HAUORA WAITAHA I

Health Profile for Māori in Canterbury

Canterbury District Health Board

April 2010

Canterbury
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Te Poari Hauora ō Waitaha

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Mihi

Tēnā koutou katoa ngā iwi o Waitaha.
Mokori anō te mihi mō tō koutou āwhina
me tō koutou tautoko i tēnei mahi me ōna
hua hirahira ka puta mai.
Ko te tumanako, he oranga kei roto.

Ko tōna panekiritanga,ko ngā kōrero kua
kohia,ka whakatairanga i te hauora o te iwi.
Kua kohikohia enei whakamōhiotanga, mai
i ngā rauemi katoa mō tenei pūrongo, hei
whakanui ake i ngā mōhio hauora o te iwi
kia nui ake ngā hua ka whiwhi.

Ko te hiahia, ko ngā mōhiotanga kei roto i tēnei
Pūrongo, ka whakaatuhia he mōhiotanga o ngā take
hauora mō ngā iwi o Waitaha. Mā tēnei,ka taea
e ngā iwi o Waitaha me wahi kē hoki, te tū pakari
me te mōhio ki te āhua o tō rātou tūranga hauora, ā, ka
pewhea hoki e whakatutukihia ai.

"Heoti ake, e ngā iwi o Waitaha, ngā mihi me ngā whakau,
Tēnā koutou."

Greetings to the esteemed people of Canterbury. We congratulate and commend you for your support and endorsement of this work, and the positive benefits that we hope may result from it.

The hope is that the information presented will contribute positively to the health of the people. Information has been gathered from many sources in this report to improve the knowledge of the health of the people, so that as much benefit as possible can be gained from its use.

It is hoped that this report will add to the knowledge of the obstacles to health for the people of Canterbury. In this way the people of Canterbury and elsewhere can be empowered with understanding of their health status to be better able to work to overcome those obstacles.

Finally, greetings and salutations to the people of Canterbury.

Acknowledgements

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Executive Summary

This profile prepared for the Canterbury District Health Board provides the first comprehensive picture of the health of Māori in Canterbury. It is hoped that it will be useful for Māori and those working to improve health for Māori in Canterbury. The profile draws on data from a range of sources. These data are presented in such a way as to allow comparison of the health of Māori and non-Māori in Canterbury, and the health of Māori in Canterbury and at the national level.

The overall picture that emerges is that for a number of health indicators, Māori in Canterbury are in a better position than Māori nationally but in a worse position than non-Māori in Canterbury. This is the case for: socioeconomic status; smoking; mortality (including avoidable mortality); avoidable hospitalisation; cardiovascular disease; cancer (and cancer screening); respiratory disease, diabetes; immunisation; injury mortality; oral health status (compared to other non-fluoridated areas); and some conditions in childhood such as bronchiolitis and asthma.

Many of the outcomes listed above for which Māori in Canterbury fare worse than non-Māori but better than Māori nationally have a strong association with socioeconomic position, and some of them with smoking. Those associated with smoking include, in particular, mortality, avoidable hospitalisation, cardiovascular disease, cancer and respiratory disease (both in adults and in children).

Demographic, social and risk data

Canterbury Māori made up 7.2% of the Canterbury population and 5.9% of the New Zealand Māori population at the last Census. Ngāi Tahu/Kāi Tahu is the most common iwi affiliation among Māori, with over 120 other iwi also represented in Canterbury. As with the national Māori population, Māori in Canterbury are youthful compared to non-Māori and have a higher fertility rate, meaning that the growth of the Māori population is faster than that of the non-Māori population.

The Canterbury population is less deprived than the New Zealand population. Māori in Canterbury are relatively more deprived than non-Māori, but relatively less deprived than Māori nationally.

The prevalence of smoking is higher for Māori in Canterbury than non-Māori, especially for females and young people, but lower than for Māori nationally. While youth smoking is decreasing over time, a higher proportion of Māori than non-Māori young people are exposed to smoke at home. Māori in Canterbury also have a higher prevalence of obesity than non-Māori.

Health data

All-cause mortality is significantly higher for Māori than non-Māori in Canterbury, but lower than that for Māori at the national level, where there is a greater difference between Māori and non-Māori. The overall rate of hospitalisation is lower for Māori than non-Māori in Canterbury, in contrast to a higher rate for Māori than non-Māori nationally.

Cardiovascular disease

Māori in Canterbury have a larger burden of cardiovascular disease in terms of mortality and hospitalisation, but this is smaller than that for Māori nationally. For ischaemic heart disease, the mortality rate is higher for Māori in Canterbury than non-Māori, but hospitalisation rates are the same, suggesting an area of unmet need for Māori. In addition, Canterbury Māori have a lower rate of angioplasty and a higher rate of coronary artery bypass grafting than non-Māori, which may indicate a higher level of disease severity among Māori. Stroke mortality and hospitalisation rates are not significantly different for Māori and non-Māori in Canterbury, but the rates for Māori in Canterbury are significantly lower than for Māori nationally. Hospitalisation rates for other cardiovascular disease indicators are higher for Māori in Canterbury than for non-Māori but similar to or lower than for Māori nationally.

Cancer

Canterbury Māori also have a larger burden of cancer than non-Māori in Canterbury. Incidence overall for Māori is lower but the mortality rate for Māori is higher than that for non-Māori. Incidence and mortality from cancer are lower for Māori in Canterbury

than nationally. Lung cancer incidence and mortality rates are higher for Māori in Canterbury than non-Māori. Incidence of colorectal cancer is lower for Māori than non-Māori in Canterbury, but there is no difference in the mortality rate. Incidence of breast cancer is the same for Māori and non-Māori in Canterbury but the mortality rate is higher for Māori. Māori in Canterbury who have different forms of cancer seem therefore to die more frequently from those cancers than do non-Māori. In keeping with this, rates of screening coverage for breast and cervical cancer are lower for Māori than non-Māori in Canterbury and this suggests an area of unmet need for Māori.

Respiratory disease

Respiratory disease mortality and hospitalisation rates are higher for Māori than non-Māori in Canterbury, but lower than for Māori nationally. Māori are hospitalised more than non-Māori in Canterbury for asthma, chronic obstructive pulmonary disease and bronchiectasis, but less than Māori nationally.

Diabetes

Canterbury Māori mortality, hospitalisation and complications rates for diabetes are much higher than for non-Māori but lower than those for Māori nationally. A lower proportion of Māori in Canterbury have annual diabetes reviews and retinal screening than non-Maori, suggesting important unmet need for Māori with diabetes in Canterbury.

Communicable diseases

Mortality from communicable diseases is similar for Māori and non-Māori in Canterbury, but Māori are hospitalised less often for these diseases. Notification and hospitalisation for intestinal infections are less frequent for Māori than for non-Māori in Canterbury, while notification for invasive pneumococcal disease and tuberculosis, and hospitalisation for viral hepatitis, are higher for Māori than non-Māori in Canterbury. Immunisation coverage is lower for Māori in Canterbury than for non-Māori, but higher than for Māori nationally.

Mental health

Māori in Canterbury access mental health services more than non-Māori, but at a level lower than the target set by the Mental Health Commission. The rates of hospitalisation for schizophrenia, manic episodes, bipolar disorder and psychoactive substance use

disorders are higher for Māori than for non-Māori in Canterbury. The overall rate of hospitalisation for Māori for mental health problems is similar in Canterbury and nationally, although lower for schizophrenia and higher for psychoactive substance use and depression.

Injury

Mortality from external causes of injury is higher for Māori in Canterbury than non-Māori, particularly for deaths due to drowning, fires, and accidental poisoning. However, the rate of hospitalisation for injuries is lower for Māori in Canterbury than non-Māori and lower than for Māori nationally.

Oral health

Māori children in Canterbury have poorer oral health status than non-Māori in Canterbury, and poorer oral health status than Māori living in fluoridated areas of New Zealand. However, their oral health status is better than that of Māori living in other non-fluoridated areas nationally.

Children and youth

In children's health, the rates of preterm birth, low birthweight and infant mortality appear higher for Māori than Europeans, while the rate of breastfeeding is lower. This suggests a relationship between higher risk (preterm birth and low birth weight) and lower protective (breastfeeding) factors for infants, and worse outcomes in terms of mortality. Māori children and young people in Canterbury have lower rates of admission for upper respiratory tract infection, tonsillectomy, and gastroenteritis than Europeans, but higher rates of admission for bronchiolitis and asthma. The rate of hearing test failure at school entry is higher for Māori children than Others in Canterbury, and the rate of admission for grommets insertion is also higher.

Sexual and reproductive health

In sexual and reproductive health, the rate of hospitalisation is higher for Māori than non-Māori in Canterbury, but admissions per live birth are lower for Māori. The rate of teenage pregnancy is much higher for Māori than for Europeans in Canterbury. Canterbury Māori have higher rates of manually assisted deliveries than non-Māori and lower rates of procedures related to delivery such as caesarean section (emergency and elective), and instrumental deliveries. Attendance at sexual health, family planning and

student and youth clinics for sexually transmitted infections is higher for Māori in Canterbury than for Europeans.

Health service utilisation and performance

In terms of health service utilisation, a lower proportion of older Māori than Others in Canterbury are in aged care facilities. Māori are more likely to have had an unmet need for a general practitioner than European/Others. PHO enrolment is lower for Māori in Canterbury than for Others. Māori in Canterbury are under-represented in hospital activity and in spending per capita on prescriptions and laboratory testing. In terms of indicators of health system performance, avoidable mortality and hospitalisation are higher for Māori in Canterbury than for European/Others, but lower than for Māori nationally.

1 Introduction

This section describes the scope of the profile, placing it in the context of a larger process of planning for Māori health in the Canterbury District Health Board (CDHB), and noting the sources of data and some pertinent methodological issues.

1.1 Scope of this health profile

This health profile for Māori in Canterbury may be considered the first stage of a process that will result in a health needs assessment for Māori in Canterbury. Health needs assessment is defined by Coster (2000) as the "assessment of the population's capacity to benefit from health care services prioritised according to effectiveness, including cost-effectiveness, and funded within available resources."

As a description of the Māori population in Canterbury and a portrait of its health status, this profile involves the use of routinely collected data from as wide a range of sources as possible. It does not involve generation of new data solely for the purposes of the profile; collection of healthcare user or provider views on services; consultation with the community; or a stocktake or cost analysis of the available services. The information the profile contains is intended to inform further consideration of Māori health priorities and fuller engagement with Māori to identify unmet health and healthcare needs. Subsequent stages of health needs assessment for Māori in Canterbury may include using the data in this profile alongside information about health services from the wider Māori community and health providers.

This profile was requested and guided by Hector Matthews, Executive Director of Māori and Pacific Health for CDHB and Dr Ramon Pink, Medical Officer of Health for Canterbury, CDHB. It contributes to fulfilling objectives of the CDHB Whakamahere Hauora Māori Ki Waitaha – Māori Health Plan (Canterbury District Health Board 2006).

The importance of the principles of the Treaty of Waitangi – partnership, participation and protection – in determining and addressing health priorities for Māori are recognised in this profile. These principles are described in He Korowai Oranga: Māori Health Strategy (Minister of Health and Associate Minister of Health 2002) as underpinning the

relationship between the government and Māori. This profile is intended to contribute to the understanding of Māori health by CDHB and Māori in Canterbury, in order to facilitate partnership between CDHB and Māori in developing strategies for Māori health gain. It is intended to inform Māori participation in decision-making and planning for Māori health. It is also intended to ensure that understanding of Māori health status in Canterbury leads to the protection of Māori health and to the reduction of health inequalities between Māori and non-Māori.

He Korowai Oranga: Māori Health Strategy (Minister of Health and Associate Minister of Health 2002) and Whakatātaka Tuarua: Māori Health Action Plan 2006–2011 (Minister of Health and Associate Minister of Health 2006) also describe whānau ora as fundamental to Māori health and wellbeing individually and collectively. This profile is intended to contribute to the CDHB applying equitable resources to realise Māori health gain, reduce health inequalities and achieve whānau ora (Ministry of Health 2008), and to contribute to the vision of 'Whānau Ora Ki Waitaha' expressed in Whakamahere Hauora Māori Ki Waitaha – Māori Health Plan (Canterbury District Health Board 2006).

Documents similar to this profile have been produced around New Zealand comparing Māori and non-Māori health status, and these have informed the structure and scope of this profile. These documents include:

- Hauora: Māori Standards of Health IV. A study of the years 2000–2005 (Robson and Harris 2007), which is the fourth of a series of reports on Māori health and uses national data;
- Tatau Kahukura: Māori Health Chart Book (Ministry of Health 2006), which also uses national data;
- West Coast – Te Tai O Poutini Māori Health Profile (Begg 2008), for the West Coast DHB;
- Health Needs Assessment for Maori. Waitemata District Health Board 2009 (Loring and Ratima 2009), for the Waitemata DHB.

1.2 Data sources and methodological issues

The data presented in this profile were sourced from a range of organisations:

- Statistics New Zealand;
- the Health and Disability Information Unit, Ministry of Health;
- Ngāi Tahu Development;
- Action on Smoking and Health;
- Te Rōpū Rangahau Hauora a Eru Pōmare;
- the Information Directorate, Ministry of Health;
- the Institute of Environmental Science and Research;
- the Injury Prevention Unit, University of Otago, Dunedin;
- the New Zealand Child and Youth Epidemiology Service, University of Otago, Dunedin;
- the Royal New Zealand Plunket Society;
- the National Immunisation Register;
- BreastScreen Aotearoa;
- the National Cervical Screening Programme; and
- the Canterbury District Health Board.

A detailed discussion of the data sources and methodological considerations is presented in Appendix 1. A brief overview of issues that should be kept in mind in considering the data is presented below:

- A limited range of years of data were available for consideration in this profile, for example:
    - for Statistics New Zealand data, those that were collected in the Census are restricted to the years in which the Censuses were held (2001 and 2006 were the last two Census years);
    - for data on health status the most recent year for data that had been released and processed at the time of writing the profile was 2005.
- Data have been processed in order to allow comparison of the health of Māori and non-Māori, for example:
    - data have been adjusted to take into account differential classification of ethnicity in hospital records;

    - data have been age-standardised to take into account the different age structures of the Māori and non-Māori populations;
    - estimations have been made for New Zealand Health Survey data at the Canterbury level by using national figures to adjust local data.
- Ethnicity data are presented as either total response or prioritised. If ethnicity is reported as 'total response' it means the individual is recorded in each ethnic group they specify. If ethnicity is reported as prioritised, each individual is allocated to a single ethnic group by priority (Māori > Pacific > Asian > European/Other).

2 Demographic Profile

Key points

- Māori made up 7.2% of people in Canterbury at the 2006 Census, up from 6.9% at the 2001 Census. This increase is projected to continue, such that in 2026 Māori will make up 9.4% of the Canterbury population.
- The number of people in Canterbury identifying as Māori in 2006 was 33,417, which was 5.9% of all Māori in New Zealand.
- Kaikoura District had the largest proportion of Māori in 2006 with 16.3%, while Christchurch City had the largest number of Māori at 25,725 people.
- The age profile for Māori in Canterbury in 2006 was similar to that nationally in that the Maori population was much more youthful than the non-Māori population.
- Higher birth rates for Māori in Canterbury than for non-Māori result from there being more women of childbearing age in the Māori population and a higher fertility rate for Māori.
- Ngāi Tahu/Kāi Tahu was the most common iwi affiliation indicated by Māori, while Ngāpuhi and Ngāti Porou were the second and third most common iwi affiliations for Māori in Canterbury.

2.1 Canterbury population characteristics

The total population in Canterbury was 466,407 at the 2006 Census (Statistics New Zealand 2006). This represents an increase from 411,834 in 1996 and 427,086 in 2001 (Statistics New Zealand website, accessed August 2009). The Canterbury population was projected to increase to 498,840 by 2009 (Statistics New Zealand 2006). Of the six territorial authority districts in Canterbury, Christchurch City had the largest population with 348,435 people in 2006, followed by Hurunui District with 42,834, Selwyn District with 33,666, Ashburton District with 27,372, Waimakariri District with 10,476 and Kaikoura District with 3,621. The population of all six districts in Canterbury has grown over the period between the 2001 Census and 2006 Census with 4.1% growth in the Kaikoura District, 6% in Hurunui District, 7.5% in Christchurch City, 7.6% in Ashburton District, 16.1% in Waimakariri District and 23.3% in Selwyn District. The

Canterbury DHB area has seen population growth of 9.2% overall, compared to 7.8% growth for all of New Zealand from 2001 to 2006.

Table 2.1 presents the ethnicity distribution for each district, all Canterbury, and all New Zealand at the 2006 Census. The European ethnic group is the largest in each territorial authority, followed by Māori in all areas except Christchurch City, where the Asian ethnic group is slightly larger than the Māori ethnic group. The Asian ethnic group is the third largest ethnic group in all areas other than Christchurch City (Statistics New Zealand 2006).

Table 2.1 Number and proportion of people indicating each ethnic group, by district, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)

Ethnicity	Area							
	Kaikoura District	Hurunui District	Waimakariri District	Christchurch City	Selwyn District	Ashburton District	Canterbury	New Zealand
Māori	591	591	2,856	25,725	2,010	1,641	33,417	565,329
	16.3%	5.6%	6.7%	7.4%	6.0%	6.0%	7.2%	14.0%
European*	2,793	9,357	38,238	275,985	29,667	24,669	380,706	2,693,820
	77.1%	89.4%	89.3%	79.2%	88.1%	90.1%	81.6%	66.9%
Asian	48	66	408	26,019	747	348	27,636	340,812
	1.3%	0.6%	1.0%	7.5%	2.2%	1.3%	5.9%	8.5%
Pacific	12	33	213	8,223	228	279	8,991	226,293
	0.3%	0.3%	0.5%	2.4%	0.7%	1.0%	1.9%	5.6%
Others**	177	429	1,119	12,483	1,014	435	15,657	201,693
	4.9%	4.1%	2.6%	3.6%	3.0%	1.6%	3.4%	5.0%
Total	**3,621**	**42,834**	**10,476**	**348,435**	**33,666**	**27,372**	**466,407**	**4,027,947**

* Includes 'New Zealanders'
** Includes 'Others', 'Not elsewhere included' and 'MELAA' (Middle Eastern, Latin American, African)

2.2 Canterbury Māori

Māori population characteristics

In Canterbury there were 33,417 (7.2%) people identifying as Māori at the 2006 Census. This group is composed of 13,629 people who indicated only Māori ethnicity and 19,788 who indicated Māori ethnicity among others, compared to 41,766 who indicated Māori descent. The non-Māori population in 2006 was 432,990 (92.8%).

Table 2.1 shows that the territorial authority with the highest proportion of people indicating Māori ethnicity in 2006 was Kaikoura District with 16.3%, followed by Christchurch City with 7.4%, Waimakariri District with 6.7%, Ashburton District and Selwyn District each with 6%, and Hurunui District with the lowest proportion at 5.6%. This compares to 14.0% of people indicating Māori ethnicity in New Zealand as a whole.

The proportion of people indicating Māori ethnicity has increased from 2001 to 2006 in all the territorial authorities in Canterbury, as shown in Table 2.2. This represents a faster rate of growth for Māori than that for the general population. The number of people indicating Māori ethnicity in Canterbury in 2006 increased by 4,689 from 28,728 in 2001. This represents a 16% increase in the size of the Māori ethnic group over the five-year period (average annual growth of 3.3%), with the proportion of people indicating Māori ethnicity in the total Canterbury population increasing from 6.7% to 7.2%. The relative increase in the size of the Māori ethnic group between the 2001 Census and the 2006 Census ranged from Hurunui District with the smallest increase at 13.9% (average annual growth of 2.8%) to Ashburton District with the largest increase at 39.2% (average annual growth of 7.8%).

Table 2.2 Number and proportion of Māori in each territorial local authority, and inter-Census increase, Canterbury and New Zealand, 2001 and 2006
(Source: Statistics New Zealand)

Territorial authority	2001 Census			2006 Census			Māori inter-Census pop^n increase		
	No. of Māori	Total pop^n	Māori as % of total	No. of Māori	Total pop^n	Māori as % of total	No.	%	Average per annum
Kaikoura District	495	3,480	14.2%	591	3,621	16.3%	96	19.4%	3.9%
Hurunui District	519	9,885	5.2%	591	10,476	5.6%	72	13.9%	2.8%
Waimakariri District	2,433	36,903	6.6%	2,856	42,834	6.7%	423	17.4%	3.5%
Selwyn District	1,572	27,312	5.8%	2,010	33,666	6.0%	438	27.9%	5.6%
Christchurch City	22,533	324,057	7.0%	25,725	348,435	7.4%	3,192	14.2%	2.8%
Ashburton District	1,179	25,446	4.6%	1,641	27,372	6.0%	462	39.2%	7.8%
Total Canterbury DHB	28,728	427,083	6.7%	33,417	466,407	7.2%	4,689	16.3%	3.3%
Total New Zealand	526,281	3,737,280	14.1%	565,329	4,027,947	14.0%	39,048	7.4%	1.5%

Births

Birth rates for Māori in Canterbury are substantially higher than for non-Māori, and also higher than for Māori in New Zealand, as shown in Table 2.3. Higher crude and general birth rates result from a combination of a younger Māori population with proportionally more women of child-bearing age, and higher fertility rates for Māori compared to non-Māori.

Table 2.3 Live births, crude birth rate, and general fertility rate, Canterbury and New Zealand, 2006
(Source: HDIU, Statistics New Zealand)

Indicator	Canterbury			New Zealand		
	Māori	non-Māori	Total	Māori	non-Māori	Total
Live births	1,120	5,076	6,196	17,935	42,339	60,274
Population (all ages)	33,417	432,990	466,407	565,326	3,462,621	4,027,947
Crude birth rate (live births per 1,000 people)	33.5	11.7	13.3	31.7	12.2	15.0
Female population (15-49 years)	8,832	109,218	118,050	151,464	874,809	1,026,273
General fertility rate (live births per 1,000 women 15-49 years)	126.8	46.5	52.5	118.4	48.4	58.7

Table 2.4 shows the number of births for Māori and non-Māori for the 10 years from 1999 to 2008, and shows a trend of an increasing number of births over time for Māori, and an increasing proportion of births for Māori in Canterbury compared to non-Māori, from 14.5% in 1999 to 17.9% in 2008. Māori are over-represented in births in both Canterbury and New Zealand.

Table 2.4 Live births, Canterbury and New Zealand, 1999-2008
(Source: HDIU)

Year	Canterbury			New Zealand		
	Māori (%)	non-Māori (%)	Total	Māori (%)	non-Māori (%)	Total
1999	805 (14.5%)	4,754 (85.5%)	5,559	16,027 (27.9%)	41,394 (72.1%)	57,421
2000	874 (15.8%)	4,658 (84.2%)	5,532	15,867 (27.8%)	41,127 (72.2%)	56,994
2001	820 (14.5%)	4,823 (85.5%)	5,643	15,869 (28.2%)	40,355 (71.8%)	56,224
2002	862 (16.2%)	4,470 (83.8%)	5,332	14,905 (27.3%)	39,610 (72.7%)	54,515
2003	856 (15.2%)	4,793 (84.8%)	5,649	15,682 (27.7%)	40,894 (72.3%)	56,576
2004	1,067 (17.6%)	4,995 (82.4%)	6,062	16,520 (28.1%)	42,203 (71.9%)	58,723
2005	937 (15.5%)	5,104 (84.5%)	6,041	17,004 (29.0%)	41,723 (71.0%)	58,727
2006	1,120 (18.1%)	5,076 (81.9%)	6,196	17,935 (29.8%)	42,339 (70.2%)	60,274
2007	1,256 (18.2%)	5,637 (81.8%)	6,893	19,338 (29.7%)	45,783 (70.3%)	65,121
2008	1,191 (17.9%)	5,467 (82.1%)	6,658	19,452 (29.8%)	45,881 (70.2%)	65,333

Māori population age and gender distribution

Table 2.5 presents the age profile of Māori and non-Māori in Canterbury and in New Zealand. At the 2006 Census, the Māori population of Canterbury was composed of 16,854 males (50.4%) and 16,563 females (49.6%). The comparable proportions for non-Māori in Canterbury and Māori nationally were 48.6% males and 51.4% females, and for non-Māori in New Zealand were 48.8% males and 51.2% females.

Children under 15 years of age made up 35.4% of the Māori population in Canterbury with the same age group making up 35.4% of Māori in New Zealand, 18% of non-Māori in Canterbury, and 19.3% of non-Māori in New Zealand. This illustrates the youthful age structure of the Māori population of Canterbury and New Zealand compared to the non-Māori population.

Older adults aged over 65 years of age made up only 3.2% of the Māori population in Canterbury whereas the same age group was 4.1% of Māori in New Zealand, 14.2% of non-Māori in Canterbury, and 13.6% of non-Māori in New Zealand. Thus the older adult population is relatively small among Māori, particularly in Canterbury.

Table 2.5 Age distribution, by life-cycle age group, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)

Age group (years)	Canterbury						New Zealand					
	Māori			non-Māori			Māori			non-Māori		
	Male	Female	Total (%)	Male	Female	Total (%)	Male	Female	Total (%)	Male	Female	Total (%)
0-14	6,024	5,802	11,820 (35.4%)	40,623	39,237	79,869 (18.4%)	102,645	97,275	199,920 (35.4%)	341,385	326,271	667,653 (19.3%)
15-24	3,198	3,210	6,411 (19.2%)	30,957	29,142	60,096 (13.9%)	49,374	51,933	101,304 (17.9%)	238,152	231,720	469,872 (13.6%)
25-44	4,530	4,761	9,291 (27.8%)	58,923	63,453	122,376 (28.3%)	70,824	82,605	153,432 (27.1%)	471,180	509,646	980,820 (28.3%)
45-64	2,568	2,256	4,821 (14.4%)	53,382	55,641	109,032 (25.2%)	41,541	45,999	87,546 (15.5%)	429,381	442,416	871,791 (25.2%)
65+	537	540	1,074 (3.2%)	26,706	34,908	61,617 (14.2%)	10,476	12,651	23,127 (4.1%)	210,666	261,816	472,479 (13.6%)
Total (%)	16,854 (50.4%)	16,563 (49.6%)	33,417	210,597 (48.6%)	222,390 (51.4%)	432,990	274,860 (48.6%)	290,469 (51.4%)	565,326	1,690,758 (48.8%)	1,771,857 (51.2%)	3,462,621

Figures 2.1 and 2.2 present the age and sex distribution for Māori and non-Māori in Canterbury, respectively. Figure 2.3 presents the age distribution for Māori and non-Māori in Canterbury together. These figures show the markedly different age-structure of the Māori and non-Māori populations. The triangular shape of the pyramid for Māori, indicates a large proportion of the population in younger age groups and steadily diminishing proportion of the population in the older age groups, with very few in the 85 years and older age group (approximately 36 people, 24 female, 12 male, in 2006).

This contrasts with the more pear-shaped pyramid for non-Māori, which is due to relatively small younger age groups and large older age groups. Both the Māori and non-Māori populations are under-represented in the 25- to 29-year old age group, possibly representing outward migration of this age group. Figure 2.4 presents the age and sex distribution of the Māori population in New Zealand, which is similar to the age and sex distribution of Māori in Canterbury.

Figure 2.1 Age distribution of Canterbury Māori population, males and females, 2006
(Source: Statistics New Zealand 2006 Census)

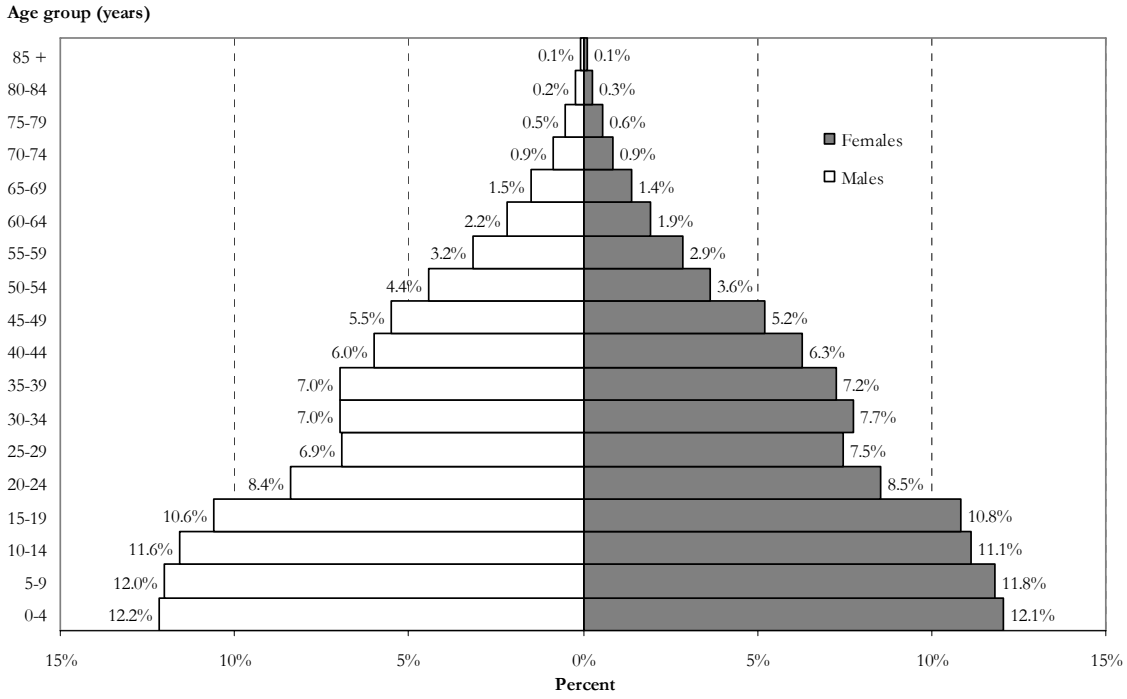


Figure 2.2 Age distribution of the Canterbury non-Māori population, males and females, 2006
(Source: Statistics New Zealand 2006 Census)

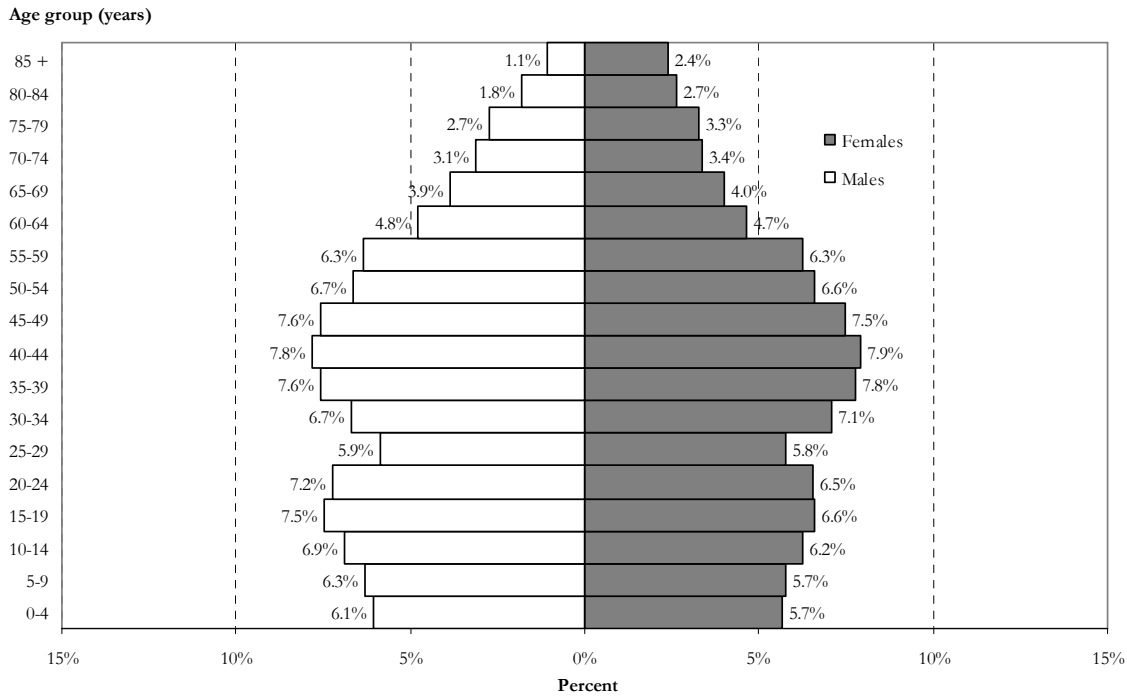


Figure 2.3 Age distribution of Canterbury Māori and non-Māori, 2006
(Source: Statistics New Zealand 2006 Census)

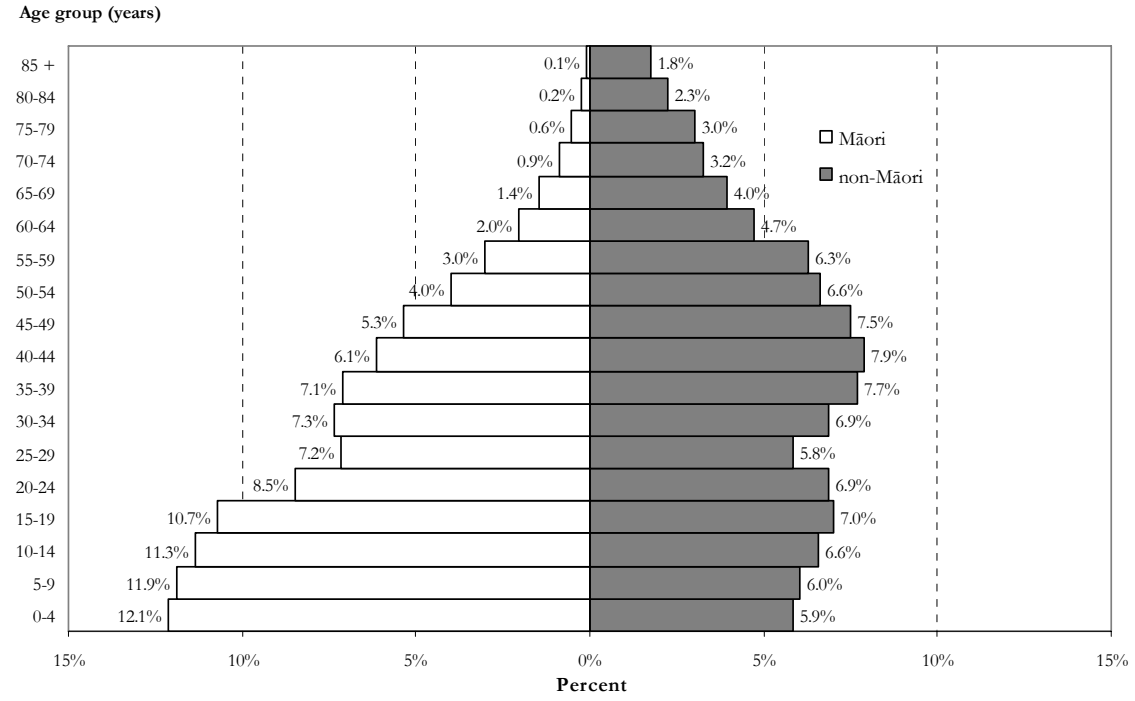
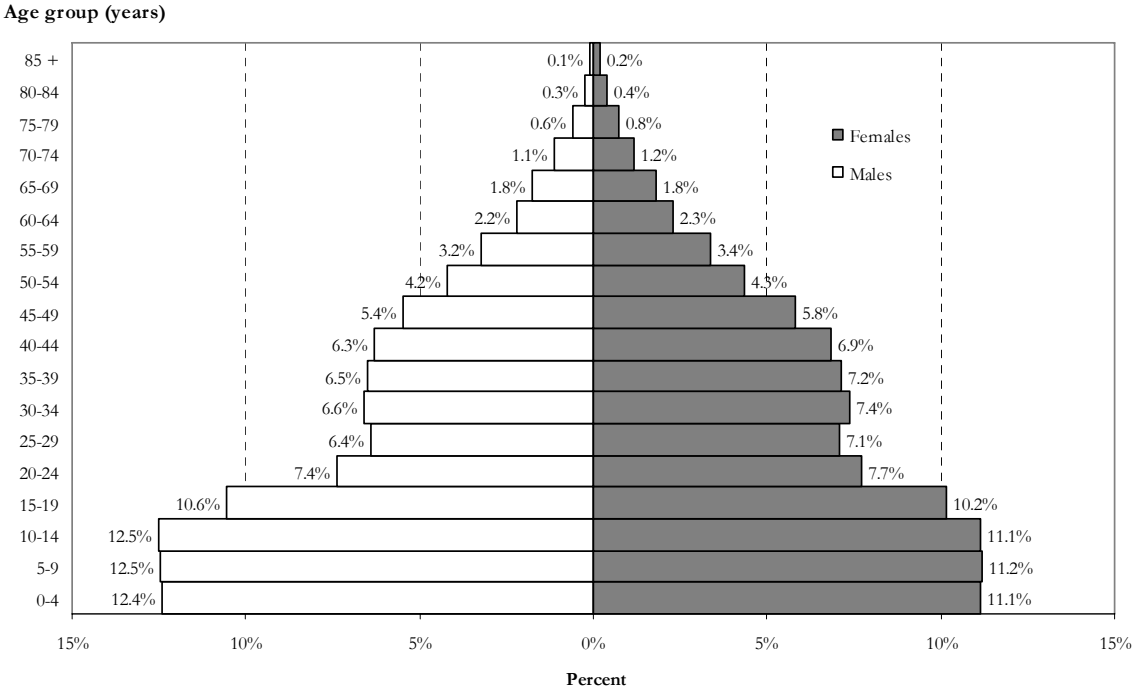


Figure 2.4 Age distribution of New Zealand Māori, male and female, 2006

(Source: Statistics New Zealand 2006 Census)



Population projections

The Māori ethnic group in Canterbury is projected to increase over the coming years[1]. The estimate[2] of the Māori population used for population projections was 36,560 in 2006. This is predicted to increase to 53,100 by 2026, as shown in Table 2.6, an average growth rate of 9.8% per five-year period. The rate of growth is projected to slow gradually, from an 11.5% increase in the five years from 2006 to 2011 to 8.7% in the five years from 2021 to 2026. In New Zealand, the Māori population is projected to increase to 810,730 by 2026, an average increase of 6.8% per five-year period from 2006 to 2026.

The proportion of the population that identifies as Māori is also projected to increase in Canterbury and in New Zealand, because the growth of the non-Māori population is projected to be slower, at 3.4% increase per five-year period in Canterbury and 3.8% increase per five-year period in New Zealand. The proportion of Māori in the Canterbury population is projected to increase from 7.6% in 2006 to 9.4% in 2026. In New Zealand the proportion of the population identifying as Māori is projected to increase from 14.9% in 2006 to 16.4% in 2026.

Table 2.6 Projected populations, Canterbury and New Zealand, 2006-2026
(Source: HDIU)

Year	Canterbury					New Zealand				
	Māori		non-Māori		Total	Māori		non-Māori		Total
	No.	%	No.	%		No.	%	No.	%	
2006	36,560	7.6%	446,760	92.4%	483,320	624,280	14.9%	3,559,815	85.1%	4,184,095
2011	40,780	8.0%	468,660	92.0%	509,440	672,220	15.3%	3,729,240	84.7%	4,401,460
2016	44,790	8.5%	484,360	91.5%	529,150	717,800	15.6%	3,873,235	84.4%	4,591,035
2021	48,850	8.9%	498,350	91.1%	547,200	763,780	16.0%	4,007,615	84.0%	4,771,395
2026	53,100	9.4%	510,840	90.6%	563,940	810,730	16.4%	4,129,120	83.6%	4,939,850

The age structure of the Māori population is projected to change by 2021. Using the population projection estimates, in 2006 the proportions of the Māori population under

[1] Statistics New Zealand based the projections on assumptions of medium fertility, mortality, migration and inter-ethnic mobility for Māori and other populations.

[2] Whereas Census data are a count of people who completed the Census forms at the time of the Census, population projections use the Census count as a base, but also take into account those absent overseas at the time of the Census, non-response on Census night, and those who did not fill out a form (undercount). In addition, population projections are estimated approximately four months after the Census count and take into account population change due to births, deaths and net migration over the intervening period.

15 years and over 65 years were 34.3% and 3.3% respectively, as shown in Table 2.7. In 2021 the respective proportions are projected to be 36.1% and 6.6%, which represents a small increase in the younger age group and a doubling of the older age group.

Table 2.7 Projected age distributions, by life-cycle age group, Canterbury, 2006 and 2021
(Source: Statistics New Zealand)

Age group (years)	Māori		non-Māori	
	2006	2021	2006	2021
0-14	34.3%	36.1%	18.2%	16.1%
15-24	19.9%	16.5%	14.0%	13.1%
25-44	28.0%	23.5%	28.3%	23.7%
45-64	14.6%	17.2%	25.3%	27.4%
65+	3.3%	6.6%	14.2%	19.7%

Iwi

Table 2.8 presents the number of people in Canterbury and New Zealand indicating affiliation with each iwi at the 2006 Census. Ngāi Tahu/Kāi Tahu was the most common affiliation in Canterbury with 29% of people of Māori descent indicating an affiliation with this iwi. Ngāpuhi (11.1%) and Ngāti Porou (8.9%) were the next most common iwi affiliations. Out of all those who indicated an affiliation with Ngāi Tahu/Kāi Tahu in New Zealand, 24.6% were in Canterbury.

Table 2.8 Iwi affiliation, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)

Iwi*	Canterbury	New Zealand
Ngāi Tahu/Kāi Tahu	12,093	49,185
Ngāpuhi	4,626	122,214
Ngāti Porou	3,708	71,907
Ngāti Tūwharetoa	1,620	34,674
Waikato	1,242	33,429
Tūhoe	1,185	32,670
Te Arawa	1,170	23,316
Ngāti Maniapoto	1,161	33,627
Ngāti Kahungunu ki Te Wairoa	1,161	20,982
Ngāti Kahungunu, region unspecified	984	18,462
Te Atiawa (Taranaki)	747	12,852
Tainui	696	14,070
Kāti Māmoe	558	2,880
Ngāti Raukawa (Horowhenua/Manawatū)	525	13,233
Ngāti Awa	489	15,258
Te Ati Haunui-a-Pāpārangi	468	10,437
Ngaiterangi	444	12,201
Ngāti Mutunga (Wharekauri/Chatham Islands)	441	1,392
Ngāti Whātua	393	14,721
Whakatōhea	372	12,069
Te Whānau-a-Apanui	369	11,808
Ngāti Kahungunu ki Wairarapa	363	7,440
Ngāti Ruanui	357	7,035
Ngāti Kahungunu ki Heretaunga	351	9,525
Te Rarawa	303	14,892
Ngāti Raukawa, region unspecified	297	8,022
Te Aupōuri	291	9,333
Hapū Affiliated to More Than One Iwi	282	11,964
Ngāti Raukawa (Waikato)	276	8,166
Ngāti Mutunga (Taranaki)	273	2,094
Te Atiawa (Te Waipounamu/South Island)	255	2,433
Te Atiawa, region unspecified	255	4,644
Not Elsewhere Included	10,293	131,694

*Iwi (total responses) for the Census usually resident population count of people with Māori descent, restricted to iwi with 250 or more responses (for the full list of iwi with any responses see Appendix 2 Iwi in Canterbury). As 'total responses' count individuals in each iwi they indicate, the sum of all response will exceed the total number of people indicating an iwi affiliation.

3 Social Indicators

Key points

In 2006:

- A larger proportion of Māori than non-Māori in Canterbury lived in more deprived areas, and a smaller proportion lived in less deprived areas.
- Nationally, there was a steep gradient of socioeconomic deprivation (as measured by NZDep) for Māori, with more Māori living in areas with higher deprivation. While there was also a gradient for Māori in Canterbury the deprivation profile was less steep than that seen nationally.
- Māori in Canterbury, when compared to non-Māori (in a non-age-standardised analysis):
  - Were more likely to have lower income, be on a benefit and be unemployed
  - Were less likely to have a qualification beyond NCEA level 2
  - Were less likely to own their home, or have access to a car or telephone
  - Were more likely to live in an over-crowded house
  - Were less likely to heat their home.

3.1 Socioeconomic determinants of health

Health services provide care when people are unwell and help restore people to good health, but the contribution they make towards health status is restricted. For example, the contribution of health services to gains in life expectancy may be up to only 30% (Ministry of Health 2005). Greater impacts on health status are made by socio-economic factors including income, education, employment and housing (Ministry of Health 2002; Public Health Advisory Committee 2004). Unequal distribution of these socio-economic determinants contributes to differences in the health status of Māori and non-Māori (Ministry of Health and University of Otago 2006).

Socioeconomic deprivation

Socio-economic status is an important determinant of health. The New Zealand deprivation index, NZDep2006, is a measure of socioeconomic deprivation for small

geographical areas (meshblocks) based on nine socio-economic variables measured in the 2006 Census. A weighted sum of these variables is calculated for all of New Zealand. The variables, in order of weighting, are: receiving a means tested benefit, living in a household with a low income, not owning the home lived in, living in a single parent family, unemployment, being without school qualifications, living in a crowded household, having no access to a telephone and having no access to a car (Salmond, Crampton et al. 2007). Areas are distributed into ten deciles with decile 1 being the 10% least deprived and decile 10 being the 10% most deprived. The deprivation of different populations, for example geographical populations (Canterbury) or ethnic groups (Māori and non-Māori), can be assigned based on the area in which the individuals that make up that population live. Populations can then be compared to the national figures, or to each other.

Table 3.1 lists the number and proportion of people in each NZDep decile for Māori and non-Māori in Canterbury and New Zealand[3] in 2006. The information in the table is presented in more detail in the following figures, but it can be seen from Table 3.1 that fewer Māori lived in lower decile, less deprived areas than non-Māori in Canterbury, but Māori in Canterbury lived in relatively lower decile areas than Māori nationally. Conversely, there were higher proportions of Māori in Canterbury living in higher decile, more deprived areas than non-Māori.

[3] The totals presented have been aggregated from Census meshblock counts, in order to compile populations at the same level of aggregation as NZDep2006 deciles, which are calculated at meshblock level. Due to unit enumeration, round-off, and privacy data suppressions at meshblock level, the ethnicity responses presented undercount totals for ethnicity compiled at higher levels of aggregation, such as Canterbury, or New Zealand.

Table 3.1 Deprivation, by decile, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)

Decile	Canterbury				New Zealand			
	Māori		non-Māori		Māori		non-Māori	
1	2,262	6.8%	67,626	15.1%	19,020	3.42%	407,637	11.18%
2	2,358	7.1%	55,119	12.3%	24,435	4.39%	396,924	10.89%
3	2,622	7.9%	50,592	11.3%	28,830	5.18%	391,833	10.75%
4	3,255	9.8%	51,003	11.4%	33,096	5.95%	382,407	10.49%
5	3,204	9.7%	47,385	10.6%	39,366	7.07%	373,137	10.24%
6	4,080	12.3%	47,982	10.7%	49,350	8.87%	368,670	10.12%
7	3,573	10.8%	37,644	8.4%	57,879	10.40%	358,503	9.84%
8	3,948	11.9%	37,473	8.4%	72,459	13.02%	345,585	9.48%
9	4,416	13.3%	33,831	7.6%	97,323	17.49%	329,961	9.05%
10	3,471	10.5%	19,110	4.3%	134,616	24.19%	285,990	7.85%
Unknown			15	0%	171	0.03%	4,068	0.11%
Total	**33,189**	**100%**	**447,765**	**100%**	**556,545**	**100%**	**3,644,715**	**100%**

Note: Ethnicity is based on total grouped responses. As 'total responses' count individuals in each ethnicity they indicate, the sum of all response will exceed the total number of people indicating an ethnicity.

As Figure 3.1 shows, the NZDep data from 2006 for the Canterbury population as a whole suggest that people in the CDHB region live in areas with relatively less deprived NZDep scores compared to all New Zealand (for whom all deciles, by design, equal approximately 10%). There are lower proportions in the two most deprived deciles (12.2%) compared to the two least deprived deciles (27.0%).

Figure 3.1 Deprivation profile, Canterbury, all ethnicities, 2006
(Source: Statistics New Zealand 2006 Census)

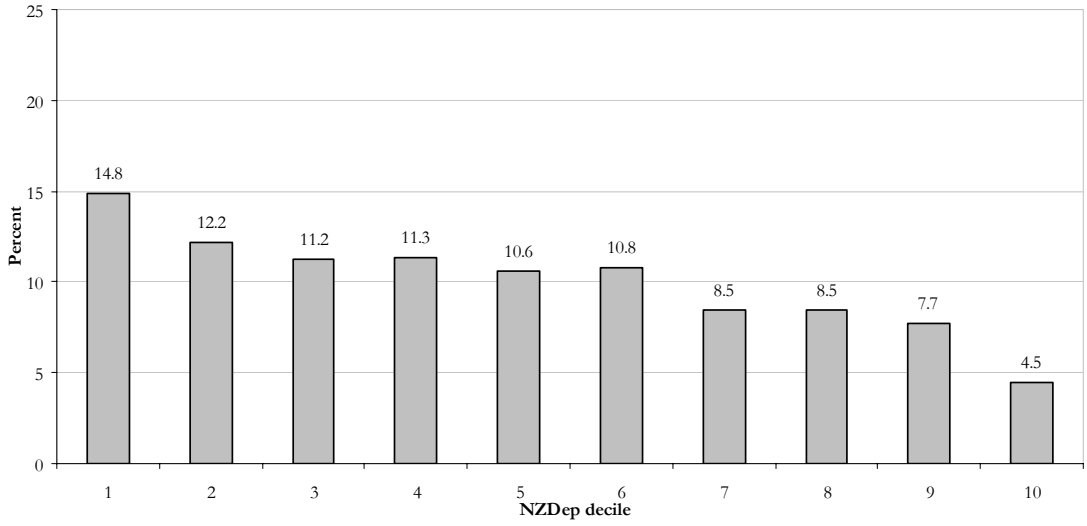
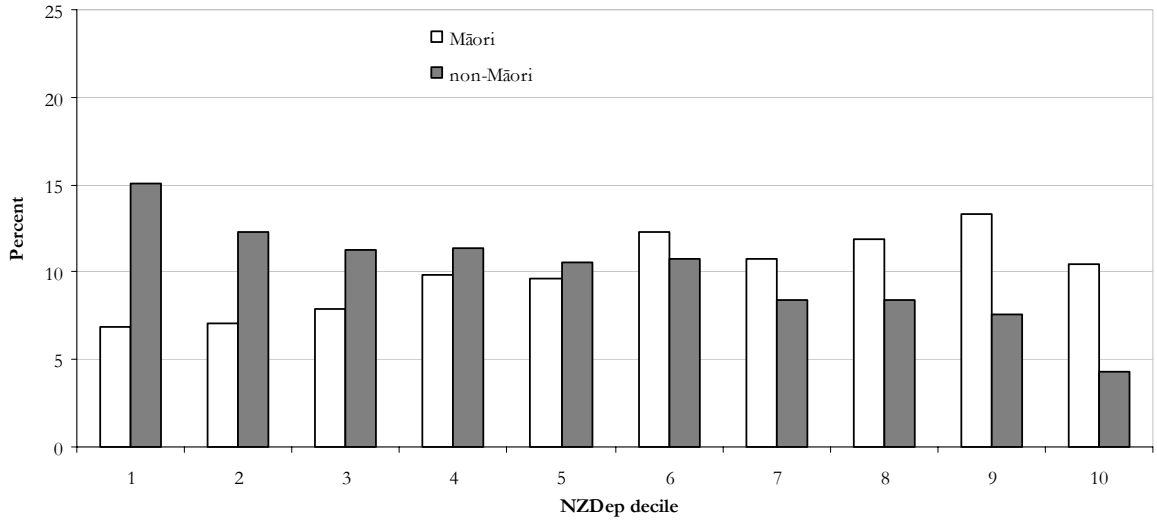


Figure 3.2 presents data from Table 3.1, comparing Māori to non-Māori in Canterbury and shows that while non-Māori follow a similar pattern to all ethnicities in Canterbury (of being relatively less deprived), Māori are more likely to live in areas with more deprived NZDep scores. The deprivation profile for Māori in Canterbury is somewhat

skewed toward higher deprivation with 23.8% of Māori living in areas with the two most deprived scores (deciles 9 and 10), compared to 13.9% in the two least deprived areas (deciles 1 and 2).

