated further by TA and ethnicity. Using this method 51,800 residents (21%) aged 15 and over were expected to have experienced a mental health disorder in 2012. The limitations behind utilising this method stem from variability among the TAs of the Southern district, particularly surrounding the age structure and level of deprivation within each TA.

The tertiary institution in Dunedin City and high level of tourism in Queenstown-Lakes District result in a greater proportion of younger residents (Chapter 1, page 14), who have a higher prevalence of mental health disorders (Te Rau Hinengaro). Additionally, the majority of TAs in Southern district, excluding Central Otago and Queenstown Lakes, are affected by deprivation resulting in a greater

⁵⁸ Southern DHB. *Raise Hope -Hapaia te Tumanako Background Paper: Supporting the Southern DHB Mental Health and Addiction Strategic Plan 2012-2015*. Southern DHB 2012.

proportion of residents living with a degree of socioeconomic disadvantage (Chapter 2, page 19). This has also increases the prevalence of mental health disorders (Te Rau Hinengaro) and is visible within the Southern district (Figure 100). This portrays the adult mental health bed day rates by quintile - quintile 5 residents are far more likely to use inpatient mental health services than people living in other quintile areas. The selected localities appear even lower than their deprivation level peers, and may reflect migration of the more severely mentally ill to the larger urban areas, particularly Dunedin.

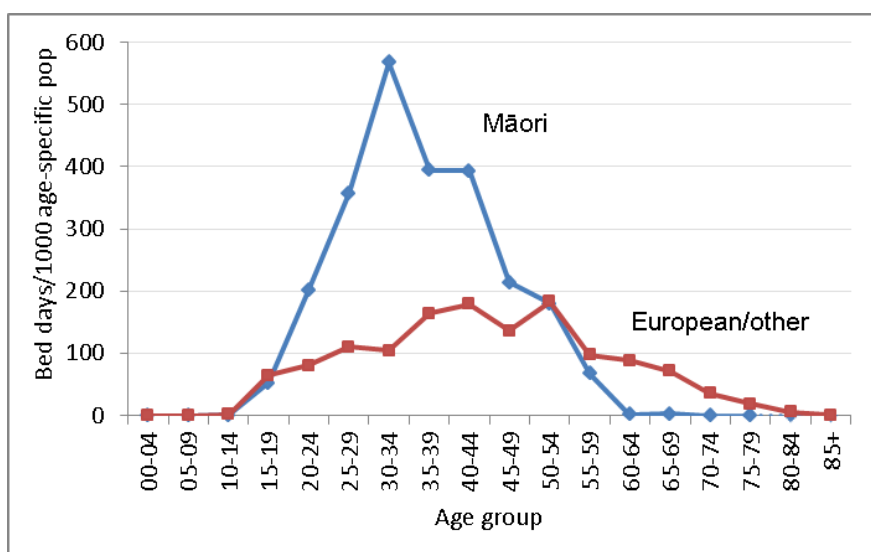
Figure 100 Adult mental health bed day annual rates 2011/2013



Notes. NMDS analysis, all mental health specialties, 2010/11 to 2012/13, public hospital bed days only.

Bed day rates per 1000 people were significantly higher for Māori peoples and residents living in the most deprived areas of the Southern district. This is in line with evidence that Māori peoples have a higher prevalence of mental health disorders when compared with European/Other. This additional burden of disease has been attributed to the younger age of Māori populations and their relative socioeconomic disadvantage (Te Rau Hinengaro). Figure 101 shows the mental health related bed days by age and ethnicity, with Māori populations displaying a distinctive spike reaching a rate five times greater than that of the Other population.

