Márama's story

Márama and Tāne are seasonal workers in the shearing sheds. They reside in Raupunga and have six children. During the year 2000, one of their sons was involved in a car accident in Wairoa, which left him seriously injured and hospitalised at Hastings Hospital in the intensive care unit. He was to spend almost all of his hospital stay there. Márama stayed with her son, Kani, and was his nurse/caregiver during this time. Tāne returned home to Raupunga, (two hours drive northeast of Hastings) to look after the rest of the children. They were to lead two separate lives for the next five months, which proved to be very draining on the whānau, healthwise and financially.

One life was with Tāne at home caring for their children – managing the family unit with their daily living like the food, the monthly bills such as the power and phone as well as the mortgage – all adding up to a high financial burden for Tāne to look after. The power tariff in Wairoa is amongst one of the dearest in New Zealand.

The second life involved the daily living costs within the hospital such as the payment for lodgings at the whānau whare (hospital accommodation). Márama had to supply their own food or buy from the hospital cafeteria, which wasn't cheap and doesn't cater for long-term residential whānau in terms of a discount. Yet discounted meals, if not free, were made available for some hospital staff.

One of the biggest expenses for the whānau was the petrol. Márama and Tāne were not given any travel assistance and, because they were seasonal workers, during the off season they were faced with a stand-down period of up to 12 weeks.

"Tāne was spending most of our money on petrol, and then I said, "Fill up our cupboards, like for the kids' lunches", so we were just living on like gee!! Like sometimes he would leave me on the Sunday and then come back and I would only have $20 to last me until Thursday and that's the pits. You imagine living on $20. There was three (Márama, Kani and Manu, Márama's youngest daughter) of us and you're spending like so much a day on food and those cafés are so expensive."

The stress didn't stop here for Márama and her whānau. For Márama it was also dealing with the racism that she witnessed on a day-to-day basis by some professional hospital staff, which angered Márama a lot.

"Well I've seen it, you know, when you're in the children's ward, well my son was under 16, and you don't go up to the other wards until you're 16 and over and I have seen many, like they'll run and do this person and they won't go and do this person and you can guarantee because there are three of us in there, they'll be running to a Pākehā and not a Māori. That's only some reasons but I have seen it happen."

However, she and her family learned to cope with the indifferences that they saw. After a long five months, Kani was well enough to be allowed home, with a lot of ongoing rehabilitation and visits back to the hospital. Apart from this, it was a big relief for the whānau that they were once again reunited as a whole and able to refamiliarise and get back into the routine of their daily whānau lives.

Source: Rameka R. 2006. *He Arakanihi ki te Oranga*. Wellington: Te Rōpū Rangahau Hauora a Eru Pōmare.

5 HOSPITALISATIONS

Bridget Robson, Carey Robson, Ricci Harris, Gordon Purdie

Key points

- In 2005 just over one in eight Māori and just under one in eight non-Māori people were admitted to public hospitals, with an average of 1.7 admissions each among Māori and 1.6 admissions among non-Māori.
- Māori age-standardised rates of public hospitalisations (not individuals) were 30% higher than non-Māori rates during 2003–2005. The rates were higher in each age group except for babies under the age of one, among whom the rate was 80% that of non-Māori. In the 45–64 years age group Māori had more than twice the rate of admissions of non-Māori.
- Infants had the highest rate of hospitalisations. Those aged 65 years and over had the second highest rate. The age group least likely to be hospitalised was 5–14 years. This pattern held among Māori and non-Māori, and among males and females.
- All-cause hospitalisation rates increased with increasing socioeconomic deprivation among Māori and non-Māori males and females in each age group. Because Māori are disproportionately represented in the most deprived areas, Māori are at higher risk overall of hospitalisation than non-Māori. With the exception of children under the age of 15 years, Māori public hospitalisation rates were higher than non-Māori rates at the same level of deprivation, in each age group.
- There was a small increase in all-cause public hospital admission rates among both Māori and non-Māori between 2000 and 2005. The largest rate increases among Māori were in the 45–64 years age group (15%) and those aged 65 years and over (13%). Non-Māori rates changed very little in any age group. The total *number* of hospital admissions increased by 20% among Māori and by 7% among non-Māori (an increase of 44% and 49% among Māori aged 45–64 and 65 years and over respectively).
- Apart from admissions for specific procedures and healthy newborns (factors influencing health status not associated with illness, injury or childbirth), pregnancy and childbirth was the most common cause of admission among Māori, followed by injuries and respiratory disease. The leading causes were similar for non-Māori, but cardiovascular disease replaced respiratory disease as the fourth leading major cause.
- The largest causes of female hospitalisations were those related to pregnancy and childbirth.