Figure 3.2 Deprivation profile, Canterbury, 2006
(Source: Statistics New Zealand 2006 Census)



Māori who specified their iwi as Ngāi Tahu/Kāi Tahu (as their only iwi affiliation or among other iwi affiliations) in Canterbury live in areas with slightly less deprived NZDep scores than Māori of other iwi or Māori who did not specify an affiliation with an iwi, as can be seen in Figure 3.3.

Figure 3.3 Deprivation profile, Canterbury, by iwi, 2006
(Source: Statistics New Zealand 2006 Census)

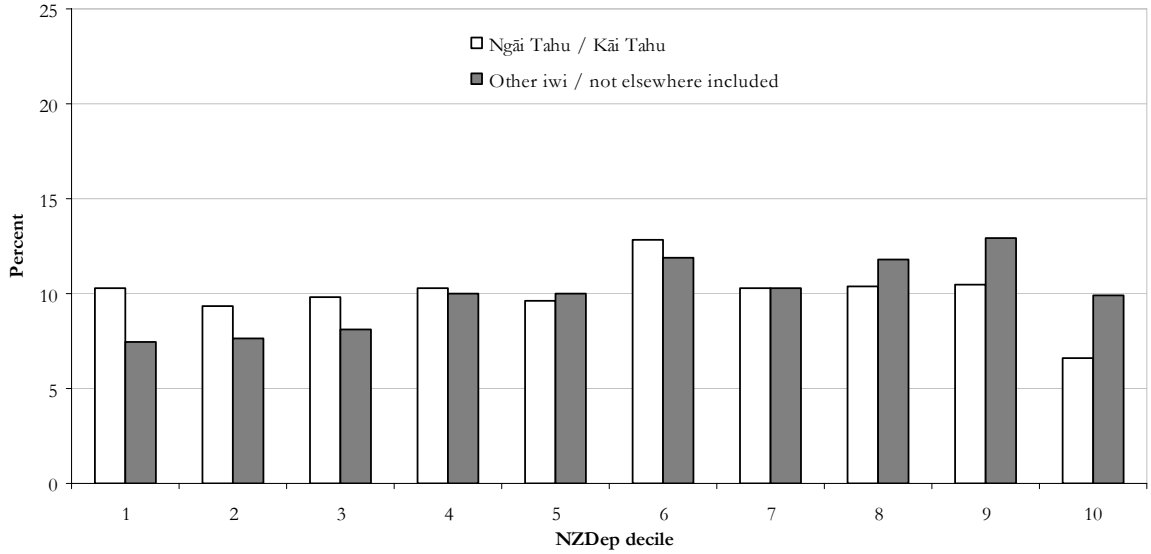
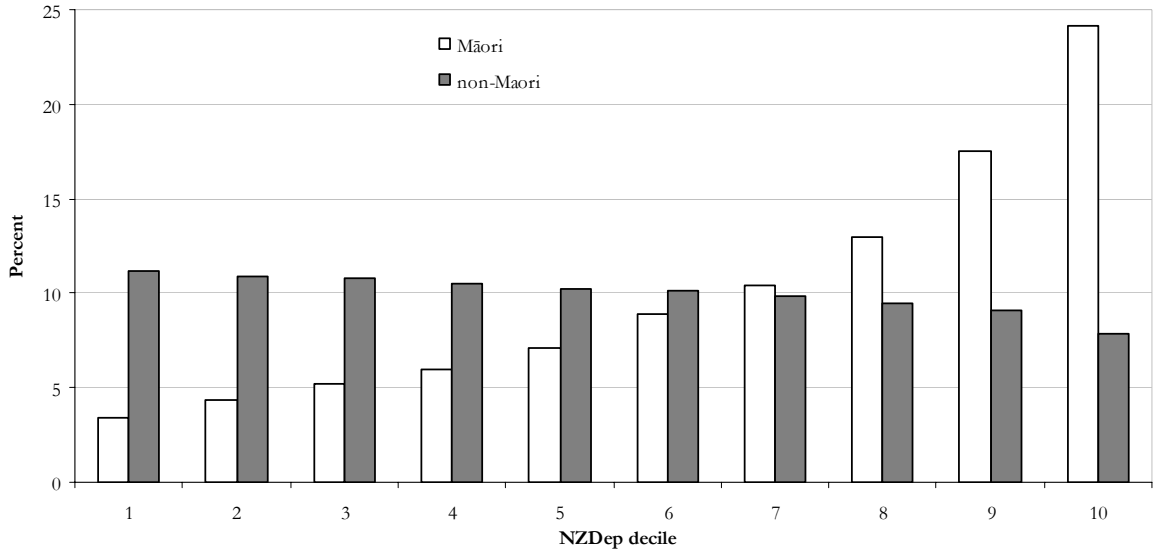


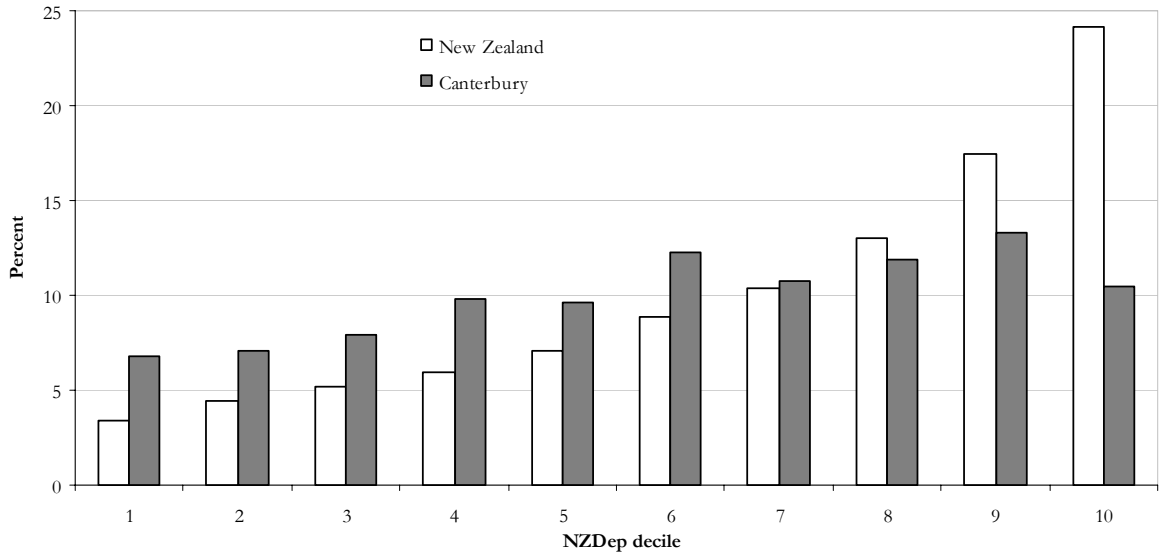
Figure 3.4 presents data from Table 3.1 for New Zealand, for Māori and non-Māori.

Figure 3.4 Deprivation profile, New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)



Comparing the situation for Māori in Canterbury to all of New Zealand in Figure 3.5 we can see that Māori in Canterbury live in areas with relatively less deprived NZDep scores than Māori in all New Zealand. Nationally, 41.7% of Māori live in areas with the two most deprived scores (deciles 9 and 10), compared to 7.8% in areas with the two least deprived scores (deciles 1 and 2).

Figure 3.5 Deprivation profile for Māori, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)



Social and economic indicators

Table 3.2 summarises some of the elements that make up the NZDep scores, and which are important indicators of socio-economic status. These indicators are presented without age-sex standardisation, which limits the direct comparisons that can be made between ethnic groups. For example, an indicator that is associated with younger age will be artificially increased for the Māori population due to its younger age structure. However, overall, the pattern is that for all the indicators Māori are disadvantaged compared to non-Māori.

With respect to these indicators from the 2006 Census:

- Income is used as a measure of socioeconomic position, is related to other measures such as education and employment (Blakely, Tobias et al. 2007) and is therefore an important determinant of health. In Canterbury, a higher proportion of Māori than non-Māori aged over 15 years had an annual income less than $10,000. Additionally, more than twice as many Māori as non-Māori were receiving a government benefit.
- Home ownership is an indicator of income and the quality of housing, which is related to health (Rose 1992; Howden-Chapman and Wilson 2000). Almost twice as many Māori as non-Māori in Canterbury did not own their own home.
- Unemployment and occupational status are related to health (Ministry of Health and University of Otago 2006). The rate of unemployment in Canterbury for Māori over 15 year olds was more than double the rate for non-Māori, although it was lower than for Māori in New Zealand[4].
- Higher levels of educational attainment are related to improved health outcomes (Wilkinson and Marmot 2006). A lower proportion of Māori over 15 years in Canterbury had attained NCEA Level 2 or a higher qualification compared to non-Māori.
- Household overcrowding indicates lower socio-economic status, and is associated with poor health (Baker, Zhang et al. 2006), particularly from infectious diseases (Baker, Milosevic et al. 2004). Almost three times as many Māori as non-Māori lived

[4] This indicator gives an example of the potential confounding by the different age structures in the Māori and non-Māori populations as the Māori population has a younger age structure and young people in general have a higher rate of unemployment (Department of Labour 2006).

in a dwelling where there were insufficient bedrooms for the number of people living in the house.

- More than three times as many Māori as non-Māori in Canterbury did not have access to a phone.
- More Māori than non-Māori in Canterbury did not have access to a motor vehicle.

Table 3.2 Social and economic indicators, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand 2006 Census)

Indicator*	Canterbury		New Zealand	
	Māori	non-Māori	Māori	non-Māori
Total personal income less than $10,000§, 15+ years	21.5%	18.7%	22.0%	18.6%
Receiving government benefit†, 15+ years	24.2%	10.9%	27.6%	10.5%
Not living in own home, 15+ years	49.0%	26.5%	50.1%	27.7%
Unemployed, 15+ years	5.8%	2.5%	7.6%	2.8%
NCEA Level 2 or higher, 15+ years	41.5%	51.8%	37.9%	50.7%
Household crowding‡, all ages	14.2%	4.9%	22.1%	7.8%
Living in household with no access to a telephone or cellphone, 15+ years	2.8%	0.8%	4.9%	1.1%
Living in household with no access to a motor vehicle, 15+ years	7.7%	4.6%	8.9%	4.8%

*Note: Proportions are not age or sex standardised
§This indicator includes those who made a loss or had zero income.
†Includes unemployment, sickness, domestic purposes, and invalids benefits, student allowance and other government benefits and payments.
‡Household crowding is based on the Canadian Household Crowding index. The number of bedrooms required (based on the age, sex, and number of people living in the house) is compared with the actual number of bedrooms – where the required number exceeds the actual number, a household is considered crowded.

Access to heating

Inadequate household heating can have negative health consequences for the occupants (Howden-Chapman, Signal et al. 1999; Howden-Chapman and Wilson 2000). Table 3.3 presents access to home heating in Canterbury and New Zealand and shows that at the 2006 Census more Māori than non-Māori in Canterbury did not heat their homes.

Table 3.3 Access to home heating, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand)

Fuel type	Canterbury		New Zealand	
	Māori	non-Māori	Māori	non-Māori
No Heating Fuels Used	1.0%	0.6%	3.2%	2.2%

Note: Proportions are not age or sex standardised

3.2 Māori population geographical distribution

Figures 3.6, 3.7 and 3.8 present the distribution of Māori in Canterbury at the 2006 Census, by census area unit. They indicate that the largest number of Māori lived in Aranui (936 people), Bexley (600), Hornby South (579) and Sydenham (576). Outside Christchurch City the areas with the largest numbers of Māori were Kaiapoi North (in Waimakariri District, 447 people), Kaikoura Township (in Kaikoura District, 393 people) and Burnham Military Camp (in Selwyn District, 342 people). Figure 3.9 presents the relative number of Māori in each census area unit, with the size of each census area unit adjusted to correspond to the number of Māori living within that area.

Figure 3.6 Māori population counts, Christchurch and surrounds, 2006
(Source: Community and Public Health, CDHB)

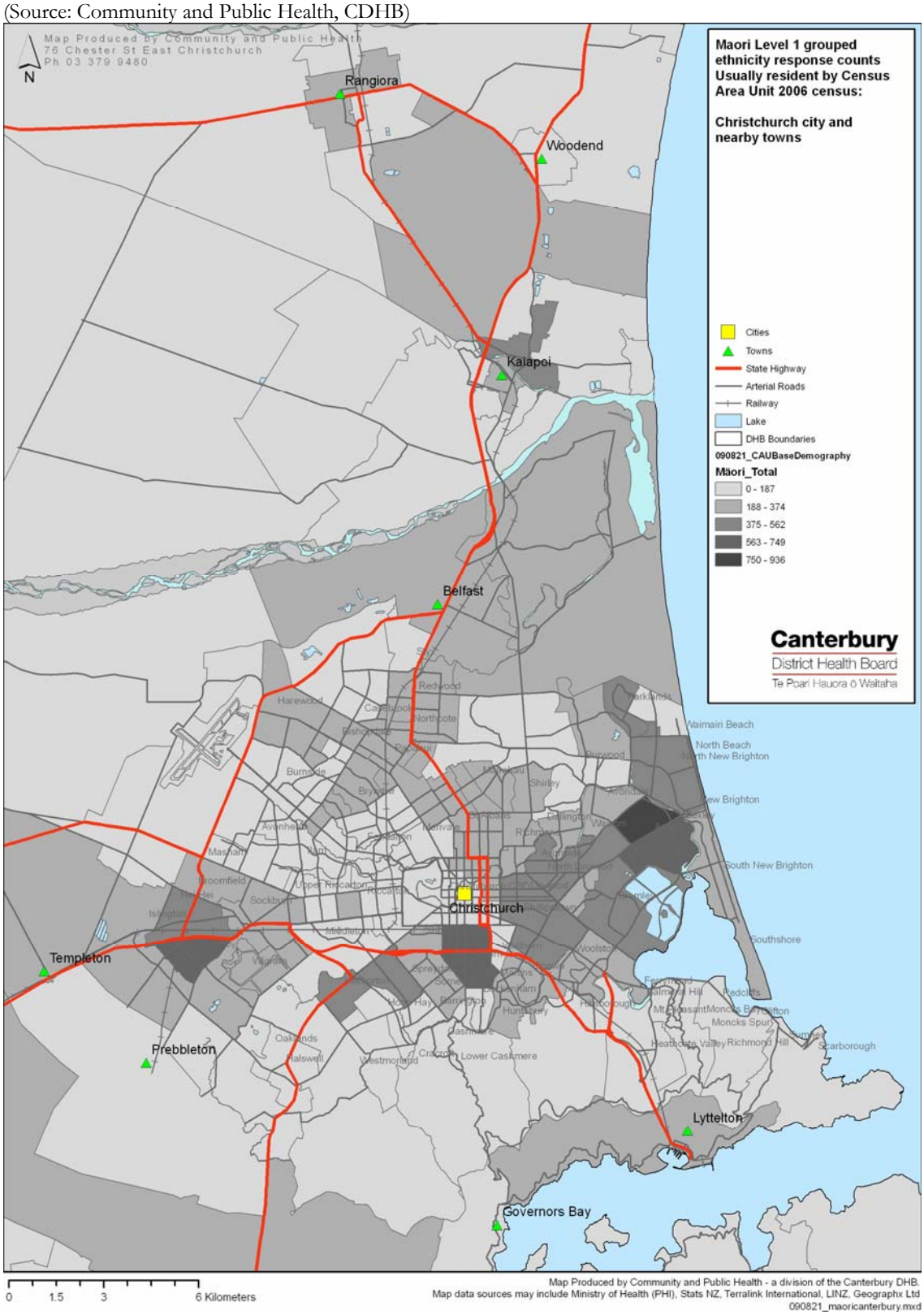


Figure 3.7 Māori population counts, Hurunui – Kaikoura, 2006
(Source: Community and Public Health, CDHB)

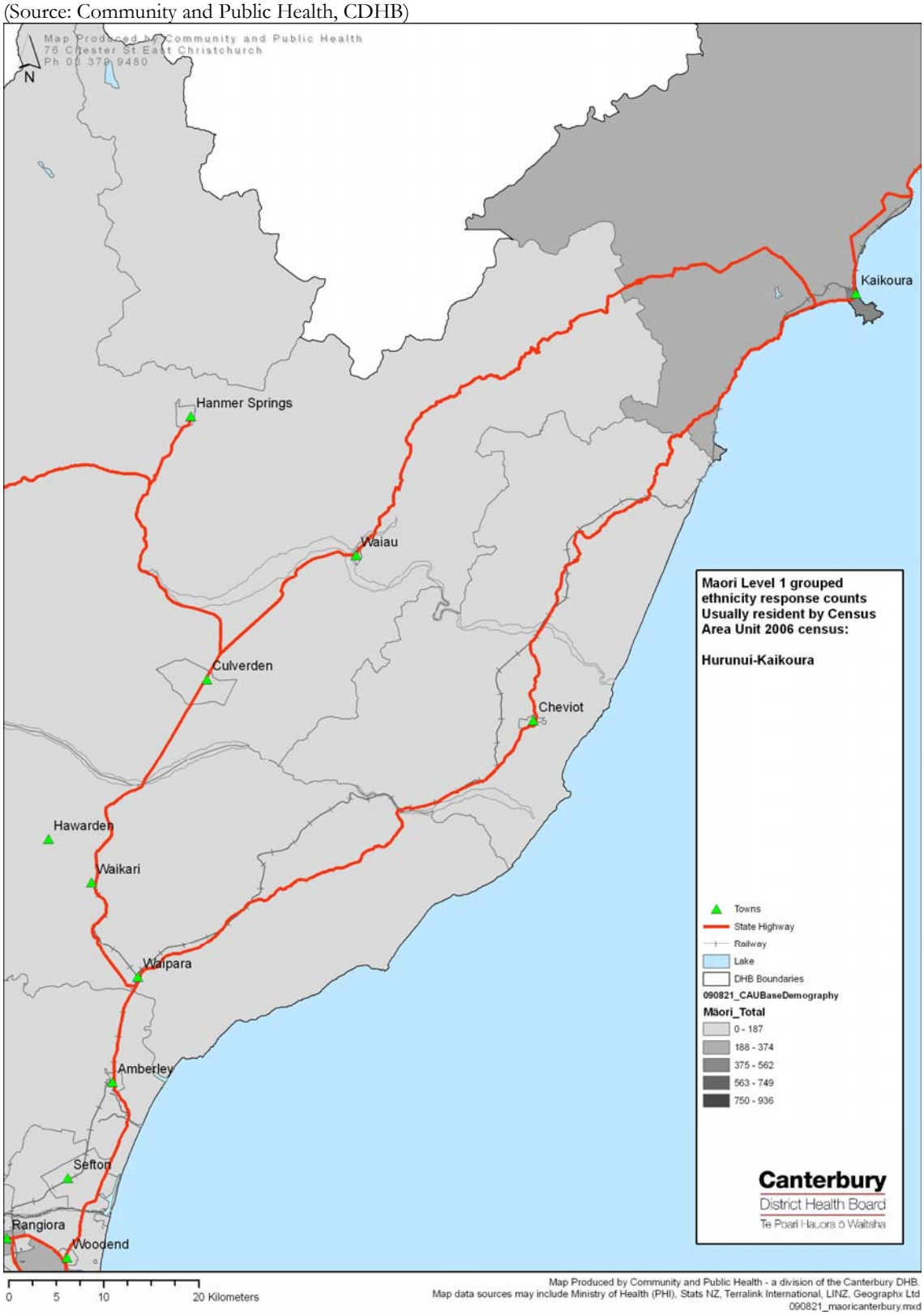


Figure 3.8 Māori population counts, Selwyn – Banks Peninsula – Ashburton, 2006
(Source: Community and Public Health, CDHB)

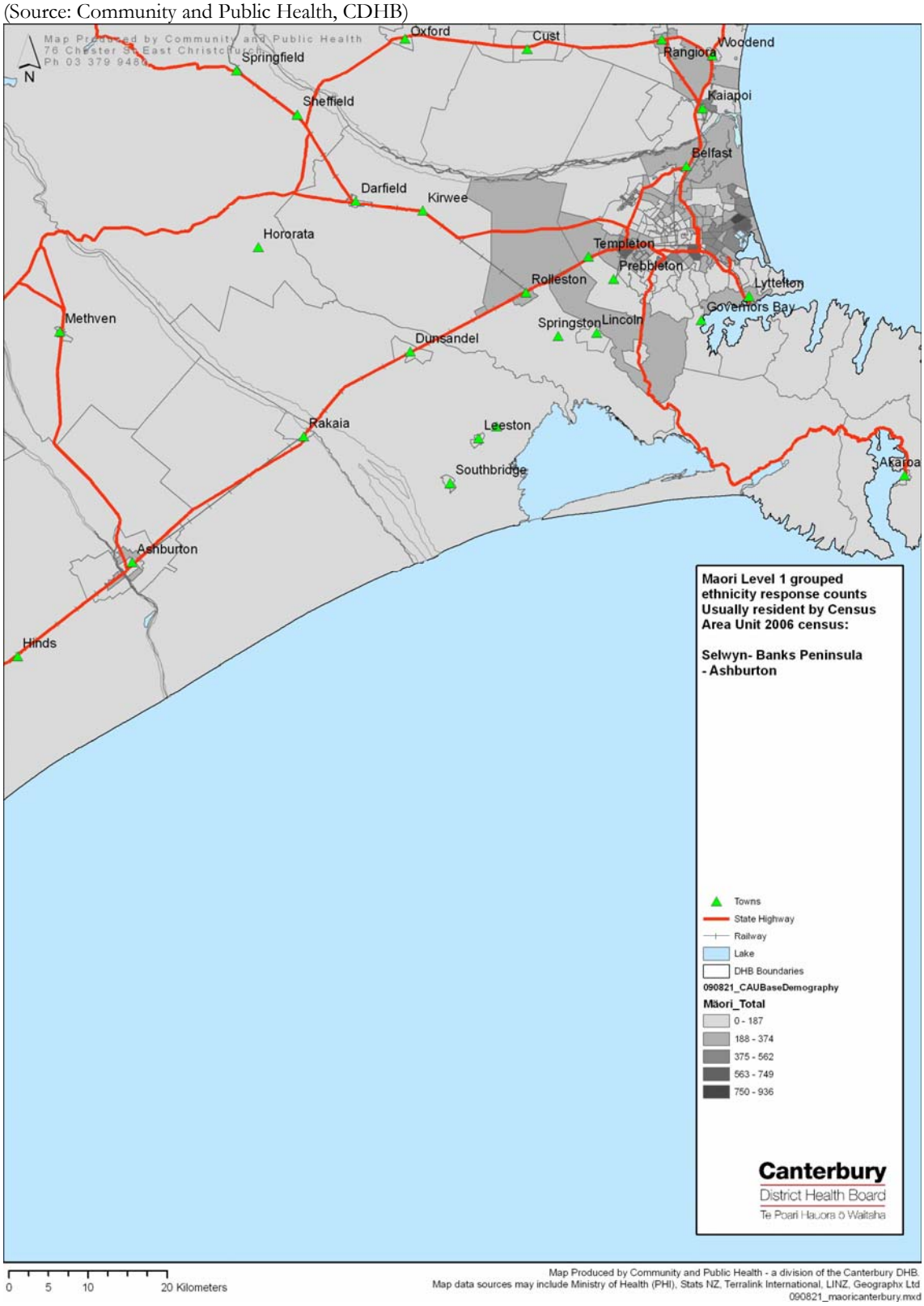
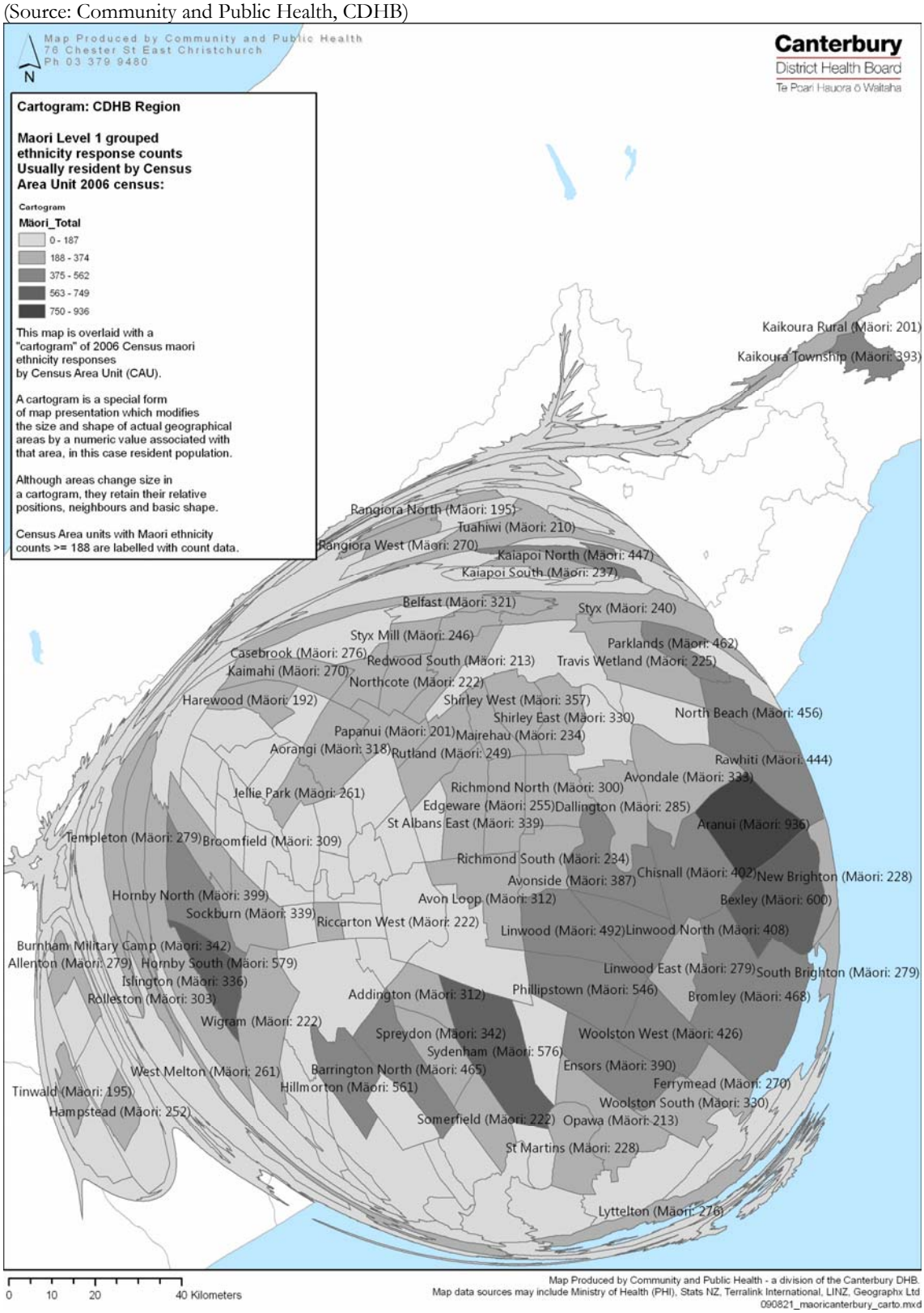


Figure 3.9 Māori population counts cartogram Canterbury area, 2006
(Source: Community and Public Health, CDHB)



4 Risk and Protective Factors

Key points

- In 2006, the prevalence of smoking in those over 15 years was higher for Māori in Canterbury than non-Māori, especially for females and for those aged 15 to 24 years. The prevalence of smoking was lower for Māori in Canterbury than nationally.
- In 2008, the prevalence of youth smoking (Year 10 students) was over four times as high for Māori than for non-Māori. The prevalence was higher and the difference between Māori and non-Māori was larger, for girls compared to boys. There has been a reduction in prevalence of Māori youth smoking over 1999 to 2008, but this reduction has been relatively less than that seen for non-Māori.
- In 2008, a higher proportion of Māori youth was exposed to smoking at home than non-Māori, but, like non-Māori, this proportion is decreasing over time.
- In 2006/07, the prevalence of obesity in those over 15 years was significantly higher for Māori than non-Māori in Canterbury
- In 2006/07, although differences were not significant, for those over 15 years:
  - Among protective factors, the prevalence of healthy nutrition was lower for Māori than non-Māori in Canterbury and the rate of physical activity higher
  - Among risk factors, the prevalence of being overweight was lower for Māori than non- Māori in Canterbury and the rates of hazardous drinking and marijuana smoking were higher.

Sources of data for many risk and protective factors are limited, with the main data for many of them available only through the New Zealand Health Survey (NZHS) (Ministry of Health 2008). Other than the NZHS[5], data on smoking were collected in the Census 2006, and are also available from Action on Smoking in Health who survey Year 10 students at schools throughout New Zealand every year.

[5] See 'Appendix 1 Data sources and methodological issues' for a discussion of the synthetic estimates in the NZHS and the limitations of the interpretation of NZHS data at the CDHB level.

4.1 Protective factors

Protective factors are health behaviours that promote the attainment or maintenance of an individual's wellbeing by supporting good health and preventing illness. Table 4.1 presents data about protective factors for Canterbury and New Zealand for 2006/07 from the NZHS.

In Canterbury the prevalence of healthy nutrition behaviours (having three or more servings of vegetables or two or more servings of fruit a day) appeared to be lower for Māori than European/Others, but this was not a significant difference (95% CIs for the rates overlapped). The prevalence rate for Māori of doing regular physical activity appeared higher, but again this was not a significant difference.

Table 4.1 Protective factor prevalence, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Having 3+ servings of vegetables/day	**Total**	61.9 (56.8–66.8)	69.6 (64.8–74.0)	58.8 (56.1–61.4)	66.0 (64.2–67.8)
	Male	56.1 (50.2–61.8)	62.5 (57.6–67.2)	53.2 (49.3–57.2)	59.3 (57.1–61.5)
	Female	67.0 (61.3–72.3)	76.1 (71.1–80.7)	63.5 (60.1–66.9)	72.3 (70.0–74.4)
Having 2+ servings of fruit/day	**Total**	54.3 (49.3–59.2)	59.6 (55.0–64.0)	54.7 (51.8–57.5)	60.0 (58.0–62.0)
	Male	45.8 (40.0–51.7)	49.8 (45.1–54.5)	46.1 (42.0–50.4)	50.2 (47.7–52.6)
	Female	61.6 (56.4–66.7)	68.6 (63.8–73.2)	62.1 (58.8–65.3)	69.1 (66.7–71.5)
Doing regular physical activity	**Total**	56.7 (51.4–61.9)	53.7 (48.7–58.6)	55.6 (52.9–58.2)	52.6 (50.5–54.7)
	Male	62.0 (56.1–67.6)	56.7 (51.6–61.8)	60.7 (57.1–64.2)	55.6 (53.1–58.0)
	Female	52.2 (46.5–57.9)	50.8 (45.7–56.0)	51.1 (47.7–54.6)	49.8 (47.4–52.3)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

4.2 Risk factors

Risk factors are states or activities that increase an individual's likelihood of becoming unwell or getting a disease. Table 4.2 presents data about risk factors for Canterbury and New Zealand for 2006/07 from the NZHS.

The prevalence of obesity[6] was significantly higher for Māori in Canterbury than European/Others, although there was a lower (but non-significantly different, as the 95% CIs for the rates overlapped) prevalence of being overweight for Māori. There was a slightly higher prevalence of combined overweight and obesity among Māori men than Māori women.

The prevalence of current daily smoking was significantly higher for Māori in Canterbury than for European/Others, with a higher prevalence among Māori women than Māori men. More detailed data about smoking are presented in the following section.

The prevalence rates of hazardous drinking[7] and marijuana smoking[8] appeared to be higher for Māori in Canterbury, but these were not significant differences.

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[6] For obesity and overweight, participants in the NZHS were weighed and had their height measured. The body mass index (BMI) was calculated from these measurements for each participant. Participants could then be classified as obese or overweight if their BMI was above internationally defined levels.

[7] Hazardous drinking, which is associated with a high risk of damage to physical or mental health, is defined as a score of eight or more out of ten on the Alcohol Use Disorders Identification Test (AUDIT), which was developed by the WHO. The test was completed by those adults in the NZHS who had had an alcoholic drink in the previous year. The test's questions cover participants' alcohol consumption and drinking behaviour, and problems related to drinking.

[8] Data about marijuana smoking were drawn from the 2002/03 NZHS.

Table 4.2 Risk factor prevalence, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07 & 2002/03)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Overweight	**Total**	29.0 (24.6–33.6)	35.2 (31.1–39.4)	30.2 (27.9–32.5)	36.6 (35.2–38.1)
	Male	31.1 (25.9–36.6)	40.5 (36.2–44.9)	32.4 (28.8–36.1)	42.2 (40.1–44.2)
	Female	27.0 (22.2–32.2)	29.9 (25.7–34.3)	28.1 (25.1–31.4)	31.1 (29.3–33.0)
Obesity	**Total**	35.2 (31.8–38.6)	20.4 (17.5–23.6)	40.1 (37.9–42.4)	23.3 (21.8–24.9)
	Male	34.8 (30.4–39.4)	20.1 (17.0–23.5)	39.7 (36.1–43.4)	22.9 (21.0–25.0)
	Female	35.5 (31.4–39.7)	20.8 (17.6–24.2)	40.5 (37.3–43.7)	23.7 (21.7–25.8)
Current daily smokers	**Total**	37.4 (33.5–41.4)	16.2 (13.0–19.8)	41.5 (39.0–44.0)	17.9 (16.5–19.4)
	Male	34.5 (29.5–39.7)	16.9 (13.6–20.7)	38.3 (34.3–42.4)	18.8 (17.1–20.6)
	Female	39.9 (35.3–44.5)	15.5 (12.2–19.2)	44.2 (40.8–47.6)	17.1 (15.5–18.9)
Hazardous drinking	**Total**	29.0 (19.6–38.4)	22.1 (17.6–26.7)	30.9 (29.0–32.8)	20.6 (19.3–21.9)
	Male	34.9 (20.8–49.0)	33.2 (27.3–39.0)	40.9 (37.7–44.2)	29.2 (27.0–31.3)
	Female	22.4 (9.1–41.8)	11.7 (5.8–17.7)	22.2 (20.1–24.3)	12.7 (11.2–14.1)
Marijuana use in previous 12 months (2002/03 NZHS)	**Total**	35.3 (15.9–58.9)	16.8 (13.0–20.7)	27.3 (24.3–30.4)	16.9 (15.6–18.2)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

Table 4.3 presents the prevalence of high cholesterol and high blood pressure for which medication was taken, from the NZNHS 2006/07. The prevalence of both risk factors was reported as lower for Māori in Canterbury than for European/Others and lower than for Māori in New Zealand, but none of these differences were statistically significant (95% CIs for the rates overlapped). At the national level, Māori were significantly less likely to have medicated high cholesterol and hypertension. This may be due to lack of diagnosis rather than a truly lower burden of disease from these risk factors.

Table 4.3 Prevalence of medicated risk factors, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported medicated high cholesterol	Total	3.8 (2.4–5.6)	6.0 (4.7–7.5)	4.4 (3.4–5.7)	7.1 (6.2–8.0)
	Male	4.5 (2.7–6.9)	6.8 (5.4–8.5)	5.3 (3.7–7.2)	8.1 (7.0–9.3)
	Female	3.2 (1.7–5.3)	5.2 (3.9–6.8)	3.7 (2.5–5.3)	6.1 (5.2–7.2)
Self-reported medicated high blood pressure	Total	7.4 (5.6–9.7)	10.3 (8.6–12.2)	8.2 (7.0–9.6)	11.4 (10.5–12.3)
	Male	7.5 (5.2–10.4)	9.7 (7.8–11.9)	8.3 (6.4–10.4)	10.7 (9.5–12.0)
	Female	7.4 (5.4–9.9)	10.8 (9.0–12.9)	8.2 (6.7–9.9)	12.0 (10.8–13.1)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

Tobacco

Exposure to tobacco smoke is a well established risk factor for health problems, both for the smoker and those exposed to environmental tobacco smoke. These health problems include cancers of the lung, larynx, pancreas, kidney, mouth oesophagus, stomach, cervix, and bladder; ischaemic heart disease, peripheral vascular disease and stroke; chronic obstructive pulmonary disease (COPD); and reproductive and childhood effects such as preterm delivery, stillbirth, low birth weight and sudden infant death syndrome (SIDS) (Woodward and Laugesen 2001; U.S. Department of Health and Human Services 2004).

Smoking prevalence

In the 2006 Census a smaller proportion of Māori aged over 15 years in Canterbury was current daily smokers (38%) compared to Māori in New Zealand (40.1%), as shown in Table 4.4. However, the rate of smoking in Māori in Canterbury was more than double that for non-Māori (18.4%). More Māori women in Canterbury smoked daily (40.4%) than men (35.6%), which was consistent with the national picture for Māori, but was in contrast to the picture for non-Māori, among whom men smoked more than women.

The prevalence of smoking among respondents in a Ngāi Tahu survey, Mō Tātou (Ahuriri-Driscoll, Cram et al. 2004) conducted in 2003/04 was 25.9%. This was lower

than the prevalence for all Māori from the Census, although the Mō Tātou prevalence was not age-standardised.

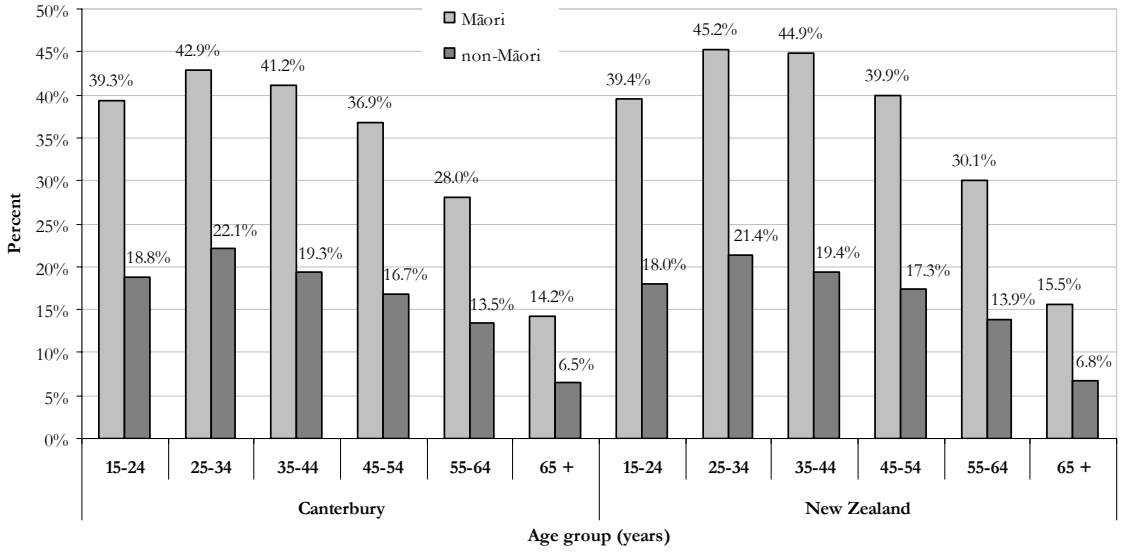
Table 4.4 Current daily smokers, 15+ years, by gender, Canterbury and New Zealand, 2006
(Source: Statistics New Zealand Census 2006)

	Canterbury		New Zealand	
	Māori	**non-Māori**	**Māori**	**non-Māori**
Males	35.6%	19.9%	36.2%	19.9%
Females	40.4%	16.9%	43.5%	16.4%
Total	38.0%	18.4%	40.1%	18.1%

Note: Rates are age-standardised to the 2001 Māori population

The pattern of regular smoking by age group in Canterbury and New Zealand at the 2006 Census, as shown in Figure 4.1, was that the highest rates were in those in the 25-34 and 35-44 year age groups. Those in the 15-24 year age group were slightly less likely to be regular smokers, and the rates declined in the age groups older than 45 years, with the lowest rates being among those over 65 years. Across the age groups, the age-specific rates for Māori were around double those for non-Māori, both nationally and in Canterbury.

Figure 4.1 Current regular smokers, 15+ years, by age group, Canterbury and NZ, 2006
(Source: Statistics New Zealand Census 2006)

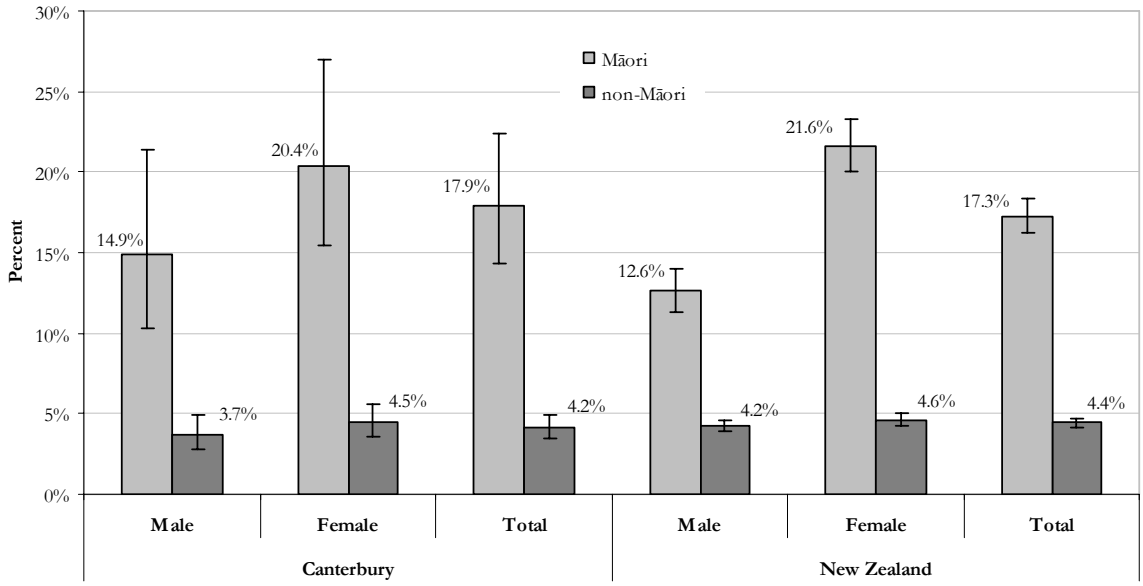


Youth smoking

There were marked differences over the period from 1999 to 2008 in the rates of smoking among Māori and non-Māori Year 10 students in Canterbury, as shown in Figure 4.2. In the 2008 Year 10 survey conducted by Action on Smoking in Health (ASH), more than four times as many Māori Year 10 students smoked daily (17.9%) than non-Māori (4.2%), and this difference was statistically significant. The rate of daily smoking among female Māori Year 10 students (20.4%) was higher than that for males (14.9%), although the rates were not significantly different (95% CIs for the rates overlapped). However, this female:male difference did mirror a difference found for all of New Zealand, where the difference was statistically significant (non-overlapping 95% CIs for the rates).

Figure 4.2 Current smokers, 14-15 year olds, Canterbury and New Zealand, 2008

(Source: Action on Smoking and Health Year 10 Survey)



The trends over time for Year 10 students who were daily smokers and who had never smoked are shown in Figures 4.3 and 4.4, respectively. These show that there was an important decline in the prevalence of daily smokers and increase in never smokers among Year 10 students in the ten years from 1999 to 2008. The rate of smoking in Māori Year 10 students in Canterbury decreased in the period from 1999 to 2008 from 35.7% to 17.9%, a fall of 17.8 percentage points, or almost 50%. The absolute reduction

was less in non-Māori Year 10 students, at 10.1 percentage points, from 14.3% to 4.2%, but this was a greater relative reduction, of over 70%.

Figure 4.3 Daily smokers, 14-15 year olds, Canterbury and New Zealand, 1999-2008
(Source: Action on Smoking and Health Year 10 Survey)

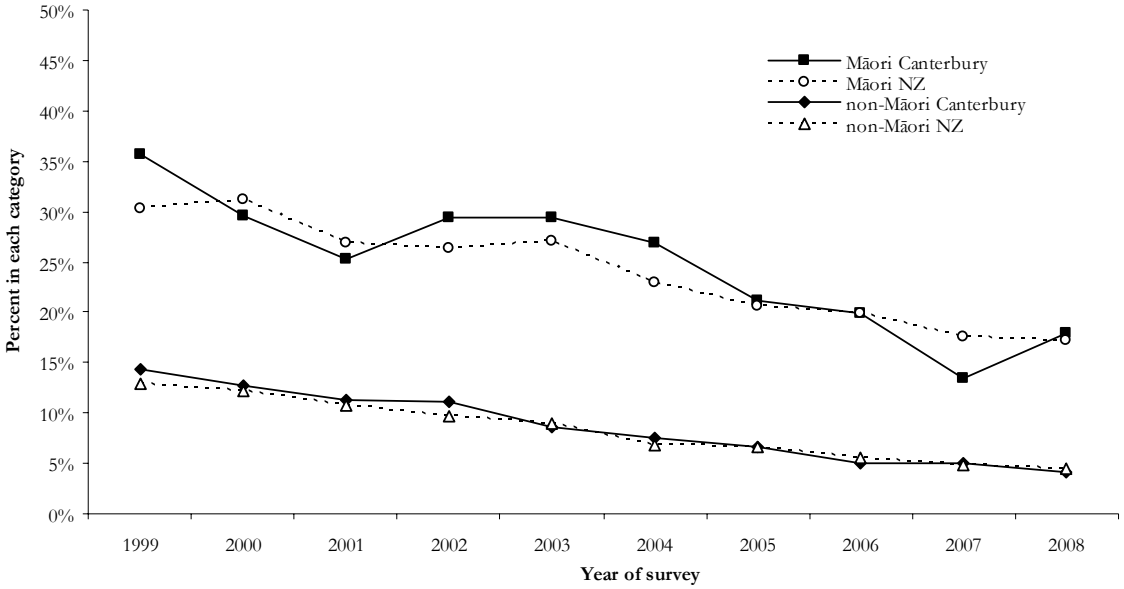


Figure 4.4 Never smokers, 14-15 year olds, Canterbury and New Zealand, 1999-2008
(Source: Action on Smoking and Health Year 10 Survey)

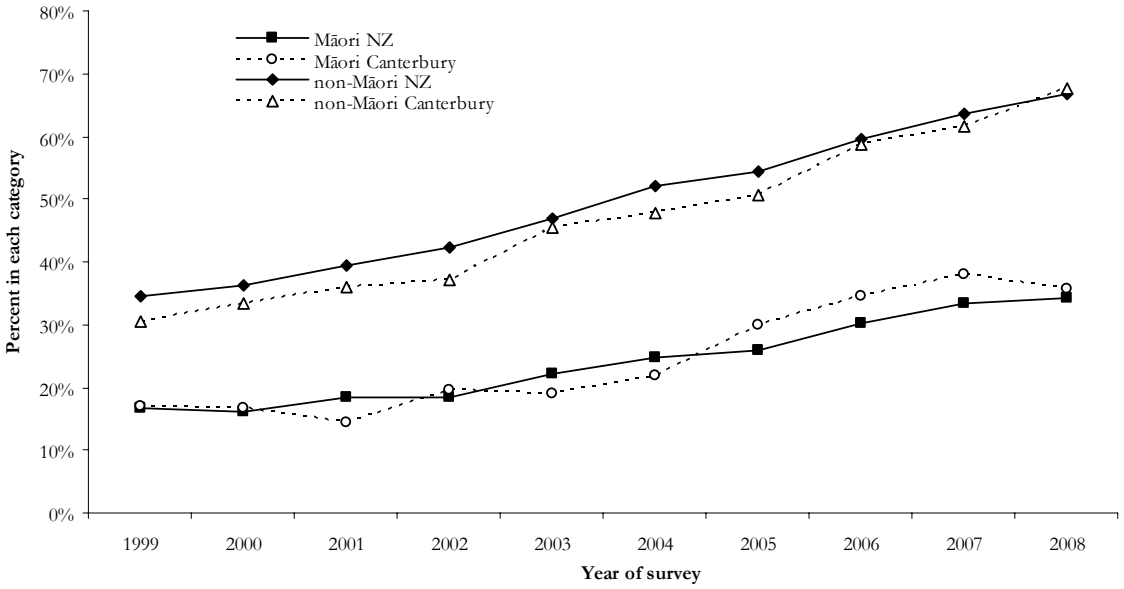
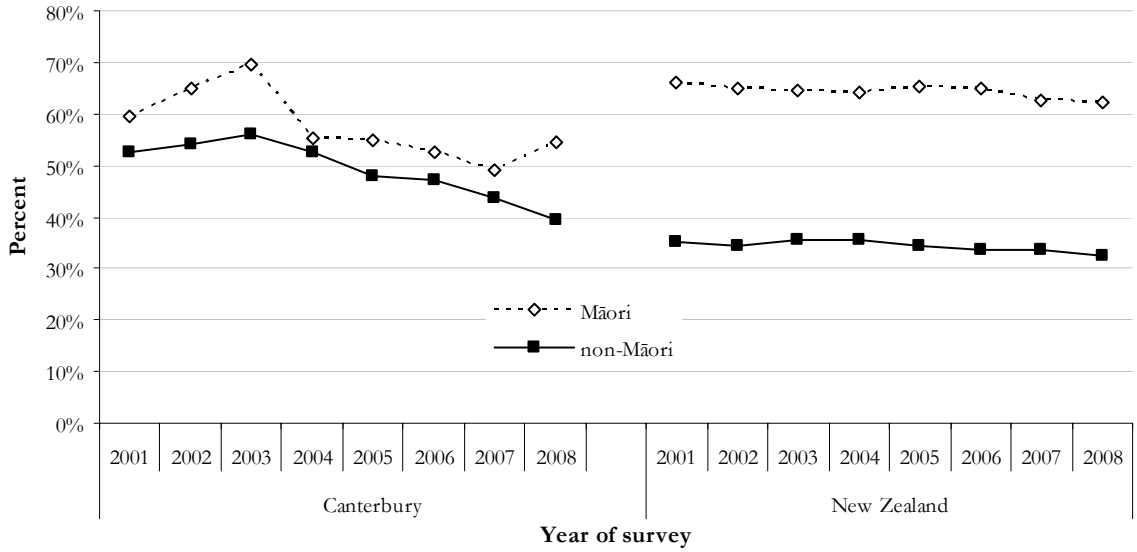


Figure 4.5 presents the percentage of homes of Year 10 students where one or both parents smoked, over the period from 2001 to 2008. The proportion of Year 10 students in Canterbury exposed to tobacco smoke at home was greater for Māori than non-Māori,

although the difference was smaller than for Māori and non-Māori in New Zealand. Over half of Māori Year 10 students were exposed to health risks from exposure to environmental tobacco smoke, regardless of whether they smoked themselves. These risks include higher rates of a range of diseases (DiFranza, Aligne et al. 2004) and increased likelihood of young people becoming smokers themselves (Darling and Reeder 2003; Vink, Willemsen et al. 2003).