Figure 101 Mental health related bed days per year by age and ethnicity, Southern DHB 2011-2013

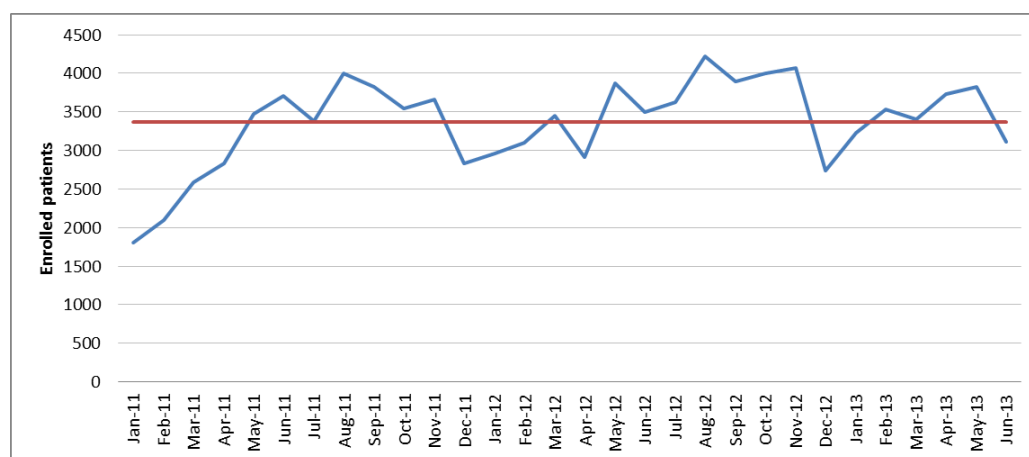


Notes. NMDS analysis, all mental health specialties, 2010/11 to 2012/13, public hospital bed days only.

Adequate access to the appropriate mental health services is vital in reducing the impact of mental health disorders. The original 1998 Blueprint outlined acceptable access rates to mental health and addiction services, which was tailored towards 3% of the population per annum who were estimated at the time to be most affected by mental illness and addiction. The second version of the Blueprint released in June 2012 acknowledged the revised figure of 4.7% of the population per annum to be most affected by mental illness and addiction, released in the Te Rau Hinengaro report. However, it also noted that not all of these patients would need support through mental health services in the course of 12 months. Data released by the Ministry of Health in 2012 suggested that 3.31% and 3.28% of the Otago and Southland populations, respectively, accessed mental health services in a 12 month period and this was higher than the New Zealand average of 2.75%.⁵⁹

Service activity data available from PRIMHD, the national mental health and addiction information portal, suggests that between the months of January 2011 and July 2013 approximately 3,400 patients were accessing services per month (Figure 102). However there have been concerns around the quality and particularly the completeness of PRIMHD data available as yet.

Figure 102 Mental health service activity for Southern district between Jan 2011 – July 2013

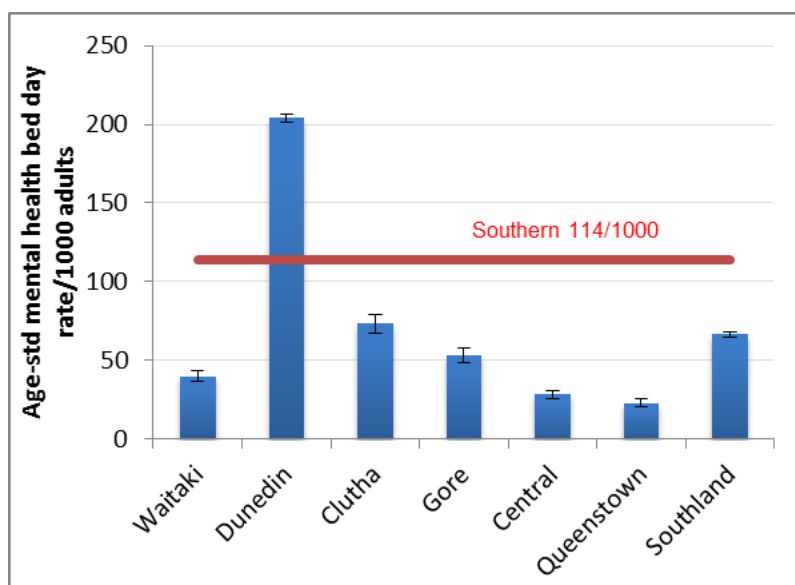


Source: PRIMHD NGO volumes monthly report.