- Higher rates of admissions for pregnancy and childbirth among Māori women accounted for a third of the difference in total hospitalisation rates between Māori and non-Māori.
- Women were more likely than men to be admitted for genitourinary diseases, cancer, signs and symptoms, and factors relating to health status.
- Males had a higher risk of hospital admission than females for injuries and poisoning, mental and behavioural disorders, ear diseases, circulatory diseases, and infectious diseases.
- Māori had higher rates of hospitalisation than non-Māori for preventable conditions, including skin infections, glue ear, dental caries, injuries, asthma, COPD, bronchiectasis, bronchitis and bronchiolitis, diabetes and its complications, hypertensive disease, congestive heart failure, acute rheumatic fever and chronic rheumatic heart disease.
- Age-specific rates of hospital discharges among middle-aged Māori were similar to or exceeded those of non-Māori aged between 15 to 25 years older for chronic conditions associated with age, such as non-insulin dependent diabetes, hypertensive disease, heart failure, and COPD (including transfers and readmissions).
- The main causes of hospitalisations involving injury and poisoning were falls, exposure to mechanical forces, transport accidents, and complications of medical and surgical care. Māori hospitalisation rates were higher than non-Māori rates for each of these causes and for injuries from assault.
- Publicly funded surgical procedure rates for 2003–2005 were higher among Māori for procedures related to ear disease, diabetes and its complications, some cardiac procedures including angiography, heart valve replacements and coronary artery bypass and graft (CABG), but not angioplasty. CABG and angioplasty rates remain lower than expected for Māori given the high mortality rates. Caesarean section rates were lower for Māori women.
- There was a large increase in the rate of haemodialysis for Māori between 2000 and 2005 while the rates did not increase significantly for non-Māori. Cardiac procedure rates have increased generally since the early 1990s as best practice changed. Between 2000 and 2005, rates of angiography and angioplasty rates continued to increase for both Māori and non-Māori, but at a faster rate for Māori. CABG rates decreased between 2000 and 2005 among both groups.
- The major causes of hospital admission for Māori infants (apart from healthy live births) were perinatal conditions and respiratory disease. Māori admission rates were lower than those of non-Māori for perinatal conditions but higher for respiratory disease.
- For Māori children aged 1–4 years respiratory disease was the leading cause of hospitalisation, followed by injuries, ear disease and dental caries. Māori rates were higher than non-Māori rates for these causes.

- Among Māori children aged 5–14 years injury was the main cause of admission followed by respiratory and ear disease.
- At ages 15–24 and 25–44 years pregnancy and childbirth were the main causes of admission for Māori, followed by injury.
- For Māori adults aged 45–64 years and 65 years and over admissions for specific procedures (mainly dialysis) were the most common, followed by cardiovascular disease and respiratory disease. Although the rate of admissions for dialysis was very high among Maori, the proportion of individuals admitted for dialysis was relatively small compared to the proportion of people admitted for CVD or respiratory disease. The high admission rate for dialysis is driven by the large number of admissions per person.

Introduction

This chapter describes patterns of public hospitalisations for Māori and non-Māori during the period 2003–2005 for all ages, by sex, by age group, and by deprivation quintile. Annual rates between 2000 and 2005 are also examined for all-cause hospitalisations.

Hospitalisation data is one measure of health care utilisation. By itself it is not a measure of need, nor of the extent to which the health system is meeting need. Nevertheless, it can provide some information on the performance of the health system, including the effectiveness of the primary care sector. Alongside other data such as mortality or incidence, hospital data can contribute to an assessment of whether Māori are receiving appropriate and equitable access to the most resource-intensive sector of the health system. Trends in hospital admissions can assist the planning of future services and health strategies.

Statistical coverage

The statistics in this chapter refer to publicly funded hospital discharges[1], including inpatients and day patients. An inpatient is "a person who is admitted to hospital for medical, surgical, psychiatric, or obstetric treatment, observation or care and stays at least one night. It also includes healthy persons if formally admitted by the hospital as boarders" (NZHIS 2006). Healthy babies born in hospital are counted as inpatients. Day patients are admitted and discharged on the same day. Outpatients are excluded.

Publicly funded hospital discharges include inpatient care provided by district health boards, community health trusts, and publicly funded hospital services provided in private hospitals. Privately funded hospital care is not included.

The unit of analysis is generally the number of discharges (episodes of care). Therefore, each readmission of a patient for the same condition is counted as a separate episode of care and patients transferred to another public hospital are counted twice. A smaller

[1] Hospitalisations from routinely collected data are counted when a person is discharged from hospital. While hospitalisations and hospital admissions are often used in describing the data, strictly speaking these refer to hospital discharges.

proportion of Māori admissions were coded as transfers from another hospital than non-Māori patients (4.47% compared to 6.71%) during the period of our analysis.