Figure 4.5 Parental smoking in the home, Canterbury and New Zealand, 2001-2008
(Source: Action for Smoking and Health Year 10 Survey)



5 Health Status

This chapter presents mortality and public hospitalisation data, followed by a discussion of health and health problems under the categories of general health status, cardiovascular disease, cancer, respiratory disease, diabetes, communicable disease, mental health, injury, oral health, child and youth health, sexual and reproductive health, and older persons' health.

5.1 Mortality

Key points

From 2000 to 2004:

- Age-standardised all-cause mortality was significantly higher for Māori than non-Māori in Canterbury.
- The difference between the all-cause mortality rates for Māori and non-Māori in Canterbury was not as great as it was nationally.
- The leading causes of death for Māori in Canterbury were ischaemic heart disease, lung cancer, chronic obstructive pulmonary disease, type 2 diabetes and transport accidents.

This section presents the number of deaths and the age-sex-standardised mortality rates for all causes and then by specific cause in Canterbury and New Zealand for Māori and non-Māori from 2000 to 2004.

All-cause mortality

Table 5.1 presents the number of deaths from all causes and mortality rates for Canterbury and New Zealand for Māori and non-Māori. Rate ratios are presented giving the risk of death from all causes for Māori relative to non-Māori.

There was an average of 97 deaths a year for Canterbury Māori over the period from 2000 to 2004. The all-cause mortality rate was higher for Māori than non-Māori in Canterbury (RR 1.45, 95% CI 1.32-1.59). However, the all-cause mortality rate for Māori

was lower in Canterbury than in New Zealand (RR 0.72) [9], and the disparity between Māori and non-Māori in Canterbury (RR 1.45, 95% CI 1.32-1.59) was lower than that for New Zealand (RR2.04, 95% CI 2.00-2.03).

Table 5.1 All-cause mortality, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Canterbury					New Zealand				
Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
485	312.5 (285.6-342.0)	16,320	215.5 (210.8-220.3)	1.45 (1.32-1.59)	13,254	434.3 (426.9-441.8)	126,658	213.1 (211.3-214.8)	2.04 (2.00-2.08)

Note: Rates are calculated per 100,000, age-sex standardised to the 2001 Māori population.

Due to small numbers, age-specific mortality rates have not been presented, except those that will be presented in later chapters for children and young people (see section 5.12). Sex-specific rates are included where appropriate in the sections for each disease.

Causes of mortality

Table 5.2 presents the leading causes of death from 2000 to 2004, which are ranked in the table according to the rate for Māori in Canterbury. Several of the categories of causes of mortality are described in more detail in later sections of this profile, and are therefore not dealt with extensively in this section.

The leading causes of death for Māori in Canterbury were circulatory system diseases, cancer, accidents, respiratory diseases, and endocrine, nutritional and metabolic diseases (consisting mostly of type 2 diabetes). For all five of these categories of cause of death, the mortality rate for Māori was significantly higher than for non-Māori in Canterbury. Among these causes the highest rate ratio was for endocrine, nutritional and metabolic diseases at 3.56 (95% CI 2.43-5.23), indicating that deaths among Canterbury Māori for this group of causes were three and a half times more common than for non-Māori.

[9] Throughout this section and those following rate ratios comparing Māori in Canterbury and New Zealand are calculated by dividing the rate for Māori in Canterbury by the rate for Māori in New Zealand. These are presented in the text but are not included in the tables for reasons of clarity (whereas rate ratios comparing Māori and non-Māori in Canterbury and Māori and non-Māori nationally are presented in the tables). Ninety-five percent confidence intervals have not been calculated for these rate ratios, although the 95% CIs for the rates themselves can be compared to see whether or not they overlap.

Although the rate ratio was lower for cardiovascular disease, at 1.50 (95% CI 1.27-1.77), indicating that Māori were 50% more likely to die from this cause, cardiovascular disease had the biggest rate difference[10] with around 32 more deaths per 100,000 for Māori than for non-Māori.

For other causes of death, including suicide, digestive system disease, mental disorders, unknown causes and homicide, the rates appeared higher in Māori but the confidence interval for the rate ratio included 1. In keeping with this, the 95% confidence intervals for the rates for Māori and non-Māori overlapped, indicating a non-statistically significant difference. For nervous system disease, congenital anomalies, perinatal conditions and genito-urinary system disease the rates in Māori appeared lower but again these were not statistically significant differences. Small numbers for some of the causes of death may preclude detection of real differences as small numbers are associated with wide confidence intervals.

The rates of the top five causes of death for Māori in Canterbury were lower than for Māori nationally, and the 95% confidence intervals for the rates for Māori in Canterbury and New Zealand did not overlap, indicating that these differences were statistically significant. The difference between the rates for Māori in Canterbury and New Zealand varied, with the rate ratio for Māori in Canterbury compared to nationally being 0.59 for endocrine, nutritional and metabolic diseases (meaning Māori in Canterbury were at around 41% lower risk of dying from these causes than Māori nationally), for respiratory diseases 0.62, cardiovascular disease 0.68, cancer 0.79, and accidents 0.89 (with non-overlapping 95% CIs for the rates except for accidents).

[10] The rate difference is calculated by subtracting the rate for non-Māori from that for Māori: 95.2 - 63.3 = 31.9. Cardiovascular disease has the biggest rate difference because it is the most prevalent cause of death and because the rate ratio is relatively high.

Table 5.2 Leading causes of death, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Cause of death	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Circulatory system disease	148	95.2 (80.9-112.1)	6,865	63.3 (63.3-61.5)	1.50 (1.27-1.77)	4,316	139.8 (135.7-144.1)	51,805	61.2 (61.2-60.5)	2.29 (2.21–2.36)
Cancer	141	93.7 (79.2-110.8)	4,740	69.3 (66.9-71.7)	1.35 (1.14-1.60)	3,640	119.2 (115.4-123.2)	36,372	67.3 (66.5-68.2)	1.77 (1.71-1.83)
Accidents	51	30.7 (23.3-40.5)	502	15.8 (14.2-17.7)	1.94 (1.44-2.61)	1,030	34.6 (32.5-36.8)	4,521	17.8 (17.2-18.5)	1.94 (1.81-2.08)
Respiratory diseases	32	21.0 (14.8-29.9)	1,311	13.2 (12.3-14.2)	1.59 (1.11-2.28)	1,037	33.8 (31.8-36.0)	10,658	13.1 (12.8-13.4)	2.59 (2.42-2.76)
Endocrine, nutritional, metabolic	30	20.9 (14.5-30.0)	457	5.9 (5.2-6.6)	3.56 (2.43-5.23)	1,082	35.4 (33.4-37.6)	4,069	6.8 (6.5-7.1)	5.20 (4.83-5.59)
Suicide	22	12.7 (8.4-19.3)	295	11.4 (10.1-12.9)	1.11 (0.72-1.72)	437	14.8 (13.5-16.2)	2,004	10.0 (9.5-10.4)	1.49 (1.34-1.65)
Digestive system disease	11	7.4 (4.1-13.4)	474	5.1 (4.5-5.7)	1.45 (0.79-2.67)	235	7.6 (6.7-8.7)	3,568	4.7 (4.5-5.0)	1.61 (1.40-1.84)
Nervous system diseases	8	5.2 (2.6-10.3)	548	7.9 (7.0-9.0)	0.65 (0.32-1.32)	183	5.9 (5.1-6.8)	4,290	7.1 (6.8-7.5)	0.83 (0.71-0.97)
Mental disorders	8	4.8 (2.4-9.6)	479	4.3 (3.8-4.9)	1.10 (0.54-2.25)	103	3.3 (2.7-4.0)	3,434	3.1 (3.0-3.3)	1.06 (0.86-1.30)
Congenital anomalies	8	4.8 (2.4-9.6)	88	5.3 (4.2-6.8)	0.90 (0.43-1.88)	161	5.4 (4.7-6.3)	761	6.0 (5.5-6.5)	0.91 (0.76-1.08)
Perinatal conditions	7	4.3 (2.1-9.1)	59	6.1 (4.8-7.9)	0.71 (0.32-1.54)	224	7.6 (6.7-8.7)	517	6.4 (5.9-7.0)	1.19 (1.01-1.39)
Unknown causes	6	3.7 (1.7-8.3)	14	1.1 (0.6-1.9)	3.52 (1.31-9.43)	212	7.2 (6.3-8.3)	168	1.4 (1.2-1.7)	5.14 (4.13-6.40)
Certain infectious diseases	4	2.7 (1.0-7.3)	75	1.5 (1.0-2.2)	1.79 (0.62-5.15)	137	4.5 (3.8-5.3)	665	2 (1.8-2.3)	2.22 (1.82-2.72)
Homicide	2	1.4 (0.3-5.7)	15	0.6 (0.3-1.0)	2.33 (0.52-10.54)	109	3.6 (3.0-4.4)	175	1.0 (0.9-1.2)	3.52 (2.74-4.52)
Genitourinary system disease	2	1.2 (0.3-4.8)	183	1.7 (1.4-2.1)	0.69 (0.17-2.80)	174	5.7 (4.9-6.6)	1,685	1.8 (1.7-1.9)	3.19 (2.71-3.76)

Note: Rates are calculated per 100,000, age-sex-standardised to the 2001 Māori population.
The ranking of this table is by the rate for Māori in Canterbury

Table 5.3 shows the leading causes of death for Māori and non-Māori in Canterbury and New Zealand over the period from 2000 to 2004, with ischaemic heart disease having been the major cause of death for all groups. The second most common cause of death among Māori in Canterbury was lung cancer, followed by chronic obstructive pulmonary disease (COPD), type 2 diabetes, and transport accidents. Lung cancer was also among the leading causes for non-Māori in Canterbury, but was third after stroke, and followed by suicide and colorectal cancer. Stroke replaced transport accidents as one of the five leading causes of death among Māori in New Zealand compared to Māori in Canterbury.

Table 5.3 Five leading causes of death, ranked by mortality rate, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

	Māori	non-Māori
Canterbury	Ischemic heart disease Lung cancer COPD Type 2 diabetes Transport accidents	Ischemic heart disease Stroke Lung cancer Suicide Colorectal cancer
New Zealand	Ischemic heart disease Lung cancer Type 2 diabetes COPD Stroke	Ischemic heart disease Stroke Breast cancer in women Lung cancer Transport accidents

Note: The ranking in this table is according to the mortality rates after age-sex-standardisation to the 2001 Māori population.

5.2 Hospitalisation

Key points

From 2000 to 2005:

- The overall rate of hospitalisation was lower for Māori than non-Māori in Canterbury, in contrast to a higher rate for Māori than non-Māori nationally.
- Māori in Canterbury also had lower rates of hospitalisation than Māori nationally, both overall and for every major cause.
- Among the leading specific major causes of hospitalisation:
  - The rates of hospitalisation for pregnancy and childbirth, respiratory disease, mental and behavioural disorders and circulatory diseases were higher for Māori than non-Māori in Canterbury.
  - The rates of hospitalisation for injury and poisoning, and digestive system disease were lower for Māori than non-Māori in Canterbury.

This section examines the public hospitalisations in Canterbury and New Zealand for Māori and non-Māori over the period from 2003 to 2005. The number of hospitalisations and the age-sex-standardised rates are presented (except for sex-specific conditions, where the rates are age-standardised only).

Over the period from 2003 to 2005 there were an average of around 5,400 public hospitalisations per year for Māori in Canterbury and around 82,350 a year for non-Māori.

The total number and rate of all hospitalisations per 100,000 population in Canterbury and New Zealand are shown in Table 5.4. These data indicate that Māori were hospitalised significantly less often overall than non-Māori in Canterbury, with a rate ratio of 0.89 (95% CI 0.87-0.91), indicating that Māori in Canterbury had an 11% lower rate of hospital admission than non-Māori. As Māori also had a higher rate of admission for pregnancy, childbirth and puerperium (as will be discussed below), the difference in rates of hospitalisation for morbidity (as opposed to hospitalisation only for childbirth) was greater still.

The rate of hospitalisation for Māori in Canterbury was also significantly less than that for Māori nationally, with a rate ratio for hospital admission for Māori in Canterbury compared to Māori in New Zealand of 0.67 (95% CIs for the rates did not overlap). This indicates that Māori in Canterbury had a 33% lower rate of admission than Māori nationally.

The difference between the rates of hospitalisation for Māori and non-Māori in Canterbury and New Zealand was quite marked. In Canterbury there was a lower overall rate of hospitalisation for Māori than for non-Māori (RR 0.89, 95% CI 0.87-0.91), but in contrast, nationally there was a significantly higher rate of hospitalisation for Māori than non-Māori. The rate ratio for hospital admission for Māori compared to non-Māori in New Zealand was 1.32 (95% CI 1.31-1.33), indicating that Māori had a 32% higher rate of hospitalisation than non-Māori nationally.

Table 5.4 Public hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Canterbury					New Zealand				
Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
16,189	15,635.7 (15,363.2-15,913.1)	247,062	17,553.3 (17,455.2-17,652.0)	0.89 (0.87-0.91)	443,800	23,442.0 (23,373.1-23,511.1)	2,968,301	17,781.9 (17,761.7-17,802.14)	1.32 (1.31-1.33)

Note: Rates are calculated per 100,000, age-sex-standardised to the 2001 Māori population

Major causes of hospitalisation

The leading causes of hospitalisation are presented in Table 5.5. This table ranks causes of hospitalisation according to the number of admissions for Māori in Canterbury. Several of the categories of causes of hospitalisation are described in more detail in later sections of this profile, and are therefore not dealt with extensively in this section.

The most common category of hospitalisation for Māori in Canterbury was 'Factors influencing health status and contact with health services' (16.2% of all admissions), as it was for non-Māori in Canterbury (15.8%), and Māori (21.4%) and non-Māori (14.2%) nationally (see Table 5.6). Māori in Canterbury were significantly less likely than non-Māori to be admitted under this category, which covers admissions that are not for conditions listed in other International Classification of Disease (ICD) chapters, such as

births (for the baby) and admissions for procedures and other services. Of admissions under this category, 38.6% for Māori in Canterbury were for live births, compared to 25.4% for non-Māori, reflecting the higher fertility and birth rates among Māori. Another 19.9% of admissions for Māori in Canterbury, and 35% for non-Māori, were admissions for specific procedures. While 19.1% of admissions for non-Māori under this category were for rehabilitative services, admission for these services made up only 4.6% of hospitalisations for Māori, although the rates were similar for Māori and non-Māori (RR 1.04, 95% CI 0.86-1.26). The different age profiles of the Māori and non-Māori populations are likely to have contributed to this, with fewer Māori among the older age group which is more likely to require rehabilitative services.

The rate of hospitalisation for 'Factors influencing health status and contact with health services' for Māori in Canterbury was significantly lower than the rate for Māori nationally (RR 0.51, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori varied markedly between Canterbury (RR 0.67, 95% CI 0.64-0.70), and New Zealand (RR 1.46, 95% CI 1.44-1.48). That is, in Canterbury Māori were hospitalised under this category 33% less frequently than non-Māori, whereas nationally Māori were hospitalised under this category 46% more frequently than non-Māori.

Admissions related to pregnancy and childbirth were the second most frequent cause of admission for Māori in Canterbury, making up 16% of all hospitalisations and 26.8% of hospitalisations for females. By comparison, this category accounted for 10.2% of admissions for non-Māori in Canterbury (17.5% of hospitalisations for females), and Māori were significantly more likely to be admitted for this cause than non-Māori in Canterbury (RR 1.13, 95% CI 1.09-1.18). The rate of admission for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.73, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was less in Canterbury (RR 1.13, 95% CI 1.09-1.18) than in New Zealand (RR 1.41, 95% CI 1.40-1.43). Pregnancy and childbirth are examined further in section 5.13 Sexual and reproductive health.

The third most frequent cause of hospital admission for Māori in Canterbury was respiratory disease, making up 10.9% of hospitalisations. In comparison this was the

cause of 6.7% of non-Māori hospitalisations in Canterbury (the seventh most frequent cause) and 9.5% of hospitalisations for Māori nationally (fourth most frequent cause). The rate of admission for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.78, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was less in Canterbury (RR 1.29, 95% CI 1.23-1.37) than nationally (RR 1.65, 95% CI 1.62-1.68). Respiratory disease is examined further in section 5.6.

Injury and poisoning was the fourth most frequent cause of admission for Māori in Canterbury (9.1% of the total) and the third most frequent cause both for non-Māori in Canterbury (9.4% of the total) and for Māori nationally (9.7% of the total). The rate of admission for injury and poisoning for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.61, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori varied between Canterbury (RR 0.89, 95% CI 0.84-0.94) and New Zealand (RR 1.27, 95% CI 1.25-1.28). Injury and poisoning are examined further in section 5.10 Injury.

The fifth most frequent cause of hospital admission for Māori in Canterbury was digestive system disease (5.2% of the total), as it was for non-Māori in Canterbury (7.4%). The rate of admission for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.53, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori varied between Canterbury (RR 0.73, 95% CI 0.68-0.79) and New Zealand (RR 1.20, 95% CI 1.18-1.22). A greater proportion of admissions under this category for Māori in Canterbury were for dental problems (18.4%) compared to non-Māori (6.6%), although the rates of admission were similar, and not significantly different (RR 0.93, 95% CI 0.78-1.11). This may be influenced by the younger age profile of the Māori population, with younger people more likely to need admission for teeth and gum problems, which require hospitalisation for anaesthetic to carry out dental procedures. Dental problems are examined further in section 5.11 Oral health.

The next most frequent category of hospitalisation for Māori in Canterbury was 'Symptoms and signs' (5.2% of the total). Admissions under this category include symptoms, signs and abnormal clinical and laboratory findings that are not classified

under other ICD chapters. The rate of admission for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.64, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori varied between Canterbury (RR 0.81, 95% CI 0.75-0.87) and New Zealand (RR 1.13, 95% CI 1.12-1.15).

Genitourinary system disease was the seventh most frequent category of hospital admission for Māori in Canterbury (4.8% of the total) and the tenth most frequent for non-Māori in Canterbury (4.7%). The rate of admission for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.81, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was not significant in Canterbury (RR 1.05, 95% CI 0.97-1.13), but there was a significant difference nationally (1.25, 95% CI 1.23-1.27). Although the proportion of admissions under this category that was for renal failure was similar for Māori (3.5%) and non-Māori (3.6%) in Canterbury, the rate of renal failure hospitalisation was significantly higher for Māori (RR 1.85, 95% CI 1.21-2.82). Renal failure is examined again in section 5.7 Diabetes.

Mental and behavioural disorders were the eighth most frequent cause of admission for Māori in Canterbury (4.4% of the total). The rates of hospitalisation for Māori in Canterbury and in New Zealand were not statistically different (RR 1.01, overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was smaller in Canterbury (RR 1.29, 95% CI 1.19-1.40) than nationally (RR 1.81, 95% CI 1.77-1.85). Mental and behavioural disorders are examined further in section 5.9 Mental health.

The ninth most frequent cause of hospitalisation for Māori in Canterbury was circulatory system disease (4.2% of the total), although it was the fourth most frequent cause for non-Māori (8.4% of the total). The rate of admission for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.60, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was smaller in Canterbury (RR 1.22, 95% CI 1.13-1.32) than nationally (RR 1.74, 95% CI 1.71-1.77). Circulatory system disease is examined further in section 5.4 Cardiovascular disease.

Cancers were the tenth most frequent cause of admission for Māori in Canterbury (3.7%), but the eighth most frequent cause for non-Māori (6.4%). The rate of admission

for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.81, non-overlapping 95% CIs for the rates). The difference in the rates between Māori and non-Māori was not significant in Canterbury (RR 0.96, 95% CI 0.88-1.05), but there was a relatively small significant difference nationally (RR 1.07, 95% CI 1.05-1.09). Cancer is examined further in section 5.5.

Among the other categories of hospitalisation, the rates of admission for Māori compared to non-Māori in Canterbury were significantly different (95% CIs for the rate ratios did not include 1) as follows:

- Lower rates for perinatal conditions, musculoskeletal disease, infectious and parasitic diseases, nervous system disease, and congenital anomalies;
- Higher rates for ear diseases and skin diseases.

There were non-significant differences (95% CIs for rate ratios included 1) between rates for Māori and non-Māori for endocrine, nutritional and metabolic diseases, diseases of the blood, and diseases of the eye.

The rates of hospitalisation for Māori in Canterbury were lower than for Māori in New Zealand for all of the categories listed in the previous paragraph, except for nervous system diseases, congenital anomalies and diseases of the blood. For these categories of disease the rate ratios for Māori in Canterbury compared to Māori nationally were less than one, but the 95% confidence intervals for the rates overlapped, and the rates were therefore not significantly different.

Noteworthy among the remaining causes of hospitalisation were:

- Much lower rates of hospitalisation for Māori in Canterbury than for non-Māori for perinatal conditions, with statistically significant lower rates for prematurity (RR 0.51, 95% CI 0.40-0.64), birth trauma (RR 0.18, 95% CI 0.11-0.32), perinatal respiratory and cardiovascular disorders (RR 0.47, 95% CI 0.41-0.55) and perinatal infections (RR 0.47, 95% CI 0.26-0.84), but a non-significantly lower rate for slow foetal growth and maturation (RR 0.75, 95% CI 0.49-1.15).
- Among musculoskeletal diseases, a significantly higher rate for Māori in Canterbury than non-Māori for gout (RR 3.46, 95% CI 2.06-5.82), but a lower rate of other causes under this category.

- Among infectious and parasitic infections, a higher rate for Māori in Canterbury than non-Māori for viral hepatitis (RR 3.09, 95% CI 2.15-4.45), a lower rate for intestinal infectious diseases (RR 0.59, 95% CI 0.49-0.70), and non-significant differences for other causes. This is examined further in section 5.8 Communicable disease.
- Among ear diseases, almost the same rate for suppurative otitis media for Māori and non-Māori in Canterbury (RR 0.99, 95% CI 0.77-1.28), but higher rates for Māori in Canterbury than non-Māori for non-suppurative otitis media (glue ear) (RR 1.27, 95% CI 1.11-1.46), and perforation of the ear drum (RR 2.17, 95% CI 1.52-3.06).
- Among skin diseases, higher rates for Māori in Canterbury compared to non-Māori for skin infections (RR 1.28, 95% CI 1.10-1.49).
- A much lower rate of admission for congenital anomalies for Māori in Canterbury than non-Māori (RR 0.67, 95% CI 0.58-0.77).
- Among endocrine, nutritional and metabolic diseases higher rates for Māori in Canterbury than non-Māori for type 2 diabetes (RR 2.64, 95% CI 2.14-3.27) (diabetes is examined further in section 5.7) and disorders of the thyroid (RR 3.15, 95% CI 2.07-4.78), but lower rates for Māori in Canterbury than non-Māori for type 1 diabetes (RR 0.56, 95% CI 0.40-0.78).

Table 5.5 Leading causes of public hospitalisation, by major cause of admission, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

ICD Chapter	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Factors influencing health status	2,624	2,578.5 (2,471.9-2,689.7)	39,107	3,842.1 (3,791.7-3,893.2)	0.67 (0.64-0.70)	94,974	5,038.1 (4,983.3-5,093.5)	293,773	3,456.3 (3,431.3-3,481.5)	1.46 (1.44-1.48)
Pregnancy, childbirth & puerperium*	2,586	4,698.4 (4,511.7-4,892.8)	25,127	4,146.3 (4,088.7-4,204.6)	1.13 (1.09-1.18)	60,832	6,423.6 (6,349.8-6,498.3)	213,596	4,544.1 (4,516.4-4,572.0)	1.41 (1.40-1.43)
Respiratory disease	1,768	1,755.5 (1,670.5-1,844.9)	16,592	1,356.4 (1,325.8-1,387.8)	1.29 (1.23-1.37)	42,182	2,249.8 (2,217.9-2,282.2)	138,034	1,367.2 (1,351.8-1,382.8)	1.65 (1.62-1.68)
Injury and poisoning	1,471	1,408.5 (1,335.8-1,485.2)	23,242	1,581.6 (1,554.1-1,609.5)	0.89 (0.84-0.94)	43,091	2,311.1 (2,286.3-2,336.2)	206,887	1,822.3 (1,809.7-1,835.1)	1.27 (1.25-1.28)
Digestive system disease	840	820.8 (765.2-880.4)	18,317	1,119.3 (1,096.9-1,142.2)	0.73 (0.68-0.79)	29,428	1,556.3 (1,536.4-1,576.4)	173,892	1,299.4 (1,289.2-1,309.8)	1.20 (1.18-1.22)
Symptoms and signs	840	816.1 (760.8-875.4)	16,938	1,006.4 (985.4-1,027.9)	0.81 (0.75-0.87)	24,723	1,284.5 (1,267.2-1,302.1)	157,645	1,133.9 (1,125.0-1,142.9)	1.13 (1.12-1.15)
Genitourinary system disease	775	745.0 (692.8-801.1)	11,629	711.7 (695.2-728.6)	1.05 (0.97-1.13)	17,940	922.8 (908.4-937.3)	97,348	738.1 (731.2-745.0)	1.25 (1.23-1.27)
Mental and behavioural disorders	705	663.1 (614.5-715.4)	8,429	512.9 (499.1-527.1)	1.29 (1.19-1.40)	12,376	658.1 (645.9-670.5)	49,373	364.0 (359.1-368.9)	1.81 (1.77-1.85)
Circulatory system disease	684	667.5 (617.3-721.9)	20,685	547.1 (536.6-557.7)	1.22 (1.13-1.32)	22,326	1,119.9 (1,104.1-1,135.8)	183,516	643.2 (638.5-647.9)	1.74 (1.71-1.77)
Cancers	593	580.1 (533.6-630.6)	15,716	604.8 (591.0-618.9)	0.96 (0.88-1.05)	14,209	720.4 (708.0-733.1)	148,405	671.7 (666.3-677.0)	1.07 (1.05-1.09)
Perinatal conditions	511	513.0 (467.5-562.9)	6,443	1,085.5 (1,057.2-1,114.5)	0.47 (0.43-0.52)	10,432	582.9 (565.8-600.6)	44,278	923.1 (911.7-934.8)	0.63 (0.61-0.65)
Musculoskeletal diseases	498	479.6 (438.0-525.2)	13,694	703.9 (688.5-719.6)	0.68 (0.62-0.75)	11,874	617.7 (606.1-629.5)	88,137	532.4 (526.9-538.0)	1.16 (1.14-1.19)
Infectious & parasitic diseases	462	456.9 (415.6-502.4)	5,563	594.9 (575.4-615.1)	0.77 (0.69-0.85)	11,430	620.8 (607.3-634.5)	48,370	636.9 (628.4-645.6)	0.97 (0.95-1.00)
Ear diseases	459	460.7 (418.7-506.8)	2,723	360.1 (343.2-377.8)	1.28 (1.15-1.42)	9,463	522.3 (510.1-534.7)	23,367	367.6 (360.2-375.1)	1.42 (1.38-1.47)
Nervous system diseases	343	330.2 (295.9-368.4)	6,884	390.1 (377.5-403.2)	0.85 (0.75-0.95)	7,158	374.7 (365.7-383.9)	44,408	314.4 (309.8-319.1)	1.19 (1.16-1.23)
Skin diseases	331	321.6 (287.7-359.5)	3,740	252.8 (241.3-264.9)	1.27 (1.13-1.44)	12,445	664.8 (652.2-677.5)	47,132	395.2 (389.0-401.6)	1.68 (1.64-1.72)
Congenital anomalies	233	233.1 (203.9-266.5)	2,364	350.0 (334.1-366.5)	0.67 (0.58-0.77)	4,690	259.7 (250.9-268.7)	18,660	340.7 (334.3-347.4)	0.76 (0.73-0.79)
Endocrine, nutritional & metabolic	219	212.5 (185.3-243.8)	3,825	199.8 (191.0-209.1)	1.06 (0.92-1.23)	7,007	356.3 (347.7-365.2)	31,030	188.5 (185.1-191.9)	1.89 (1.83-1.95)
Diseases of the blood	148	145.8 (123.4-172.4)	3,041	140.2 (132.3-148.5)	1.04 (0.87-1.24)	3,269	168.9 (163.0-175.1)	25,251	148.0 (145.0-151.1)	1.14 (1.10-1.19)
Diseases of the eye	98	97.9 (79.7-120.3)	3,004	120.5 (113.6-127.8)	0.81 (0.66-1.01)	3,867	196.5 (190.1-203.2)	34,896	164.3 (161.2-167.4)	1.20 (1.15-1.24)

Note: Rates are calculated per 100,000 and are age-sex-standardised (except * which is sex-specific and therefore only age-standardised) to the 2001 Māori population. The ranking in this table is according to the number of hospitalisations for Māori in Canterbury.

Table 5.6 Major causes of public hospitalisation, as percentage of total activity, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

ICD Chapter	Canterbury		New Zealand	
	Māori	non-Māori	Māori	non-Māori
Factors influencing health status	16.2%	15.8%	21.4%	14.2%
Pregnancy, childbirth and puerperium*	16.0% (26.8%)	10.2% (17.5%)	13.7% (24.4%)	10.3% (18.5%)
Respiratory disease	10.9%	6.7%	9.5%	6.7%
Injury and poisoning	9.1%	9.4%	9.7%	10.0%
Digestive system disease	5.2%	7.4%	6.6%	8.4%
Symptoms and signs	5.2%	6.9%	5.6%	7.6%
Genitourinary system disease	4.8%	4.7%	4.0%	4.7%
Mental and behavioural disorders	4.4%	3.4%	2.8%	2.4%
Circulatory system disease	4.2%	8.4%	5.0%	8.9%
Cancers	3.7%	6.4%	3.2%	7.2%
Perinatal conditions	3.2%	2.6%	2.4%	2.1%
Musculoskeletal diseases	3.1%	5.5%	2.7%	4.3%
Infectious and parasitic diseases	2.9%	2.3%	2.6%	2.3%
Ear diseases	2.8%	1.1%	2.1%	1.1%
Nervous system diseases	2.1%	2.8%	1.6%	2.1%
Skin diseases	2.0%	1.5%	2.8%	2.3%
Congenital anomalies	1.4%	1.0%	1.1%	0.9%
Endocrine, nutritional and metabolic	1.4%	1.5%	1.6%	1.5%
Diseases of the blood	0.9%	1.2%	0.7%	1.2%
Diseases of the eye	0.6%	1.2%	0.9%	1.7%

Note: All figures are percentages of total activity except for * where the figure in brackets is for female-specific activity

5.3 Self-reported health

Key point

- Māori in Canterbury reported worse health status than European/Others in 2006/07.

Table 5.7 presents the prevalence of self-reports of general health status as excellent or very good, from the NZHS 2006/07. The prevalence of excellent or very good health was significantly lower for Māori in Canterbury than for European/Others (non-overlapping 95% CIs for the rates). The prevalence appeared to be higher for Māori in Canterbury than nationally, but this difference was not statistically significant (overlapping 95% CIs for the rates).

Table 5.7 Prevalence of self-reported excellent or very good health, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported excellent or very good health	Total	53.7 (48.7–58.5)	65.0 (60.5–69.3)	52.0 (49.0–55.0)	63.0 (60.9–65.1)
	Male	54.2 (48.1–60.1)	62.8 (58.0–67.3)	52.5 (48.0–57.1)	60.9 (58.3–63.4)
	Female	53.2 (48.0–58.3)	67.1 (62.4–71.5)	51.6 (48.3–55.0)	65.1 (62.7–67.3)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

5.4 Cardiovascular disease

Key points

From 2000 to 2005:

- Cardiovascular disease mortality and hospitalisation rates for Māori were higher than for non-Māori in Canterbury, but lower than for Māori nationally.
- The ischaemic heart disease mortality rate was higher for Māori in Canterbury than non-Māori, but there was no difference in the rate of hospitalisation.

This may suggest an important area of unmet need in the treatment of ischaemic heart disease for Māori.

- Rates of angiography were the same for Māori and non-Māori in Canterbury, but Māori had a lower rate of angioplasty and a higher rate of coronary artery bypass grafting.

This may suggest Māori in Canterbury were treated with more severe coronary artery disease than non-Māori.

- Rates of stroke mortality and hospitalisation were similar for Māori and non-Māori in Canterbury, but the rates for Māori in Canterbury were about half those for Māori nationally.
- The rate of hospitalisation for heart failure for Māori in Canterbury was higher than for non-Māori in Canterbury, but lower than for Māori nationally.
- The rate of hospitalisation for hypertensive disease for Māori in Canterbury was three times higher than for non-Māori in Canterbury, and similar to that for Māori nationally.
- Hospitalisation and mortality rates for chronic rheumatic heart disease were higher for Māori in Canterbury than for non-Māori, but there was no difference in the rate of valve replacement.

Cardiovascular disease is a leading cause of death in New Zealand and Māori have worse outcomes for cardiovascular disease than non-Māori in New Zealand (Ajwani, Blakely et al. 2003; Bramley, Riddell et al. 2004). This section examines cardiovascular disease, and includes discussion about ischaemic heart disease, stroke, heart failure, hypertensive disease and rheumatic heart disease.

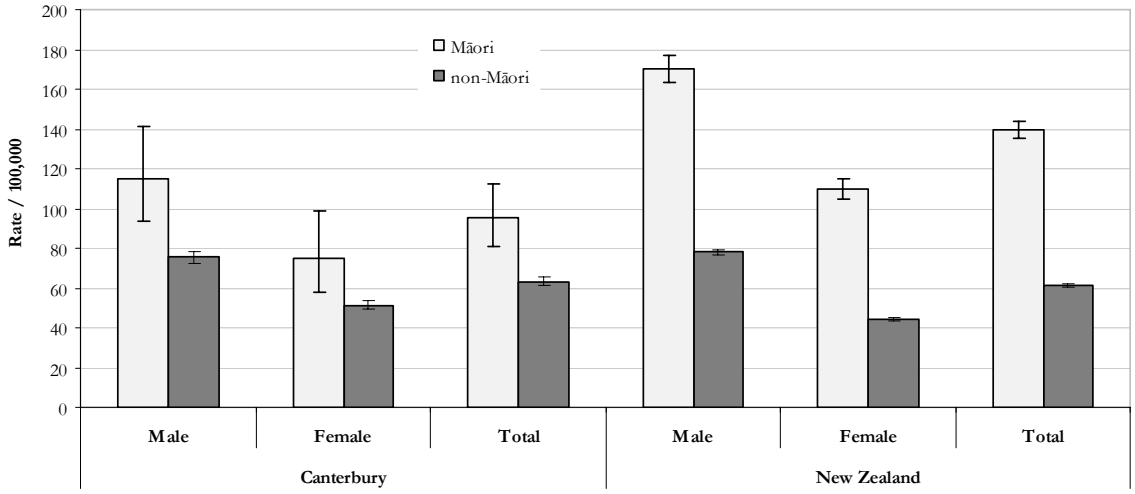
Data presented in this chapter are also presented in Tables 8.2 to 8.7 in Appendix 3 Health status tables.

Cardiovascular disease deaths and hospitalisation

Figures 5.1 and 5.2 present data about cardiovascular disease mortality from 2000 to 2004 and hospitalisation from 2003 to 2005, respectively, for Canterbury and New Zealand. Cardiovascular disease was a significantly greater cause of death for Māori than non-Māori in Canterbury and nationally during this period, for both males and females. The rates of cardiovascular mortality for Māori in Canterbury were lower than for Māori nationally. Similarly, the disparity in mortality rates in Canterbury (RR 1.50, 95% CI 1.27-1.77) was not as marked as it was nationally (RR 2.29, 95% CI 2.21–2.36).

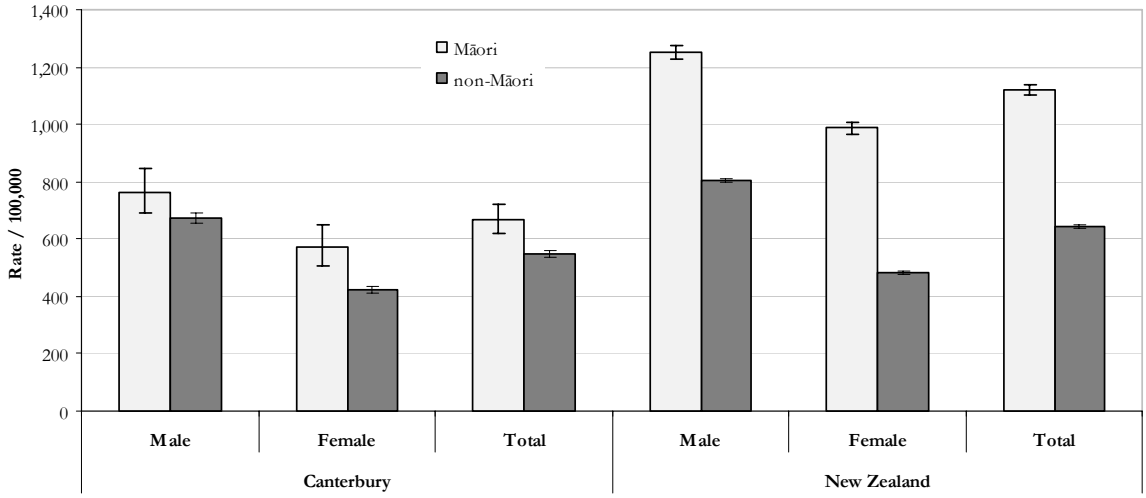
The rates of hospitalisation for cardiovascular disease were higher for Māori in Canterbury than for non-Māori (RR 1.22, 95% CI 1.13-1.32), but the difference in hospitalisation rates was smaller than that for mortality (RR 2.29, 95% CI 2.21–2.36). The rates of hospitalisation for Māori compared to non-Māori were more different nationally (RR 1.74, 95% CI 1.71–1.77) than in Canterbury (RR 1.22, 95% CI 1.13-1.32), but again the difference for hospitalisation was smaller than the difference in rates for mortality between Māori and non-Māori.

Figure 5.1 Cardiovascular disease deaths, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Figure 5.2 Cardiovascular disease hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Ischaemic heart disease

Table 5.8 presents the prevalence of self-reported ischaemic heart disease for Canterbury and New Zealand from the NZHS 2006/07. The prevalence of self-reported ischaemic heart disease appeared to be lower for Māori in Canterbury than for European/Others and higher than for Māori nationally, but none of these differences were statistically significant.

Table 5.8 Prevalence of self-reported ischaemic heart disease, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

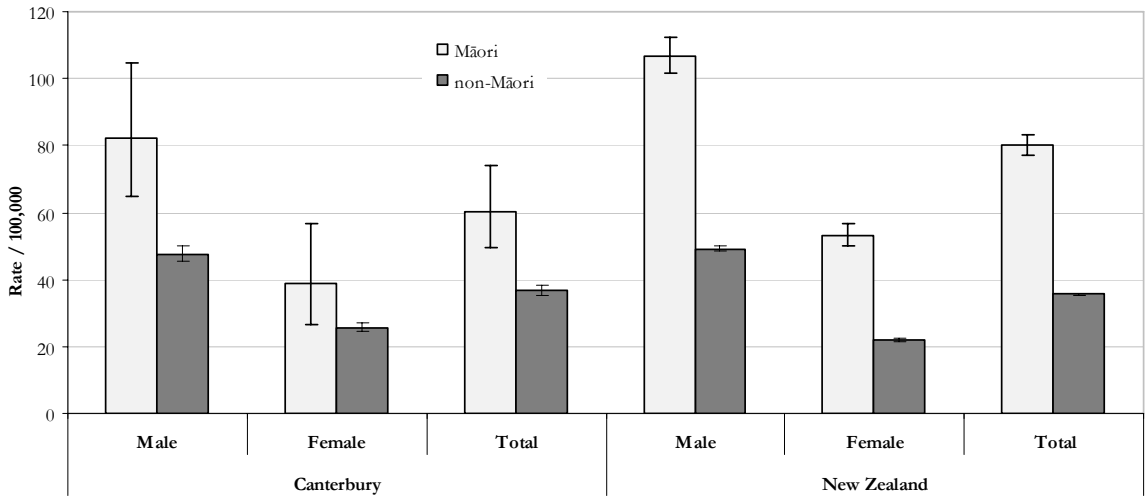
Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported ischaemic heart disease	Total	3.9 (2.7–5.5)	4.6 (3.5–5.9)	3.6 (2.7–4.7)	4.2 (3.6–4.9)
	Male	3.5 (2.1–5.4)	5.6 (4.3–7.0)	3.2 (2.2–4.7)	5.1 (4.3–6.1)
	Female	4.2 (2.8–6.2)	3.7 (2.5–5.2)	3.9 (2.7–5.4)	3.4 (2.6–4.3)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

Figures 5.3, 5.4, and 5.5 present data about ischaemic heart disease mortality (2000-2004), hospitalisation (2003-2005), and procedures (2003-2005), respectively, for Canterbury and New Zealand.

The rates of mortality from ischaemic heart disease were significantly higher for Māori in Canterbury than for non-Māori (RR 1.65, 95% CI 1.34-2.03), for both males (RR 1.73, 95% CI 1.35-2.21) and females (RR 1.51, 95% CI 1.03-2.21), as can be seen in Figure 5.3. The mortality rate for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.76, non-overlapping 95% CIs for the rates). The disparity in rates between Māori and non-Māori in Canterbury (RR 1.65, 95% CI 1.34-2.03) was smaller than that for New Zealand (RR 2.25, 95% CI 2.16–2.35).

Figure 5.3 Ischaemic heart disease deaths, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

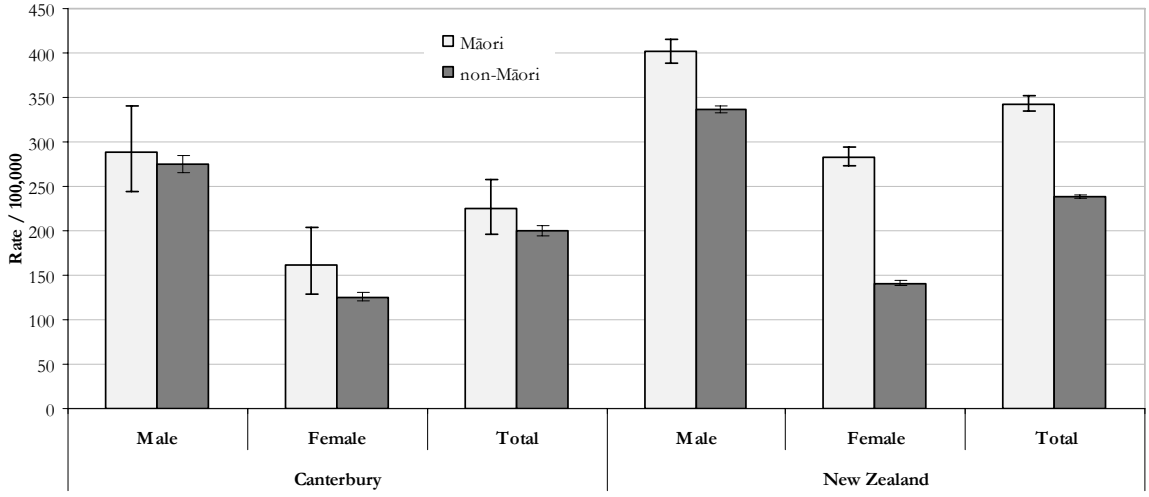


Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

There was no significant difference in the rates for hospitalisation for Māori and non-Māori in Canterbury (RR 1.12, 95% CI 0.98-1.29), as can be seen in Figure 5.4. Broken down by sex, there was a significant difference for Māori females compared to non-Māori (RR 1.28, 95% CI 1.01-1.62), but not for males (RR 1.05, 95% CI 0.88-1.24). The lack of statistically significant difference in the rate of hospitalisation for Māori in Canterbury compared to non-Māori was in contrast to the significantly higher mortality rate: Māori in Canterbury were no more likely to be admitted to hospital for ischaemic heart disease than non-Māori, but their rate of ischaemic heart disease mortality was 65% higher.

The rate of hospitalisation for ischaemic heart disease for Māori in Canterbury was significantly lower than for Māori in New Zealand (RR 0.66, non-overlapping 95% CIs for the rates), and there was a significant difference in the rates between Māori and non-Māori nationally (RR 1.43, 95% CI 1.40–1.47). Nationally, as in Canterbury, the hospitalisation rate for Māori was disproportionately low compared to the mortality rate when compared to the corresponding rates for non-Māori.

Figure 5.4 Ischaemic heart disease hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

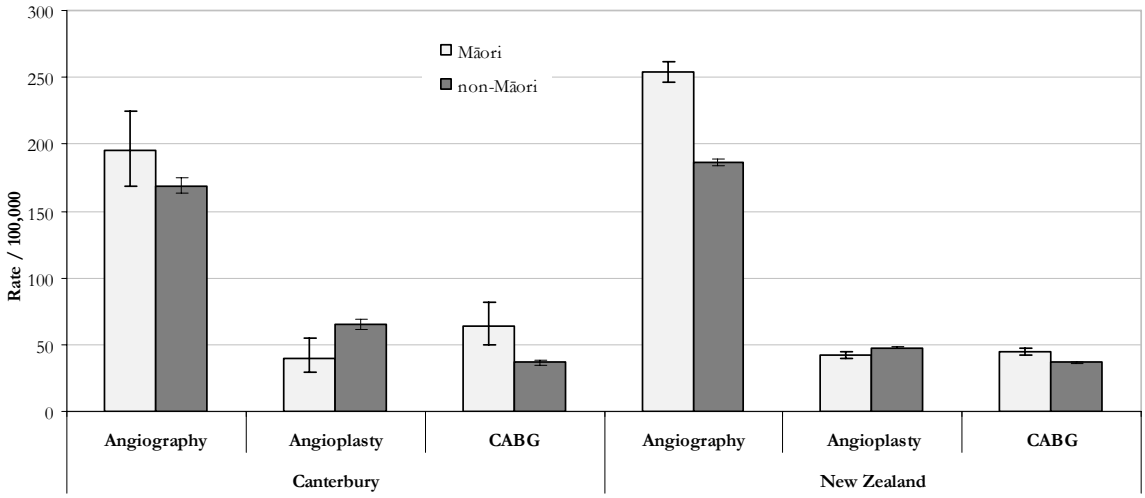


Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

The rates of angiography (a diagnostic radiological procedure to assess narrowing of the coronary arteries), angioplasty (a therapeutic procedure that uses a balloon or stents to widen narrowed coronary arteries) and coronary artery by-pass grafting (CABG, a surgical procedure in which blood vessels, often from the patient's legs, are grafted to the coronary arteries to by-pass narrowing) are shown in Figure 5.5. There was no significant difference between the rates of coronary angiography for Māori and non-Māori in Canterbury (RR 1.15, 95% CI 1.00-1.33). The rate of angioplasty was, however, significantly lower for Māori in Canterbury than for non-Māori (RR 0.62, 95% CI 0.45-0.85), while the rate of CABG (RR 1.74, 95% CI 1.34-2.25) was significantly higher. As CABG is likely to be done for more severe coronary artery disease (Serruys, Morice et al. 2009), it may be that the higher rate of CABG than angioplasty for Māori in Canterbury was due to more severe disease among Māori (Tukuitonga and Bindman 2002).

The rate of angiography for Māori in Canterbury was significantly lower than for Māori in New Zealand (RR 0.77, non-overlapping 95% CIs for the rates), and nationally there was a significant difference between the rates for Māori and non-Māori (RR 1.36, 95% CI 1.32–1.41). Similarly to the case for hospitalisation for ischaemic heart disease, the rate of angiography for Māori was disproportionately low compared to the rate of ischaemic heart disease mortality when compared to the corresponding rates for non-Māori.