There are two main inpatient facilities for mental health patients residing in Southern that receive the majority of patient flow. These include Southland mental health unit, located in Southland Hospital and Wakari Hospital located in Dunedin. On average there are approximately 1200 patients who access in-patient mental health services per annum in the Southern district, 72% are discharged from Wakari Hospital and 27% from Southland Hospital, leaving approximately 1% of patients accessing Dunedin Hospital or facilities out of district. Figure 103 shows the adult mental health hospitalisation bed day rates per 1000 people between 2011 and 2013. Dunedin locality has a significantly higher mental health bed day rate per 1000, which can be largely explained by existence of Wakari Hospital and the potential mental health support structures built in close proximity, like supported accommodation, in order to assist patients in recovery and reintegration into the community.

⁵⁹ Southern DHB. *Raise Hope -Hapaia te Tumanako Background Paper: Supporting the Southern DHB Mental Health and Addiction Strategic Plan 2012-2015*. Southern DHB 2012.

Figure 103 Age standardised adult mental health annual bed day rates per 1000, Southern DHB 2011/2013



Notes. NMDS analysis, all mental health specialties, 2010/11 to 2012/13, public hospital bed days only.

6.3 Suicide

While not specific to mental illness, suicide is often used as a marker for mental health, so is included here. In reality the suicide rates of a community is a wider public health issue and can reflect unemployment rates, social isolation, alcohol and drug problems and so on. The following data was compiled in the *Southern Suicide Prevention Action Plan 2011 – 2013*.⁶⁰

Suicide mortality in the Southern District was 13.4 deaths per 100,000 per year from 2003 to 2007, higher than the national average of 11.9 deaths per 100,000 people per annum. The previous Otago DHB area averaged 11.3, while Southland averaged 15.4 deaths per 100,000 per year. Given the relatively low deprivation levels in Southern (Chapter 2), this rate is higher than expected, but is consistent with national data showing the suicide rate for people living in rural areas is 16 per 100,000 people compared to 11.2 for every 100,000 people living in urban areas.

Taking a longer baseline, from 1988 and 2005, there was an average of 15 suicides per annum in the Dunedin city area. Invercargill City averaged 9 per annum, while Queenstown-Lakes District averaged 1.7 and Gore District 1.5 deaths per annum. The Central Otago TA had the lowest average suicide rate in Otago whilst the Waitaki District has the highest (7.9 and 13.2 per 100,000 people per annum respectively).

In Otago there were on average 81.2/100,000 population hospitalisations for incidents of self-harm per year in the Otago area over 2005-2007. Southland recorded 65.9 hospitalisations for incidents of self-harm per 100,000. In both areas females are approximately twice as likely as males to present to hospital following an incident of self-harm, consistent with national figures.

⁶⁰ Southern DHB. *Southern Suicide Prevention Action Plan 2011 – 2013*. Southern DHB Dec 2010.

Appendix 1 – Smoking prevalence – New Zealand Health Survey compared to Census

As noted in Section 4.1 the fall in smoking prevalence in Southern is lagging the New Zealand fall slightly based on Census 2013 data. Examining the changes based on Health Survey responses the lag appears much greater. Indeed the Health Survey results apparently show an **increase** in smoking rates, as detailed in Table 54 and Table 53 below. This was unexpected, with results for other DHBs appear more in keeping with census data. Overall the 2013 Census and Health Survey results appear reasonably in line, 16.4% (95% CI 15.5-16.3%) of New Zealanders daily smoking in the Health Survey for 2011/12 compared with 15.1% for 2013 in the Census. But there does appear to be an unexplained difference for Southern. This short Appendix just notes the data as reported from the Health Survey for completeness; Section 4.1 uses the Census data as this represents the largest sample of the population and is thought to be the best estimate of the actual situation.

Table 53 shows the NZ Health Survey data for daily smoking rates, defined as adults who smoke every day and have smoked more than 100 cigarettes in their life time. Southern is the only larger DHB showing an increase in the prevalence of daily smoking from 2006/07 to 2011/12, and is in contrast to the census data as noted above. Although a minor increase and not statistically significant, within the Survey data there is a statistically significant difference between the national average and Southern rates of daily smoking (p-value 0.01).