Figure 5.5 Ischaemic heart disease hospital procedures, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Stroke

Table 5.9 presents prevalence of self-reported stroke for Canterbury and New Zealand from the NZHS 2006/07. The prevalence of self-reported stroke appeared to be lower for Māori in Canterbury than for European/Others and higher than for Māori nationally, but none of these differences were statistically significant.

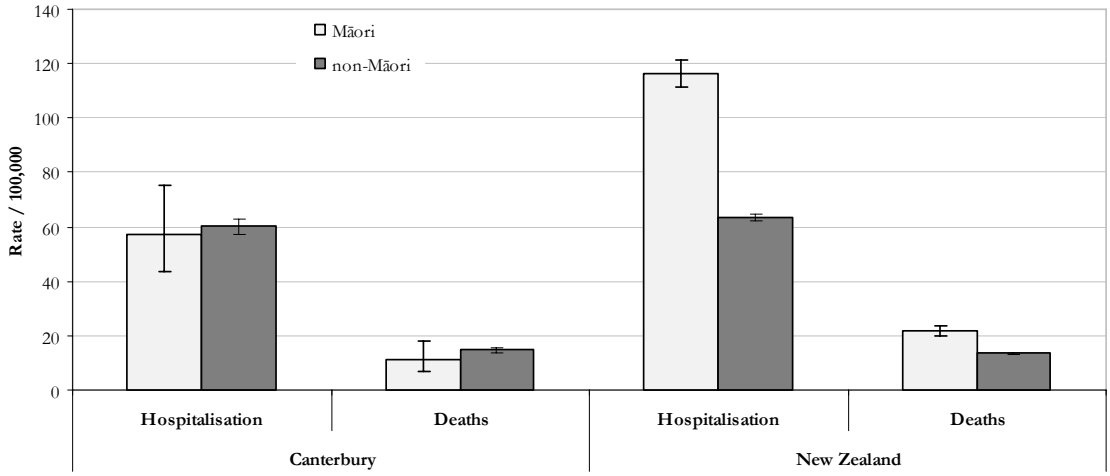
Table 5.9 Prevalence of self-reported stroke, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported stroke	Total	1.7 (0.9–3.0)	1.9 (1.1–2.8)	1.4 (0.8–2.2)	1.5 (1.1–1.8)
	Male	1.8 (0.8–3.5)	1.9 (1.1–2.9)	1.4 (0.6–2.8)	1.4 (1.0–2.0)
	Female	1.7 (0.9–3.0)	1.9 (1.1–2.9)	1.3 (0.7–2.2)	1.5 (1.1–2.0)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

Figure 5.6 presents stroke hospitalisation (2003-2005) and mortality (2000-2004) data for Canterbury and New Zealand. The rates of stroke hospitalisation and mortality were slightly lower for Māori in Canterbury than for non-Māori, but not significantly different (hospitalisation: RR 0.96, 95% CI 0.73-1.26; mortality: RR 0.77, 95% CI 0.48-1.24). The rates of hospitalisation and mortality for Māori in Canterbury were about half those for Māori in New Zealand, and these differences were statistically significant (RRs 0.49 and 0.52, respectively, non-overlapping 95% CIs for the rates for both). The rates for Māori nationally were significantly higher than for non-Māori (hospitalisation: RR 1.84, 95% CI 1.75–1.92; mortality: RR 1.61, 95% CI 1.49–1.74).

Figure 5.6 Stroke hospitalisations (2003-2005) and mortality (2000-2004), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

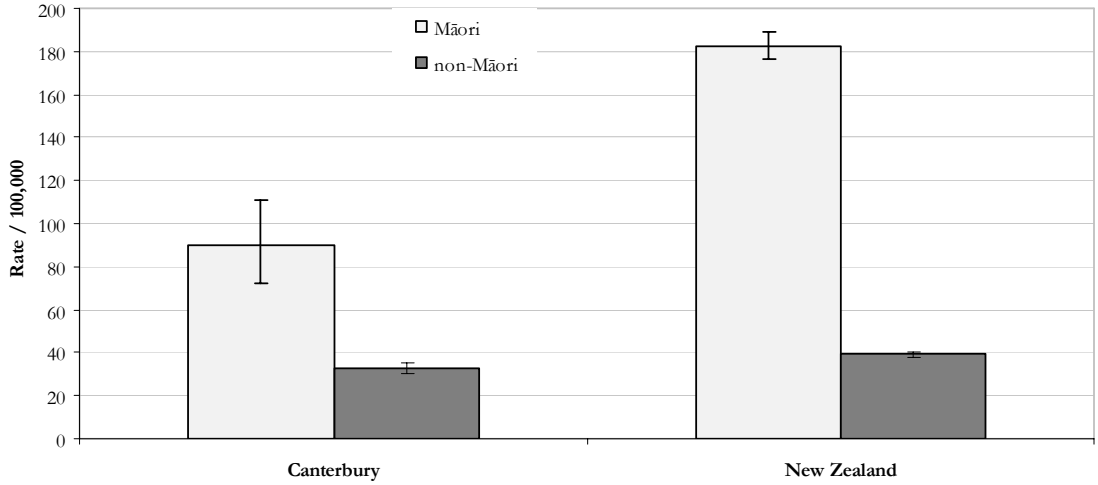


Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Heart failure

Figure 5.7 presents heart failure hospitalisations for Canterbury and New Zealand from 2003 to 2005 (the numbers of heart failure deaths from 2000 to 2004 were too small to present in the figure, but the rates can be found in Table 8.5 in Appendix 3 Health status tables). The rates of hospitalisation were higher for Māori in Canterbury and in New Zealand than for non-Māori (Canterbury: RR 2.73, 95% CI 2.19-3.41; NZ: RR 4.64, 95% CI 4.43–4.86). The rate for Māori in Canterbury was about half that for Māori nationally and this difference was statistically significant (RR 0.49, non-overlapping 95% CIs for the rates).

Figure 5.7 Heart failure hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

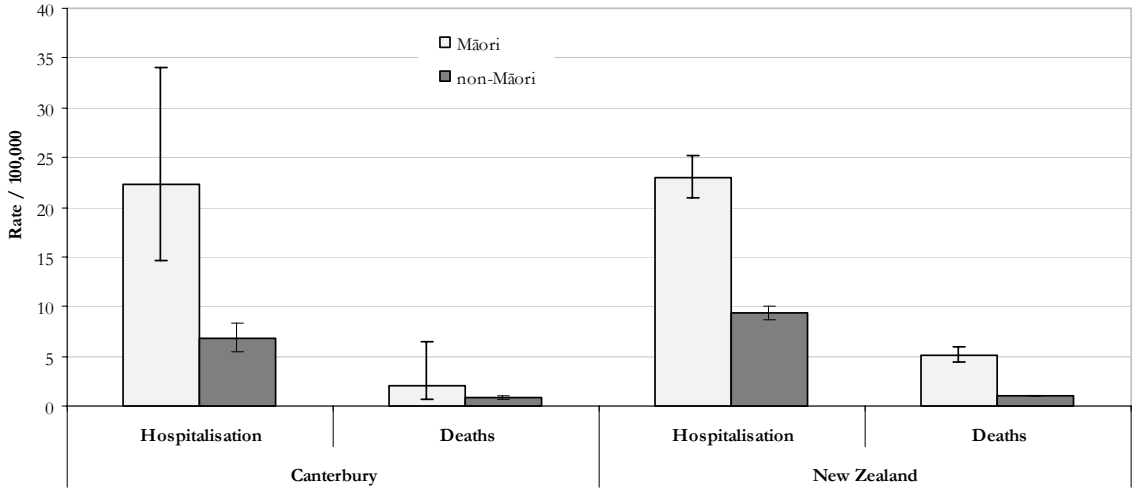
Hypertensive disease

Figure 5.8 presents data about hospitalisation (2003-2005) and mortality (2000-2004) for hypertensive disease for Canterbury and New Zealand. The numbers of hospitalisations and deaths due to hypertensive disease were small, and 95% confidence intervals relatively wide, so caution should be taken with comparison of rates.

The rate of hospitalisation for hypertensive disease for Māori in Canterbury was more than three times higher than for non-Māori (RR 3.31, 95% CI 2.06-5.33). The mortality rate was also higher, but not significantly so (RR 2.44, 95% CI 0.76-7.89). The rate of hospitalisation for Māori in Canterbury was about the same as that for Māori nationally (RR 0.97, overlapping 95% CIs for the rates), and although the mortality rate was lower for Māori in Canterbury than nationally this was not a significant difference (RR 0.41, overlapping 95% CIs for the rates).

The difference in the rates of hospitalisation in Canterbury (RR 3.31, 95% CI 2.06-5.33) was greater than that nationally (RR 2.48, 95% CI 2.20–2.80). The difference in the rates of mortality between Māori and non-Māori was significant nationally (RR 4.87, 95% CI 4.08–5.81) but non-significant in Canterbury (RR 2.44, 95% CI 0.76-7.89). However, for both mortality and hospitalisation, as the 95% CIs for the rate ratios for Canterbury and New Zealand overlapped these were not significant differences.

Figure 5.8 Hypertensive disease hospitalisations (2003-2005) and deaths (2000-2004), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Chronic rheumatic heart disease

Figure 5.9 presents data relating to hospitalisation (2003-2005), mortality (2000-2004) and procedures (2003-2005) for chronic rheumatic heart disease[11] for Canterbury and New Zealand. The numbers of hospitalisations and deaths due to chronic rheumatic heart disease were small and 95% confidence intervals relatively wide, so caution should be taken with comparison of rates.

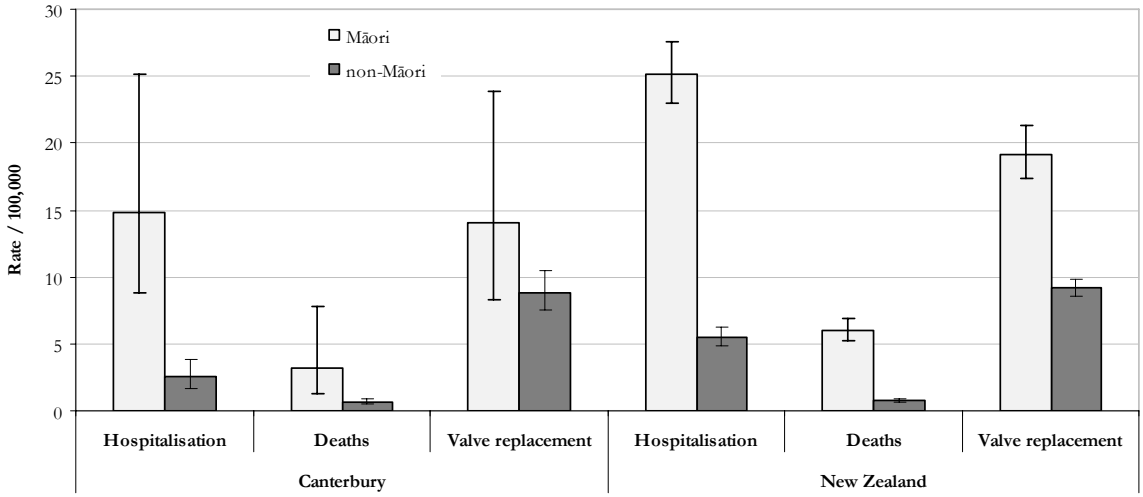
The rate of hospitalisation for chronic rheumatic heart disease for Māori in Canterbury was more than five times higher than for non-Māori (RR 5.83, 95% CI 3.01-11.31). The rate for deaths was five times higher (RR 5.01, 95% CI 1.94-12.96), whereas the rate of valve replacement was higher but not significantly so (RR 1.49, 95% CI 0.92-2.76).

The rate of hospitalisation for Māori in Canterbury was lower but not significantly different from that for Māori nationally (RR 0.59, overlapping 95% CIs for the rates), and, similarly, for mortality (RR0.53, overlapping 95% CIs for the rates). The difference in the rates of hospitalisation between Māori and non-Māori in Canterbury (RR 5.83, 95% CI 3.01-11.31) was greater than that nationally (RR 4.62, 95% CI 3.95–5.39). For mortality, the rate ratio was higher nationally (RR 7.46, 95% CI 6.19–9.00) than in Canterbury (RR 5.01, 95% CI 1.94-12.96). Nationally, Māori had a significantly higher rate of valve replacement than non-Māori (RR 2.10, 95% CI 1.85–2.38), which was greater than the non-significant difference between Māori and non-Māori in Canterbury (RR 1.49, 95% CI 0.92-2.76).

Similarly to the picture for ischaemic heart disease, there was a disproportionately low rate of procedures to treat chronic rheumatic heart disease for Māori. The rate of valve replacement for Māori was low relative to the rates of hospitalisation and death from chronic rheumatic fever, when compared to the corresponding rates for non-Māori.

[11] There were very few hospital admissions for acute rheumatic heart disease in Canterbury from 2003 to 2005 and no deaths from 2000 to 2004.

Figure 5.9 Chronic rheumatic heart disease hospitalisations (2003-2005), mortality (2000-2004), and valve replacement (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

5.5 Cancer

Key points

From 2000 to 2005:

- The incidence of cancer for Māori in Canterbury was lower than for non-Māori, but the mortality rate was higher for Māori.
- Cancer incidence and mortality rates for Māori in Canterbury were lower than for Māori nationally.
- The incidence and mortality rates for lung cancer were higher for Māori in Canterbury than for non-Māori. The difference between Māori and non-Māori was larger for females than males.
- The incidence of colorectal cancer was lower for Māori than non-Māori in Canterbury, but there was no difference in the mortality rate.
- The incidence of breast cancer was the same for Māori and non-Māori in Canterbury but the mortality rate was higher for Māori.
- These results suggest poorer cancer outcomes for Māori than non-Māori in Canterbury.

From 2006 to 2009:

- Rates of screening coverage for breast and cervical cancer were lower for Māori than non-Māori.

In light of the poorer cancer outcomes for Māori, priority areas include improving Māori breast and cervical screening coverage, implementing colorectal screening well for Māori, and concentrating on detection and prevention of lung and other cancers for Māori.

Cancer is a significant cause of death in New Zealand and Māori have a higher incidence and worse outcomes for cancer than non-Māori (Ajwani, Blakely et al. 2003; Robson, Purdie et al. 2006). This section examines cancer as a whole, and includes discussion about lung, colorectal and breast cancer and screening for breast and cervical cancer.

Data presented in this chapter are also summarised in Tables 8.8 to 8.10 in Appendix 3 Health status tables.

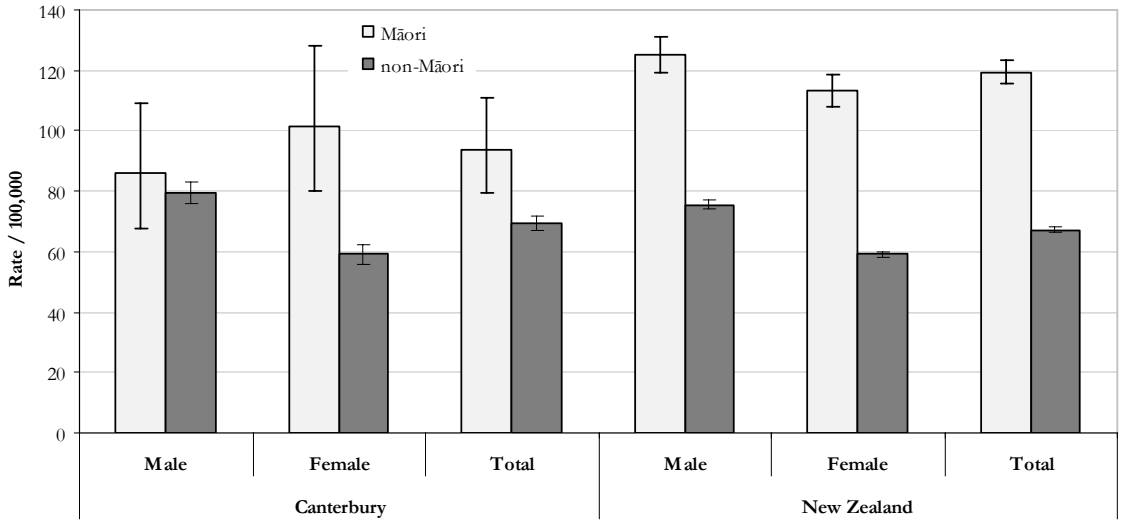
Cancer deaths and registrations

Figures 5.10 and 5.11 present data for the period from 2000 to 2004 for all-site mortality and registrations, respectively, for Canterbury and New Zealand.

The rate of cancer mortality was higher for Māori in Canterbury than for non-Māori (RR 1.35, 95% CI 1.14-1.60). For females, the difference in rates between Māori and non-Māori in Canterbury (RR 1.72, 95% CI 1.35-2.19) was more than that for males, for whom the difference in rates was non-significant (RR 1.08, 95% CI 0.85-1.38).

The mortality rate was lower for Māori in Canterbury than for Māori nationally (RR 0.79, non-overlapping 95% CIs for the rates). The difference in the mortality rates between Māori and non-Māori in Canterbury (RR 1.35, 95% CI 1.14-1.60) was smaller than that in New Zealand (RR 1.77, 95% CI 1.71-1.83). Nationally there were significant differences between Māori and non-Māori rates for both males (RR 1.66, 95% CI 1.59-1.74) and females (RR 1.92, 95% CI 1.82-2.01).

Figure 5.10 Cancer mortality, all sites, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

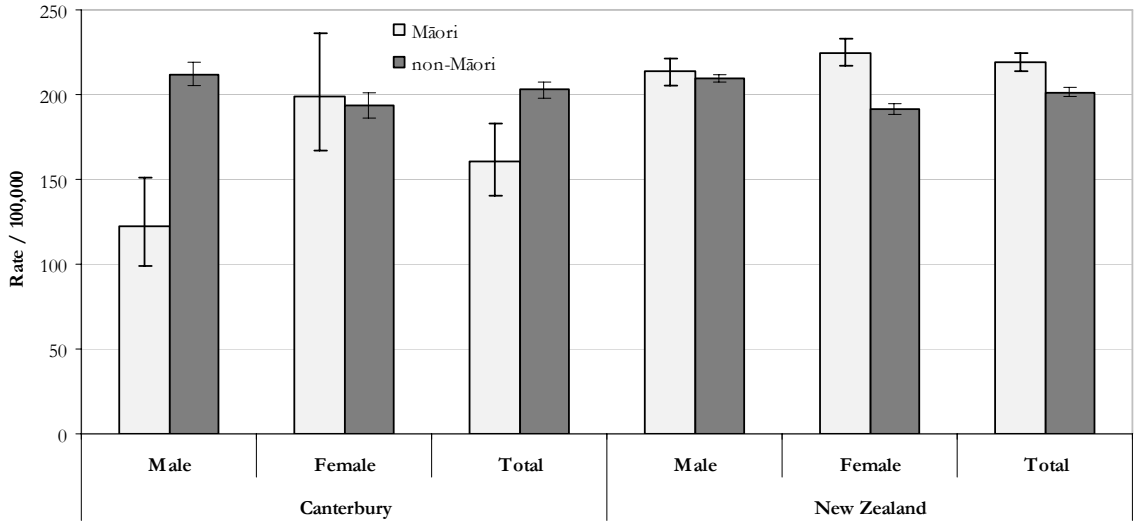
The rate of cancer registration was significantly lower for Māori in Canterbury than for non-Māori (RR 0.79, 95% CI 0.69-0.91). The rate of cancer registrations for males was significantly lower for Māori than non-Māori in Canterbury (RR 0.58, 95% CI 0.47-0.71),

and lower than that for females, for whom the difference between Māori and non-Māori rates was not significant (RR 1.03, 95% CI 0.86-1.23).

The rate of cancer registration was lower for Māori in Canterbury than for Māori nationally (RR 0.73, non-overlapping 95% CIs for the rates). The lower rate of registration for Māori than non-Māori in Canterbury (RR 0.79, 95% CI 0.69-0.91) was in contrast to the picture for New Zealand, where Māori had a slightly higher registration rate than non-Māori (RR 1.09, 95% CI 1.06-1.12). Nationally, the difference between Māori and non-Māori rates was significant for females (RR 1.17, 95% CI 1.13-1.22), but not significant for males (RR 1.02, 95% CI 0.98-1.06).

Comparing registration to mortality for cancer there was a sharp contrast between the lower incidence (indicated by the registration rate) for Māori than non-Māori in Canterbury and the higher mortality rate. For females, the incidence for Māori in Canterbury was not significantly different from non-Māori, but the Māori mortality rate was significantly higher. For males there was a significantly lower incidence for Māori in Canterbury relative to non-Māori, but mortality was not significantly different. The implication for Māori females in Canterbury was that their cancers were just as likely to be detected, but they were around 72% more likely to die from those cancers than non-Māori. Similarly, cancers in Māori males were much less likely to be detected (42% less), but they were as likely to die from those cancers as non-Māori.

Figure 5.11 Cancer registrations, all sites, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



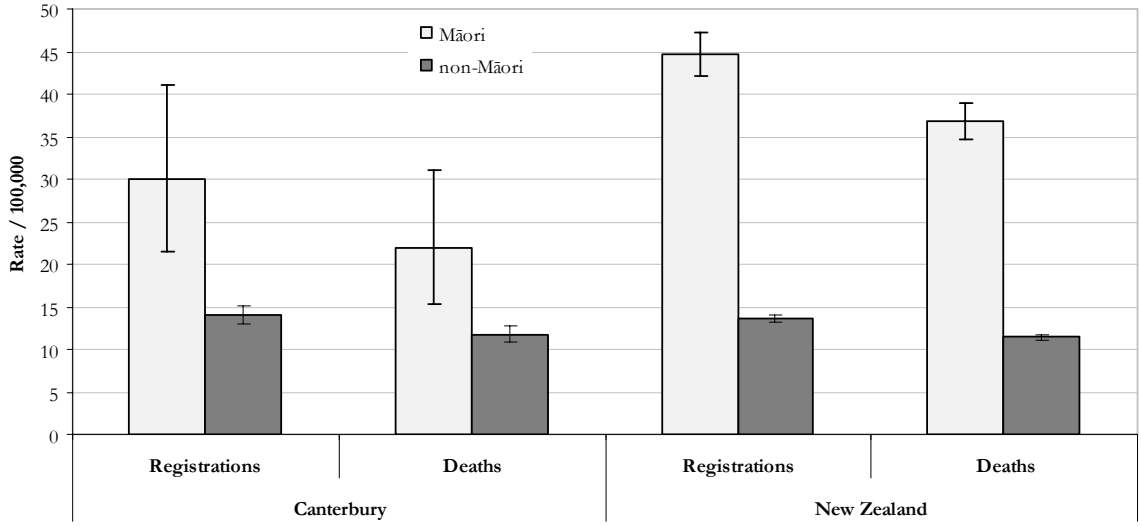
Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population.

Lung cancer

Figure 5.12 presents registration and mortality data from 2000 to 2004 for lung cancer (cancer of the trachea, bronchus and lung) in Canterbury and New Zealand. The rate of registration for Māori in Canterbury was more than double that for non-Māori (RR 2.13, 95% CI 1.54-2.94). The mortality rate was also significantly higher for Māori than non-Māori in Canterbury (RR 1.87, 95% CI 1.30-2.68).

The rates of registration and death for Māori in Canterbury were both significantly lower than for Māori nationally (registrations: RR 0.67; mortality: RR 0.59; non-overlapping 95% CIs for the rates for both). The rates of registration and death for non-Māori in Canterbury were very similar to those nationally. This indicates that the differences in rates between Māori and non-Māori in Canterbury (registrations: RR 2.13, 95% CI 1.54-2.94; mortality: RR 1.87, 95% CI 1.30-2.68) were smaller than they were in New Zealand (registrations: RR 3.26; 95% CI 3.05-3.48; mortality: RR 3.23; 95% CI 3.03-3.45). All of these differences were statistically significant.

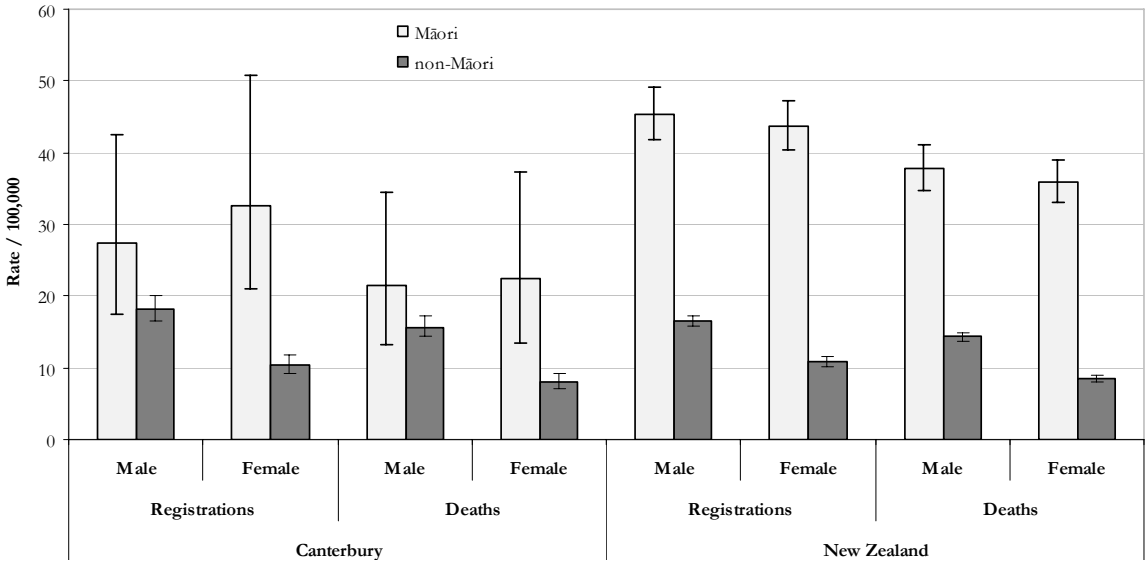
Figure 5.12 Lung cancer mortality and registrations, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-sex-standardised to the 2001 Māori population

Figure 5.13 presents lung cancer registrations and deaths by gender, and shows that the disparity in rates between Māori and non-Māori in Canterbury and New Zealand was larger for females than for males. The rate ratios for Māori and non-Māori for lung cancer registration and deaths in Canterbury for females were 3.14 (95% CI 1.98-4.99) and 2.81 (95% CI 1.66-4.75), respectively, and for males 1.50 (95% CI 0.95-2.36) and 1.36 (95% CI 0.83-2.22), respectively. As can be seen from the 95% CI, for males these were non-significant differences. The disparities were greater nationally, where the Māori/non-Māori rate ratios were, respectively, for females 4.04 (95% CI 3.67-4.45) for registrations and 4.24 (95% CI 3.86-4.66) for deaths, and for males 2.75 (95% CI 2.51-3.01) for registrations and 2.64 (95% CI 2.41-2.89) for deaths.

Figure 5.13 Lung cancer registrations and deaths, by gender, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-sex-standardised to the 2001 Māori population

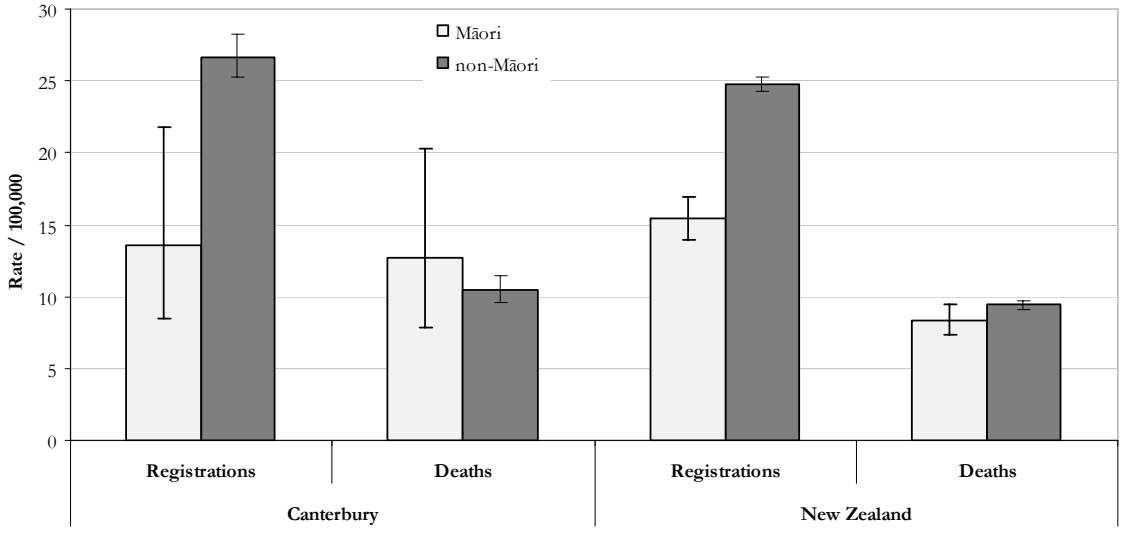
As shown in Chapter 4 Risk and protective factors, the prevalence of smoking is considerably higher among Māori than non-Māori, particularly among Māori females. This will have contributed to the higher incidence rates for lung cancer for Māori, and especially Maori females. Other risk factors for lung cancer include exposure to environmental tobacco smoke, marijuana smoking, occupational exposure to carcinogens, and dietary and socioeconomic factors (Harwood, Aldington et al. 2005). However, disparities in diagnosis and treatment are also likely to have contributed to the higher mortality rates. A study in Auckland and Northland found Māori are more likely to be diagnosed with advanced than localised lung cancer, less likely to receive curative (rather than palliative) treatment, and subsequent to diagnosis experience more delays before receiving treatment (Stevens, Stevens et al. 2008). Nationally, it has been found that Māori have lung cancer diagnosed at a more advanced stage on average and, after taking stage into account, there is a disparity in survival after diagnosis between Māori and non-Māori (Robson, Purdie et al. 2006).

Colorectal cancer

Figure 5.14 presents registration and mortality data for colorectal cancer from 2000 to 2004 for Canterbury and New Zealand. The rate of registration for Māori in Canterbury was about half that for non-Māori (RR 0.51, 95% CI 0.32-0.82). However, the mortality rates were not significantly different for Māori and non-Māori in Canterbury (RR 1.22, 95% CI 0.75-1.96). This indicates that there is an excess in mortality for Māori in Canterbury relative to incidence, compared to non-Māori. That is, Māori are less likely to be diagnosed with colorectal cancers but no less likely to die from them than non-Māori.

The rates of registration and death for Māori in Canterbury were not significantly different from those for Māori nationally (registrations RR 0.88, mortality RR 1.51, overlapping 95% CIs for the rates for both).

Figure 5.14 Colorectal cancer mortality and registrations, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-sex-standardised to the 2001 Māori population

The lower incidence but similar mortality for Māori compared to non-Māori may be due to several factors. It has been found nationally that survival disparities may be due to later, more advanced stage at diagnosis but that disparities in survival are also present between Māori and non-Māori with similar stage of disease spread at diagnosis (Robson, Purdie et al. 2006). Hill, Sarfati et al. (2010) found the most important factors explaining poorer colon cancer survival for Māori nationally were higher co-morbidity and smoking,

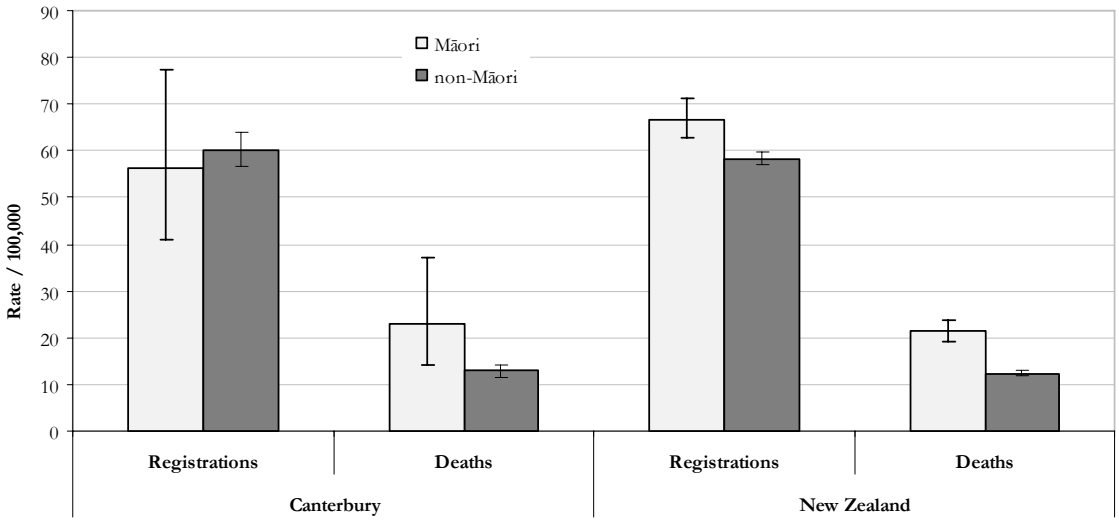
and poorer access and quality of healthcare for Māori than non-Maori. Health system factors may also play a part, such as different surgical treatment, and less and more delayed chemotherapy (Hill, Sarfati et al. 2009). There is potential for the planned national colorectal cancer screening programme to reduce stage at diagnosis as a source of disparity, if the programme is designed to optimise Māori participation (Shaw, Cunningham et al. 2008). However, other reasons for differences in outcomes between Māori and non-Māori also need to be identified and addressed (Robson, Purdie et al. 2006).

Breast cancer

Figure 5.15 presents registration and mortality data from 2000 to 2004 for breast cancer for females in Canterbury and New Zealand. The rate of registration for Māori in Canterbury was not significantly different from that for non-Māori (RR 0.93, 95% CI 0.67-1.29). However, the rate of death was higher for Māori than non-Māori in Canterbury (RR 1.77, 95% CI 1.08-2.90). The rates of registration and death for Māori in Canterbury did not differ significantly from those for Māori nationally (registrations: RR 0.84; mortality: RR 1.08; 95% CIs overlapping for the rates for both).

The disparity between the similar rate of registration but higher mortality for Māori compared to non-Māori has also been described nationally. It has been established that Māori women are diagnosed with more advanced disease spread (Curtis, Wright et al. 2005), but also that survival disparities between Māori and non-Māori remain when stage at diagnosis is taken into account (Robson, Purdie et al. 2006).

Figure 5.15 Breast cancer mortality and registrations, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-standardised to the 2001 Māori population

Screening

Breast screening

Breast cancer is the most common cancer diagnosed in Māori (and non-Māori) women in New Zealand, and this is also true for Canterbury, where there is an age-standardised rate of breast cancer of 56.2/100,000 person-years (see Table 8.8). Screening for breast cancer is intended to detect lesions early, at a time when they may be more easily treated. As stated above, there is a disparity between the mortality rates for breast cancer for Māori women in Canterbury and those for non-Māori women, despite registration rates being similar, and some of this is related to stage at diagnosis. If screening can detect tumours early this may help improve breast cancer outcomes for Māori women.

Māori women had lower breast screening coverage rates than non-Māori women nationally, although BreastScreen South (the provider of breast screening services in Canterbury but covering all the South Island) did meet its target of 70% breast screening coverage within the last 24 month period for Māori women from 2004 to 2006. BreastScreen South had increased coverage for Māori women from 2002 to 2004, in part by using mobile units. Nationally, a monitoring report of BreastScreen Aotearoa for the

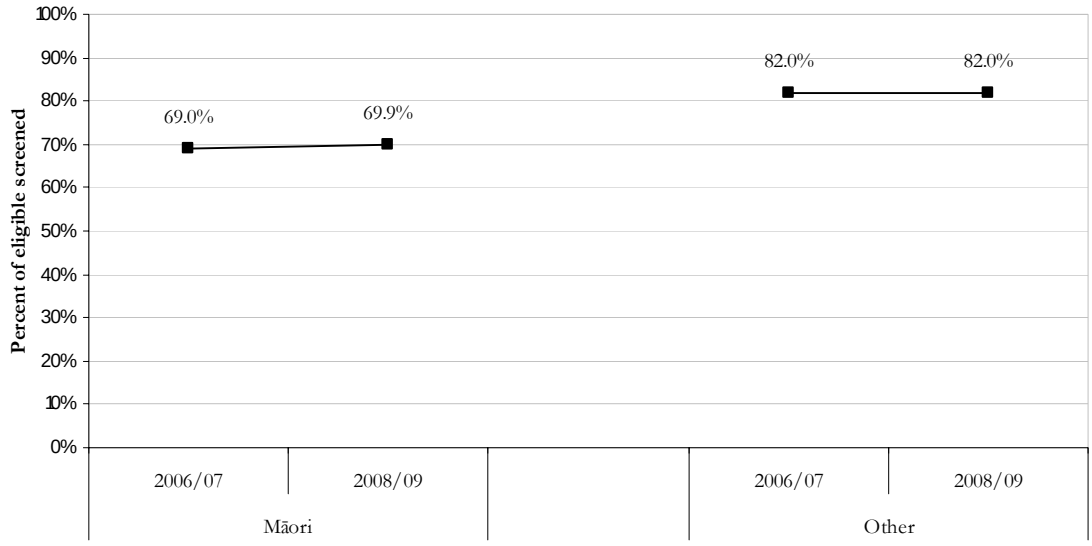
period from 2004 to 2006 found Māori women were more likely than non-Māori women, among indicators of the quality of screening, to:

- have more than four films taken;
- have technical problems with films, necessitating recall to the screening unit;
- be referred for assessment;
- have a false positive screening.

Māori women were also more likely than non-Māori women to have cancer detected and for these to be more invasive, indicating that when cancers were detected they were at a more advanced stage (Simmonds and Robson 2008).

Figure 5.16 presents breast screening coverage data for Canterbury in 2006/07 and 2008/09. It shows that Māori women had lower coverage rates than Other women (which refers to non-Māori, non-Pacific women) and that coverage for Māori women improved slightly between the two time periods. Both of the rates for Māori in 2006/07 and 2008/09 fell slightly below the national target coverage rate of 70%, whereas the rate for Other women in both periods exceeded that target.

Figure 5.16 Breast screening coverage, Canterbury, 2006/07 and 2008/09
(Source: BreastScreen Aotearoa)



Note: Breast cancer screening coverage is defined as the proportion of women in eligible age range (45-69 years) who have had a screening mammogram in the preceding two years. The target for breast cancer screening coverage is >70%.

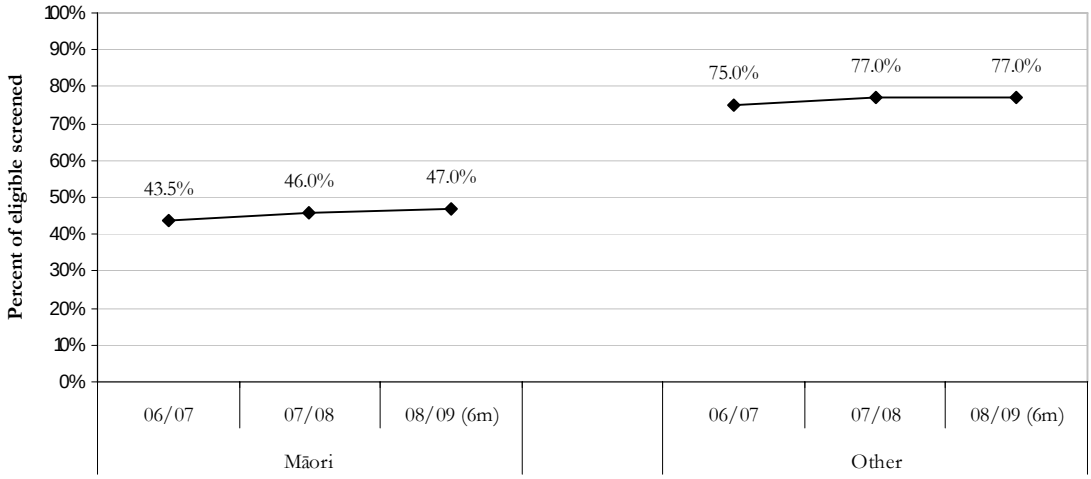
Cervical screening

At the national level, cervical cancer affects Māori disproportionately compared to non-Māori, with almost twice the incidence and three times the mortality for Māori women than for non-Māori in 2000 to 2004 (Cormack, Purdie et al. 2007). Numbers for Māori in Canterbury are too small to reliably detect differences in mortality or registration rates between Māori and non-Māori. For both mortality (RR 1.92, 95% CI 0.45-8.21) and registration (RR 1.44, 95% CI 0.66-3.18) the rates for Māori appeared higher than for non-Māori in Canterbury but were not significantly different, as shown in Table 8.10. The rate of hospitalisation for cervical cancer for Māori was significantly higher than for non-Māori (RR 2.69, 95% CI 1.35-5.39). Registration rates for cervical carcinoma in situ (a precursor to cervical cancer) were lower for Māori, but this was not a significant difference (RR 0.85, 95% CI 0.67-1.07), and may not reflect the true situation as carcinoma in situ is not compulsorily notified.

Screening for cervical abnormalities, similarly to breast screening, is intended to detect lesions early when they may be more amenable to treatment. However, Māori are under-represented for enrolment in the National Cervical Screening Programme, both nationally and in Canterbury. While 94.8% of all women in Canterbury were enrolled in the programme in 2007, only 64.9% of Māori women were enrolled (63.1% in 2006 and 61.0% in 2005). This compares to national figures of 78.3% of Māori and 95.5% of all women enrolled (Brewer, McKenzie et al. 2008).

Figure 5.17 presents screening coverage data for Canterbury from 2006 to 2009, and shows that while coverage rates for Māori women in Canterbury improved over the time period, they remained substantially lower than Other (non-Māori, non-Pacific) women. At 43.5% in 2006/07 and 46.0% in 2007/08, the screening coverage rate for Māori women in Canterbury fell well below the screening coverage target of 75%, and was lower than the national rate for Māori women in 2007, which was 48.2% (Brewer, McKenzie et al. 2008).

Figure 5.17 Cervical screening coverage, Canterbury, 2006-2009
(Source: National Cervical Screening Programme)



Note: Cervical screening coverage is defined as the proportion of women aged 20-69 years who have had a smear in the preceding three years. The cervical screening coverage target is >75%.

5.6 Respiratory disease

Key points

From 2000 to 2005:

- Respiratory disease mortality and hospitalisation rates for Māori in Canterbury were higher than for non-Māori in Canterbury, but lower than for Māori nationally.
- Rates of hospitalisation for asthma, chronic obstructive pulmonary disease and bronchiectasis were higher for Māori than non-Māori in Canterbury, whereas there was no difference for pneumonia.
- The rates of hospitalisation for asthma and bronchiectasis were similar for Māori in Canterbury to those for Māori nationally, whereas the rates for chronic obstructive pulmonary disease and pneumonia were lower for Māori in Canterbury.

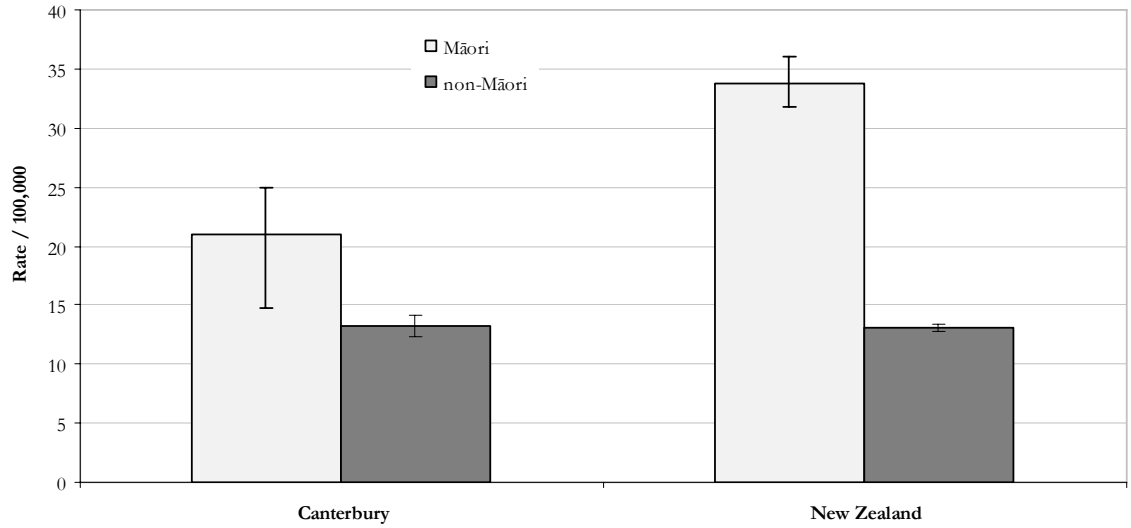
Several respiratory diseases disproportionately affect Māori, including chronic obstructive pulmonary disease (COPD), asthma, and bronchiectasis (Ellison-Loschmann, Cheng et al. 2002; Twiss, Metcalfe et al. 2005; Blakely, Tobias et al. 2007). Disparities have been identified between Māori and non-Māori in both hospitalisation and mortality data (Crengle, Pink et al. 2007).

Data presented in this chapter are also summarised in Tables 8.11 to 8.16 in Appendix 3 Health status tables.

Respiratory disease deaths and hospitalisation

Figure 5.18 presents data on respiratory disease mortality from 2000 to 2004 for Canterbury and New Zealand. The mortality rate was significantly higher for Māori in Canterbury and nationally than for non-Māori (Canterbury: RR 1.59, 95% CI 1.11-2.28; NZ RR 2.59, 95% CI 2.42-2.76). The rate for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.62, non-overlapping 95% CIs for the rates), and the disparity in rates between Māori and non-Māori was smaller in Canterbury than that seen nationally.

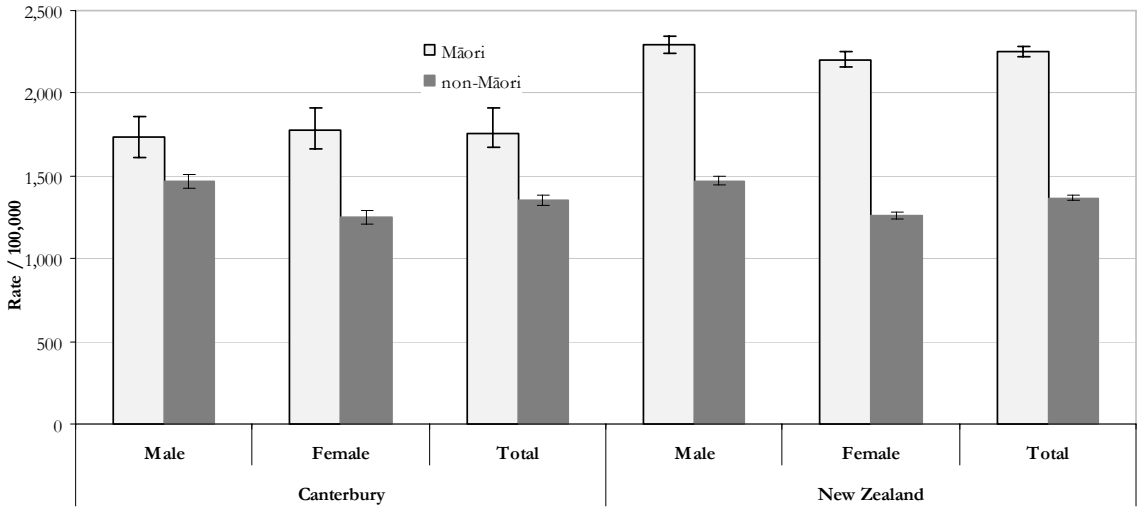
Figure 5.18 Respiratory disease mortality, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-sex-standardised to the 2001 Māori population

Figure 5.19 presents respiratory disease hospitalisation data from 2003 to 2005 for Canterbury and New Zealand. The rate was significantly higher for Māori in Canterbury and in New Zealand than for non-Māori (Canterbury: RR 1.29, 95% CI 1.23-1.37; NZ: RR 1.65, 95% CI 1.62-1.68), for both males and females. The hospitalisation rate for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.78, non-overlapping 95% CIs for the rates), and the difference in rates between Māori and non-Māori in Canterbury was smaller than that seen nationally.

Figure 5.19 Respiratory disease hospitalisation, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population.

Asthma, COPD, pneumonia and bronchiectasis

Table 5.10 presents prevalence of self-reported asthma requiring medication and COPD for Canterbury and New Zealand from the NZHS 2006/07. The prevalence of self-reported medicated asthma appeared to be higher for Māori in Canterbury than for European/Others and similar to the prevalence for Māori nationally, but these differences were not statistically significant. The prevalence of self-reported COPD appeared to be much higher for Māori in Canterbury than for European/Others and higher than for Māori nationally, but again these differences were not statistically significant.

Table 5.10 Prevalence of self-reported asthma requiring medication and COPD, 15+ years, Canterbury and New Zealand, 2006/07

(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator	Canterbury		New Zealand	
	Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported medicated asthma	15.5 (12.8–18.5)	11.9 (9.6–14.5)	15.8 (14.0–17.7)	12.1 (10.9–13.3)
Self-reported COPD	18.7 (5.4–41.2)	6.2 (4.0–8.4)	12.8 (9.2–16.3)	6.5 (5.7–7.3)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

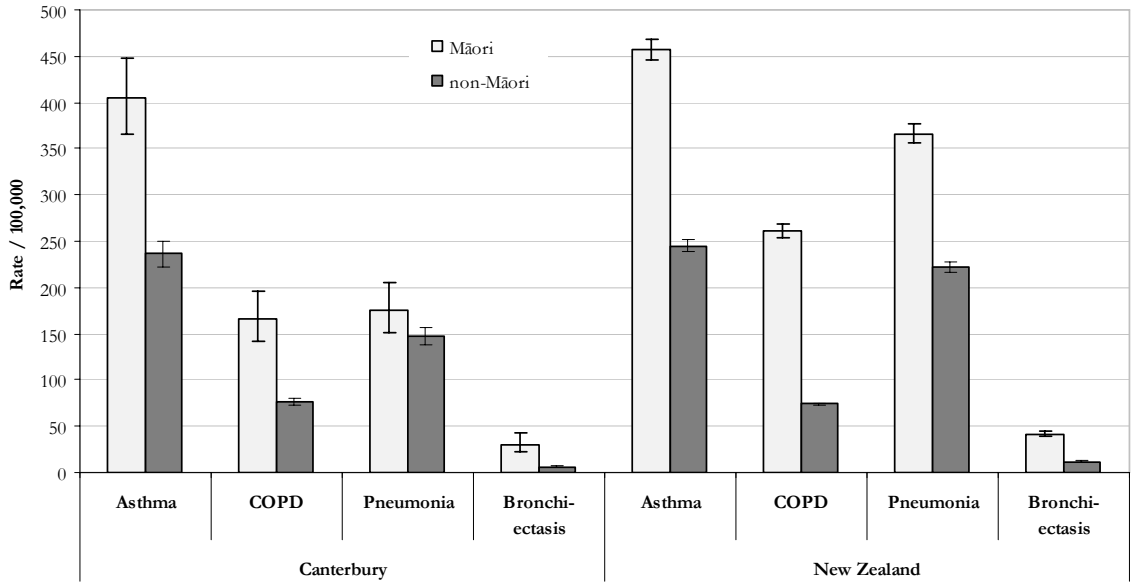
Figure 5.20 presents hospitalisation data for selected respiratory diseases for 2003 to 2005. For asthma, the rate of hospitalisation was significantly higher for Māori in Canterbury than for non-Māori (RR 1.72, 95% CI 1.53-1.93). The rate for Māori in Canterbury was slightly lower than that for Māori nationally, but this was not a significant difference (RR 0.89, overlapping 95% CIs for the rates) and the difference in rates between Māori and non-Māori in Canterbury (RR 1.72, 95% CI 1.53-1.93) and New Zealand (RR 1.86, 95% CI 1.80–1.93) were comparable.

For chronic obstructive pulmonary disease (COPD) the rate of hospitalisation for Māori in Canterbury was over twice that for non-Māori (RR 2.18, 95% CI 1.84-2.57). The rate for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.64, non-overlapping 95% CIs for the rates). The difference in rates between Māori and non-Māori in Canterbury (RR 2.18, 95% CI 1.84-2.57) was smaller than that for New Zealand, where the rate for Māori was three and a half times that for non-Māori (RR 3.54, 95% CI 3.42–3.67).

For pneumonia there was no significant difference between the rate of hospitalisation for Māori and non-Māori in Canterbury (RR 1.20, overlapping 95% CIs for the rates). This was in contrast to the national picture where Māori (and non-Māori) had a significantly higher rate of pneumonia (RR 0.48, non-overlapping 95% CIs for the rates) and there was a larger difference between the rates for Māori and non-Māori (RR 1.65, 95% CI 1.59–1.71).

Numbers of bronchiectasis hospitalisations were small, but differences between the rates for Māori and non-Māori, both in Canterbury (RR 5.11, 95% CI 3.32-7.84), and nationally (RR 3.60, 95% CI 3.19–4.08), were large. The rate for Māori in Canterbury was lower, but not significantly different from that for Māori nationally (RR 0.73, overlapping 95% CIs for the rates).

Figure 5.20 Asthma, COPD, pneumonia, and bronchiectasis hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 1000,000 and are age-sex-standardised to the 2001 Māori population

5.7 Diabetes

Key points

From 2000 to 2005:

- The type 2 diabetes hospitalisation rate for Māori in Canterbury was over two and a half times higher than for non-Māori in Canterbury, while the mortality rate was more than five and a half times higher for Māori.
- Type 2 diabetes hospitalisation and mortality rates for Māori in Canterbury were lower than for Māori nationally.

From 2005 to 2007:

- Rates of long term complications from diabetes were two to five times higher for Māori in Canterbury than European/Others.

From 2005 to 2009:

- A lower proportion of Māori expected to have diabetes had had an annual review than of Others expected to have diabetes.
- A lower proportion of Māori than Others with diabetes had undergone retinal screening.

The lifetime risk of having a diagnosis of type 2 diabetes was over twice as high for Māori as for New Zealand Europeans in 1996 (Ministry of Health 2002) and Māori also suffer diabetes complications, such as lower limb lesions requiring amputation and diabetic eye disease, two to three times as frequently as non-Māori (Harwood and Tipene-Leach 2007). This section presents data on diabetes prevalence, type 2 diabetes mortality and hospitalisation, the complications resulting from diabetes, and aspects of the management of diabetes.

Data presented in this chapter are also summarised in Tables 8.17 and 8.18 in Appendix 3 Health status tables.

Diabetes prevalence

Table 5.11 presents the prevalence of diabetes by self-report in the 2006/07 New Zealand Health Survey, and shows that the prevalence for Māori appeared higher than

for non-Māori in Canterbury, although this was not a significant difference (overlapping 95% confidence intervals). As the data presented are synthetic estimates comparison between Māori and European/Others in Canterbury and between Māori in Canterbury and nationally should be made with caution.

Table 5.11 Prevalence of self-reported diabetes, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Self-reported diabetes	Total	4.2 (2.7–6.2)	3.1 (1.8–4.9)	4.8 (3.9–5.9)	3.6 (3.0–4.2)
	Male	4.9 (3.1–7.3)	3.3 (2.0–5.3)	5.7 (4.3–7.4)	3.9 (3.1–4.7)
	Female	3.5 (2.0–5.8)	2.8 (1.5–4.8)	4.1 (3.0–5.4)	3.3 (2.6–4.1)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

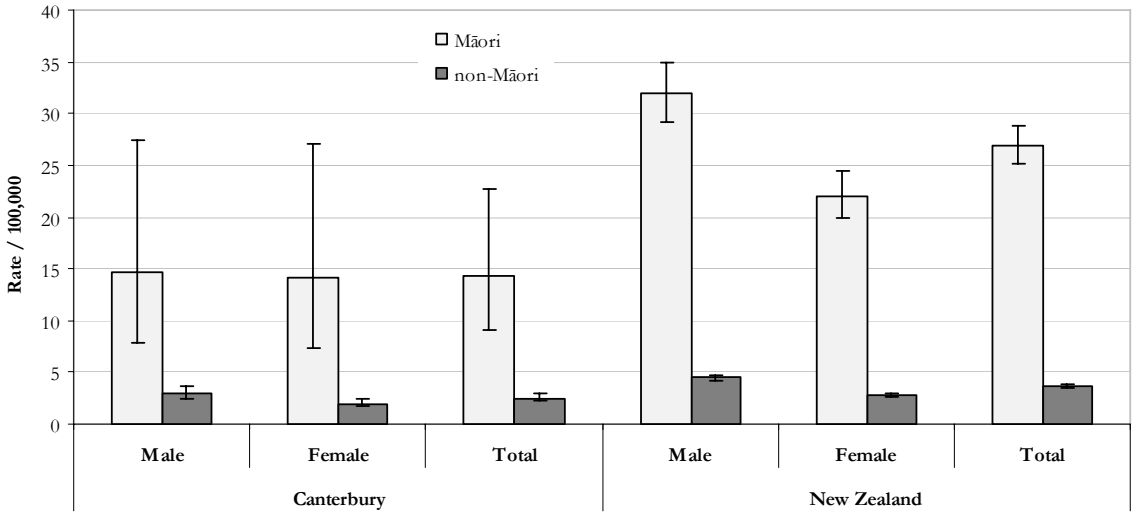
Type 2 diabetes mortality and hospitalisation

Diabetes mortality was much higher for Māori in Canterbury than non-Māori, as shown in Figure 5.21. The mortality rate was over five times higher for Māori in Canterbury (RR 5.69, 95% CI 3.55-9.14) and more so for Māori females (for whom the rate was almost seven times higher than for non-Māori, RR 6.94, 95% CI 3.50-13.75) than for males (RR 4.86, 95% CI 2.53-9.33). However, the rate of hospitalisation, shown in Figure 5.22, while higher, was not above the non-Māori rate to an extent that is proportional to mortality. That is, given their higher mortality it would be expected that Māori would have an even higher hospitalisation rate. The hospitalisation rate for Māori was two and a half times higher overall (RR 2.64, 95% CI 2.14-3.27), approaching four times higher for men (RR 3.84, 95% CI 3.00-4.89) but not significantly different from non-Māori for females (RR 1.28, 95% CI 0.81-2.00). Māori males and females had similar mortality rates, but males were over three times more likely to be hospitalised.

The rates of mortality and hospitalisation for Māori in Canterbury were significantly lower than the rates for Māori nationally, both overall (mortality: RR 0.53; hospitalisation: RR 0.53; non-overlapping 95% CIs for the rates for both), and for males (mortality: RR 0.46; hospitalisation: RR 0.71, non-overlapping 95% CIs for the rates for both) and females. The difference was not, however, significant for mortality for females

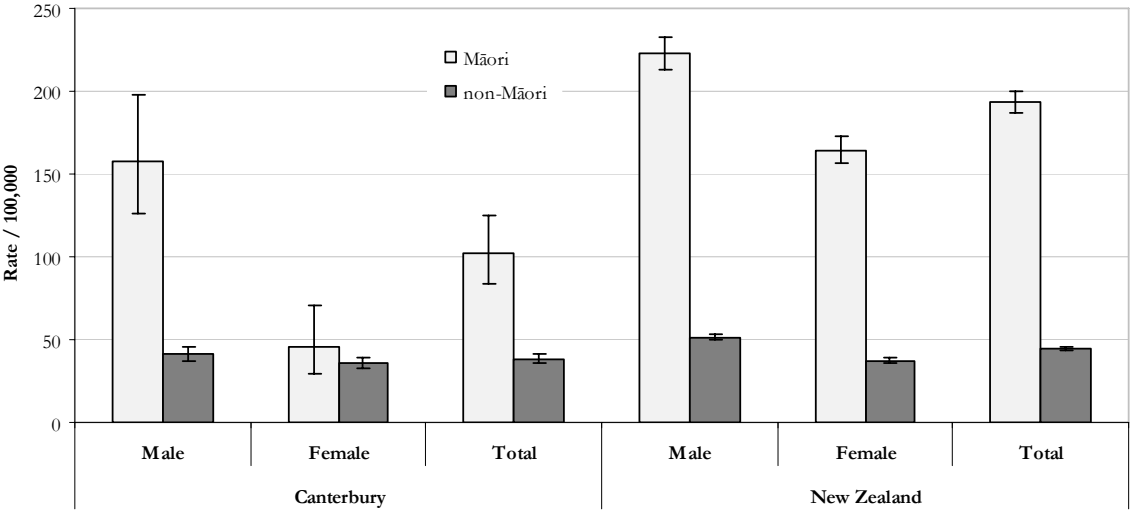
(RR 0.64, overlapping 95% CIs for the rates), although it was for hospitalisation (RR 0.28, non-overlapping 95% CIs for the rates).

Figure 5.21 Type 2 diabetes mortality, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population.

Figure 5.22 Type 2 diabetes hospitalisation, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population.

Diabetes complications

Table 5.12 presents data from 2005 to 2007 for hospitalisations for the long-term complications of diabetes in adults, in Canterbury and New Zealand. The rate of admission for renal failure due to diabetes for Māori in Canterbury was five times higher than for European/Others (RR 5.09, non-overlapping 95% CIs for the rates). The rate of admission for lower limb amputations was more than twice as high for Māori in Canterbury than for European/Others. The rate of admission for Māori in Canterbury was less than half that for Māori nationally (RR 0.47, non-overlapping 95% CIs for the rates) and nationally there was a greater difference between Māori and European/Others (RR 10.31, non-overlapping 95% CIs for the rates) than in Canterbury (RR 5.09, non-overlapping 95% CIs for the rates).

The rate of admission for lower limb (leg/foot/toe) amputations for Māori was over twice as high as that for European/Others (RR2.34, non-overlapping 95% CIs for the rates). The rate for Māori in Canterbury appeared to be about half that for Māori nationally, but this was not a significant difference (RR 0.51, overlapping 95% CIs for the rates). Nationally, there was a greater difference between Māori and European/Others (RR 4.63, non-overlapping 95% CIs for the rates) than was the case in Canterbury (RR 2.34, non-overlapping 95% CIs for the rates).

Table 5.12 Hospitalisation for long term complications of diabetes, 15+ years, Canterbury and New Zealand, 2005-07
(Source: HDIU)

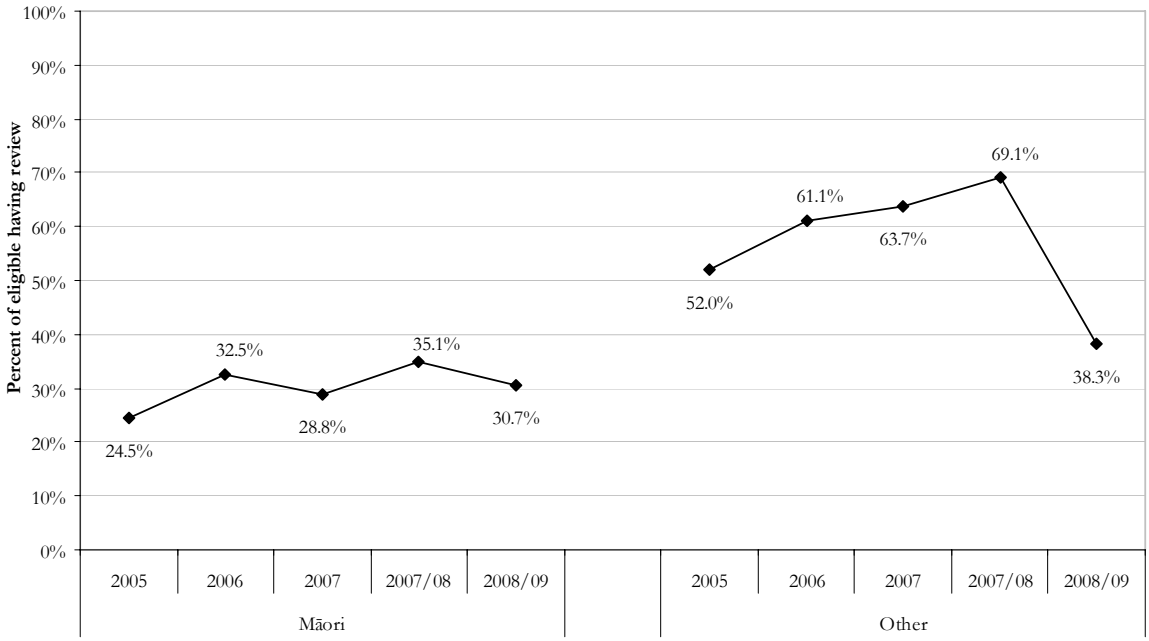
Indicator	Canterbury			New Zealand		
	Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio	Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio
Renal failure hospitalisations	46.8 (27.7 - 73.9)	9.2 (7.7 - 11.0)	5.09	99.0 (92.5 - 105.9)	9.6 (9.0 - 10.2)	10.31
Leg/foot/toe amputation hospitalisations	20.6 (9.9 - 37.9)	8.8 (7.4 - 10.5)	2.34	40.7 (36.4 - 45.3)	8.8 (8.3 - 9.4)	4.63

Note: Rates are calculated per 100,000 and are age-standardised to the WHO population

Diabetes management

Figure 5.23 presents the proportion of people who received a diabetes review out of those expected to have diabetes in the population (calculated by the Ministry of Health, based on population profile and incidence rates). The proportion of Māori expected to have diabetes who had had a review did not show major improvement from 2005 (24.5%) to 2008/09 (30.7%), and was lower than for Others (52% in 2005, 38.3% in 2008/09), although the rate for Others fell sharply in 2008/09 to be closer to the Māori rate. The national target in 2008/09 for diabetes annual reviews was not met for Māori (33% of eligible having a review) or for Others (44% of eligible having a review). The Ministry of Health definition of the expected number of diabetics was broadened in 2008/09, which may partly explain the drop-off in the proportion of eligible receiving a review in 2008/09, especially for Others.

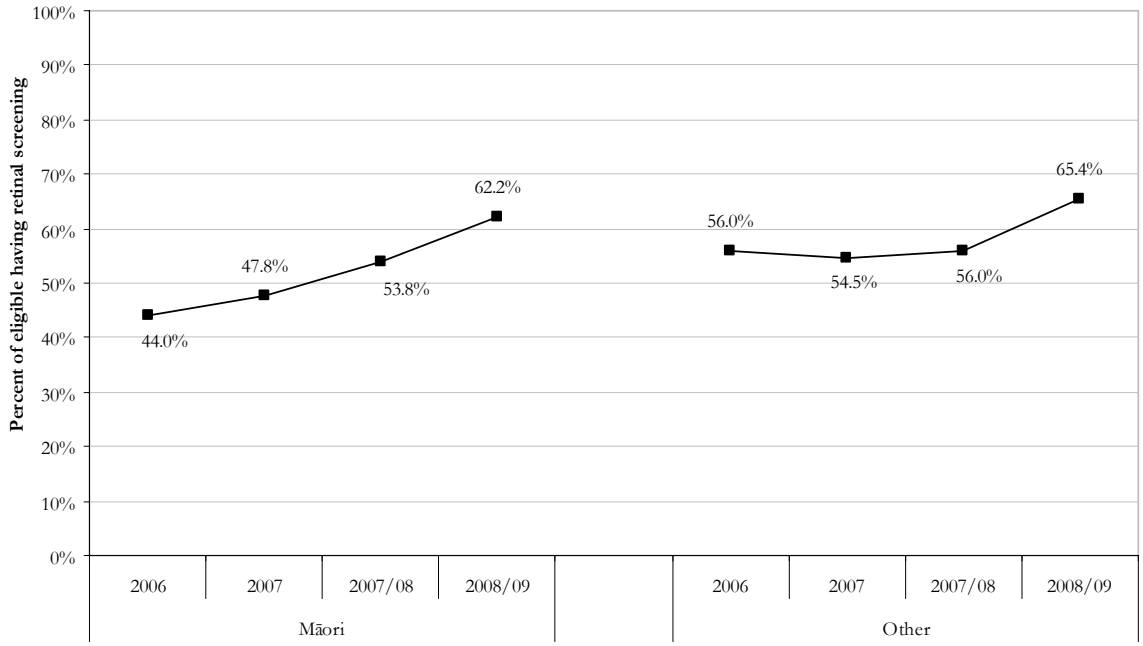
Figure 5.23 Diabetes annual reviews, all ages, 2005-2009
(Source: CDHB Local Diabetes Team/Canterbury PHOs)



Note: The period of data collection changed after 2007 and 2007/08 was a Ministry of Health estimate

Figure 5.24 presents the proportion of people having a review who then had a retinal screening examination. Both Māori and Others had increasing rates over the period 2006 to 2008/09, with Māori having a larger increase, from 44% to 62.2%, to be closer to the figure for Others which was 65.4%.

Figure 5.24 Diabetes retinal screening, all ages, 2006-2009
(Source: CDHB Local Diabetes Team/Canterbury PHOs)



Note: The period of data collection changed after 2007 and 2007/08 was a Ministry of Health estimate.

5.8 Communicable disease

Key points

- From 2000 to 2005, the rate of mortality from communicable diseases was not significantly different for Māori and non-Māori in Canterbury, but the rate of hospitalisation was lower for Māori.
- The rate of hospitalisation (from 2003 to 2005) and notification (from 2004 to 2008) for intestinal infections was lower for Māori than for non-Māori in Canterbury.

From 2004 to 2008:

- The rate of viral hepatitis hospitalisation was three times higher for Māori than for non-Māori in Canterbury.
- Notifications for invasive pneumococcal disease and tuberculosis disease were significantly higher for Māori than non-Māori in Canterbury.

In 2008/09:

- National immunisation register data indicate lower immunisation coverage for Māori in Canterbury than for non-Māori, but higher than for Māori nationally.

Infectious disease mortality and hospitalisation

Table 5.13 presents mortality (from 2000 to 2004) and hospitalisations (from 2003 to 2005) from communicable diseases for Māori and non-Māori in Canterbury and New Zealand. Mortality appeared higher for Māori than non-Māori in Canterbury, but this was not a significant difference (RR 1.79, 95% CI 0.62-5.15). There was a lower rate of hospitalisation for Māori than non-Māori in Canterbury (RR 0.77, 95% CI 0.69-0.85), whereas there was no significant difference between Māori and non-Māori nationally (RR 0.97, 95% CI 0.95-1.00). The rate of hospitalisation for Māori in Canterbury was significantly lower than for Māori nationally (RR 0.74, non-overlapping 95% CIs for the rates).

The rate of admissions for intestinal infectious disease was also lower for Māori than non-Māori in Canterbury (RR 0.59, 95% CI 0.49-0.70). This was consistent with the pattern nationally (RR 0.80, 95% CI 0.77-0.84), although the rate for Māori in Canterbury

was significantly lower than for Māori nationally (RR 0.73, non-overlapping 95% CIs for the rates). The rate of admissions for tuberculosis also appeared lower for Māori than non-Māori in Canterbury but this was not a significant difference (RR 0.77, 95% CI 0.18-3.25), with small numbers in Canterbury precluding further analysis of differences in rates.

Meningococcal infection hospitalisations appeared higher for Māori than non-Māori in Canterbury but this was not a significant difference (RR 1.51, 95% CI 0.78-2.94), whereas nationally hospitalisation for meningococcal infection was higher for Māori than non-Māori (RR1.52, 95% CI 1.31-1.77). The rate for Māori in Canterbury appeared lower but was not significantly different from that for Māori nationally (RR 0.59, overlapping 95% CIs for the rates).

The rate of admission for viral hepatitis was three times higher for Māori than non-Māori in Canterbury (RR 3.09, 95% CI 2.15-4.45). Nationally, the rate was also higher for Māori than non-Māori, but the difference was smaller (RR1.39, 95% CI 1.24-1.57). The rate for Māori in Canterbury was significantly higher than for Māori nationally (RR1.80, non-overlapping 95% CIs for the rates).

Table 5.13 Infectious disease mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Certain infectious and parasitic diseases	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	*	2.7 (1.0-7.3)	75	1.5 (1.0-2.2)	1.79 (0.62-5.15)	137	4.5 (3.8-5.3)	665	2.0 (1.8-2.3)	2.22 (1.82-2.72)
Hospitalisation Total	462	456.9 (415.6-502.4)	5,563	594.9 (575.4-615.1)	0.77 (0.69-0.85)	11,430	620.8 (607.3-634.5)	48,370	636.9 (628.4-645.6)	0.97 (0.95-1.00)
Intestinal infectious diseases	137	137.2 (115.4-163.3)	115	234.2 (221.8-247.2)	0.59 (0.49-0.70)	3,423	188.8 (181.8-196.1)	15,229	235.8 (230.6-241.2)	0.80 (0.77-0.84)
Viral hepatitis	40	37.4 (27.2-51.4)	198	12.1 (10.1-14.4)	3.09 (2.15-4.45)	393	20.8 (18.7-23.0)	1,915	14.9 (14.1-15.8)	1.39 (1.24-1.57)
Meningococcal infection	12	11.9 (6.6-21.5)	72	7.9 (5.8-10.6)	1.51 (0.78-2.94)	365	20.2 (18.1-22.4)	846	13.2 (11.9-14.7)	1.52 (1.31-1.77)
Tuberculosis	*	2.0 (0.5-7.9)	0	2.6 (1.7-3.8)	0.77 (0.18-3.25)	226	11.7 (10.2-13.4)	1,227	10.9 (10.1-11.7)	1.07 (0.92-1.25)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Notifiable communicable diseases

Crude data for notifications of communicable diseases from 2008 are presented in Table 5.14. This table allows comparison between Canterbury and New Zealand, and compares Māori and New Zealand Europeans (rather than Māori and non-Māori) because of a large proportion of Unknown ethnic group in the data (in some cases representing over 10% of the total for a disease). These data are not age-standardised and therefore do not take into account the differences in age structure between the two populations. The number of cases for many diseases is small so caution should be taken with comparisons. However, of note, these data suggest Māori may be relatively over-represented in Canterbury for tuberculosis notifications compared to non-Māori. This is inconsistent with the apparently lower (but non-significantly different) rate of hospitalisation for tuberculosis.

Māori in Canterbury appeared to be under-represented in the intestinal infection notifiable diseases such as campylobacteriosis, cryptosporidiosis, gastroenteritis, giardiasis, salmonellosis and yersiniosis. This correlates with the lower rate of admission for intestinal infection for Māori in Canterbury compared to non-Māori.

Table 5.14 Communicable disease notifications, all ages, Canterbury and New Zealand, 2008
(Source: ESR (Institute of Environmental Science and Research Limited 2009) and Episurv)

Disease	Canterbury					New Zealand				
	Māori (% of total)		NZ European (% of total)		Total	Māori (% of total)		NZ European (% of total)		Total
Campylobacteriosis	27	(4.6%)	469	(79.1%)	593	348	(5.2%)	3,570	(53.3%)	6693
Cryptosporidiosis	*	(0.9%)	97	(89.0%)	109	56	(7.3%)	589	(77.1%)	764
Gastroenteritis	3	(2.6%)	106	(90.6%)	117	32	(4.6%)	441	(63.9%)	690
Giardiasis	6	(3.2%)	145	(78.4%)	185	62	(3.7%)	861	(51.8%)	1662
Haemophilus influenzae type b	*	(100%)	-		2	6	(66.7%)	-		9
Hepatitis A	-		-		4	14	(15.4%)	33	(36.3%)	91
Hepatitis B	-		5	(71.4%)	7	4	(10.3%)	18	(46.2%)	39
Hepatitis C	*	(33.3%)	-		3	5	(21.7%)	15	(65.2%)	23
Legionellosis	*	(8.3%)	11	(91.7%)	12	3	(3.9%)	59	(77.6%)	76
Leptospirosis	-		6	(85.7%)	7	26	(21.5%)	78	(64.5%)	121
Listeriosis	-		3	(100%)	3	-		20	(74.1%)	27
Measles	*	(14.3%)	6	(85.7%)	7	-		9	(75.0%)	12
Meningococcal disease	*	(11.1%)	6	(66.7%)	9	40	(32.8%)	52	(42.6%)	122
Mumps	-		10	(76.9%)	13	16	(20.5%)	33	(42.3%)	78
Pertussis	4	(4.5%)	79	(89.8%)	88	61	(14.1%)	324	(74.8%)	433
Rheumatic fever	-		-		1	99	(65.1%)	10	(6.6%)	152
Rubella	-		-		1	-		7	(77.8%)	9
Salmonellosis	10	(5.8%)	133	(77.3%)	172	108	(8.0%)	820	(60.9%)	1346
Shigellosis	-		6	(100%)	6	4	(3.5%)	53	(46.9%)	113
Tuberculosis disease	4	(16.7%)	3	(12.5%)	24	48	(15.9%)	35	(11.6%)	302
VTEC/STEC infection	*	(10.0%)	17	(85.0%)	20	12	(9.8%)	88	(71.5%)	123
Yersiniosis	*	(2.1%)	67	(71.3%)	94	26	(5.1%)	273	(53.6%)	509

Note: * represents a number less than 3

Table 5.15 presents aggregate data for Māori and New Zealand Europeans in Canterbury for the five-year period from 2004 to 2008, which have been age-standardised. Māori are significantly over-represented in notifications for invasive pneumococcal disease and tuberculosis disease. The number of cases for several other diseases is small so caution should be taken with comparison of rates, although Māori appear to have higher rates (but not significantly so) for Haemophilus influenzae type b, hepatitis C, measles, meningococcal disease, rheumatic fever, and latent tuberculosis.

Māori are significantly under-represented in total notifications, and in notifications for campylobacteriosis, cryptosporidiosis, gastroenteritis, giardiasis, salmonellosis, yersiniosis, and pertussis. Rates for Māori were lower (but not significantly so) for VTEC/STEC (Verotoxin or Shiga toxin producing E. coli), hepatitis A and B, legionellosis, leptospirosis, and mumps, although the number of cases is small, suggesting caution is needed with interpretation of differences in rates.

The lower rates of notification for some infectious diseases may be due to a number of factors including a lower incidence of disease among Māori or undercounting of Māori due to, for example, misclassification or non-classification (i.e. classification as Unknown) of Māori. Differential presentation of Māori to health services may also be a factor – it is worth noting that diseases likely to be more severe and treated in a secondary care setting are those for which Māori are over-represented, such as invasive pneumococcal disease and tuberculosis. This may be due to better recording of ethnicity in secondary care compared to primary care, to the greater likelihood of direct involvement of Public Health Unit staff, or to greater inequality of access to primary care (where there are costs associated with treatment), compared to secondary care.

Table 5.15 Notifiable communicable diseases, all ages, Canterbury, 2004-2008
(Source: ESR, Episurv database)

Communicable notifiable diseases	Māori		NZ European		Rate ratio
	No.	Rate (95% CI)	No.	Rate (95% CI)	
Total	556	335.3 (308.0-364.4)	10,984	639.9 (626.1-654.0)	0.52
Campylobacteriosis	289	173.1 (153.7-194.3)	6,304	343.8 (334.0-353.9)	0.50
Cryptosporidiosis	17	10.3 (6.0-16.5)	400	32.0 (28.7-35.6)	0.32
Gastroenteritis	17	10.2 (5.9-16.3)	529	25.5 (22.9-28.2)	0.40
Giardiasis	23	14.2 (9.0-21.3)	575	33.7 (30.6-37.0)	0.42
Haemophilus influenzae type b	3	1.8 (0.4-5.2)	2	0.2 (0.0-0.6)	11.26
Hepatitis A	*	1.2 (0.1-4.5)	30	1.8 (1.1-2.8)	0.67
Hepatitis B	*	0.6 (0.0-3.4)	25	1.1 (0.7-1.6)	0.56
Hepatitis C	5	3.1 (1.0-7.2)	37	2.1 (1.4-2.9)	1.49
Invasive pneumococcal disease	3	1.8 (0.4-5.3)	11	0.1 (0.0-0.3)	13.50
Legionellosis	*	0.6 (0.0-3.5)	55	1.0 (0.7-1.4)	0.64
Leptospirosis	*	0.6 (0.0-3.4)	26	1.3 (0.8-1.9)	0.48
Listeriosis	-	-	4	0.0 (0.0-0.1)	-
Measles	6	3.7 (1.3-8.0)	18	2.0 (1.2-3.2)	1.80
Meningococcal disease	11	6.8 (3.4-12.2)	63	5.1 (3.8-6.6)	1.34
Mumps	*	0.5 (0.0-2.9)	27	2.3 (1.4-3.4)	0.23
Pertussis	116	70.4 (58.2-84.5)	1,775	118.2 (112.0-124.6)	0.60
Rheumatic fever	*	0.6 (0.0-3.5)	3	0.3 (0.1-0.9)	2.14
Rubella	-	-	3	0.4 (0.1-1.0)	-
Salmonellosis	32	19.4 (13.3-27.5)	647	45.1 (41.2-49.2)	0.43
Shigellosis	-	-	53	2.7 (1.9-3.7)	-
Tuberculosis - latent	5	3.0 (1.0-7.0)	16	1.2 (0.6-2.1)	2.41
Tuberculosis disease	9	5.2 (2.4-10.0)	16	0.7 (0.3-1.1)	8.03
VTEC/STEC	5	3.2 (1.0-7.4)	59	4.9 (3.6-6.4)	0.65
Yersiniosis	6	3.7 (1.3-8.1)	292	13.9 (12.0-16.1)	0.26

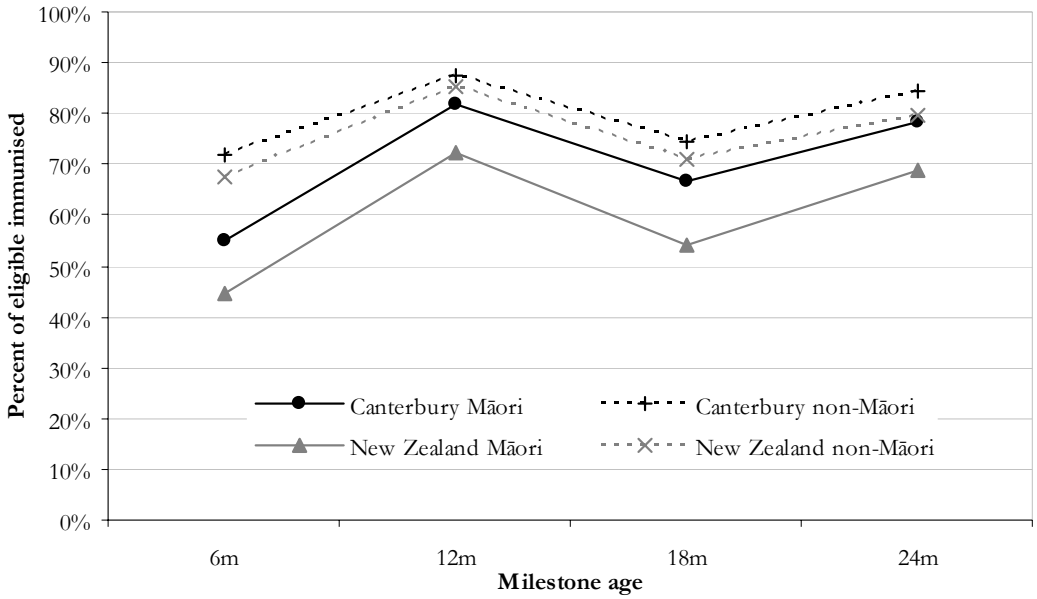
Note: Rates are calculated per 100,000 and are age-standardised to the 2001 Māori population
* represents a number less than 3

Immunisation coverage - children

Immunisation coverage is recorded by the National Immunisation Register for the milestone age groups of 6, 12, 18 and 24 months. Completed age-appropriate immunisations are reported for each child turning the milestone age in the reporting period. Figure 5.25 shows immunisation coverage for the period from April 2008 to March 2009. Māori in Canterbury had lower coverage rates for immunisation than non-Māori across all the milestone ages, particularly at 6 months, before which children

should have been immunised for diphtheria, tetanus, pertussis, polio, Haemophilus influenzae type b and hepatitis B. However, the rates for Māori in Canterbury are higher than for Māori nationally.

Figure 5.25 Immunisation coverage, at milestone ages, Canterbury and New Zealand, 2008/09
(Source: National Immunisation Register)



5.9 Mental health

Key points

- From 2005 to the beginning of 2009, the proportion of Māori in Canterbury accessing mental health services was higher than non-Māori, and increasing, but below the target set by the Mental Health Commission.

For 2000 to 2005:

- The rate of hospitalisation for mental and behavioural disorders for Māori males was higher than for non-Māori, but there was no difference in the rate for Māori females compared to non-Māori.
- The rate of hospitalisation for schizophrenia and similar disorders was twice as high for Māori than for non-Māori in Canterbury. It was also higher for Māori for manic episodes and bipolar disorder and psychoactive substance use, but lower for Māori for personality and behavioural disorders.
- The rate of hospitalisation for Māori for schizophrenia was lower in Canterbury than nationally, but higher for depression.
- In hospitalisations for disorders due to psychoactive substance use the rate for Māori in Canterbury was higher than for non-Māori for use of cannabinoids and opioids. The rate of hospitalisation for Māori in Canterbury was much higher than for Māori nationally.
- The mortality rate from suicide was not significantly different for Māori and non-Māori in Canterbury.

Māori have been shown in Te Rau Hinengaro: The New Zealand Mental Health Survey (Oakley Browne, Wells et al. 2006) to have a relatively high prevalence of mental health disorders, with 50.7% of Māori in New Zealand having met criteria for a DSM-IV[12] mental disorder in their life (compared to 39.5% for non-Māori/non-Pacific) and 29.5% in the last 12 months (20.7% for non-Māori/non-Pacific). The prevalence of mental disorder within the last 12 months did not vary significantly according to region, and for Māori in the South Island the 12 month prevalence was 32.3%. The rates did, however,

[12] Diagnostic and Statistical Manual IV, published by the American Psychiatric Association, providing diagnostic criteria for mental disorders.

vary according to socioeconomic status with higher prevalence in Māori living in areas with the two most deprived NZDep[13] scores (32.5%) compared to those living in areas with the two least deprived NZDep scores (14.1%). As shown in section 3.1 Socioeconomic determinants of health, Māori in Canterbury have a different socioeconomic profile from Māori in New Zealand, so it cannot be assumed that the rates of mental disorder will necessarily be similar between Canterbury and New Zealand[14].

Access to services

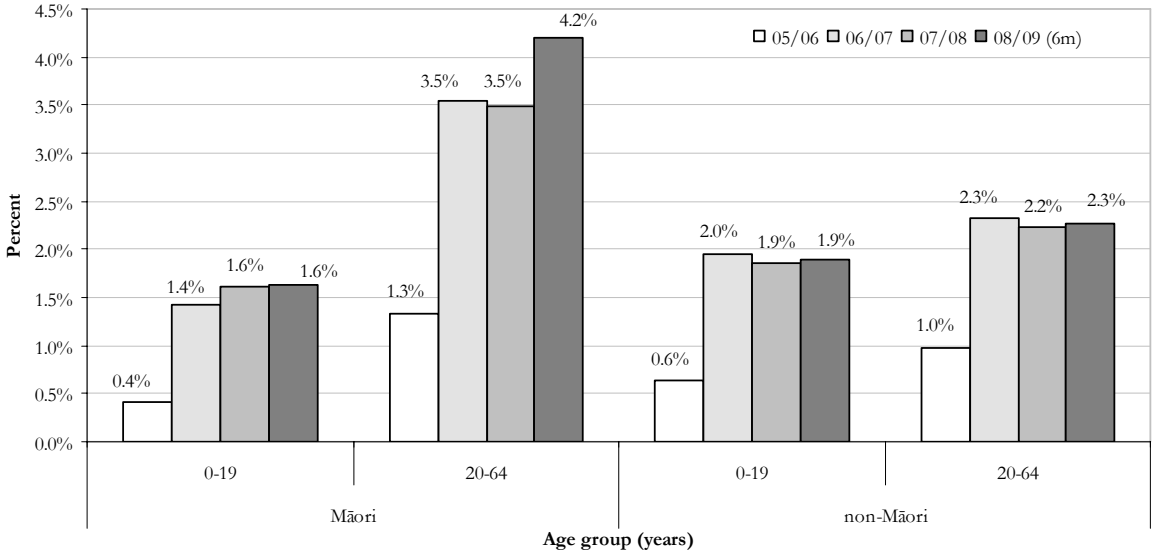
Figure 5.26 presents the proportion of people accessing secondary mental health treatment and support services in Canterbury from 2005 to 2009, for Māori and non-Māori. The proportion of Māori aged 20 to 64 years accessing services increased over the period to 4.2% in the first six months of the 2008/09 year, but still remained below the 6% access target set by the Mental Health Commission in its Blueprint for Mental Health Services in New Zealand (Mental Health Commission 1998). This compares to 2.3% for non-Māori, which was proportionately closer to the 3% target set for the total population.

The level of access for Māori nationally was 2.0% in the first six months of 2006 (Mental Health Commission 2007). In the 2005/06 year in Canterbury the corresponding figure was 1.3%, but the following year it was 3.5%, as shown in Figure 5.26, making comparison uncertain.

[13] NZDep2001 was used in Te Rau Hinengaro, which was based on the 2001 Census, whereas NZDep2006 has been used for this profile.

[14] For the reasons outlined in the Introduction this profile has not drawn Canterbury data from Te Rau Hinengaro: The New Zealand Mental Health Survey.

Figure 5.26 Utilisation of mental health treatment and support services, by age group, Canterbury, 2005-2009
(Source: Planning and Funding, CDHB)



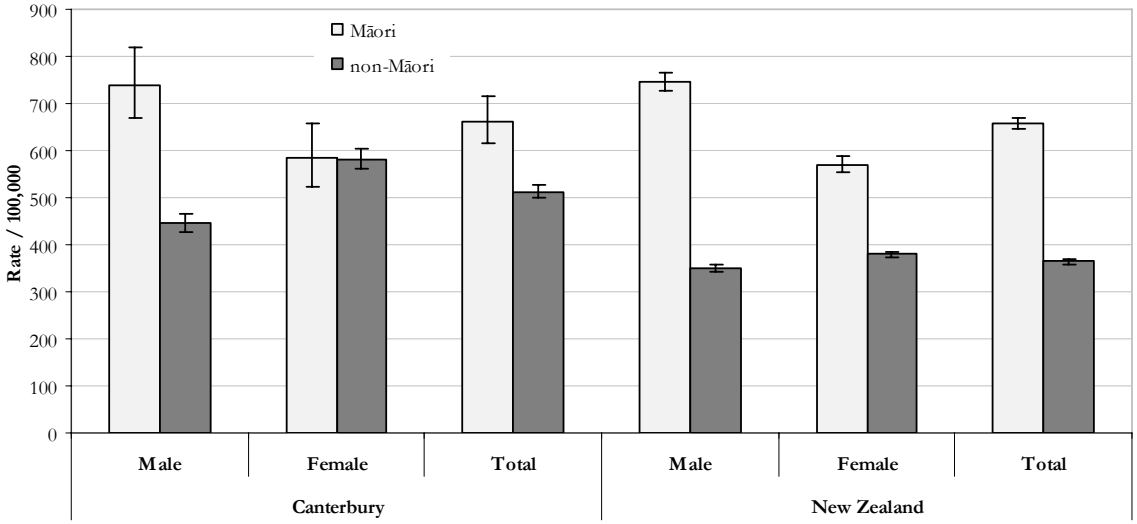
Mental health hospitalisations

Figure 5.27 presents data about hospitalisation for mental and behavioural disorders for Māori and non-Māori in Canterbury and New Zealand from 2003 to 2005 (the data presented in this figure are also summarised in Table 8.19 in Appendix 3 Health status tables).

Māori men in Canterbury were hospitalised for mental health problems more frequently than non-Māori men (RR 1.67, 95% CI 1.49-1.86), whereas Māori and non-Māori women in Canterbury had similar hospitalisation rates (RR 1.01, 95% CI 0.89-1.14). Overall, the rate ratio between Māori and non-Māori in Canterbury for hospitalisations for mental health problems was 1.29 (95% CI 1.19-1.40). Māori men in Canterbury had significantly higher mental hospitalisation rates than Māori women (RR 1.26, non-overlapping 95% CIs for the rates), which was in contrast to the pattern for non-Māori men and women (RR 0.76, non-overlapping 95% CIs for the rates). The rate of hospitalisation for mental and behavioural disorders for Māori men in Canterbury was similar to that for Māori men nationally (RR 0.99, overlapping 95% CIs for the rates). The difference between the rates for Māori and non-Māori men was less in Canterbury (RR 1.67, 95% CI 1.49-1.86) than nationally (RR 2.14, 95% CI 2.07-2.21). Māori women in Canterbury had similar hospitalisation rates to Māori women nationally (RR 1.03, overlapping 95% CIs for the rates), but the higher rate of hospitalisation for Māori

women compared to non-Māori seen nationally (RR 1.51, 95% CI 1.46-1.56) was not seen in Canterbury, where female Māori and non-Māori hospitalisation rates were not significantly different (RR 1.01, 95% CI 0.89-1.14).

Figure 5.27 Hospitalisation for mental and behavioural disorders, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)



Note: Rates are calculated per 100,000. Sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population.

As shown in Table 5.16, rates of hospitalisation for Māori were higher than those for non-Māori for all mental and behavioural disorder causes apart from personality disorders and depressive disorders. The hospitalisation rate for Māori for personality disorders was significantly lower than for non-Māori (RR 0.36, 95% CI 0.23-0.55). Although the rate appeared also to be lower for depressive disorders, this was not a significant difference (RR 0.82, 5% CI 0.66-1.03). Numbers were too small to present the rates of hospitalisation for eating disorders.

The greatest differences between Māori and non-Māori in Canterbury for the rates of hospitalisation for mental and behavioural disorders were for schizophrenia and bipolar disorder, mirroring the situation seen nationally. Canterbury Māori were more than twice as likely as non-Māori to be hospitalised for 'Schizophrenia, schizotypal and delusional disorders' (RR 2.15, 95% CI 1.84-2.51) and over 80% more likely to be hospitalised for bipolar disorder (RR 1.82, 95% CI 1.50-2.21). Māori in Canterbury were also 66% more likely to be hospitalised for organic disorders, (RR 1.66 95% CI 1.17-2.36) although this was less often for dementia than other organic causes, and 46% more likely (RR1.46,

95% CI 1.21-1.75) to be admitted for disorders related to psychoactive substance use (see next section).

Māori in Canterbury were significantly less likely than Māori nationally to be hospitalised for schizophrenia (RR 0.61, non-overlapping 95% CIs for the rates), but significantly more likely to be admitted for disorders associated with substance use (RR 1.83, non-overlapping 95% CIs for the rates) and depressive disorders (RR1.74, non-overlapping 95% CIs for the rates). Nationally, the disparities between rates for Māori and non-Māori of schizophrenia (RR 3.51, 95% CI 3.37-3.66) and bipolar disorder (RR 2.41, 95% CI 2.27-2.56) were significantly larger than those in Canterbury (schizophrenia: RR 2.15, 95% CI 1.84-2.51; bipolar disorder: RR 1.82, 95% CI 1.50-2.21).

Table 5.16 Mental and behavioural disorder hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Mental health and behavioural disorder hospitalisations	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Schizophrenia, schizotypal and delusional disorders	209	194.7 (169.4-223.9)	1,318	90.6 (84.6-97.0)	2.15 (1.84-2.51)	5,924	319.6 (311.1-328.2)	10,717	91.0 (88.2-94.0)	3.51 (3.37-3.66)
Disorders due to psychoactive substance use	135	128.3 (107.9-152.5)	1,290	88.1 (82.4-94.2)	1.46 (1.21-1.75)	1,309	70.2 (66.3-74.2)	6,318	55.0 (53.2-56.9)	1.28 (1.20-1.36)
Manic episode and bipolar affective disorder	126	120.4 (100.6-144.1)	1,174	66.2 (61.6-71.2)	1.82 (1.50-2.21)	1,996	103.5 (98.9-108.3)	5,940	42.9 (41.3-44.6)	2.41 (2.27-2.56)
Depressive episode and persistent mood disorders	90	84.9 (68.7-104.9)	1,836	103.0 (97.2-109.2)	0.82 (0.66-1.03)	933	48.9 (45.7-52.2)	9,020	61.9 (60.2-63.6)	0.79 (0.73-0.85)
Organic disorder	37	35.0 (25.1-48.8)	986	21.1 (18.8-23.6)	1.66 (1.17-2.36)	532	26.9 (24.6-29.4)	7,022	19.2 (18.4-20.1)	1.40 (1.27-1.55)
Disorders of adult personality and behaviour	22	20.4 (13.3-31.4)	720	57.1 (52.8-61.7)	0.36 (0.23-0.55)	262	13.9 (12.2-15.7)	2,343	21.8 (20.8-22.9)	0.64 (0.56-0.73)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Alcohol and drug use hospitalisations

Patterns of alcohol use differ between Māori and non-Māori (Bramley, Broad et al. 2003). Alcohol has harmful effects on health and these are known to disproportionately affect Māori (Alcohol Advisory Council of New Zealand 2005). Use of other drugs also has harmful health effects, and Māori are known to be significantly more likely to use several types of recreational drugs (Ministry of Health 2007).

Mental health hospitalisations due to alcohol and drug use are presented in Table 5.17. These do not include hospitalisations for other harm caused or contributed to by alcohol and drug use. The rate of hospitalisations will only reflect the risks related to alcohol and drug use at the most severe end of the spectrum, with only a proportion of those with substance use disorders making contact with treatment services (Wells, Baxter et al. 2007), and fewer again requiring hospitalisation. Differences in rates between groups may be due to factors other than differences in alcohol and other drug use, for example, differential management such as a lower or higher threshold for admission. Table 5.17 shows similar rates of hospitalisation due to alcohol use from 2003 to 2005 for Māori and non-Māori in Canterbury, but a significantly higher rate of hospitalisation due to canabinoid use and opioid use in Māori. The rate of hospitalisation in Canterbury exceeded that for New Zealand for Māori and non-Māori, especially hospitalisations due to opioid use (RR 9.45, non-overlapping 95% CIs for the rates). This is likely to have been partly due to different admission practices in Canterbury and nationally, rather than solely representing differences in prevalence of substance use.

Table 5.17 Disorders due to psychoactive substance use, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Alcohol and drug use hospitalisations	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Alcohol	67	63.6 (49.7-81.3)	950	61.5 (56.9-66.5)	1.03 (0.80-1.34)	654	34.5 (31.9-37.4)	4,887	40.6 (39.2-42.2)	0.85 (0.78-0.93)
Opioids	32	31.2 (21.9-44.4)	218	17.3 (14.8-20.1)	1.81 (1.23-2.65)	62	3.3 (2.6-4.3)	438	4.3 (3.8-4.8)	0.77 (0.59-1.02)
Cannabinoids	14	12.6 (7.3-21.7)	33	2.8 (1.7-4.5)	4.51 (2.18-9.32)	128	6.9 (5.8-8.3)	211	2.3 (1.8-2.8)	3.07 (2.34-4.04)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population.

Suicide mortality

Table 5.18 presents the number and rate of suicides from 2000 to 2004 in Canterbury and New Zealand. The rates of death from suicide in Māori and non-Māori in Canterbury were not significantly different, whereas there was a statistically significant difference at the national level, which has also been found in other national data (Ministry of Health 2006). Suicide was more common among males for Māori in Canterbury (male:female ratio of 4.5:1). This was also the case for Māori in New Zealand and non-Māori in Canterbury and New Zealand (Baxter 2007).

Table 5.18 Deaths from suicide, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Suicide	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	22	12.7 (8.4-19.3)	295	11.4 (10.1-12.9)	1.11 (0.72-1.72)	437	14.8 (13.5-16.2)	2,004	10 (9.5-10.4)	1.49 (1.34-1.65)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

5.10 Injury

Key points

- From 2000 to 2004, the mortality rate for deaths from external causes (injuries and poisoning) was higher for Māori in Canterbury than for non-Māori. Within this category the mortality rates for deaths due to drowning, fires, and accidental poisoning were significantly higher for Māori in Canterbury than non-Māori.
- From 2001 to 2007, the non-age-standardised rate of hospitalisation for injuries was lower for Māori in Canterbury than non-Māori and lower than for Māori nationally.