Table 53 Age standardised daily smoking prevalence by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	19.4	(18.5–20.3)	17.7	(16.8–18.6)	Decrease
Waitemata	14.0	(11.3–17.2)	13.4	(10.6–16.5)	-
Auckland	14.5	(11.7–17.6)	10.4	(7.6–13.7)	Decrease
Counties Manukau	20.2	(17.3–23.4)	18.6	(15.5–22.2)	Decrease
Waikato	23.6	(20.5–27.0)	17.1	(13.8–20.8)	Decrease
Capital and Coast	12.3	(9.2–16.1)	12.2	(8.7–16.5)	-
Canterbury	17.1	(14.3–20.2)	15.6	(12.2–19.6)	Decrease
Southern	22.1	(16.8–28.1)	22.9	(19.6–26.5)	Increase

Source: New Zealand Health Survey. Age standardised to WHO world population. Daily smoking defined as adults (age 15+) who smoke at least once each day, and have smoked more than 100 cigarettes in their life time. Red/green figures are statistically higher/lower than the national average.

Table 54 shows the age standardised prevalence of 'current smoking' rates in New Zealand from the Health Survey defined as adults who smoke at least monthly and have smoked more than 100 cigarettes in their life time. Comparing results with the previous Health Survey, run with the same methodology, Southern is only one of two larger DHBs portraying an increase in the prevalence of smoking from 2006/07 to 2011/12. Although this is not a statistically significant increase, there is a statistically significant difference between the national average and Southern rates of smoking (p-value 0.03) and shows a different pattern to most other DHBs, and the country as a whole. While consistent with the daily smoking figures, again it varies from the census results as noted above.

Table 54 Age standardised current smoking prevalence by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	21.3	(20.3–22.3)	19.8	(18.8–20.8)	Decrease
Waitemata	16.6	(13.4–20.1)	16.3	(13.1–20.0)	-
Auckland	17.2	(14.2–20.7)	13.5	(10.4–17.2)	Decrease
Counties Manukau	22.1	(18.9–25.5)	20.4	(17.4–23.7)	Decrease
Waikato	25.3	(22.1–28.7)	18.8	(15.0–23.0)	Decrease
Capital and Coast	13.8	(10.4–17.8)	16.5	(12.5–21.2)	Increase
Canterbury	19.0	(16.0–22.3)	17.7	(14.3–21.4)	Decrease
Southern	22.9	(17.5–29.0)	24.1	(20.6–27.8)	Increase

Source: New Zealand Health Survey. Age standardised to WHO world population. Current smoking defined as adults (age 15+) who smoke at least monthly and have smoked more than 100 cigarettes in their life time. Red/green figures are statistically higher/lower than the national average.

Interestingly Southern DHB results from the Health Survey has also seen a 3 percentage point increase in the number of ex-smokers in the region, and shows a higher percentage than the national average (Table 55). Although this is not statistically significant it may be suggesting a movement in the right direction for the study sample.

Table 55 Age standardised prevalence of ex-smokers by DHB for 2006/07 and 2011/12

Larger District Health Boards (DHB)	Age-standardised prevalence (%) 2006/07	95% Confidence Interval 2006/07	Age-standardised prevalence (%) 2011/12	95% Confidence Interval 2011/12	Trend
All New Zealand	20.6	(19.8–21.5)	22.1	(21.3–23.0)	Increase
Waitemata	19.9	(16.7–23.3)	20.8	(17.6–24.1)	Increase
Auckland	19.1	(15.8–22.8)	22.7	(19.8–25.8)	Increase
Counties Manukau	19.1	(16.5–22.0)	16.0	(13.9–18.3)	Decrease
Waikato	21.5	(18.6–24.7)	21.2	(18.5–24.0)	-
Capital and Coast	21.5	(17.7–25.7)	18.9	(15.6–22.6)	Decrease
Canterbury	19.1	(16.5–21.9)	22.3	(19.9–24.9)	Increase
Southern	20.3	(16.5–24.5)	23.2	(19.5–27.2)	Increase

Source: New Zealand Health Survey. Adults (age 15+), age standardised to WHO world population. Ex-smoking defined as adults who used to smoke but do not currently.

Appendix 2 – Map showing localities variance from territorial authorities

The localities used in this report vary slightly from TAs as explained in the methods section of the introduction and Section 1.1. The map below shows the approximate areas of variance and population involved for each.