Injury mortality

Māori have been shown to suffer disproportionately from mortality due to injury (Blakely, Tobias et al. 2007). From 2000 to 2004, Māori rates for external causes[15] of mortality were significantly higher (60%) than non-Māori in Canterbury, as shown in Table 5.19. The rate of transport accidents (most of which are motor vehicle related) appeared higher in Māori, but was not significantly different from the rate for non-Māori. The rate for other causes of accidental injury was significantly higher (RR 2.73, 95% CI 1.79-4.15) for Māori than non-Māori. The number of deaths was small for several other causes of death from injury, so caution should be taken with comparison of rates. However, among 'Other causes of accidental injury', fire (RR 7.58, 95% CI 2.26-25.43), poisoning (RR 3.78, 95% CI 1.39-10.29), and drowning (RR 3.15, 95% CI 1.10-9.06) as causes of death were significantly more common among Māori than non-Māori in Canterbury.

Rates of death from injuries for Māori in Canterbury did not vary significantly from those for Māori nationally, although transport accidents appeared to be less frequent as a cause of death, and fires and poisoning more frequent.

[15] External causes are the category of casues of medical conditions that are associated with an object or process outside the body.

Table 5.19 External causes of mortality, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

External causes	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
External causes	76	45.5 (36.3-57.1)	826	28.3 (26.1-30.7)	1.61 (1.26-2.04)	1,616	54.4 (51.8-57.1)	6,865	29.6 (28.8-30.5)	1.83 (1.73-1.94)
Transport accidents	24	14.0 (9.4-20.9)	229	9.7 (8.4-11.2)	1.44 (0.94-2.21)	642	21.5 (19.9-23.3)	2,166	11.4 (10.9-12.0)	1.89 (1.72-2.06)
Other causes of accidental injury	27	16.7 (11.5-24.5)	273	6.1 (5.1-7.3)	2.73 (1.79-4.15)	388	13 (11.8-14.4)	2,355	6.4 (6.0-6.8)	2.04 (1.81-2.29)
Falls	4	2.3 (0.9-6.3)	167	1.8 (1.5-2.3)	1.28 (0.47-3.51)	82	2.7 (2.2-3.4)	1453	2 (1.8-2.1)	1.38 (1.10-1.75)
Exposure to mechanical forces	3	2.0 (0.6-6.4)	17	0.7 (0.4-1.2)	2.78 (0.79-9.83)	46	1.5 (1.1-2.0)	135	0.6 (0.5-0.8)	2.44 (1.72-3.46)
Drowning	5	3.0 (1.3-7.3)	16	1.0 (0.5-1.7)	3.15 (1.10-9.06)	83	2.8 (2.3-3.5)	215	1.3 (1.1-1.5)	2.15 (1.65-2.79)
Accidental threats to breathing	4	2.5 (0.9-6.6)	18	0.9 (0.5-1.7)	2.68 (0.86-8.37)	56	1.9 (1.5-2.5)	127	0.8 (0.6-1.0)	2.48 (1.76-3.49)
Fires	4	2.6 (1.0-6.9)	11	0.3 (0.2-0.7)	7.58 (2.26-25.43)	40	1.4 (1.0-1.9)	74	0.4 (0.3-0.5)	3.87 (2.52-5.96)
Accidental poisoning	5	3.0 (1.2-7.2)	18	0.8 (0.5-1.3)	3.78 (1.39-10.29)	56	1.9 (1.4-2.4)	142	0.8 (0.7-0.9)	2.4 (1.74-3.29)
Homicide	*	1.4 (0.3-5.7)	15	0.6 (0.3-1.0)	2.33 (0.52-10.54)	109	3.6 (3.0-4.4)	175	1 (0.9-1.2)	3.52 (2.74-4.52)

Note: Rates are calculated per 100,000 and are age-standardised to the 2001 Māori population
* represents a number less than 3

Injury morbidity

Table 5.20 presents the number and rates of hospitalisation, by mechanism of injury, for Canterbury and New Zealand aggregated for the period from 2001 to 2007. The rates are calculated using the average of counts in the 2001 and 2006 Censuses as the denominator, and are not adjusted or standardised. The rate of hospitalised injury for Māori was lower than that for non-Māori, with a rate ratio of 0.73 (non-overlapping 95% CIs for the rates). The rates were higher (with a statistically significant difference because the 95% CIs of the rates did not overlap) for Māori for the following mechanisms of injury: firearm (RR 2.80), struck by or against (RR 1.24), and unspecified (RR 1.42). The rates were significantly lower (with non-overlapping 95% CIs for the rates) for the following mechanisms of injury: falls (RR 0.46), other land transport (trains and others) (RR 0.38), overexertion (RR 0.62), and poisoning (RR 0.81).

Canterbury Māori had significantly lower rates than Māori nationally for the following mechanisms of injury: cut/pierce (RR 0.53), falls (RR 0.61), fire/hot object or substance (RR 0.42), motor vehicle traffic (RR 0.55), natural/environmental (RR 0.70), other land transport (RR 0.44), other specified (RR 0.70), pedal cyclist (RR 0.65), and struck by or against (RR 0.60). The rates of injuries caused by firearms and other transport were higher for Māori in Canterbury than nationally, but not significantly so. The rate of injury overall (all types of injury) was significantly lower for Māori in Canterbury than nationally (RR 0.64, non-overlapping 95% CIs for the rates).

Nationally, Māori had a higher rate of injury overall (all types of injury) than non-Māori (RR 1.20, non-overlapping 95% CIs for the rates). Māori nationally had a higher rate of injury than non-Māori and the disparity in rates between Māori and non-Māori was larger at the national level than it was in Canterbury for all of the following mechanisms: cut/pierce, fire/hot object or substance, machinery, motor vehicle traffic, natural/environmental, other specified, pedal cyclist, pedestrian, poisoning, struck by or against and suffocation.

Because these injury morbidity data are not age-standardised, several of the differences described may be at least partly explained by the different age structure of the Māori and non-Māori populations. For example, as falls are common in the elderly (Coggan, Hooper et al. 2002), this may explain why the rate of hospitalisation for falls was much lower in the more youthful Māori population.

Table 5.20 Injury morbidity, all ages, Canterbury and New Zealand, 2001-2007
(Source: Injury Prevention Research Unit)

Mechanism of injury	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio	Māori		non-Māori		Rate ratio
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Adverse Effects	11	32.4 (17.9-58.4)	241	53.0 (46.7-60.1)	0.61	210	34.7 (30.3-39.7)	1,771	46.6 (44.5-48.9)	0.74
Cut/Pierce	180	529.4 (457.5-612.7)	2,026	445.5 (426.5-465.3)	1.19	6,024	995.5 (970.7-1,201.0)	19,050	501.7 (494.7-508.9)	1.98
Drowning	*	-	31	6.8 (4.8-9.7)	-	118	19.5 (16.3-23.4)	360	9.5 (8.6-10.5)	2.06
Fall	485	1,426.5 (1,305.0-1,559.2)	13,958	3,069.3 (3,018.8-3120.7)	0.46	14,230	2,351.7 (2,313.4-2,390.6)	109,169	2,875.2 (2,858.2-2,892.3)	0.82
Fire/Hot object or substance	31	91.2 (64.1-129.6)	417	91.7 (83.3-100.9)	0.99	1,300	214.8 (203.5-226.8)	3,620	95.3 (92.3-98.5)	2.25
Firearm	9	26.5 (13.8-50.9)	43	9.5 (7.0-12.7)	2.80	122	20.2 (16.9-24.1)	355	9.3 (8.4-10.4)	2.16
Machinery	40	117.6 (86.3-160.4)	700	153.9 (142.9-165.8)	0.76	937	154.9 (145.2-165.1)	5,149	135.6 (132.0-139.4)	1.14
Motor Vehicle Traffic	173	508.8 (438.4-590.6)	2,717	597.5 (575.4-620.4)	0.85	5,569	920.3 (896.5-944.8)	23,359	615.2 (607.4-623.2)	1.50
Natural/Environmental	49	144.1 (108.9-190.7)	678	149.1 (138.3-160.7)	0.97	1,254	207.2 (196.1-219.0)	5,701	150.1 (146.3-154.1)	1.38
Other Land Transport	33	97.1 (69.0-136.5)	1,149	252.7 (238.5-267.7)	0.38	1,350	223.1 (211.5-235.3)	10,488	276.2 (271.0-281.6)	0.81
Other Specified	109	320.6 (265.7-386.8)	1,238	272.2 (257.5-287.8)	1.18	2,777	458.9 (442.2-476.3)	10,555	278.0 (272.7-283.3)	1.65
Other Transport	13	38.2 (22.2-65.8)	140	30.8 (26.1-36.3)	1.24	163	26.9 (23.1-31.4)	1,614	42.5 (40.5-44.6)	0.63
Overexertion	85	250.0 (202.1-309.2)	1,823	400.9 (382.9-419.7)	0.62	1,527	252.4 (240.0-265.3)	10,263	270.3 (265.1-275.6)	0.93
Pedal Cyclist	41	120.6 (88.8-163.8)	791	173.9 (162..2-186.5)	0.69	1,126	186.1 (175.5-197.3)	6,026	158.7 (154.8-162.8)	1.17
Pedestrian	9	26.5 (13.8-50.9)	129	28.4 (23.9-33.7)	0.93	300	49.6 (44.3-55.5)	1,047	27.6 (26.0-29.3)	1.80
Poisoning	203	597.1 (520.3-685.1)	3,358	738.4 (713.9-763.8)	0.81	3,889	642.7 (622.8-663.2)	21,021	553.6 (546.2-561.2)	1.16
Struck by or against	219	644.1 (564.2-735.3)	2,368	520.7 (500.2-542.1)	1.24	6,514	1,076.5 (1,050.7-1,103.0)	19,666	517.9 (510.8-525.2)	2.08
Suffocation	11	32.4 (17.9-58.4)	122	26.8 (22.5-32.0)	1.21	244	40.3 (35.6-45.7)	900	23.7 (22.2-25.3)	1.70
Unspecified	68	200.0 (157.7-253.7)	647	142.3 (131.7-153.7)	1.41	1,391	229.9 (218.1-242.3)	5,918	155.9 (151.9-159.9)	1.47
Total	1,770	5,205.9 (4,968.9-5,454.1)	32,576	7,163.4 (7,086.0-7,241.6)	0.73	49,045	8,105.3 (8,033.9-8,177.3)	256,032	6,743.2 (6,717.1-6769.4)	1.20

Note: Rates are calculated per 100,000 but are not age or sex standardised. Readmissions and admissions for which the length of stay was less than one day have been excluded.
* represents a number less than 3

5.11 Oral health

Key points

From 1996 to 2008:

- Māori children in Canterbury had worse oral health status than non-Māori in Canterbury, and worse oral health status than Māori living in fluoridated areas of New Zealand.
- Māori children in Canterbury had better oral health status than Māori living in other non-fluoridated areas nationally.

From 2003 to 2008:

- The rates of hospitalisation for forceps extraction of teeth (all ages) and general anaesthesia for dental procedures on children were higher for Māori in Canterbury than non-Māori.

Oral health status in children

Table 5.21 presents data on oral health in Canterbury and fluoridated and non-fluoridated areas in New Zealand, reported by the School Dental Service, for 2007. Canterbury is almost completely non-fluoridated, with only Methven and Burnham Military Camp having fluoridated water supplies, and therefore data are not given for fluoridated areas of Canterbury (Ashburton also had a fluoridated water supply in the past, but this was stopped in 2002).

The mean dmft score[16] and proportion of children who did not have caries (tooth decay) for five year olds and Year 8 students (11 to 12 year olds) show that Māori children in Canterbury had higher rates of decayed, missing or filled teeth and around half the rate of being decay-free of non-Māori. The mean dmft scores and percent caries-free for Māori children in Canterbury fell between the rates for Māori in New Zealand in fluoridated and non-fluoridated areas. This suggests that while Māori children in Canterbury had healthier teeth than Māori living in similarly non-fluoridated areas of New Zealand, there would be potential to improve their oral health further if they had access to fluoridated water supplies.

[16] dmft is a score derived from the number of decayed, missing, or filled deciduous teeth

Table 5.21 Oral health status, 5 years and 11-12 years (Year 8), Canterbury and New Zealand, 2007
(Source: Ministry of Health, School Dental Service)

Indicator		Canterbury		New Zealand			
				Fluoridated		Non-fluoridated	
		Māori	non-Māori	Māori	non-Māori	Māori	non-Māori
5 years old	Mean dmft *	3.51	1.67	3.05	1.68	4.23	1.99
	Percent caries-free (dmft = 0)	35.6%	60.5%	35.1%	58.7%	22.8%	57.8%
Year 8	Mean DMFT *	2.41	1.49	1.93	1.14	2.63	1.55
	Percent caries-free (dmft = 0)	29.4%	60.5%	35.1%	55.3%	27.0%	44.8%

* dmft is a score derived from the number of decayed, missing, or filled deciduous teeth; DMFT is a score derived from decayed, missing, or filled permanent teeth

Table 5.22 presents data regarding levels of severe tooth decay in Canterbury collected by the School Dental Service for 2008. Both measures of severe early tooth decay indicate that Māori in Canterbury were more than twice as likely to suffer from severe tooth decay from a young age. The age of onset of this pattern of decay is usually under three years old. Severe early tooth decay is associated with lack of access to fluoridated water, less use of fluoride toothpaste, and consumption of sugary foods, in particular sweet drinks.

Table 5.22 Severe early childhood dental decay, 5 years, Canterbury, 2008
(Source: CDHB School Dental Health Service)

Indicator	Māori	non-Māori
Percent with S-ECC *	15.0%	6.9%
Percent with dmft ≥ 6 **	23.5%	9.4%

* S-ECC (severe early childhood caries) is a marker of early and aggressive tooth decay and is defined here by having at least one deciduous maxillary incisor affected by decay
** dmft ≥ 6 at age 5 is the current American Academy of Pediatrics definition for S-ECC

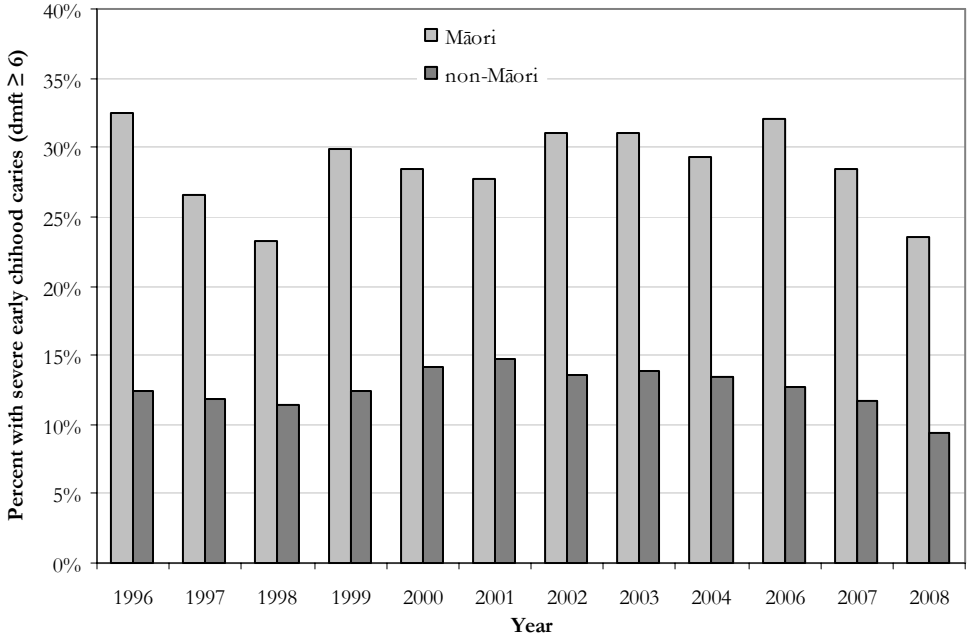
Māori nationally are more likely to live in rural areas without reticulated water supplies where fluoride is less likely to be available, making access to other forms of fluoride important (Koopu and Keefe-Ormsby 2007). In Canterbury, Māori are more urban, with only 11.7% of the Māori population living in rural areas[17] compared to 14.9% of non-Māori.

Figure 5.28 shows the rates of severe early childhood caries (measured by a dmft score greater than six) over time from 1996 to 2008, indicating that there is a consistent disparity between Māori and non-Māori in Canterbury. The rates for both Māori and

[17] This is based on Statistics New Zealand's 2006 Urban Area descriptor - a Census Area Unit with no town / city in it is defined as rural.

non-Māori appear to have been improving recently, after having shown some improvement in the late 1990s and deterioration again after 1998.

Figure 5.28 Severe early childhood caries, 5 years, Canterbury, 1996-2008
(Source: CDHB School Dental Health Service)



Note: There were no data available for 2005

Hospitalisation and treatment for dental disease

Māori and non-Māori of all ages in Canterbury were equally likely to be admitted to hospital for disorders of the teeth and gums, but it was more likely for hospital treatment for Māori to involve forceps extraction of teeth, as shown in Table 5.23.

Table 5.23 Hospitalisation for disorders of the teeth and gums, and hospital procedures for dental disease, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Disorders of teeth and gums	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Hospitalisation	155	155.9 (132.4-183.5)	1,216	167.4 (156.6-178.9)	0.93 (0.78-1.11)	7,215	400.7 (390.3-411.4)	18,090	281.5 (275.2-288.0)	1.42 (1.37-1.47)
Forceps extraction of tooth	510	515.6 (470.9-564.7)	3,041	432 (413.5-451.3)	1.19 (1.08-1.32)	136,70	759.1 (743.5-775.1)	26,550	427.9 (419.3-436.7)	1.77 (1.72-1.83)
Surgical removal of tooth	56	51 (39.0-66.9)	463	41.9 (37.5-46.8)	1.22 (0.91-1.63)	1,729	93.5 (89.0-98.1)	7,229	82.8 (80.2-85.5)	1.13 (1.06-1.20)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Table 5.24 presents the number of children under ten in Canterbury who had dental treatment under anaesthesia from 2006 to 2008, and the age-standardised rate of such treatment. This shows that Māori children were more likely to have a general anaesthetic for management of dental problems (RR 1.22, non-overlapping 95% CIs for the rates).

Table 5.24 Dental treatment under general anaesthesia, 0-9 years, Canterbury, 2006-2008
(Source: CDHB Hospital Dental Service)

	Māori		non-Māori		Rate ratio
	No.	Rate (95% CI)	No.	Rate (95% CI)	
Dental treatment under anaesthesia	240	253.0 (222.9-287.1)	1,266	207.1 (196.0-218.9)	1.22

Note: Rates are calculated per 100,000 and are age-standardised to the 2001 Māori population

Table 5.25 presents the type of treatment done under general anaesthetic to children under 14 years old. More Māori children having treatment under anaesthesia had extractions, fillings, and root canal treatment than non-Māori, who were more often having preventative treatment. This may indicate that Māori children were more likely to be having a general anaesthetic because of severe disease rather than for the other main indication, which is anxiety, or other reasons to manage dental problems under general anaesthetic.

Table 5.25 Treatment done under general anaesthesia, 0-13 years, Canterbury, 2006-2008
(Source: CDHB Hospital Dental Service)

Indicator	Māori	(% for ethnic group)	non-Māori	(% for ethnic group)
Extraction	108	(43.4%)	523	(39.4%)
Filling	118	(47.4%)	619	(46.6%)
Prevention *	16	(6.4%)	155	(11.7%)
Root canal	7	(2.8%)	32	(2.4%)
Total	249		1329	

* Prevention includes fissure sealants and topical application of fluoride

5.12 Tamariki / Child and Rangatahi / Youth health

Key points

From 1996 to 2007:

- Māori in Canterbury had higher rates of preterm birth than European/Others.

From 2003 to 2005:

- Although the differences were not statistically significant, Māori appeared to have a higher rate of low birthweight and a higher infant mortality rate than European/Others.

From 2005 to 2008:

- Rates of breastfeeding were lower for Māori than for European/Others. There was little or no improvement in breastfeeding rates for Māori in Canterbury across the six-week, three-month and six-month age groups, and those rates fell below national targets.

Collectively, these data may suggest a relationship between higher risk (preterm birth and low birth weight) and lower protective (breastfeeding) factors for infants, and worse outcomes in terms of infant mortality.

From 1996 to 2007:

- Māori children and young people in Canterbury had lower rates of admission for upper respiratory tract infection, tonsillectomy, and gastroenteritis than Europeans.
- Māori infants had a higher rate of admission for bronchiolitis than Europeans.
- The rate of admission for Māori children and young people compared to Europeans was slightly higher for pneumonia and substantially higher for asthma, particularly later in the period; the rates of admission for Māori and European children and young people for severe skin infections did not differ.

From 2003 to 2007:

- There was a higher audiometry failure rate for Māori children than Others in Canterbury, and the rate for Māori worsened over the period.

From 2000 to 2007:

- The rate of admission for grommets insertion was higher for Māori than European children in Canterbury.

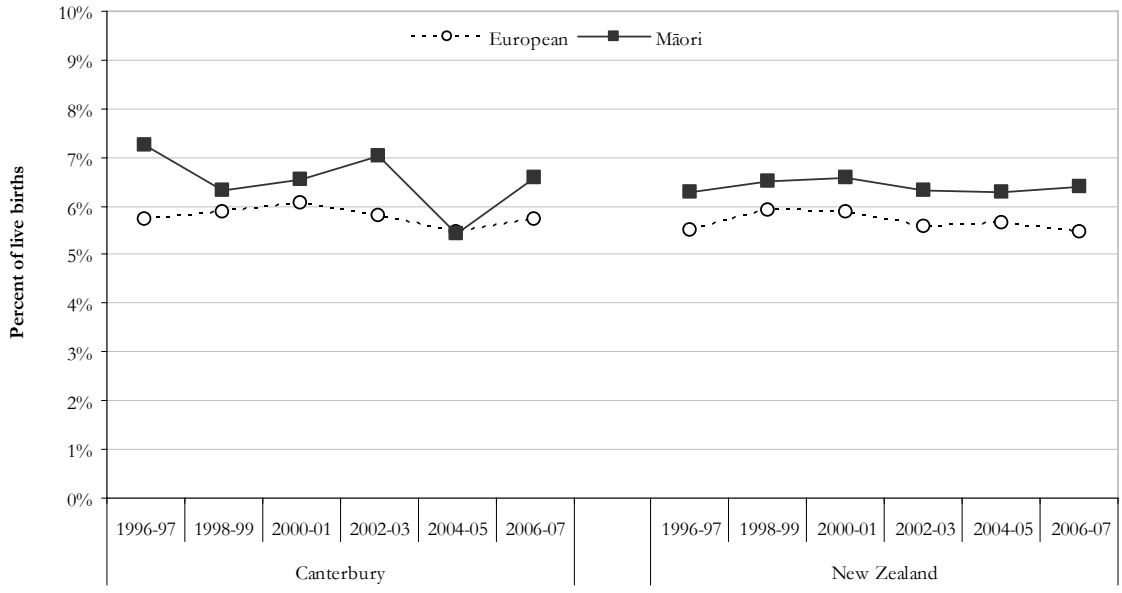
This sections presents data on child (0-14 years) and youth (15-24 years) health. It covers data on early childhood health including: preterm birth; low birthweight and perinatal and infant mortality; breastfeeding; and data on hospitalisations and other health problems for children and young people.

Preterm birth

Preterm birth is defined as birth at less than 37 completed weeks of gestation. It can be caused by a decision to electively deliver in the interests of maternal or foetal health, or can occur spontaneously either with or without prior rupture of membranes. Preterm birth, especially if it occurs before 34 weeks gestation, is a major cause of neonatal mortality and long-term health consequences for children, including neurological, developmental and respiratory problems (Goldenberg, Culhane et al. 2008). Māori women have higher rates of preterm birth than other ethnic groups (Mantell, Craig et al. 2004).

Figure 5.29 shows preterm births as a proportion of all live births for the period from 1996 to 2007. It indicates that the rate of preterm birth for Māori in Canterbury, although it fluctuated to some extent over the period, was higher than that for Europeans. This was also the case nationally. The rate for Māori in Canterbury was similar to the national rate for Māori, and the difference between Māori and European rates was also similar in Canterbury and nationally.

Figure 5.29 Preterm birth, by ethnicity, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



Low birthweight, perinatal mortality and infant mortality

Table 5.26 presents data regarding low birthweight and perinatal and infant mortality in the period from 2003 to 2005, for Canterbury and New Zealand.

Low birthweight is defined as birthweight less than 2,500 grams and results either from preterm birth or intrauterine growth restriction. It is associated with worse foetal and neonatal health, poorer growth and cognitive development in childhood, and potentially with chronic diseases, such as type 2 diabetes and cardiovascular disease, later in life (United Nations Children's Fund and World Health Organization 2004). At the national level, Māori have disproportionately high rates of low birth weight (New Zealand Health Information Service 2007). Māori in Canterbury appeared to have a higher rate of low birthweight than European/Others from 2003 to 2005, but this was not a significant difference (RR 1.15, overlapping 95% CIs for the rates), although the difference that existed between Māori and European/Others nationally was significant (RR 1.22, non-overlapping 95% CIs for the rates).

Perinatal mortality is defined as death during the period from 20 weeks gestation to seven days of age. It has been found to be higher in Māori than Europeans in New Zealand (Perinatal and Maternal Mortality Review Committee 2009). In Canterbury, the perinatal mortality rate for Māori from 2003 to 2005 was slightly lower than but not significantly different from that for European/Others (RR 0.97, overlapping 95% CIs for the rates).

Infant mortality measures deaths from birth to one year of age and has been found to be higher for Māori than non-Māori nationally (Ministry of Health 2006; Robson and Purdie 2007). The rate for Māori in Canterbury from 2003 to 2005 was higher than for European/Others, but this was not a significant difference (RR 1.11, overlapping 95% CIs for the rates), although nationally the difference that existed (and was greater than in Canterbury) between Māori and European/Others was significant (RR 1.67, non-overlapping 95% CIs for the rates). The rate for Māori in Canterbury appeared to be lower than for Māori nationally, but this was not a significant difference (RR 0.54, overlapping 95% CIs for the rates).

Table 5.26 Low birthweight, perinatal mortality, and infant mortality, rates per 1,000 live births, Canterbury and New Zealand, 2003-05
(Source : HDIU)

Indicator	Canterbury			New Zealand		
	Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio	Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio
Low birth weight	64.2 (55.2–74.2)	55.8 (51.8–60.0)	1.15	69.8 (67.4–72.1)	57.2 (55.6–58.8)	1.22
Perinatal mortality	9.8 (6.5–14.1)	10.1 (8.4–11.9)	0.97	9.7 (8.9–10.6)	9.5 (8.9–10.1)	1.02
Infant mortality	3.9 (1.9–6.9)	3.5 (2.5–4.6)	1.11	7.2 (6.5–8.0)	4.3 (3.8–4.7)	1.67

Note: European/Other is non-Māori, non-Pacific, non-Asian

Breastfeeding

Exclusive breastfeeding is recommended for the first six months of life (World Health Organisation 2002) and has positive effects including:

- For the child: optimal nutrition for infants (Ministry of Health 2008); protection against infectious diseases (such as diarrhoea, respiratory infections, otitis media, bacterial meningitis, urinary tract infection); reduced sudden infant death syndrome; reduced rates of diabetes, asthma, overweight and obesity, high cholesterol, and some cancers; and neuro-developmental benefits (American Academy of Pediatrics 2005).
- For the mother: improved recovery from birth (such as reduced post-partum bleeding); decreased risk of breast and ovarian cancer; decreased risk of osteoporosis and hip fracture later in life (American Academy of Pediatrics 2005); and other emotional and psychosocial benefits (National Breastfeeding Advisory Committee 2008).

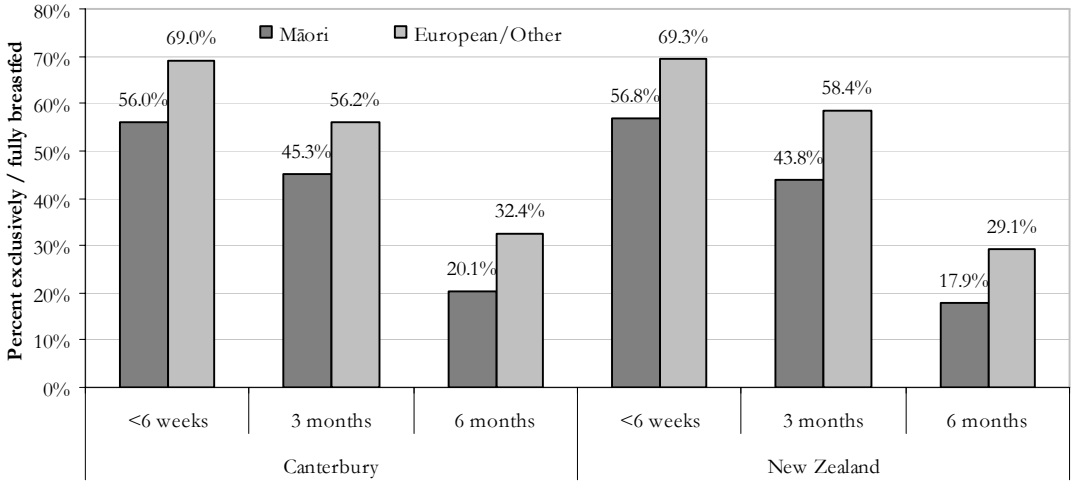
Rates of breastfeeding for Māori are lower than for non-Māori nationally. Barriers to breastfeeding include poor initiation, perceived inadequate supply, maternal smoking, lower socioeconomic status and educational attainment, need to return to work for economic reasons, lack of workplace support, and lack of appropriate community facilities (Ministry of Health 2002).

Figure 5.30 presents rates of exclusive/full breastfeeding at six weeks, three months, and six months for Māori and European/Others in Canterbury and New Zealand in 2008

and shows lower rates for Māori at every age. The rates for Māori in Canterbury were slightly higher at three and six months than national rates for Māori.

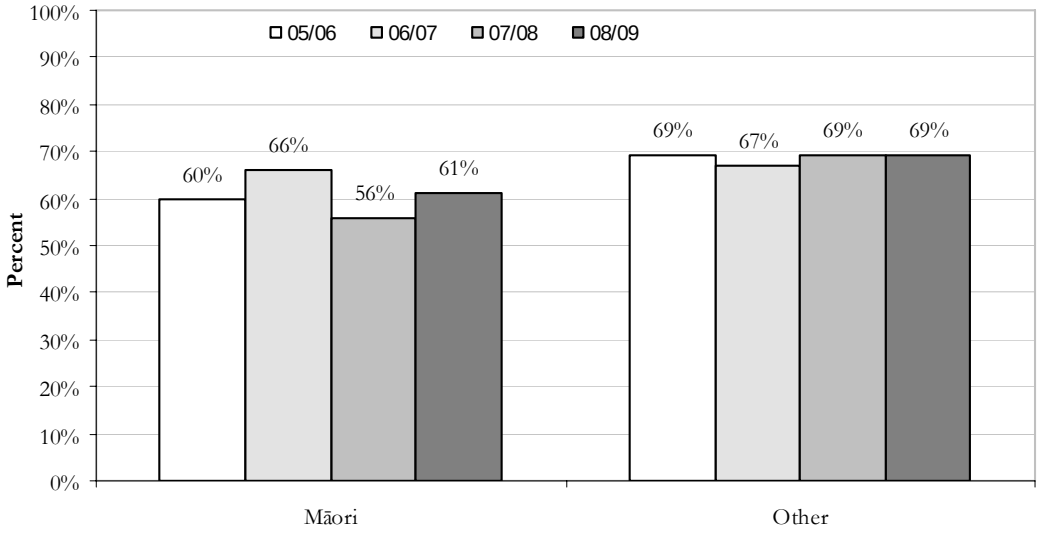
Figures 5.31, 5.32 and 5.33 present rates of exclusive/full breastfeeding in Canterbury over the period from 2005/06 to 2008/09, for Māori and Others. They show that rates did not improve substantially for Māori (or Others) for any age group, except possibly for the three months' time-point (for which only two years' data are available). There may have been deterioration in the rates of breastfeeding at six months for Māori over the period. Rates for Māori also fell below breastfeeding targets set by the Ministry of Health of 74% at 6 weeks, 57% at 3 months and 27% at 6 months (except for 2005/06).

Figure 5.30 Percent of Plunket babies fully / exclusively breastfed at 6 weeks, 3 months and 6 months, Canterbury and New Zealand, 2008
(Source: Craig, Anderson et al. 2008)



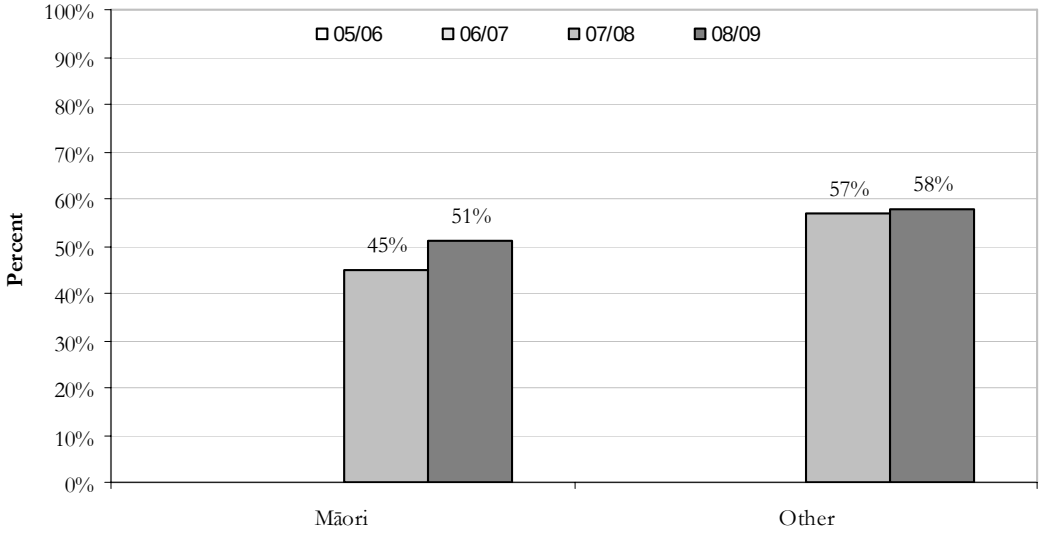
Note: European/Other is non-Māori, non-Pacific, non-Asian

Figure 5.31 Proportion of Plunket babies fully or exclusively breastfed at six weeks, Canterbury, 2005-2009
(Source: Plunket)



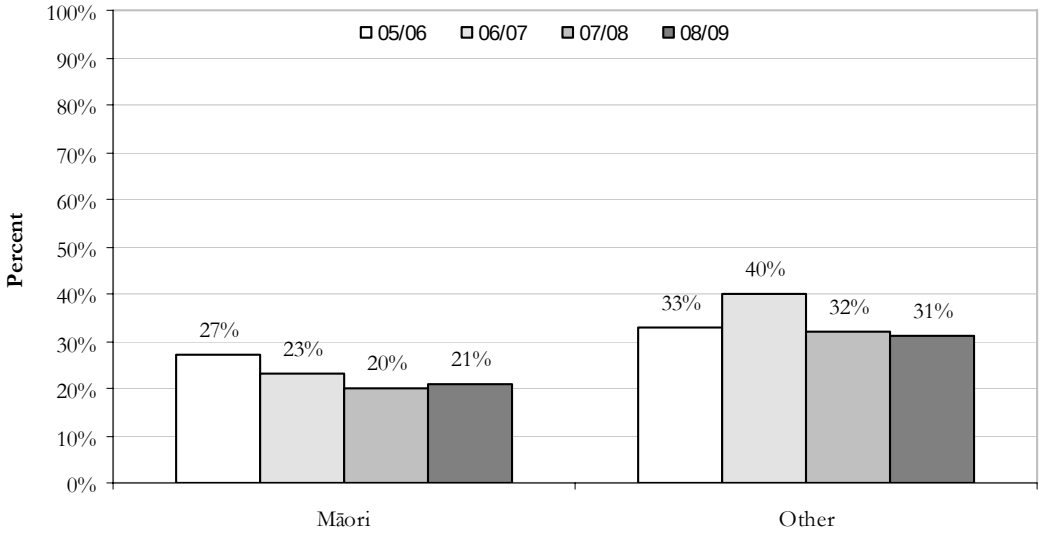
Note: Other is non-Māori, non-Pacific

Figure 5.32 Proportion of Plunket babies fully or exclusively breastfed at three months, Canterbury, 2007-2009*
(Source: Plunket)



*Note: Data for 2005/06 and 2006/07 were not available
Other is non-Māori, non-Pacific

Figure 5.33 Proportion of Plunket babies fully or exclusively breastfed at six months, Canterbury, 2005-2009
(Source: Plunket)



Note: Other is non-Māori, non-Pacific

Hospitalisations

Figures 5.34 to 5.42 present admissions for various conditions or procedures in children and young people.

Upper respiratory tract

Figure 5.34 presents upper respiratory tract infection (URTI) hospitalisations from 1996 to 2007 in Canterbury. Rates of URTI (both croup and other acute URTIs) admissions were generally higher in Europeans than Māori, although there may have been some convergence over the period from 2004/05, especially for acute URTI excluding croup.

Figure 5.35 presents rates of waiting list admission for tonsillectomy. The rates were higher earlier in the period for Europeans than Māori, but the rates converged from 2002/03 onwards. The rate for Māori in Canterbury increased above the national rate for Māori from 2004/05. The difference between the rates for Māori and Europeans was greater nationally than in Canterbury.

Figure 5.34 Upper respiratory tract infection admissions 0-14 years, Canterbury, 1996-2007
(Source: Craig, Anderson et al. 2008)

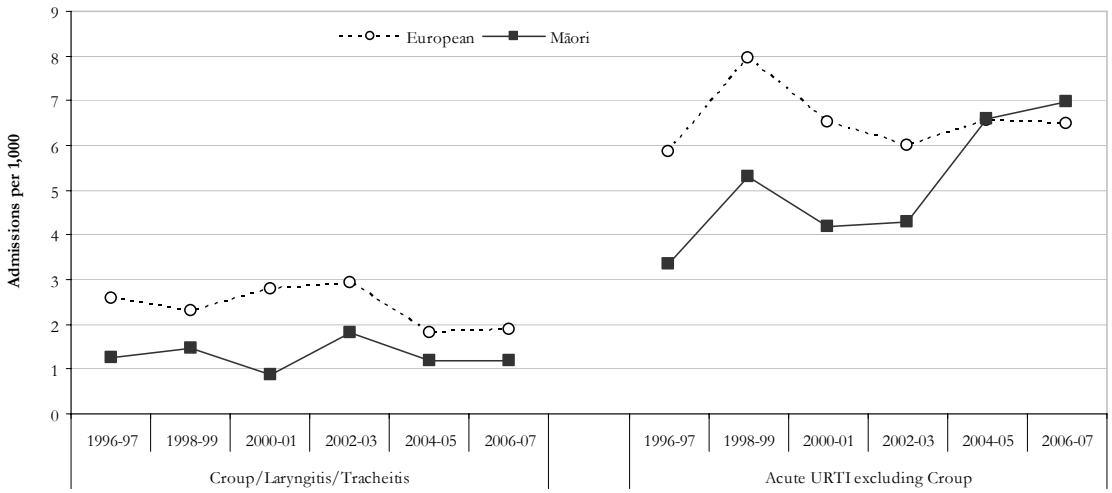
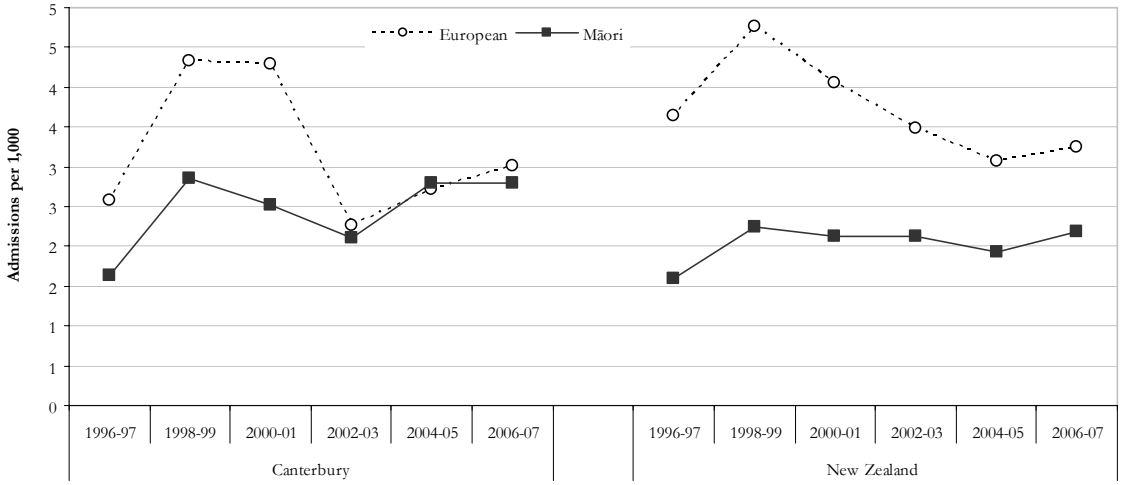


Figure 5.35 Waiting list admissions for tonsillectomy, 0-14 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



Otitis media and hearing

Figure 5.36 presents otitis media acute and arranged admissions and waiting list admissions for insertion of grommets (ventilation tubes placed in the ear drum to release fluid in the middle ear and return hearing to normal) from 1996 to 2007. The rate of otitis media admissions was very similar for Māori and Europeans in Canterbury. In contrast, the rate of waiting list admissions for grommets was higher for Māori than for Europeans from 2000/01 onwards. However, hearing tests at school entry by audiometry show higher failure rates for Māori children than Others (non-Māori, non-Pacific) over

the period from 2003 to 2007, as shown in Figure 5.37. Audiometry failure rates for Māori in Canterbury worsened over the period, while the rate for Others remained lower and stable.

These data suggest that Māori have worse outcomes than Others for otitis media in terms of hearing test failure rates. This is to some extent reflected in higher rates of grommets insertion for Māori children. However, while the proportion of Māori children failing hearing tests continued to increase up to 2007, the rate of grommets insertion for Māori children declined, and the rate of admissions for otitis media was the same as for Māori and European/Others. This suggests that the greater burden for Māori children from otitis media and consequent hearing problems is an area of unmet need.

Figure 5.36 Otitis media admissions and grommets waiting list admissions, 0-14 years, Canterbury, 1996-2007
(Source: Craig, Anderson et al. 2008)

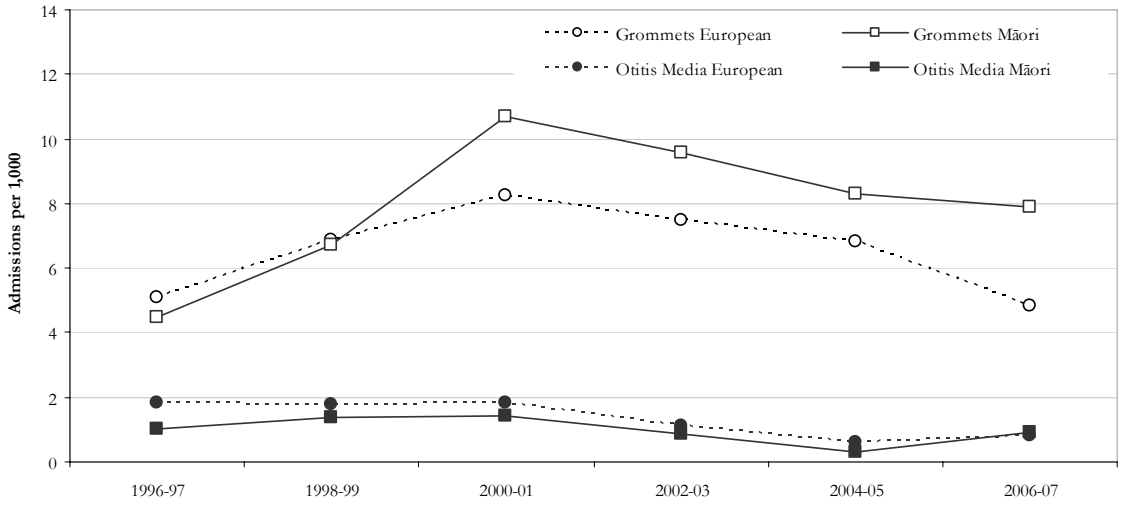
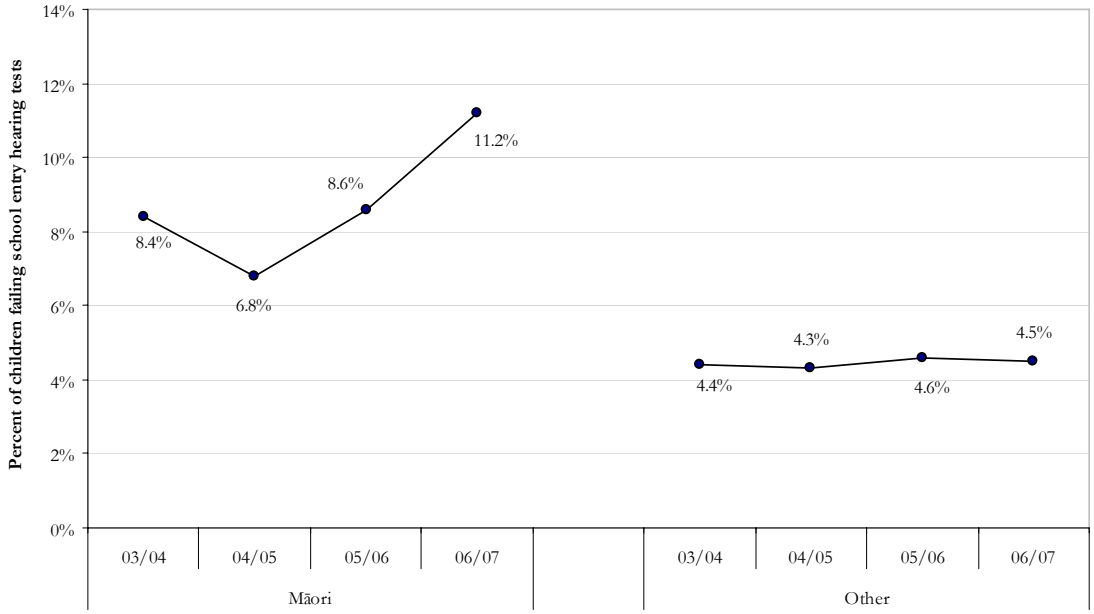


Figure 5.37 Proportion of children failing school entry audiometry tests, 4 years, Canterbury, 2003-2007
(Source: Hearing and Vision Service, CDHB)



Lower respiratory tract illness

Figure 5.38 shows that rates of hospitalisation for bronchiolitis for Māori children less than one year old in Canterbury were slightly higher than for Europeans from 1996 to 2007. This is in contrast to the national picture, where rates for Māori were almost three times those for Europeans. While the rate for Europeans in Canterbury was higher than nationally, the rate for Māori was lower in Canterbury than nationally.

Figure 5.38 Bronchiolitis admissions, under-1 year olds, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)

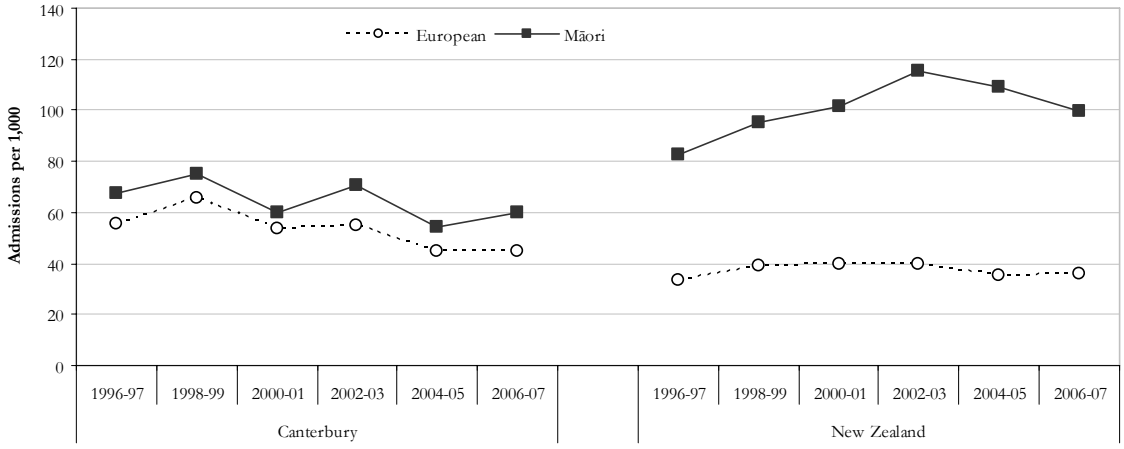


Figure 5.39 presents admissions for viral or bacterial pneumonia in children and young people, and shows that while rates for Māori and Europeans in Canterbury were similar over the period from 1996 to 2007, there was a large disparity in hospitalisation rates nationally. Rates for Māori in Canterbury were much lower than those for Māori nationally, and appeared to have reduced over the period in a similar pattern to the rates for Europeans. The differences in rates between Māori and European children and young people reflected the picture for all ages as presented in section 5.6 Respiratory disease.

Figure 5.39 Pneumonia admissions, 0-24 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)

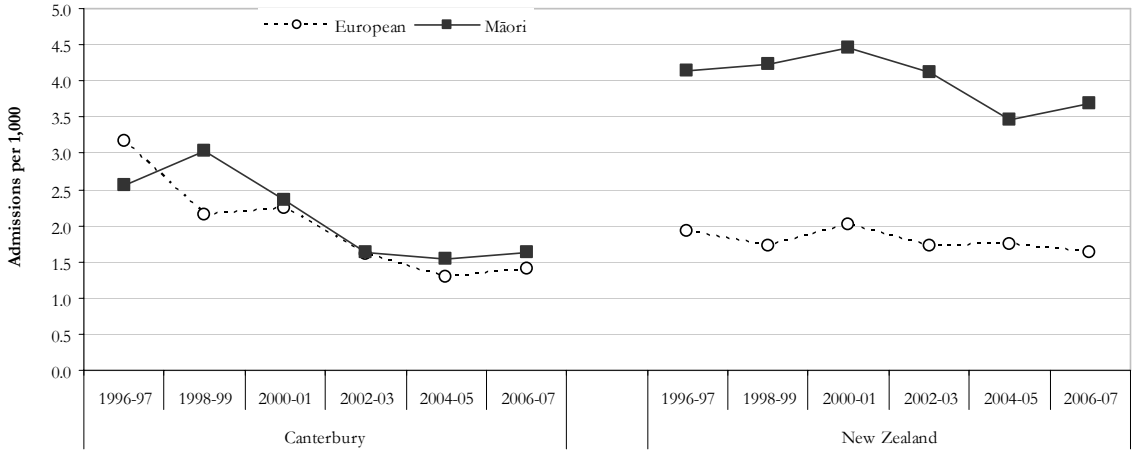
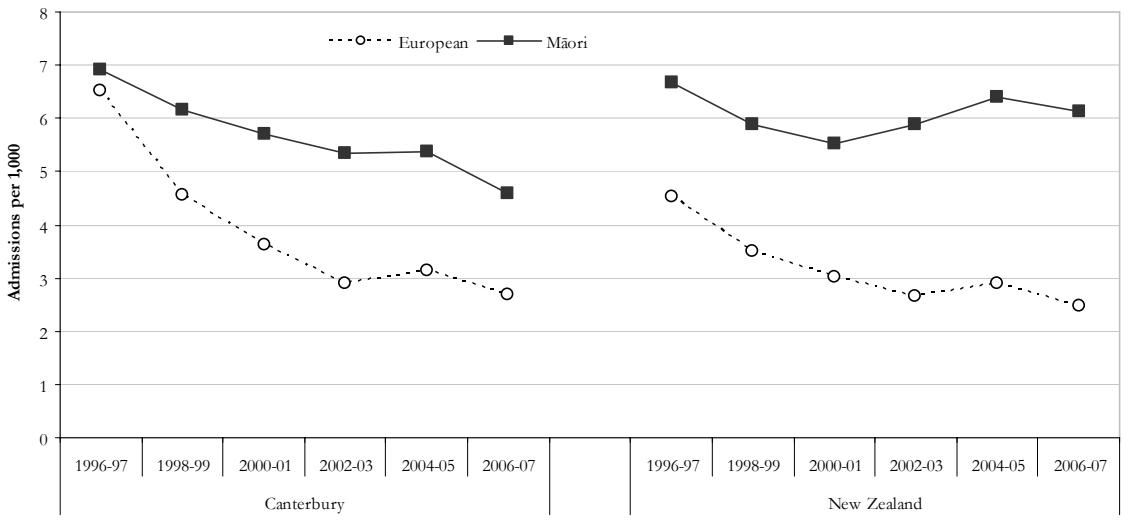


Figure 5.40 presents admissions for asthma in children and young people from 1996 to 2007. It shows that while the rates in Canterbury for both Māori and Europeans decreased over the period, the rate for Māori decreased less than that for Europeans. The effect was that the difference in rates grew from a similar rate of admission for Māori and non-Māori in 1996/97 to a rate about 70% higher for Māori for 2006/07. Over the same period, the difference between the rates for Māori and Europeans nationally started larger than that in Canterbury and grew to around two and a half times higher for Māori than Europeans.

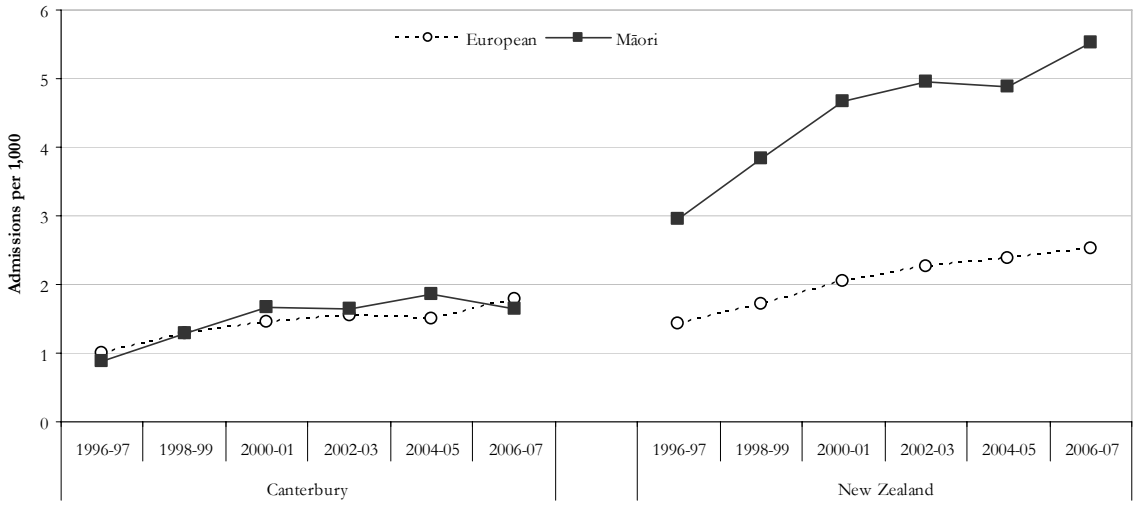
Figure 5.40 Asthma admissions, 0-24 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



Skin infections

Figure 5.41 presents admissions for serious skin infections (cellulitis and abscesses) in children and young people from 1996 to 2007. The lack of a difference in the rates for Māori and Europeans in Canterbury was in contrast to the significant difference nationally, where the rate for Māori was more than double that for Europeans over the period.

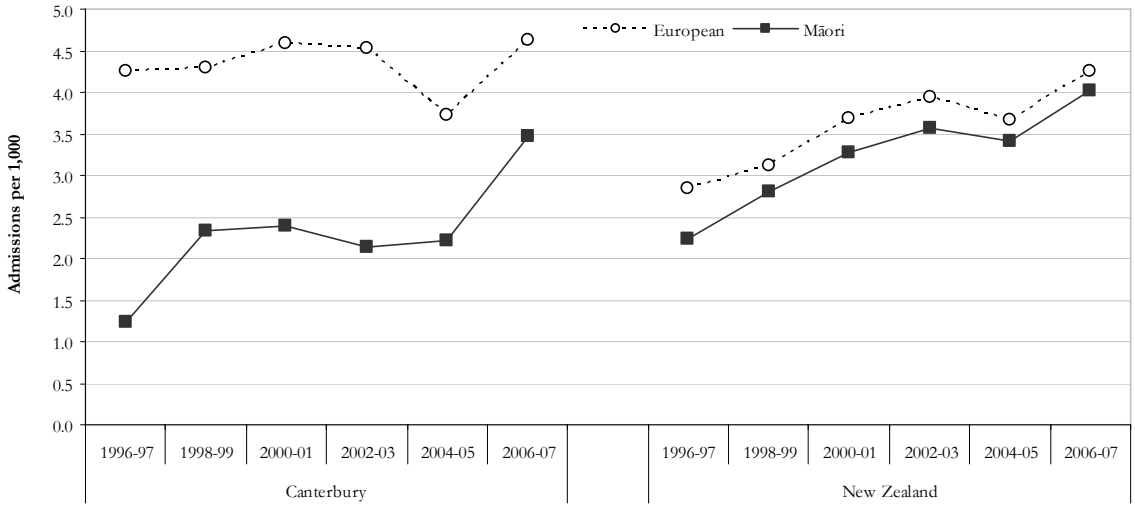
Figure 5.41 Severe skin infection admissions, 0-24 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



Gastroenteritis

Figure 5.42 presents admissions for gastroenteritis (viral, bacterial, and parasitic) for children and young people, and shows that rates for Māori were lower than those for Europeans, although they rose sharply in 2006/07. The rates for Māori in Canterbury were generally lower than those for Māori nationally over the period from 1996 to 2007. The rate for Māori nationally rose over the period, but the rate for Māori in Canterbury rose more quickly than for Māori nationally in 2006/07.

Figure 5.42 Gastroenteritis admissions, 0-24 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



5.13 Sexual and reproductive health

Key points

- From 2003 to 2005, the rate of hospitalisation per live birth was lower for Māori than for non-Māori in Canterbury.
- From 1999 to 2008, the rate of manual deliveries was higher for Māori in Canterbury than for non-Māori, but the rates of procedures related to delivery – for example, caesarean section (emergency and elective), most inductions, vacuum and forceps extractions – were lower for Māori.
- From 1996 to 2007, the rate of teenage pregnancy was three to four times higher for Māori than for Europeans in Canterbury.
- In 2007 and 2008, attendance at sexual health, family planning and student and youth clinics was higher for Māori than Europeans for chlamydia and gonorrhoea , but lower for non-specific urethritis.

This section presents data on hospitalisation and procedures done during childbirth, and examines teenage pregnancy and sexually transmitted infection.

Hospitalisations for pregnancy-related conditions

In the period from 2003 to 2005 there were 27,713 admissions for pregnancy, childbirth and puerperium in Canterbury, or around 9,240 per annum. Of these, 2,586 admissions were for Māori and 25,127 for non-Māori, meaning that Māori admissions for pregnancy and childbirth represented 9.3% of the total. This compares to 2,860 live births among Māori and 14,892 among non-Māori from 2003 to 2005 (as presented in Table 2.4 in Chapter 2 Demographic profile) making the proportion of live births among Māori 16.1% of the total. Combining the data for admissions and live births, there were 0.90 admissions for Māori in Canterbury for each live birth and 1.69 admissions for non-Māori per live birth.

This suggests that although admissions for pregnancy, childbirth and puerperium were more common for Māori in Canterbury than non-Māori (RR 1.13, 95% CI 1.09-1.18) the rate of admission per pregnancy was lower, i.e. Māori were over-represented among births but under-represented among admissions. The reasons for this difference between

Māori and non-Māori are likely to be multifactorial, but may include differential access to services, differences in risk necessitating admission or differences in clinical factors such as parity.

Birth procedures

Rates of obstetric intervention differ between Māori and non-Māori, including lower rates of induction and operative vaginal delivery (Sadler, McCowan et al. 2002), and caesarean section (Harris, Robson et al. 2007).

Table 5.27 presents data on hospital procedures associated with birth, aggregated for the ten years from 1999 to 2008 and age-standardised to the 2001 Māori population, for Canterbury and New Zealand. These data have not been adjusted for factors other than age, such as parity or maternal risk factors.

The rate of manually assisted deliveries (births requiring assistance but not further intervention) was significantly higher for Māori in Canterbury than for non-Māori (RR 1.14, non-overlapping 95% CIs for the rates), although the rate in Māori women in Canterbury was significantly lower than nationally (RR 0.59, non-overlapping 95% CIs for the rates). The rate of emergency caesarean sections was significantly lower for Māori in Canterbury than non-Māori (RR 0.71, non-overlapping 95% CIs for the rates), but there was a larger difference between Māori and non-Māori in Canterbury for elective caesarean sections (RR 0.59, non-overlapping 95% CIs for the rates). The rate of emergency caesarean sections for Māori in Canterbury was also lower than for Māori nationally (RR 0.74, non-overlapping 95% CIs for the rates), for whom the rate was closer to, but still significantly lower than, that for non-Māori nationally (RR 0.95, non-overlapping 95% CIs for the rates).

For elective caesarean sections, the rates for Māori in Canterbury and nationally were almost the same (RR 1.00, overlapping 95% CIs for the rates), but the rate for non-Māori in Canterbury was considerably higher than the non-Māori rate nationally. This resulted in a greater difference between Māori and non-Māori in Canterbury (RR 0.59, non-overlapping 95% CIs for the rates) than in New Zealand as a whole (RR 0.76, non-overlapping 95% CIs for the rates).

Several other procedures were significantly less common (RR lower than 1 and non-overlapping 95% CIs for the rates) among Māori than non-Māori in Canterbury, including the following procedures:

- several methods of induction of labour (prostaglandin or cervagem induction: RR 0.88; induction by artificial rupture of membranes: RR 0.81; other medical induction: RR 0.80);
- episiotomy (RR 0.46);
- methods of instrumentally assisting delivery such as vacuum extraction (RR 0.52) and forceps (mid forceps operation: RR 0.65; low forceps operation: RR 0.61);
- manual rotation of the foetal head (RR 0.57).

There were no statistically significant differences (overlapping 95% CIs for the rates) between the rates for Māori and non-Māori in Canterbury for the following procedures:

- artificial rupture of membranes (RR 1.02, overlapping 95% CIs for the rates);
- partial breech extraction (RR 1.59, overlapping 95% CIs for the rates);
- syntocinon induction (RR 1.14, overlapping 95% CIs for the rates).

Overall, after age has been taken into account, Māori were less likely than non-Māori to have interventions during childbirth once they were in hospital. Nationally, Māori women have been found to be significantly less likely than non-Māori to have a Caesarean section, and this persists after controlling for age, deprivation and various clinical factors (including parity, fetal presentation and gestation, multiple birth, maternal hypertension and diabetes, and antepartum haemorrhage, but excluding maternal weight or other co-morbidities, smoking, lead maternity carer type and baby's birthweight) (Harris, Robson et al. 2007). The potential sources of differences in rates of Caesarean section, and possibly other interventions, include: differential distribution of the wider determinants of health that affect individuals' risk and access to care and information; factors such as the structural influences of the healthcare system; provider practices and interactions with patients; and differential management (Harris, Robson et al. 2007).

Table 5.27 Procedures associated with birth, females, Canterbury and New Zealand, 1999-2008
(Source: Ministry of Health, Information Directorate)

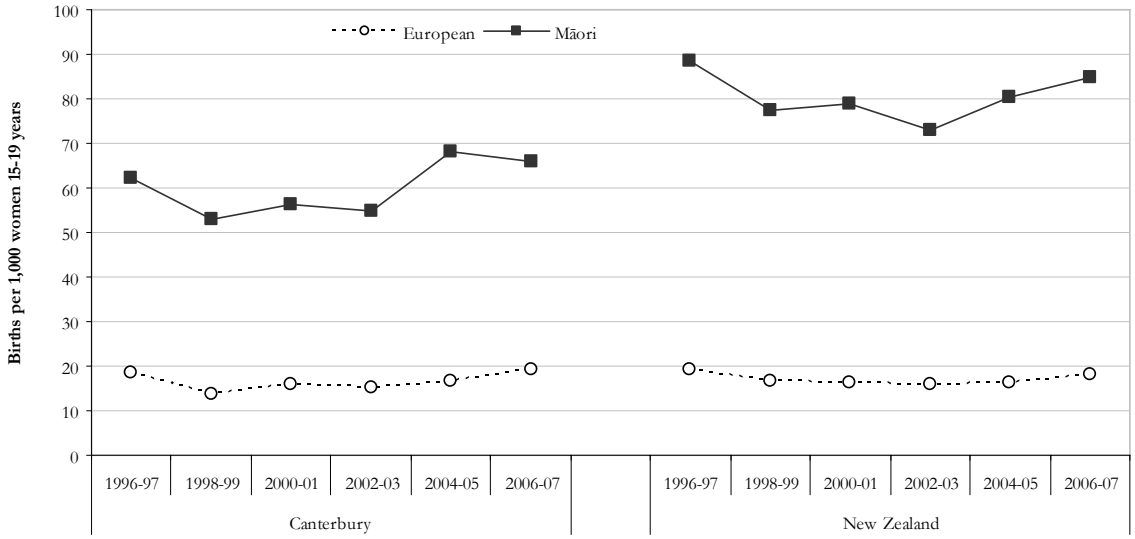
Birth procedures	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio	Māori		non-Māori		Rate ratio
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Manually assisted delivery	3,047	1,925.1 (1,857.2-1,994.7)	30,338	1,693.4 (1,693.4-1,712.7)	1.14	87,884	3,271.5 (3,249.9-3293.3)	288,386	1,977.2 (1,969.9-1,984.5)	1.65
Artificial rupture of membranes	1,084	679.1 (639.2-720.8)	11,897	667.0 (654.9-679.2)	1.02	31,736	1,177.9 (1,165.0-191.0)	109,900	758.7 (754.2-763.2)	1.55
Emergency lower segment caesarean section	500	315.3 (288.2-344.2)	8,048	441.7 (432.0-451.6)	0.71	11,544	427.9 (420.2-435.8)	67,237	449.3 (445.8-452.7)	0.95
Prostaglandin or cervagem induction	432	272.6 (247.5-299.6)	6,098	338.8 (330.2-347.5)	0.80	7,140	265.0 (258.9-271.2)	37,959	256.9 (254.3-259.5)	1.03
Induction of labour by artificial rupture of membranes	371	235.9 (212.5-261.2)	5,284	291.5 (283.6-299.5)	0.81	9,542	354.8 (347.7-362.0)	50,194	337.2 (334.2-340.1)	1.05
Elective lower segment caesarean section	328	211.0 (188.8-235.2)	6,837	358.5 (350.0-367.2)	0.59	5,652	212.0 (206.5-217.6)	44,134	280.7 (278.0-83.3)	0.76
Episiotomy	334	208.2 (186.4-231.8)	8,065	449.3 (439.5-459.4)	0.46	4,814	176.8 (171.8-181.9)	51,975	354.8 (351.8-357.9)	0.50
Vacuum extraction	256	159.5 (140.5-180.3)	5,458	305.8 (297.6-314.1)	0.52	3,999	147.3 (142.8-152.0)	32,754	223.3 (220.8-225.7)	0.66
Other medical induction	199	124.9 (108.1-143.5)	2,780	155.2 (149.4-161.1)	0.80	5,433	201.2 (195.9-206.6)	30,899	210.2 (207.8-212.6)	0.96
Mid forceps operation	126	79.0 (65.8-94.1)	2,171	121.4 (116.3-126.7)	0.65	943	34.8 (32.6-37.1)	9,588	64.7 (63.4-66.1)	0.54
Low forceps operation	31	19.1 (13.0-27.2)	547	31.4 (28.2-34.2)	0.61	911	33.5 (31.4-35.8)	7,369	50.2 (49.0-51.3)	0.67
Partial breech extraction	23	14.7 (9.3-22.1)	169	9.3 (7.9-10.8)	1.59	293	10.9 (9.7-12.3)	1,183	7.9 (7.5-8.4)	1.38
Syntocinon induction	22	13.7 (8.6-20.8)	218	12.0 (10.4-13.7)	1.14	1,777	66.0 (63.0-69.2)	7,725	51.9 (50.8-53.1)	1.27
Manual rotation of foetal head	22	13.7 (8.5-20.7)	429	23.8 (21.6-26.2)	0.57	233	8.6 (7.5-98)	2,358	15.8 (15.1-16.4)	0.55

Note: Rates are calculated per 100,000 women and age-standardised to the 2001 Māori population. More than one procedure could have been performed for each birth, and therefore there are more procedures than the total number of births.

Teenage births

Figure 5.43 presents births in 15 to 19 year olds, and shows rates for Māori in Canterbury were three to four times higher than for Europeans over the period from 1996 to 2007. The rate for Māori nationally was four and a half to five times higher than the European rate. The rate for Europeans nationally was similar to that in Canterbury.

Figure 5.43 Births to teenagers, females, 15-19 years, Canterbury and New Zealand, 1996-2007
(Source: Craig, Anderson et al. 2008)



Sexually transmitted infections

The Institute of Environmental Science and Research (ESR) conduct surveillance of sexually transmitted infections (STIs) by collecting data from sexual health clinics, family planning clinics, and student and youth health clinics, based on voluntary reporting. In Canterbury there are sexual health clinics in Christchurch and Ashburton, and several family planning clinics (Christchurch, Hornby, Rangiora and Ashburton) and student and youth health clinics (the 198 Youth Health Centre in Christchurch, Canterbury and Lincoln Universities, and CPIT). Comparisons by ethnicity must be made with caution as attendance at these clinics may be different for different age and ethnic groups, the clinics have no specific catchment areas, and other health providers such as general practitioners also diagnose and treat STIs. In addition, the denominator used in calculating disease rates for this method of surveillance is the total number of clinic visits, which may not necessarily be for STIs, rather than a population based figure.

ESR also collects data from laboratories on specimens taken to diagnose STIs, but the coverage of this data collection is only complete in parts of the North Island.

Table 5.28 presents the data for STIs collected in Canterbury. The rates for Māori appeared higher for chlamydia and gonorrhoea and lower for non-specific urethritis.

Table 5.28 Sexually transmitted infection, all ages, Canterbury Sexual Health, Family Planning and Student and Youth Health Clinics, 2007-2008
(Source: Institute of Environmental Science and Research Limited)

Sexually Transmitted Infection	Total no. cases 2007-2008		Rate per 100 visits	
	Māori	European	Māori	European
Chlamydia	202	1,174	3.8	1.9
Gonorrhoea	34	176	0.6	0.3
Genital Herpes	22	217	0.4	0.3
Genital Warts	73	764	1.4	1.2
Non specific urethritis (males only)	8	147	0.6	1.1

Note: Rate per 100 visits = (total no. cases/total no. clinic visits) x 100.
Chlamydia and gonorrhoea are confirmed cases; genital herpes and genital warts are first presentations only.

5.14 Kaumatua / Older persons' health

Key points

- A lower proportion of Māori (and of Māori over 65 years) in Canterbury was in aged care facilities.

Facility use

Table 5.29 presents the number and proportion of older people resident in various facilities. The percentages have not been age or sex standardised. The small proportion of Māori in facility-based care compared to non-Māori was contributed to by the small proportion of the Māori population remaining alive at this age (typically over 65 years) and potentially by older Māori being cared for by whānau rather than being in facilities. If all those in facilities are over 65 years then the proportion of Māori in that age group being cared for in facilities (using the number of Māori over 65 years at the Census 2006 as the denominator) was 3.4% (36/1,074). For non-Māori, the proportion of people of 65 years in facility-based care was 6.2% (3,814/61,617).

A higher proportion of older Māori in dementia care (over other types of care) may reflect the difficulty of caring for people with dementia in the community, although this is not supported by the absence of Māori in psychogeriatric care.

Table 5.29 Facility use by older people, Canterbury, 2009
(Source: CDHB Planning and Funding)

Facility	Māori		non-Māori	
	(% of total people)		(% of total people)	
Rest home care	12	(0.6%)	1,851	(99.4%)
Dementia care	10	(1.9%)	527	(98.1%)
Hospital level care	14	(1.1%)	1,288	(98.9%)
Psychogeriatric care	0		148	(100%)
Total	36	(0.9%)	3,814	(99.1%)

Note: Rates have not been age or sex standardised

6 Health Service Utilisation

Key points

In 2006/07:

- Māori were significantly more likely than European/Others to have had an unmet need for a general practitioner.

Between 2005 and the beginning of 2009, in non-age-standardised analyses:

- PHO enrolment was lower for Māori in Canterbury than for Others.
- Māori in Canterbury were under-represented in hospital activity including bed days, discharges and average length of stay.
- Spending per capita on prescriptions and laboratory testing was lower for Māori than for Others.
- These data are at odds with the higher burden of disease carried by Māori, as described in Chapter 5 Health Status.

6.1 Primary health care

General practitioner utilisation

Table 6.1 presents data about the use of general practitioner (GP) services from the NZHS 2006/07. The prevalence of having visited a GP in the previous 12 months appeared to be lower for Māori than European/Others in Canterbury, but this was not a significant difference (overlapping 95% CIs for the rates). The prevalence of having visited a GP in the previous 12 months among respondents (aged 16 years and over) in Mō Tātou, a Ngāi Tahu survey (Ahuriri-Driscoll, Cram et al. 2004), was 83.2% in 2003/04. The prevalence was 79.2% for males and 86.7% for females. These prevalence rates were higher than the prevalence for all Māori in Canterbury from the NZHS, although the Mō Tātou rates were not age-standardised. The prevalence for Ngāi Tahu from Mō Tātou more closely approximates the rates for European/Others in the NZHS.

Māori in Canterbury were significantly more likely than non-Māori to have had an unmet need for a GP[18], as shown in Table 6.1. The difference between Māori and European/Others in the prevalence of unmet need for a GP was higher for women (for whom it was a statistically significant difference) than it was for men (for whom the difference was not significant).

Table 6.1 Prevalence of visiting a GP and unmet need for a GP in previous 12 months, 15+ years, Canterbury and New Zealand, 2006/07
(Source: HDIU/New Zealand Health Survey 2006/07)

Indicator		Canterbury		New Zealand	
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Māori Rate (95% CI)	European/Other Rate (95% CI)
Visit to GP in last 12 months	Total	79.5 (75.6–83.0)	83.2 (79.8–86.2)	77.9 (75.5–80.1)	81.6 (80.0–83.0)
	Male	75.0 (70.5–79.2)	79.6 (76.0–82.9)	73.5 (70.1–76.7)	78.1 (76.1–80.0)
	Female	83.3 (79.3–86.9)	86.5 (82.9–89.6)	81.7 (79.1–84.1)	84.8 (83.1–86.4)
Unmet need for GP in past 12 months	Total	7.8 (5.8–10.2)	3.6 (2.2–5.6)	13.0 (11.4–14.7)	6.0 (5.2–6.9)
	Male	5.7 (3.4–8.9)	3.2 (1.7–5.3)	9.6 (7.5–12.0)	5.3 (4.4–6.4)
	Female	9.6 (7.0–12.6)	4.0 (2.5–6.0)	16.0 (13.7–18.5)	6.6 (5.7–7.6)

Note: Rates are age-standardised (using the WHO population) prevalence rates for adults aged over 15 years. European/Other are non-Māori, non-Pacific, non-Asian.

Nationally, according to the NZHS, Māori were significantly more likely than the total population to have given cost as the reason for an unmet need for a GP. This was despite Māori being significantly more likely than the total population to report that their last GP visit was free (Ministry of Health 2008). If this national picture is reflected for Maori in Canterbury, then the cost of attending a GP appointment may be one of the barriers for Māori obtaining primary health care. Other reasons may include indirect cost barriers such as having to take time off work and the cost of transport, and the cultural appropriateness of care (Ministry of Health 1999; Baxter 2002; Ellison-Loschmann and Pearce 2006).

[18] Unmet need for a GP meant that the person needed to see a GP in the previous 12 months but was unable to for any reason.

PHO enrolment

The five Primary Health Organisations (PHOs) in Canterbury are:

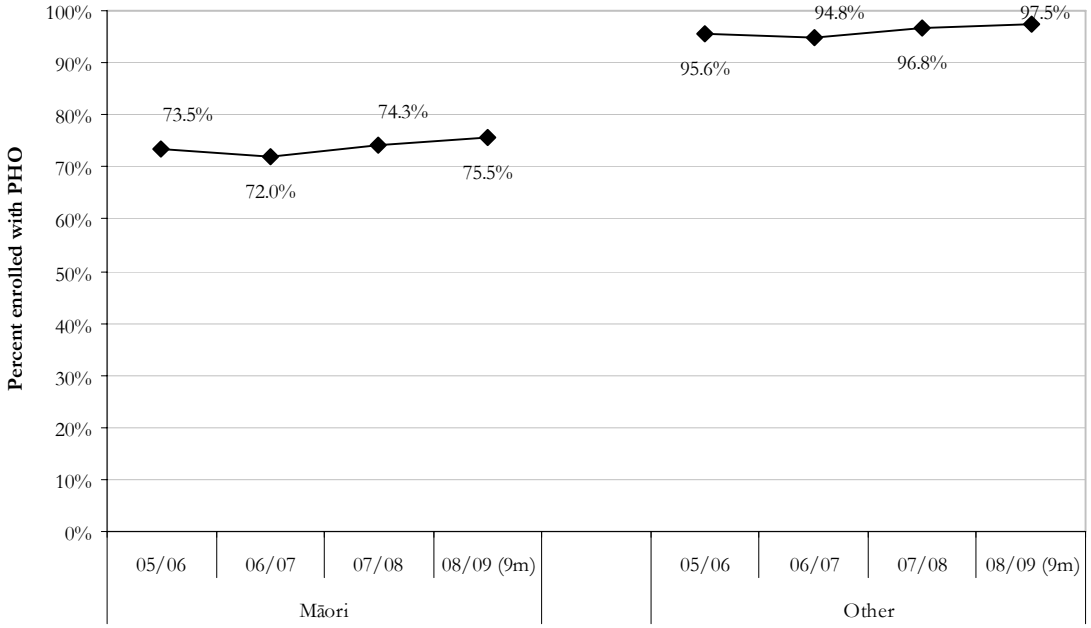
- Canterbury Community PHO
- Christchurch PHO
- Hurunui Kaikoura PHO
- Partnership Health Canterbury - Te Kei o Te Waka PHO
- Rural Canterbury PHO

All PHOs have had a Māori Health Plan agreed with CDHB since 2007/08 (three have had them from 2006/07). Each PHO has a Whānau Ora programme aimed at management of chronic conditions among Māori, with tagged additional services funding from CDHB.

Figure 6.1 presents the proportion of Māori and Others (non-Māori, non-Pacific) who were enrolled with a PHO in Canterbury over the period 2005/06 to the first nine months of 2008/09. It shows that Māori enrolment was lower than that for Others, and there was a slight improvement in Māori enrolment over the period. The denominators used for each ethnic group were based on Ministry of Health estimates and in 2005/06 were based on the 2001 Census figure, whereas from 2006/07 onwards they were based on the 2006 Census. This may explain the small drop in the proportion enrolled for Māori and Others from 2005/06 to 2006/07.

Figure 6.1 Enrolment with a PHO, all ages, Canterbury, 2005-2009

(Source: CDHB Planning and Funding / PHO enrolment registers)



Note: Population estimates are made by the Ministry of Health. In 2005/06 the estimated population was based on the 2001 Census and from 2006/07 onwards it was based on the 2006 Census.
Others are non-Māori, non-Pacific.

6.2 Canterbury District Health Board

Hospital activity

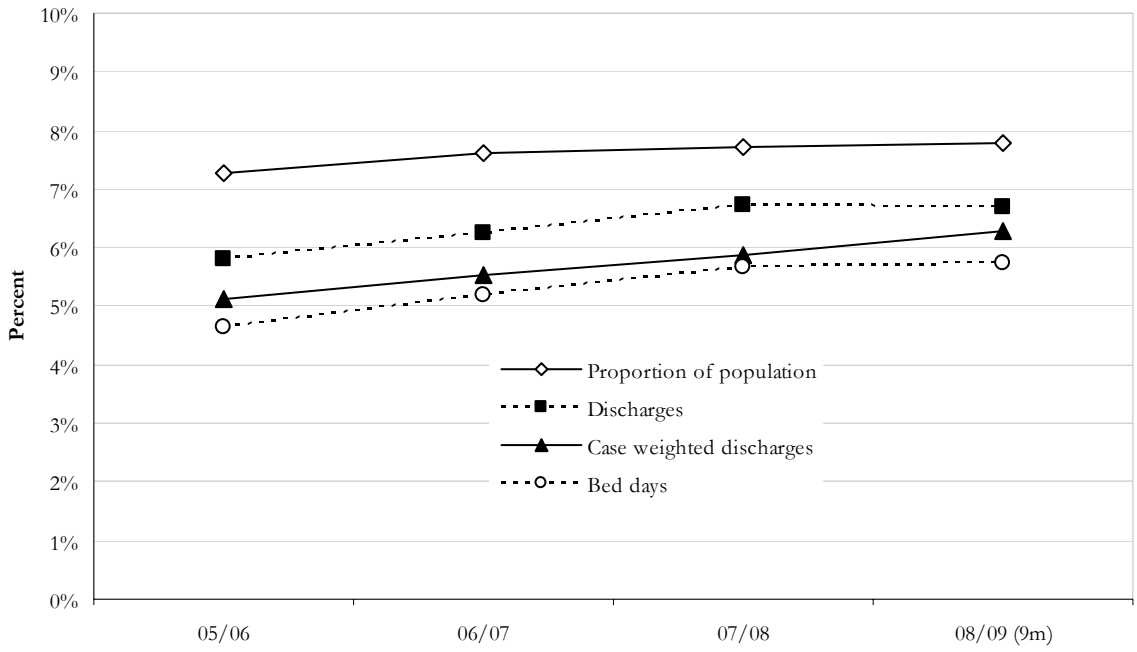
Figure 6.2 presents the proportion of hospital activity for Māori over the period from 2005/06 to the first nine months of 2008/09. The proportions of discharges, case weighted discharges and bed days that were for Māori are presented. These can be compared to the estimated proportion of the population identifying as Māori, which is also shown. Definitions for the types of hospital activity shown are as follows:

- Discharges: the number of discharges from hospital for each period;
- Case-weighted discharges: the number of discharges adjusted to take into account the relative complexity of the treatment during an admission (for example, an admission involving a hip operation will have a higher case-weight than one involving a cataract operation);
- Bed days are the number of days of admission.

Each of these types of activity is shown for Māori as a percentage of the total for all ethnicities. These data are not adjusted for age, sex or other aspects such as socioeconomic status or clinical factors.

Figure 6.2 shows Māori are under-represented in each of the indicators of hospital activity. For example, in 2007/08 the proportion of the population identifying as Māori was 7.7%, but the proportion of discharges for Māori was 6.7%, case-weighted discharges 5.9%, and bed days 5.7%. As the probability of admission to hospital increases with age, and similarly the complexity and duration of admission are likely to be higher with increasing age, the more youthful age distribution of the Māori population may explain some of this apparent under-representation in hospital activity for Māori.

Figure 6.2 Hospital activity, Māori as percentage of total, all ages, Canterbury, 2005-2009
(Source: Planning and Funding, CDHB)

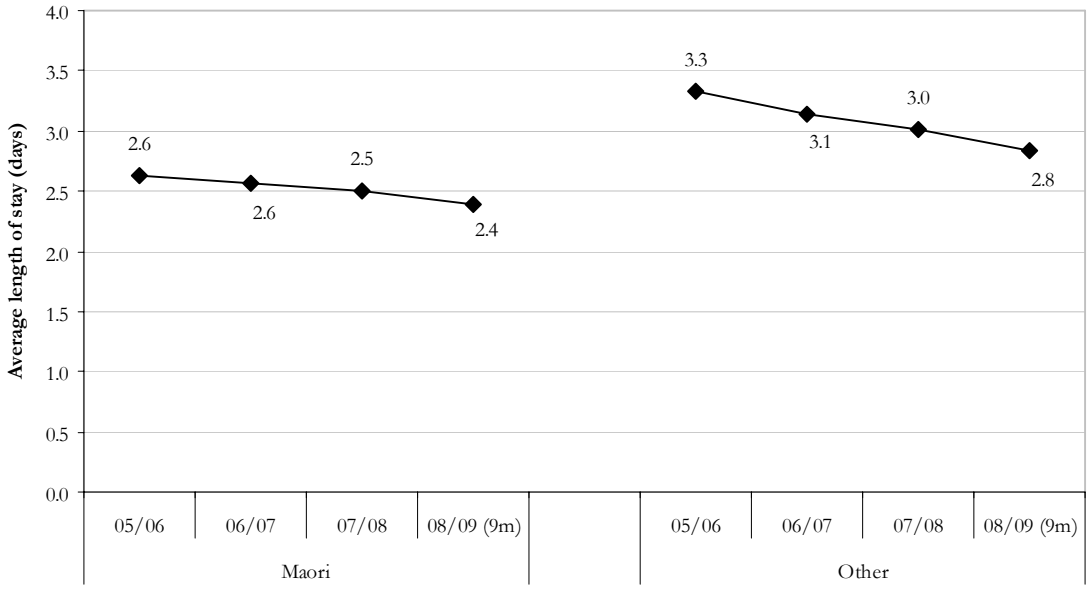


Note: Population estimates are made by the Ministry of Health. In 2005/06 the estimated population was based on the 2001 Census and from 2006/07 onwards it was based on the 2006 Census.

Figure 6.3 presents the average length of stay in hospital for admissions for Māori and Others over the period from 2005/06 to the first nine months of 2008/09. These data are not adjusted for age, sex or other aspects such as socioeconomic status or clinical factors. Figure 6.3 shows that both Māori and Others on average had declining lengths of stay in hospital over the period and that Māori had shorter lengths of stay than Others,

although the difference between Māori and Others decreased from 0.7 days in 2005/06 to 0.4 days in the first nine months of the 2008/09 year.

Figure 6.3 Average length of stay in hospital, all ages, Canterbury, 2005-2009
(Source: Planning and Funding, CDHB)



Note: Population estimates are made by the Ministry of Health. In 2005/06 the estimated population was based on the 2001 Census and from 2006/07 onwards it was based on the 2006 Census.
Others are non-Māori, non-Pacific.

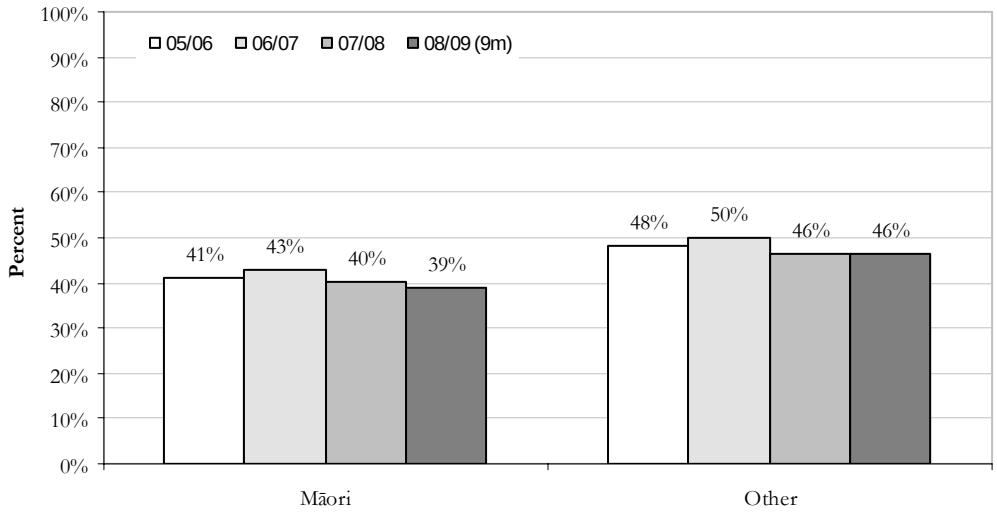
Presentations to emergency department

Figures 6.4 and 6.5 present activity in the emergency department (ED), with the proportion of those attending ED who were admitted and the proportion of those attending ED who waited less than four hours, respectively, over the period from 2005/06 to the first nine months of the 2008/09 year. These data have not been adjusted for age, sex or other clinical or socioeconomic factors.

A lower proportion of Māori were admitted from ED over the period and a higher proportion waited less than four hours.

Figure 6.4 Percentage of people attending ED who were admitted, all ages, Canterbury, 2005-2009

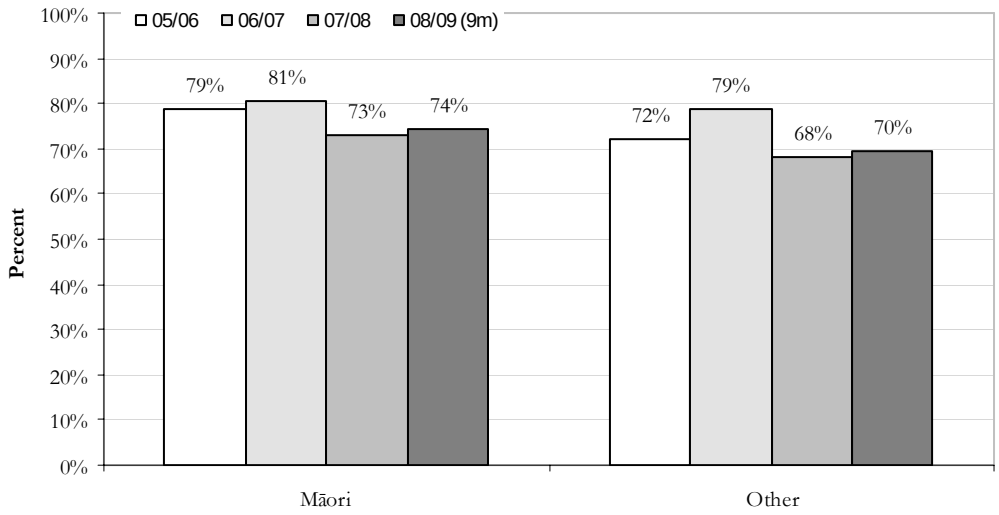
(Source: Planning and Funding, CDHB)



Note: Others are non-Māori, non-Pacific

Figure 6.5 Percentage of people attending ED who waited less than 4 hours, all ages, Canterbury, 2005-2009

(Source: Planning and Funding, CDHB)



Note: Others are non-Māori, non-Pacific

6.3 Prescriptions

Table 6.2 presents data on pharmacy dispensing costs for non-hospital prescriptions funded by the CDHB over the period from 2005/06 to the first nine months of the 2008/09 year. The average cost per prescription is the reimbursement cost (which is

exclusive of GST) divided by the number of prescriptions. The cost per capita is the reimbursement cost divided by the estimated population for each ethnic group. These data have not been adjusted for age, sex or other clinical or socioeconomic factors.

The average cost per prescription is slightly higher for Māori over the period, while the cost per capita was substantially lower for Māori compared to Others. The cost per prescription and cost per capita rose overall over the period for both Māori and Others. The relative increase in cost per capita was higher for Māori (98% increase) compared to Others (45% increase). These data indicate that the gap in prescription spending between Māori and Others has decreased.

These data suggest that Māori received fewer prescriptions than Others. Those prescriptions they do receive are of a similar cost. This is despite the higher disease burden carried by Māori as detailed in Chapter 5 Health Status. Nationally, it has been found that while the average number of prescription items was higher for Māori than for non-Māori, there was differential prescribing of drugs for some conditions. For example, for patients with COPD, fewer Māori than non-Maori received a prescription for a respiratory drug (Crengle, Lay-Yee et al. 2005).

Table 6.2 Dispensing through non-hospital pharmacies, all ages, Canterbury, 2005-2009
(Source: Planning and Funding, CDHB)

Year	Ethnic group	Number of prescriptions	Reimbursement cost	Average cost per prescription	Cost per capita
2005/06	**Māori**	89,552	$2,874,633	$32.10	$83.26
	Other	2,808,518	$87,577,882	$31.18	$203.34
2006/07	**Māori**	111,857	$3,749,459	$33.52	$108.60
	Other	3,390,019	$103,054,710	$30.40	$239.27
2007/08	**Māori**	133,703	$4,439,911	$33.21	$128.60
	Other	3,731,842	$109,324,952	$29.30	$253.83
2008/09 (9m)	**Māori**	120,878	$4,271,327	$35.34	$164.96
	Other	2,944,645	$94,971,612	$32.25	$294.00

Note: Population estimates are made by the Ministry of Health. In 2005/06 the estimated population was based on the 2001 Census and from 2006/07 onwards it was based on the 2006 Census.
Others are non-Māori, non-Pacific.

6.4 Laboratory tests

Table 6.3 presents cost data for laboratory tests included on the laboratory schedule that were funded by CDHB and done by Canterbury Health Laboratories, Medlab South, and

Southern Community Laboratories over the period from 2005/06 to the first nine months of the 2008/09 year. The average cost per test is the value of claims divided by the number of tests. The cost per capita is the value of claims divided by the estimated population for each ethnic group. These data have not been adjusted for age, sex or other clinical or socioeconomic factors.

As with prescriptions, the average cost per test is slightly higher for Māori than for Others. However, the cost per capita is lower for Māori. The costs have risen over the period for both Māori and Others. The relative increase was more for Māori (64% increase) than for Others (36% increase). These data indicate that while individual tests were more expensive for Māori, they received fewer tests overall. However, the gap between Māori and non-Māori in laboratory testing costs has narrowed slightly.

Table 6.3 Laboratory testing, all ages, Canterbury, 2005-2009

(Source: Planning and Funding, CDHB)

Year	Ethnic group	Number of tests	Value of claims	Average cost per test	Cost per capita
2005/06	**Māori**	51,299	$508,442	$9.91	$14.73
	Other	1,716,773	$16,040,736	$9.34	$37.24
2006/07	**Māori**	65,177	$653,593	$10.03	$18.93
	Other	1,991,342	$18,940,033	$9.51	$43.97
2007/08	**Māori**	72,891	$736,284	$10.10	$21.33
	Other	2,108,006	$20,179,064	$9.57	$46.85
2008/09 (9m)	**Māori**	61,314	$624,659	$10.19	$24.12
	Other	1,667,683	$16,306,559	$9.78	$50.48

Note: Population estimates are made by the Ministry of Health. In 2005/06 the estimated population was based on the 2001 Census and from 2006/07 onwards it was based on the 2006 Census.
Others are non-Māori, non-Pacific.

7 Health System Indicators

Key points

From 2003 to 2005:

- Avoidable mortality was twice as high for Māori in Canterbury than for European/Others, but lower than for Māori nationally.
- Avoidable hospitalisation was higher for Māori in Canterbury than for European/Others, but lower than for Māori nationally.

From 1996 to 2007:

- The rate of ambulatory sensitive hospitalisation for Māori under-five year olds in Canterbury started lower than that for Europeans and rose, while the rate for Europeans fell. By 2007, the rate for Māori had become higher than that for Europeans.

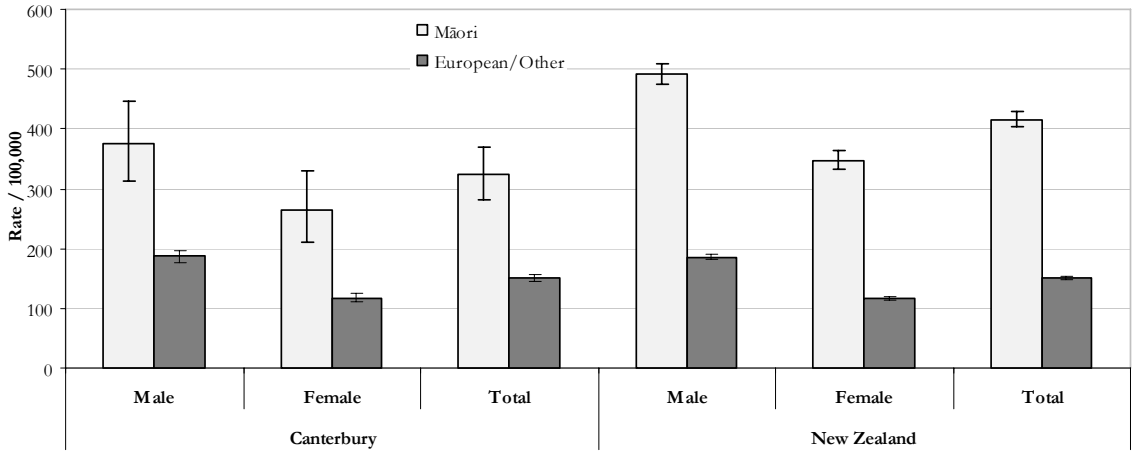
The performance of elements of the health system with respect to different populations can be assessed by reference to deaths and hospital admissions that could have been prevented. The concepts of avoidable hospitalisation and avoidable mortality have been proposed as means of identifying admissions and premature mortality that theoretically could have been prevented by timely and effective healthcare. They are based on a list of conditions that could have been identified and treated by either public health or primary health interventions (Sheerin, Allen et al. 2006).

7.1 Avoidable mortality and hospitalisation

Figure 7.1 presents rates of avoidable mortality aggregated for the period from 2003 to 2005, for Canterbury and New Zealand. The rate of avoidable mortality for Māori in Canterbury was over twice as high as that for European/Others (RR 2.15, non-overlapping 95% CIs for the rates). The rate for males appeared to be higher for Māori males than females, but this was not a significant difference. The rate for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.78, non-overlapping 95% CIs for the rates). Nationally the difference between the rate for Māori and for European/Others (RR 2.77, non-overlapping 95% CIs for the rates) was

significantly greater than that in Canterbury (RR 2.15, non-overlapping 95% CIs for the rates).

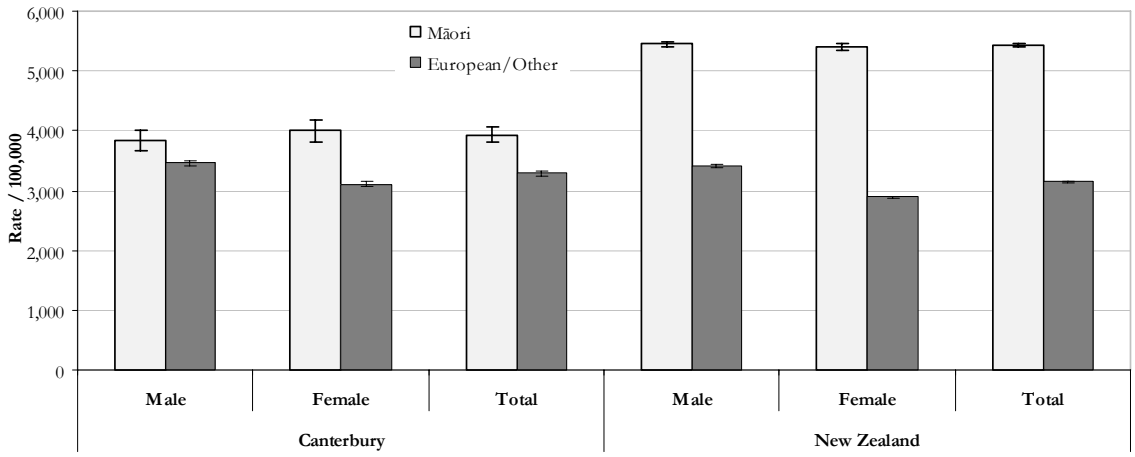
Figure 7.1 Avoidable mortality, 0-74 years, Canterbury and New Zealand, 2003-2005
(Source: HDIU)



Note: Rates are calculated per 100,000 and are age-standardised using the WHO population for people aged less than 75 years. European/Other are non-Māori, non-Pacific, non-Asian.

Figure 7.2 presents rates of avoidable hospitalisations aggregated for the period from 2005 to 2007, for Canterbury and New Zealand. The rate of avoidable hospitalisation for Māori in Canterbury was higher than that for European/Others (RR 1.20, non-overlapping 95% CIs for the rates). The rate appeared to be higher for Māori females than males, but this was not a significant difference (overlapping 95% CIs for the rates). The rate for Māori in Canterbury was significantly lower than that for Māori nationally (RR 0.72, non-overlapping 95% CIs for the rates). Nationally the difference between the rate for Māori and for European/Others (RR 1.72, non-overlapping 95% CIs for the rates) was greater than that in Canterbury (RR 1.20, non-overlapping 95% CIs for the rates).

Figure 7.2 Avoidable hospitalisation, 0-74 years, Canterbury and New Zealand, 2005-2007
(Source: HDIU)



The higher rates of avoidable mortality and hospitalisation for Māori than for European/Others indicate Māori are relatively under-served by health interventions aimed at preventable causes of death and hospital admission. The data presented in Figures 7.1 and 7.2 are also summarised in Table 8.20 in Appendix 3 Health status tables.

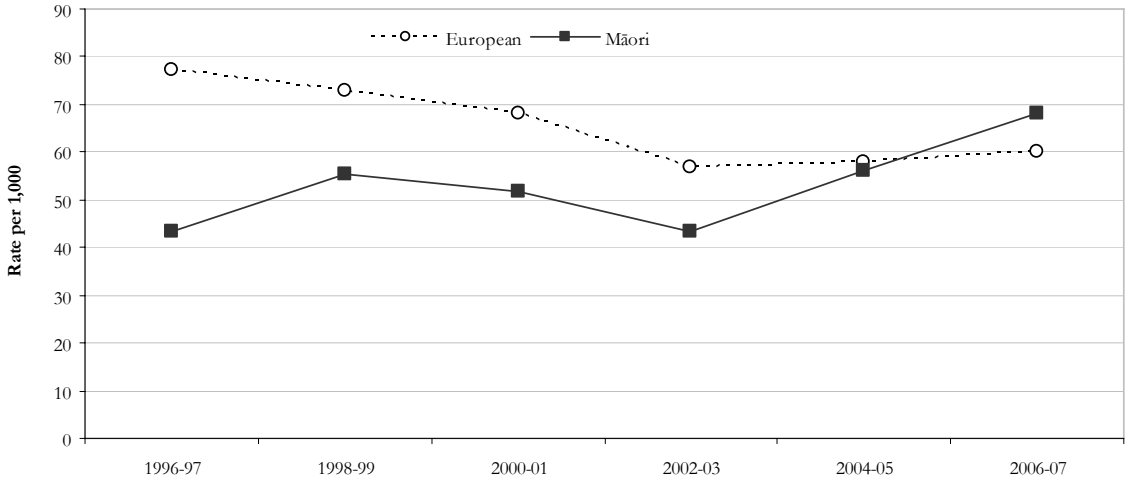
Ambulatory sensitive hospitalisation

Ambulatory sensitive hospitalisations (ASH) are a subset of avoidable hospitalisations that are admissions considered to be preventable by access to effective interventions delivered in primary health services (Jackson and Tobias 2001). Ambulatory sensitive conditions include infections (e.g. vaccine-preventable infections such as measles; gastroenteritis; respiratory infections; sexually transmitted infections), some chronic diseases (e.g. diabetes, angina and congestive heart failure, asthma, epilepsy), and some cancers (e.g. breast cancer, skin cancers). High ASH rates imply that high numbers of people were admitted to hospital with conditions that should have been avoided by preventive interventions or effective management by primary health care.

Figure 7.3 presents ASH rates over the period from 1996/97 to 2006/07, calculated by a method that takes into account characteristics of hospitalisation in the paediatric

population[19] (Craig, Anderson et al. 2008). It shows that Māori under-five year olds in Canterbury had a lower ASH rate than Europeans prior to 2004/05, when the rates were similar, but that in 2006/07 the Māori ASH rate had increased to exceed that for Europeans.

Figure 7.3 Ambulatory sensitive hospitalisation, 0-4 years, Canterbury, 1996-2007
(Source: Craig, Anderson et al. 2008)



Note: ASH calculated as rate per 1,000 children 0-4 years

[19] The New Zealand Child and Youth Epidemiology Service paediatric ASH codes exclude conditions that are present in the all-age ASH codes, but are of little relevance to the paediatric population, for example angina, and colorectal and cervical cancer,. The paediatric ASH codes also take into account that some conditions may be managed differently in primary care for adults than for children, such as seizures, which may be preventable in primary care for adults but may require admission to hospital for children.

8 Appendices

Appendix 1 Data sources and methodological issues

Data sources

The sources of data include the following:

Statistics New Zealand

Data from the 2001 and 2006 Censuses were requested for use in the demographic profile; to provide social and economic information that describe some of the factors that influence health; to provide smoking data; and to provide denominator data for use in calculating population rates of cancer registration, communicable disease notification, hospitalisation and mortality. Population projections were also obtained for the years following 2006, based on assumptions of medium fertility, mortality, migration, and inter-ethnic mobility.

Statistics New Zealand Security Statement: Access to the data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the authors, not Statistics New Zealand.

Health and Disability Information Unit, Ministry of Health

The Health and Disability Information Unit (HDIU) produced the Canterbury DHB Health Needs Assessment (Health and Disability Intelligence Unit 2008). That report analysed data from the New Zealand Health Survey, which have been used throughout this profile. The Canterbury DHB Health Needs Assessment also presented rates of diabetes complications, and low birthweight, perinatal and infant mortality, which are used in Chapter 5 Health Status, in addition to rates of avoidable mortality and hospitalisations which are used in Chapter 7 Health System Indicators.

Ngāi Tahu Development

Data from Mō Tātou (Ahuriri-Driscoll, Cram et al. 2004), a survey of Ngāi Tahu members aged 16 years and older in 2003/04 were used for prevalence of smoking and general practitioner visits.

Action on Smoking and Health

Year 10 smoking survey report data were used, including smoking among 14 to 15 year olds and young people exposed to smoking in the home.

Te Rōpū Rangahau Hauora a Eru Pōmare

Much of the data regarding mortality, hospitalisation, cancer registration and procedures used in this profile were made available by Te Rōpū Rangahau Hauora a Eru Pōmare. These data were obtained by Te Rōpū Rangahau Hauora a Eru Pōmare from the New Zealand Health Information Service (for mortality, and public hospital discharges), the New Zealand Cancer Registry (for cancer registrations) and Statistics New Zealand for population denominators. They have been reported on at the national level in Hauroa: Māori Standards of Health IV (Robson B, Harris R 2007).

The data provided by Te Rōpū Rangahau Hauora a Eru Pōmare at the DHB level were processed in the same way as is described in Hauora IV (see Appendix 1: Methods (Robson and Purdie 2007)) to adjust for undercounting of Māori and to age-standardise them to the 2001 Māori population. A brief description follows of the processing of data done by Te Rōpū Rangahau Hauora a Eru Pōmare:

- Adjustment was made to take into account the undercounting in ethnicity classification for Māori, particularly for hospitalisations and cancer registrations (mortality records are more accurate (Fawcett, Atkinson et al. 2008)). For these data an estimate of undercounting was made by linkage to other data sets (death registrations, New Zealand Housing Corporation tenant information and Ministry of Health national surveys) that have more reliable ethnicity classification. Information created from the analysis of the linked data sets generated adjusters that were applied to hospital and cancer registration data, increasing Māori hospitalisation figures by 5-15% (differing by age group) and Māori cancer registrations by 2-15% (see Appendix 3: Estimating Māori hospitalisations and cancer registrations (Harris, Purdie et al. 2007)).

  The adjustment described above was made for national data. It could be argued that undercounting in ethnicity classification of Māori may vary by DHB, and therefore not be valid for data at the DHB level. There is evidence that undercounting may be greater in South Island DHBs (Fawcett, Atkinson et al. 2008; Shaw, Atkinson et al.

2009), indicating, if anything, that adjustment for undercounting in CDHB may be conservative (Harris 2009).

- Rates for mortality, hospitalisation, cancer registration and procedures were directly age-standardised to the 2001 Māori population to take account of the different age structures of the Māori and non-Māori populations (see Appendix 4: Standard populations (Robson and Harris 2007)).
- Ninety-five percent confidence intervals (95% CIs) were determined for rates for Māori and non-Māori in New Zealand and by DHB. Rate ratios (RR) were calculated to represent the differences between Māori and non-Māori rates, and 95% confidence intervals for the rate ratios determined.
- Mortality data from death registrations were aggregated over five years from 2000 to 2004.
- Hospitalisation data included the primary diagnosis from publicly-funded hospital discharges (not private hospitalisations) and were aggregated over three years from 2003 to 2005. Hospital procedures were aggregated over the same period and included data on all procedures, which may be multiple for each hospitalisation. External causes of injury (e-codes) were analysed for all hospitalisations where injury was the principal diagnosis, and where an external cause was the cause of death.
- Cancer registrations from the New Zealand Cancer Registry were aggregated for the five years from 2000 to 2004, excluding in situ tumours and multiple registrations.

Information Directorate, Ministry of Health (formerly the New Zealand Health Information Service (NZHIS))

Data were provided on births and birth procedures.

Institute of Environmental Science and Research

Notifiable disease surveillance data (from Episurv) and sexually transmitted infection surveillance data were provided.

Injury Prevention and Research Unit, University of Otago, Dunedin

Data were provided on morbidity from injury.

New Zealand Child and Youth Epidemiology Service, University of Otago, Dunedin

The New Zealand Child and Youth Epidemiology Service (NZCYES) produced The Health Status of Children and Young People in Canterbury (Craig, Anderson et al. 2008), which was the source of much of the data for the section on tamariki/child and rangatahi/youth health in Chapter 5 Health Status. For the parts of that document reproduced in this profile, NZCYES used data from the National Minimum Dataset and the National Mortality Collection, which are managed by NZHIS, and the Birth Registration Dataset from the Department of Internal Affairs. For further information on data and methodological issues in those data sets see Appendices 1, 4, 5 and 6 in The Health Status of Children and Young People in Canterbury (Craig, Anderson et al. 2008).

Royal New Zealand Plunket Society

Data were provided on breastfeeding rates.

National Immunisation Register

Data were provided on immunisation coverage.

BreastScreen Aotearoa

Data were provided on breast cancer screening coverage.

National Cervical Screening Programme

Data were provided on cervical screening coverage.

Canterbury District Health Board

The Planning and Funding Division of the CDHB provided much of the data on health service utilisation, diabetes management and access to mental health services.
Data were obtained from Community and Public Health for NZDep profiles and geographical analyses.
The Community Dental Service provided much of the data for the section on oral health.
The Vision and Hearing Service provided audiometry failure data.

Methodological issues

Data presentation

Data are presented in this profile in tables (either in the body of the document or in Appendix 3 Health status tables) or represented in figures as:

- numbers of individual cases;
- percentages of the total population or rates, which were age- and/or sex-standardised where possible (depending on how data were provided, see below), and generally calculated per 100,000;
- rate ratios;
- 95% CIs for rates and rate ratios (depending on how data were provided).

Rate ratios are calculated by dividing one rate by another – the rate for Māori by the rate for non-Māori (or European / Other) in Canterbury or in New Zealand, or the rate for Māori in Canterbury by the rate for Māori in New Zealand.

Ninety-five percent confidence intervals give an indication of the uncertainty of an estimate, i.e. the range of values around an estimate within which there is a 95% probability of the true population value falling. If a 95% CI of a rate ratio does not include 1 then the probability of the rates on which the ratio is based not being different is less than 5% (less than 5% chance of an apparent difference being due to chance). If a 95% CI for a rate ratio does not include 1 then the difference between the rates is considered statistically significant. Another use of 95% CIs is when looking at two rates – if the 95% CIs do not overlap the difference between those rates is considered statistically significant and there is a less than 5% probability that the difference in rates is due to chance (Robson and Purdie 2007).

Small numbers of cases in Canterbury for some data meant that data had to be aggregated over years, and that in some instances resulted in wide 95% CIs, as the width is partly determined by the number of observations.

'Canterbury'

Throughout this profile when 'Canterbury' is used it means the CDHB area rather than the Canterbury region, which includes areas that are under the South Canterbury DHB.

Ethnicity data

Ethnicity information can be reported either as 'total response' or 'prioritised'. If ethnicity is reported as 'total response' it means the individual is recorded in each ethnic group they specify. The result of this is that the total of all responses by ethnic group summed will exceed the total number of individuals to the extent that those individuals selected multiple ethnicities.

If ethnicity is reported as prioritised, each individual is allocated to a single ethnic group by priority. If an individual responds to an ethnicity question with multiple responses they will be reported in the following prioritisation order: Māori > Pacific > Asian > European/Other (Ministry of Health 2004; Ministry of Health 2008). In this profile the system used is 'prioritised' unless otherwise specifically stated. The comparison ethnic group (non-Māori, European, European/Other, Other) used in this profile varies depending on the format of the data provided.

Age standardisation

As health outcomes vary by age, comparisons between groups require the use of techniques that adjust for variation in the age structure of those groups. Age-standardisation takes into account the younger age structure of the Māori population (as can be seen in Chapter 2 Demography) and similarly the higher proportion of elderly people in the non-Māori (and European) population.

In this profile, where age or age group data were available, age-standardisation was done. Where age-standardisation was done on raw data provided, the 2001 Māori population was used as the standard. This standard population was used as it represents the real rate among Māori more closely than if another standard population (such as WHO or Segi) were used (Robson, Purdie et al. 2007).

Some data were provided with age-standardisation already completed. This was the case for data provided by Te Rōpū Rangahau Hauora a Eru Pōmare (Robson and Harris 2007), which also age-standardised to the 2001 Māori population. Age-standardisation was also already completed for data provided in the Canterbury DHB Health Needs Assessment (Health and Disability Intelligence Unit 2008), which age-standardised using the WHO population. As the WHO population is somewhat older than the 2001 Māori

population its use is likely to have produced rates for Māori that are lower, and have reduced the difference in rates between Māori and the comparison population (European/Others) than if the 2001 Māori population had been used (Robson, Purdie et al. 2007).

New Zealand Health Survey data – synthetic estimates

The New Zealand Health Survey (NZHS, last conducted in 2006/07) includes questions on eating habits (3+ vegetables and 2+ fruit per day), physical activity, cigarette smoking, hazardous drinking, marijuana use (in the 2002/03 survey), overweight and obesity, and a range of other information regarding individuals' health. These data differ from Census data and routinely collected information, which have almost complete coverage of populations and provide actual counts, rather than estimates. Surveys, such as the NZHS, do not have large samples for each DHB and the numbers of respondents in subgroups, such as Māori, are smaller still[20]. Even national estimates are still estimates, with errors due to sampling (as indicated by confidence intervals) and possible bias due to non-response (about 30% for the NZHS). For sub-populations such as individual DHBs, especially sub-groups (such as Māori) within a DHB, there are problems because the number of respondents is small, making estimates based on these numbers difficult to interpret (Wells 2009).

One approach to the problem this presents is to provide estimates based only on the respondents in the sub-group. However, confidence intervals will be very wide, often so wide as to be meaningless. It is for this reason that this profile has not drawn Canterbury data from Te Rau Hinengaro: The New Zealand Mental Health Survey for section 5.9 Mental health. Another solution is to use data from the rest of the survey to improve on the estimates.

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[20] The New Zealand Health Survey collected information on 4,921 children aged 0 to 14 years and 12,488 adults aged 15 years and over, making a total of 17,409 people. The survey included 5,143 Māori or around 30% of the sample. In Canterbury, the sample included 328 children and 1,019 adults (Ministry of Health 2008). If around 30% of the sample in Canterbury were Māori, as for the whole country, then about 100 Māori children and 300 Māori adults would have been included. Māori had an overall response rate of 67.5%. If this were true for Māori in Canterbury then around 65 Māori children and around 200 Māori adults would have responded. At the 2006 Census there were 11,820 Māori children aged 0 to 14 years and 21,597 Māori adults aged 15 years and over in Canterbury.

Data from the NZHS presented in this profile have been produced by the Health and Disability Information Directorate of the Ministry of Health (Health and Disability Intelligence Unit 2008). To overcome the problem of small numbers of Māori as a sub-group in a DHB, use has been made of 'synthetic estimates'. These are appropriate to use for planning purposes, but not for other uses such as evaluating health programmes targeted at Māori.

The method used to produce synthetic estimates at the DHB level utilises data from the rest of NZHS. The synthetic estimates for Māori within a DHB are produced by taking the estimated rate for the DHB and multiplying it by the ratio of the national rate for Māori to the overall national population prevalence rate. The synthetic estimates give a likely prevalence rate for Māori (and other sub-groups) living in the DHB. The synthetic estimate is derived from the overall regional prevalence rate (for the whole population) by assuming that the relationships between subgroups (Māori and others) at the national level, as observed in the NZHS, are also reflected in the DHB region. Because of the use of this modelling technique the comparison of rate ratios between sub-groups within a DHB and between DHB and national sub-groups is not appropriate.

Appendix 2 Iwi in Canterbury

Table 8.1 Iwi, Canterbury and New Zealand, 2006 (full list)
(Source: Statistics New Zealand 2006 Census)

Iwi	Canterbury	New Zealand
Ngāi Tahu / Kāi Tahu	12,093	49,185
Ngāpuhi	4,626	122,214
Ngāti Porou	3,708	71,907
Ngāti Tūwharetoa	1,620	34,674
Waikato	1,242	33,429
Tūhoe	1,185	32,670
Te Arawa	1,170	23,316
Ngāti Maniapoto	1,161	33,627
Ngāti Kahungunu ki Te Wairoa	1,161	20,982
Ngāti Kahungunu, region unspecified	984	18,462
Te Atiawa (Taranaki)	747	12,852
Tainui	696	14,070
Kāti Māmoe	558	2,880
Ngāti Raukawa (Horowhenua/Manawatū)	525	13,233
Ngāti Awa	489	15,258
Te Ati Haunui-a-Pāpārangi	468	10,437
Ngaiterangi	444	12,201
Ngāti Mutunga (Wharekauri/Chatham Islands)	441	1,392
Ngāti Whātua	393	14,721
Whakatōhea	372	12,069
Te Whānau-a-Apanui	369	11,808
Ngāti Kahungunu ki Wairarapa	363	7,440
Ngāti Ruanui	357	7,035
Ngāti Kahungunu ki Heretaunga	351	9,525
Te Rarawa	303	14,892
Ngāti Raukawa, region unspecified	297	8,022
Te Aupōuri	291	9,333
Hapū Affiliated to More Than One Iwi	282	11,964
Ngāti Raukawa (Waikato)	276	8,166
Ngāti Mutunga (Taranaki)	273	2,094
Te Atiawa (Te Waipounamu/South Island)	255	2,433
Te Atiawa, region unspecified	255	4,644
Ngā Rauru	228	4,047
Ngāti Ranginui	225	7,644
Ngāti Kahu	213	8,313
Ngāti Pikiao (Te Arawa)	207	7,386
Waitaha (Te Waipounamu/South Island)	201	972
Taranaki	198	5,352
Rongowhakaata	189	4,710
Ngāti Kurī	186	5,757
Te Aitanga-a-Māhaki	165	5,874
Rongomaiwahine (Te Māhia)	165	4,254
Moriori	162	945
Ngāti Whakaue (Te Arawa)	156	7,311
Ngāti Haua (Waikato)	150	4,923
Ngāti Toarangatira (Te Whanganui-a-Tara/Wellington)	150	3,462
Ngāti Tahu-Ngāti Whaoa (Te Arawa)	138	1,488

Waitaha, region unspecified	132	771
Te Waipounamu/Wharekauri (South Island/Chatham Islands) Region, not further defined	120	696
Ngāti Kuia	120	1,551
Ngāti Mutunga, region unspecified	120	732
Ngāti Paoa	114	3,375
Muaūpoko	114	2,499
Rangitāne (Te Waipounamu/South Island)	114	966
Ngā Ruahine	111	3,726
Ngāti Apa ki Te Rā Tō	111	741
Rangitāne, region unspecified	108	1,569
Ngāti Wai	96	4,866
Ngāti Apa (Rangitī kei)	96	2,388
Ngāti Rārua	96	951
Ngāti Toa, region unspecified	90	1,290
Ngāti Maru (Marutuahu)	81	3,375
Te Arawa/Taupō (Rotorua/Taupō) Region, not further defined	78	2,142
Te Atiawa (Te Whanganui-a-Tara/Wellington)	78	1,728
Ngāti Tamaterā	75	2,457
Ngāti Kahungunu ki Te Whanganui-a-Orotu	75	1,674
Rangitāne (Manawatū)	72	1,281
Ngāti Rangiwewehi (Te Arawa)	69	2,346
Ngāi Tai (Tauranga Moana/Mātaatua)	63	2,313
Te Tai Tokerau/Tāmaki-makaurau (Northland/Auckland) Region, not further defined	57	2,565
Ngāti Hako	57	1,377
Ngāpuhi ki Whaingaroa-Ngāti Kahu ki Whaingaroa	54	1,746
Ngāti Pāhauwera	54	1,761
Ngāti Rangitihi (Te Arawa)	51	1,536
Ngāi Tāmanuhiri	51	1,662
Ngāti Tama (Taranaki)	51	1,167
Ngāti Maru, region unspecified	51	1,326
Ngāti Apa, area unspecified	51	1,026
Tūhourangi (Te Arawa)	48	2,277
Ngāti Pūkenga	48	1,785
Ngāti Manawa	48	1,941
Ngāti Tama (Te Waipounamu/South Island)	48	384
Ngāti Porou ki Harataunga ki Mataora	45	1,173
Ngāti Rākaipaaka	45	1,488
Ngāti Koata	45	1,062
Ngāti Tama, region unspecified	45	609
Ngāti Whare	39	1,281
Te Tai Rāwhiti (East Coast) Region, not further defined	36	915
Tapuika (Te Arawa)	33	1,383
Rangitāne (Te Matau-a-Māui/Hawke's Bay/Wairarapa)	33	1,566
Ngāti Hauiti	33	1,041
Ngāti Haua, region unspecified	33	1,530
Ngāti Maru (Taranaki)	30	732
Waikato/Te Rohe Pōtae (Waikato/King Country) Region, not further defined	27	1,086
Ngāti Kahungunu ki Tamatea	27	720
Waitaha (Te Arawa)	24	732
Te Atiawa ki Whakarongotai	24	615
Ngāti Toarangatira (Te Waipounamu/South Island)	24	183
Ngāti Hei	21	558
Ngāti Haua (Taumarunui)	18	822
Tauranga Moana	18	450

Ngāi Takoto	15	771
Te Uri-o-Hau	15	1,074
Ngāti Whanaunga	15	588
Tauranga Moana/Mātaatua (Bay of Plenty) Region, not further defined	15	162
Ngāti Tama ki Te Upoko o Te Ika (Te Whanganui-a-Tara/Wellington)	15	210
Ngāti Pūkenga ki Waiau	12	480
Tarāwhai (Te Arawa)	12	243
Ngāti Kahungunu ki Tamakinui a Rua	12	423
Manawatū/Horowhenua/Te Whanganui-a-Tara (Manawatū/Horowhenua/Wellington) Region, not further defined	12	324
Hauraki / Pare Hauraki	12	309
Ngāti Rangiteaorere (Te Arawa)	9	456
Te Matau-a-Māui/Wairarapa (Hawke's Bay/Wairarapa) Region, not further defined	9	279
Tangāhoe	9	231
Te Tauihu o Te Waka a Māui	9	111
Te Roroa	6	1,167
Ngāti Rāhiri Tumutumu	6	195
Ngāi Tai (Hauraki)	6	339
Uenuku-Kōpako (Te Arawa)	6	429
Taranaki (Taranaki) Region, not further defined	6	108
Pakakohi	6	327
Mātaatua	6	366
Hauraki (Coromandel) Region, not further defined	3	90
Ngāti Tara Tokanui	3	492
Aotea	3	51
Not Elsewhere Included	10,293	131,694

Note: *Iwi (total responses) for the Census usually resident population count of people with Māori descent.

Statistics New Zealand uses a confidentiality assurance technique of randomly rounding figures to base three. Under the random rounding process zero counts and counts which are already multiples of three are left unchanged and other counts are rounded to one of the nearest multiples of three.

Appendix 3 Health status tables

The majority of these data are presented in Figures and/or in the text of the body of the document in Chapter 5 Health Status and Chapter 7 Health System Indicators.

Cardiovascular disease

Table 8.2 Cardiovascular disease deaths (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Cardiovascular disease		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	148	95.2 (80.9-112.1)	6,865	63.3 (61.5-65.2)	1.50 (1.27-1.77)	4,316	139.8 (135.7-144.1)	51,805	61.2 (60.5-61.9)	2.29 (2.21–2.36)
	Male	95	115.1 (93.8-141.1)	3,078	75.5 (72.5-78.7)	1.52 (1.24-1.88)	2,420	170.0 (163.4-176.9)	24,462	78.2 (77.0-79.3)	2.18 (2.08-2.27)
	Female	53	75.3 (57.5-98.7)	3,787	51.2 (49.1-53.3)	1.47 (1.12-1.94)	1,896	109.7 (104.8-114.7)	27,343	44.2 (43.4-44.9)	2.48 (2.37-2.61)
Hospitalisation	**Total**	684	667.5 (617.3-721.9)	20,685	547.1 (536.6-557.7)	1.22 (1.13-1.32)	22,326	1,119.9 (1,1104.1-1,135.8)	183,516	643.2 (638.5-647.9)	1.74 (1.71–1.77)
	Male	410	762.4 (689.1-843.5)	11,230	672.7 (656.4-689.4)	1.13 (1.02-1.26)	11,820	1,252.9 (1,228.7-1,277.5)	103,206	805.5 (798.2-812.8)	1.56 (1.52-1.59)
	Female	274	572.7 (506.2-647.8)	9,455	421.5 (408.5-434.9)	1.36 (1.20-1.54)	10,506	986.8 (966.7-1,007.4)	80,310	480.9 (475.0-486.9)	2.05 (2.00-2.10)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Table 8.3 Ischaemic heart disease mortality (2000-2004), hospitalisations and hospital procedures (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Ischemic heart disease		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	94	60.5 (49.3-74.2)	3,791	36.7 (35.3-38.1)	1.65 (1.34-2.03)	2,449	80.0 (76.9-83.2)	28,688	35.5 (35.0-36.0)	2.25 (2.16–2.35)
	Male	67	82.3 (64.6-104.8)	1,873	47.6 (45.2-50.2)	1.73 (1.35-2.21)	1,523	106.7 (101.4-112.2)	15,075	49.2 (48.3-50.1)	2.17 (2.05-2.29)
	Female	27	38.7 (26.5-56.5)	1,918	25.7 (24.3-27.2)	1.51 (1.03-2.21)	926	53.3 (49.9-56.9)	13,613	21.8 (21.3-22.3)	2.45 (2.29-2.62)
Hospitalisation	**Total**	230	224.6 (196.3-257.0)	8,256	200.3 (195.1-205.7)	1.12 (0.98-1.29)	6,870	342.5 (334.0-351.1)	72,337	239.0 (236.6-241.3)	1.43 (1.40–1.47)
	Male	153	287.9 (244.0-339.6)	4,881	274.9 (265.9-284.1)	1.05 (0.88-1.24)	3,822	401.8 (388.6-415.4)	45,194	337.1 (333.2-341.0)	1.19 (1.15-1.23)
	Female	77	161.3 (127.9-203.5)	3,375	125.8 (120.4-131.5)	1.28 (1.01-1.62)	3,048	283.2 (272.8-294.0)	27,143	140.8 (138.3-143.3)	2.01 (1.93-2.10)
Angiography	**Total**	204	194.8 (168.9-224.6)	5,211	169.1 (163.7-174.7)	1.15 (1.00-1.33)	5,029	253.9 (246.6-261.3)	44,084	186.0 (183.8-188.3)	1.36 (1.32–1.41)
Angioplasty	**Total**	42	40.2 (29.3-55.2)	2,040	65.0 (61.9-68.3)	0.62 (0.45-0.85)	826	41.9 (39.1-45.0)	11,577	47.7 (46.7-48.8)	0.88 (0.82–0.95)
CABG	**Total**	66	63.3 (49.3-81.4)	1,270	36.5 (34.2-38.9)	1.74 (1.34-2.25)	876	44.5 (41.5-47.7)	9,591	36.7 (35.9-37.6)	1.21 (1.13–1.30)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Table 8.4 Stroke mortality (2000-2004), hospitalisations and hospital procedures (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Stroke	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	18	11.4 (7.1-18.3)	1,809	14.7 (13.9-15.6)	0.77 (0.48-1.24)	685	21.7 (20.1-23.4)	13,092	13.5 (13.2-13.8)	1.61 (1.49–1.74)
Hospitalisation	58	57.4 (43.8-75.1)	2,820	60.1 (57.2-63.1)	0.96 (0.73-1.26)	2,367	116.1 (111.3-121.1)	22,227	63.3 (62.0-64.6)	1.84 (1.75–1.92)
Endarterectomy	*	4.6 (1.7-12.3)	129	3.1 (2.5-3.8)	1.47 (0.53-4.04)	91	4.5 (3.6-5.6)	1,508	4.4 (4.1-4.7)	1.01 (0.81–1.26)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.5 Heart failure mortality (2000-2004), hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Heart failure	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	*	1.3 (0.3-5.3)	230	1.5 (1.3-1.8)	0.88 (0.22-3.53)	95	2.8 (2.3-3.5)	1,816	1.2 (1.2-1.3)	2.27 (1.83–2.81)
Hospitalisation	94	89.6 (72.5-110.7)	1,901	32.8 (30.6-35.1)	2.73 (2.19-3.41)	3,677	182.7 (176.5-189.0)	17,554	39.4 (38.2-40.6)	4.64 (4.43–4.86)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.6 Hypertensive disease mortality (2000-2004), hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Hypertensive disease	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	*	2.1 (0.7-6.5)	94	0.8 (0.7-1.1)	2.44 (0.76-7.89)	160	5.1 (4.4-6.0)	1,039	1.1 (1.0-1.1)	4.87 (4.08–5.81)
Hospitalisation	23	22.3 (14.7-34.0)	194	6.7 (5.4-8.4)	3.31 (2.06-5.33)	455	22.9 (20.9-25.2)	2,099	9.3 (8.6-10.0)	2.48 (2.20–2.80)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.7 Chronic rheumatic heart disease mortality (2000-2004), hospitalisations and hospital procedures (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Chronic rheumatic heart disease	Canterbury					New Zealand				
	Māori		non-Māori		Rate ratio (95%CI)	Māori		non-Māori		Rate ratio (95%CI)
	No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	5	3.2 (1.3-7.8)	63	0.6 (0.5-0.9)	5.01 (1.94-12.96)	186	6.0 (5.2-6.9)	545	0.8 (0.7-0.9)	7.46 (6.19–9.00)
Hospitalisation	15	14.8 (8.8-25.1)	81	2.5 (1.7-3.8)	5.83 (3.01-11.31)	496	25.2 (23.0-27.6)	1,004	5.5 (4.8-6.2)	4.62 (3.95–5.39)
Valve replacement	15	14.1 (8.3-23.9)	281	8.9 (7.5-10.5)	1.59 (0.92-2.76)	375	19.2 (17.2-21.3)	2,015	9.2 (8.4-10.1)	2.10 (1.85–2.38)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Cancer

Table 8.8 Cancer mortality and registrations (2000-2004), all ages, Canterbury and New Zealand, all sites and top ten sites ranked by mortality for Canterbury Māori
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Cancer		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
All sites											
Deaths	**Total**	141	93.7 (79.2-110.8)	4,740	69.3 (66.9-71.7)	1.35 (1.14-1.60)	3,640	119.2 (115.4-123.2)	36,372	67.3 (66.5-68.2)	1.77 (1.71-1.83)
	Male §	70	85.9 (67.6-109.1)	2,557.0	79.5 (76.0-83.2)	1.08 (0.85-1.38)	1,790	125.2 (119.5-131.2)	19,463.0	75.6 (74.4-76.9)	1.66 (1.59-1.74)
	Female §	71	101.5 (80.3-128.3)	2,183.0	59.0 (55.9-62.3)	1.72 (1.35-2.19)	1,850	113.2 (108.1-118.5)	16,909.0	59.1 (57.9-60.2)	1.92 (1.82-2.01)
Registrations	**Total**	243	160.6 (140.6-183.5)	10,758	203 (198.1-207.9)	0.79 (0.69-0.91)	6,697	219.0 (213.4-224.7)	83,926	200.6 (198.7-204.4)	1.09 (1.06-1.12)
	Male §	100	122.2 (99.2-150.6)	5,674	212.2 (205.5-219.1)	0.58 (0.47-0.71)	3,071	213.4 (205.5-221.7)	44,887	209.7 (207.1-212.2)	1.02 (0.98-1.06)
	Female §	143	198.9 (167.4-236.4)	5,084	193.7 (186.7-200.9)	1.03 (0.86-1.23)	3,626	224.6 (216.9-232.5)	39,039	191.5 (188.8-194.2)	1.17 (1.13-1.22)
Lung	**Deaths**	32	21.9 (15.4-31.1)	832	11.7 (10.8-12.7)	1.87 (1.30-2.68)	1,127	36.8 (34.7-39.0)	6,206	11.4 (11.1-11.7)	3.23 (3.03-3.45)
	Registrations	45	29.9 (21.9-41.0)	952	14.1 (13.0 -15.2)	2.13 (1.54-2.94)	1,366	44.6 (42.1-47.2)	7,079	13.7 (13.2-14.1)	3.26 (3.05-3.48)
Colorectal	**Deaths**	18	12.7 (7.9-20.3)	737	10.4 (9.6-11.4)	1.22 (0.75-1.96)	254	8.4 (7.4-9.5)	5,481	9.4 (9.1-9.7)	0.89 (0.78-1.01)
	Registrations	20	13.6 (8.5-21.8)	1,739	26.7 (25.3-28.3)	0.51 (0.32-0.82)	469	15.4 (14.0-16.9)	12,710	24.8 (24.3-25.3)	0.62 (0.56-0.68)
Breast: female §	**Deaths**	17	23.1 (14.3-37.3)	379	13.1 (11.6-14.7)	1.77 (1.08-2.90)	344	21.3 (19.1-23.7)	2,806	12.4 (11.9-13.0)	1.71 (1.53-1.92)
	Registrations	41	56.2 (40.8-77.4)	1,386	60.2 (56.5-64.1)	0.93 (0.67-1.29)	1,069	66.8 (62.7-71.1)	10,587	58.4 (57.0-59.9)	1.14 (1.07-1.22)
Pancreas	**Deaths**	9	6.3 (3.3-12.2)	204	2.7 (2.3-3.2)	2.33 (1.18-4.60)	128	4.1 (3.5-4.9)	1,433	2.5 (2.3-2.6)	1.68 (1.40-2.02)
	Registrations	9	6.2 (3.1-12.4)	221	3.1 (2.6-3.7)	1.98 (0.97-4.05)	149	4.8 (4.0-5.7)	1,521	2.7 (2.5-2.9)	1.76 (1.46-2.11)
Ill-defined sites	**Deaths**	8	5.3 (2.6-10.7)	276	3.2 (2.7-3.6)	1.69 (0.82-3.46)	223	7.3 (6.4-8.4)	2,170	3.5 (3.3-3.7)	2.10 (1.82-2.42)
	Registrations	5	3.8 (1.6-9.3)	310	4.0 (3.5-4.7)	0.94 (0.38-2.31)	281	9.2 (8.1-10.4)	2,499	4.4 (4.2-4.7)	2.07 (1.80-2.37)
Kidney	**Deaths**	7	4.1 (2.0-8.7)	111	1.7 (1.4-2.1)	2.41 (1.11-5.23)	65	2.2 (1.7-2.8)	707	1.4 (1.3-1.5)	1.55 (1.20-2.01)
	Registrations	12	7.8 (4.3-14.1)	253	5.3 (4.5-6.4)	1.45 (0.78-2.72)	138	4.6 (3.8-5.4)	1,642	4.3 (4.0-4.6)	1.08 (0.89-1.30)
Non-Hodgkin lymphoma	**Deaths**	6	3.9 (1.7-8.8)	164	2.6 (2.2-3.1)	1.50 (0.65-3.48)	105	3.4 (2.8-4.1)	1,364	2.6 (2.4-2.8)	1.31 (1.07-1.61)
	Registrations	8	5.6 (2.6-11.8)	386	7.6 (6.7-8.6)	0.74 (0.35-1.58)	201	6.6 (5.7-7.6)	2,887	7.2 (6.8-7.5)	0.92 (0.79-1.07)
Liver	**Deaths**	5	3.2 (1.3-7.8)	88	1.3 (1.0-1.6)	2.52 (1.00-6.32)	141	4.7 (4.0-5.6)	599	1.2 (1.1-1.4)	3.81 (3.14-4.61)
	Registrations	7	4.4 (1.9-9.9)	93	1.4 (1.0-1.8)	3.19 (1.35-7.54)	186	6.2 (5.3-7.2)	633	1.5 (1.3-1.7)	4.21 (3.45-5.13)
Ovary §	**Deaths**	*	2.9 (0.7-11.7)	113	3.5 (2.8-4.4)	0.84 (0.21-3.41)	63	3.9 (3.0-5.0)	817	3.2 (2.9-3.5)	1.22 (0.94-1.58)
	Registrations	5	7.6 (3.2-18.3)	197	8.6 (7.2-10.2)	0.89 (0.36-2.17)	135	8.4 (7.1-10.1)	1,366	7.5 (6.9-8.0)	1.13 (0.93-1.37)
Uterus §	**Deaths**	*	2.7 (0.7-10.9)	34	0.9 (0.6-1.4)	2.92 (0.69-12.33)	47	2.9 (2.2-3.8)	368	1.3 (1.1-1.4)	2.29 (1.68-3.13)
	Registrations	14	19.4 (11.2-33.4)	152	5.7 (4.6-6.9)	3.42 (1.91-6.13)	169	10.5 (9.0-12.3)	1,400	6.7 (6.2-7.2)	1.58 (1.33-1.87)

Note: Rates are calculated per 100,000 and are age-sex-standardised (except § which are age-standardised) to the 2001 Māori population
* indicates number less than five

Table 8.9 Lung cancer deaths and registrations, by gender, all ages, Canterbury and New Zealand, 2000-2004
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Lung cancer		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Deaths	Male	17	21.4 (13.2-34.6)	523	15.7 (14.3-17.3)	1.36 (0.83-2.22)	542	37.8 (34.7-41.1)	3802	14.3 (13.8-14.8)	2.64 (2.41-2.89)
	Female	15	22.4 (13.5-37.3)	316	8 (7.0-9.1)	2.81 (1.66-4.75)	585	35.8 (33.0-38.9)	2404	8.4 (8.1-8.9)	4.24 (3.86-4.66)
Registrations	Male	22	27.3 (17.5-42.6)	586	18.2 (16.5-20.0)	1.5 (0.95-2.36)	653	45.4 (41.8-49.2)	4248	16.5 (15.9-17.2)	2.75 (2.51-3.01)
	Female	22	32.6 (21.0-50.7)	377	10.4 (9.1-11.9)	3.14 (1.98-4.99)	713	43.8 (40.5-47.3)	2831	10.8 (10.2-11.5)	4.04 (3.67-4.45)

Note: Rates are calculated per 100,000 and are age-standardised to the 2001 Māori population

Table 8.10 Cervical cancer mortality and registrations (2000-2004), cervical cancer and cervical carcinoma in situ hospitalisations (2003-2005), females, all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Cervical		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Cervical cancer	**Deaths**	*	2.5 (0.6-10.0)	31	1.3 (0.8-2.0)	1.92 (0.45-8.21)	65	4.0 (3.1-5.1)	258	1.3 (1.1-1.5)	3.10 (2.33-4.11)
	Registrations	7	8.9 (4.2-18.7)	90	6.1 (4.7-7.9)	1.44 (0.66-3.18)	174	10.9 (9.4-12.7)	731	5.8 (5.2-6.4)	1.89 (1.58-2.27)
	Hospitalisation	10	20.2 (10.9-37.5)	75	7.5 (5.5-10.2)	2.69 (1.35-5.39)	214	20.9 (18.2-24.0)	834	9.7 (8.8-10.7)	2.15 (1.81-2.54)
Carcinoma in situ of cervix	**Registrations**	80	95.4 (76.3-119.2)	1,157	112.3 (105.5-119.6)	0.85 (0.67-1.07)	1,705	109.4 (104.1-114.9)	9,681	118.1 (115.3-120.9)	0.93 (0.88-0.98)

Note: Rates are calculated per 100,000 and are age-standardised to the 2001 Māori population
* indicates number less than five

Respiratory disease

Table 8.11 Respiratory disease mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Respiratory disease		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	32	21.0 (14.8-29.9)	1,311	13.2 (12.3-14.2)	1.59 (1.11-2.28)	1,037	33.8 (31.8-36.0)	10,658	13.1 (12.8-13.4)	2.59 (2.42-2.76)
Hospitalisation	**Total**	1,768	1,755.5 (1,670.5-1,844.9)	16,592	1,356.4 (1,325.8-1,387.8)	1.29 (1.23-1.37)	42,182	2,249.8 (2,217.9-2,282.2)	138,034	1,367.2 (1,351.8-1,382.8)	1.65 (1.62–1.68)
	Male	882	1,732.2 (1,613.9-1,859.2)	8,674	1,466.2 (1,421.7-1,512.1)	1.18 (1.09-1.28)	21,215	2,294.9 (2,246.8-2,344.0)	71,784	1,470.7 (1,447.5-1,494.3)	1.56 (1.52-1.60)
	Female	886	1,778.9 (1,659.2-1,907.2)	7,918	1,246.6 (1,205.0-1,289.7)	1.43 (1.32-1.54)	20,967	2,204.7 (2,163.0-2,247.2)	66,250	1,263.7 (1,243.4-1,284.3)	1.74 (1.70-1.79)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Table 8.12 Chronic obstructive pulmonary disease mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Chronic obstructive pulmonary disease		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	22	15.2 (10.0-23.3)	922	9.5 (8.8-10.2)	1.61 (1.04-2.47)	759	24.7 (23.0-26.5)	7,453	9.3 (9.1-9.6)	2.65 (2.45-2.86)
Hospitalisation	**Total**	160	165.8 (141.0-195.0)	3,416	76.2 (73.0-79.5)	2.18 (1.84-2.57)	5,331	261.1 (253.8-268.6)	25,791	73.7 (72.2-75.2)	3.54 (3.42–3.67)
	Male	79	159.7 (126.8-201.2)	1,702	78.1 (73.6-82.8)	2.05 (1.61-2.60)	2,164	229.0 (219.0-239.4)	13,378	77.8 (75.8-79.8)	2.94 (2.80-3.10)
	Female	81	171.9 (136.9-215.8)	1,714	74.3 (69.8-79.1)	2.31 (1.83-2.93)	3,167	293.1 (282.5-304.2)	12,413	69.6 (67.5-71.8)	4.21 (4.01-4.42)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Table 8.13 Asthma mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Asthma		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	*	2.4 (0.9-6.5)	36	0.6 (0.3-0.9)	4.37 (1.46-13.11)	79	2.6 (2.0-3.2)	286	0.6 (0.5-0.7)	4.10 (3.12-5.40)
Hospitalisation	**Total**	410	404.9 (366.2-447.8)	1,948	236.1 (222.6-250.5)	1.72 (1.53-1.93)	8,459	457.3 (446.2-468.5)	17,054	245.2 (239.1-251.5)	1.86 (1.80–1.93)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.14 Pneumonia mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Pneumonia		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	*	1.8 (10.6-5.5)	235	1.9 (1.6-2.4)	0.90 (0.28-2.88)	98	3.3 (2.7-4.0)	1,940	1.8 (1.6-1.9)	1.86 (1.50-2.31)
Hospitalisation	**Total**	179	176.2 (151.4-205.2)	2,839	147.3 (138.7-156.5)	1.20 (1.02-1.41)	6,934	366.5 (357.1-376.2)	28,640	222.0 (217.0-227.1)	1.65 (1.59–1.71)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.15 Bronchiectasis mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Bronchiectasis		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	*	0.6 (0.1-4.0)	30	0.3 (0.2-0.5)	1.68 (0.22-12.62)	64	2.1 (1.6-2.7)	193	0.3 (0.3-0.4)	6.70 (4.88-9.21)
Hospitalisation	**Total**	34	30.5 (21.5-43.2)	164	6.0 (4.7-7.7)	5.11 (3.32-7.84)	812	41.7 (38.8-44.8)	1,722	11.6 (10.5-12.8)	3.60 (3.19–4.08)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population
* indicates number less than five

Table 8.16 Acute bronchitis and bronchiolitis hospitalisations, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Acute bronchitis & bronchiolitis		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Hospitalisation	**Total**	205	205.3 (177.8-237.0)	890	139.3 (128.2-151.4)	1.47 (1.25-1.74)	6,907	383.6 (371.3-396.3)	8,395	157.9 (151.3-164.7)	2.43 (2.30-2.56)

Note: Rates are calculated per 100,000 and are age-sex-standardised to the 2001 Māori population

Diabetes

Table 8.17 Type 2 diabetes mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Type 2 diabetes		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	19	14.4 (9.2-22.6)	271	2.5 (2.2-2.9)	5.69 (3.55-9.14)	825	27.0 (25.2-28.9)	2,738	3.6 (3.5-3.8)	7.40 (6.81-8.03)
	Male	10	14.7 (7.9-27.5)	131	1.5 (1.1-2.1)	9.64 (4.78-19.42)	456	31.9 (29.1-35.0)	1,387	4.5 (4.2-4.7)	7.17 (6.42-8.00)
	Female	9	14.1 (7.3-27.1)	140	0.9 (0.6-1.3)	15.33 (7.21-32.62)	369	22.0 (19.9-24.4)	1,351	2.8 (2.6-3.0)	7.76 (6.86-8.78)
Hospitalisation	**Total**	104	101.9 (83.4-124.5)	1,585	38.5 (36.0-41.2)	2.64 (2.14-3.27)	3,854	193.4 (187.1-199.9)	13,389	44.4 (43.1-45.7)	4.36 (4.17–4.55)
	Male	82	158.1 (126.3-198.0)	769	41.3 (37.4-45.6)	3.83 (3.00-4.89)	2,110	222.8 (213.0-232.9)	7,245	51.6 (49.7-53.6)	4.32 (4.07-4.58)
	Female	22	45.6 (29.4-70.9)	816	35.8 (32.6-39.2)	1.28 (0.81-2.00)	1,743	164.1 (156.2-172.4)	6,145	37.2 (35.5-38.8)	4.42 (4.13-4.72)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Table 8.18 Type 1 diabetes mortality (2000-2004) and hospitalisations (2003-2005), all ages, Canterbury and New Zealand
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Type 1 diabetes		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Mortality	**Total**	6	3.4 (1.5-7.6)	64	1.1 (0.8-1.5)	3.04 (1.28-7.21)	80	2.6 (2.1-3.2)	436	0.9 (0.8-1.0)	2.88 (2.24-3.69)
Hospitalisation	**Total**	40	37.3 (27.1-51.3)	739	66.3 (61.0-72.0)	0.56 (0.40-0.78)	863	45.9 (42.9-49.2)	5,131	55.3 (53.3-57.3)	0.83 (0.77-0.90)
	Male	28	53.5 (36.7-78.1)	302	52.4 (45.9-60.0)	1.02 (0.68-1.52)	340	37.1 (33.3-41.4)	2,476	50.5 (48.1-53.1)	0.73 (0.65-0.83)
	Female	12	21.0 (11.6-38.0)	437	80.1 (72.0-89.1)	0.26 (0.14-0.48)	523	54.7 (50.1-59.8)	2,655	60.0 (57.0-63.0)	0.91 (0.82-1.01)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Mental health

Table 8.19 Mental health and behavioural disorder hospitalisation, all ages, Canterbury and New Zealand, 2003-2005
(Source: Te Rōpū Rangahau Hauora a Eru Pōmare)

Mental health and behavioural disorders		Canterbury					New Zealand				
		Māori		non-Māori		Rate ratio (95% CI)	Māori		non-Māori		Rate ratio (95% CI)
		No.	Rate (95% CI)	No.	Rate (95% CI)		No.	Rate (95% CI)	No.	Rate (95% CI)	
Hospitalisation	**Total**	705	663.1 (614.5-715.4)	8,429	512.9 (499.1-527.1)	1.29 (1.19-1.40)	12,376	658.1 (645.9-670.5)	49,373	364.0 (359.1-368.9)	1.81 (1.77-1.85)
	Male	398	740.2 (669.0-818.9)	3,475	444.3 (425.6-463.8)	1.67 (1.49-1.86)	6,746	745.4 (726.8-764.5)	22,311	348.7 (341.7-356.0)	2.14 (2.07-2.21)
	Female	307	585.9 (522.2-657.5)	4,954	581.6 (561.4-602.5)	1.01 (0.89-1.14)	5,630	570.8 (555.3-586.7)	27,062	379.2 (372.5-386.0)	1.51 (1.46-1.56)

Note: Rates are calculated per 100,000, sex-specific rates are age-standardised, total rates are age-sex-standardised to the 2001 Māori population

Avoidable mortality and hospitalisations

Table 8.20 Avoidable mortality (2003-05) and hospitalisations (2005-07), 0-74 years, Canterbury and New Zealand
(Source: HDIU)

Indicator		Canterbury			New Zealand		
		Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio	Māori Rate (95% CI)	European/Other Rate (95% CI)	Rate ratio
Avoidable mortality	**Total**	323.3 (280.7–370.6)	150.6 (144.4–156.9)	2.15	416.3 (404.9–428.0)	150.3 (148.1–152.6)	2.77
	Male	376.3 (313.7–447.8)	186.4 (176.6–196.6)	2.02	491.9 (474.0–510.2)	185.9 (182.3–189.5)	2.65
	Female	265.5 (210.2–330.9)	116.9 (109.5–124.8)	2.27	348.0 (333.4–363.0)	116.2 (113.5–119.0)	2.99
Avoidable hospitalisations	**Total**	3,931.1 (3,805.3 - 4,059.9)	3,285.2 (3,251.9 - 3,318.7)	1.20	5,427.9 (5,391.7 - 5,464.3)	3,147.1 (3,128.2 - 3,159.0)	1.72
	Male	3,843.5 (3,670.4 - 4022.7)	3,461.6 (3,413.1 – 3,510.6)	1.11	5,446.4 (5,394.7 - 5,498.5)	3,412.8 (3,392.3 - 3,430.2)	1.60
	Female	4,001.9 (3,821.3 - 4,188.8)	3,112.6 (3,067.0 - 3,158.7)	1.29	5,398.0 (5,347.3 – 5,449.0)	2,886.6 (2,869.2 – 2,902.6)	1.87

Note: Rates are calculated per 100,000 and are age-standardised using the WHO population for people aged under 75 years. European/Other are non-Māori, non-Pacific, non-Asian.

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