Māori hospital admissions are known to be undercounted in the national data set but the net undercount varies by age, increasing in the elderly. Therefore, we adjusted for the estimated undercount of Māori in each age group. Non-Māori hospitalisations were calculated as the difference between the total number of hospitalisations and the adjusted number of Māori hospitalisations. See Appendix 3 for details. Because the adjustments do not apply to hospital discharge data from the 1990s we only examined hospitalisations from the year 2000 on.

All age-standardised rates were standardised to the Māori population. Rates standardised to Segi's world population and the WHO world population will also be available on the *Hauora IV* website www.hauora.maori.nz. These standard populations are included as Appendix 4. All rates were calculated per 100,000 person-years. The NZDep2001 index of small area deprivation was used to examine patterns by socioeconomic status. The International Classification of Diseases (ICD) codes and the groupings used in this volume are listed in Appendix 2. More detail on statistical methods can be found in Appendix 1.

What is in this chapter?

The data in this chapter are presented for Māori and non-Māori and are divided into four main sections:

- All-cause public hospitalisations:
  - Numbers and rates of hospital discharges during the period 2003–2005 by sex and age group;
  - Rates of public hospital discharges by deprivation quintile (NZDep2001) and age group for 2003–2005;
  - Numbers and rates of hospitalisations by year from 2000 to 2005 for all ages and by age group.
- Major causes of public hospitalisation for all ages:
  - Leading causes of hospital admission among Māori and non-Māori during the years 2003–2005 (numbers and rates by ICD chapter);
  - Selected causes of hospital admission by sex, numbers, age-standardised rates for 2003–2005;
  - Five-year age-specific rates of admission for selected causes for the years 2003–2005;
  - Causes of public hospital admissions involving injury or poisoning, numbers and age-sex-standardised rates for 2003–2005.
- Publicly funded surgical procedures:
  - Numbers and age-sex-standardised rates for 2003–2005;
  - Yearly rates of selected procedures during the period 2000 to 2005;

- Major causes of public hospitalisation during 2003–2005 for the following age groups:
  - infants < 1 year;
  - 1–4 years;
  - 5–14 years;
  - 15–24 years;
  - 25–44 years;
  - 45–64 years;
  - 65 years and over.

All-cause public hospitalisations

Table 5.1: Public hospitalisation rates by sex and age group, 2003–2005

Age group	Female			Male		
	Māori rate	Non-Māori rate	Rate ratio	Māori rate	Non-Māori rate	Rate ratio
All ages	25,915.2	19,803.0	1.31	20,968.7	15,761.0	1.33
Under 1 year	125,380.2	157,187.7	0.80	135,865.6	165,460.1	0.82
1–4 years	15,700.1	14,766.3	1.06	19,463.4	18,738.8	1.04
5–14 years	7,338.2	6,918.0	1.06	8,992.6	8,218.1	1.09
15–24 years	29,151.3	16,195.6	1.80	10,599.5	8,161.1	1.30
25–44 years	27,376.4	22,407.4	1.22	13,803.0	9,111.4	1.51
45–64 years	30,292.2	14,690.6	2.06	34,504.1	15,847.3	2.18
65 years and over	63,029.5	35,555.2	1.77	82,474.7	44,974.1	1.83

Notes: Rates are calculated per 100,000; rates for 'all ages' and 65 years and over were age-standardised to the 2001 Māori population; shaded rate ratios are statistically significant at the 5% level.

During 2003–2005 there were approximately 148,000 public hospital discharges per year on average among Māori and 690,000 per year among non-Māori. Just over one in 8 Māori and just under one in 8 non-Māori were hospitalised each year. The average number of admissions per person was 1.7 for Māori and 1.6 for non-Māori. Age-standardised rates of hospital discharges were around a third higher for Māori than non-Māori among both males and females (Table 5.1).

Males had higher rates of hospitalisation than females in every age group except 25–44 years, when pregnancy and childbirth accounted for the greater number of female hospitalisations.

Infants had the highest admission rates among both Māori and non-Māori. This was partly because births in hospital are counted as admissions (over 40% of infant admissions). However, after taking healthy newborns into account infant admission rates were still higher than those of other age groups (65,230 per 100,000 for Māori females; 79,240 for Māori males; 83,340 for non-Māori females and 97,990 for non-Māori males).

Among Māori the second highest admission rates were among the elderly (65 years and over)[2] followed by the 45–64 years age group. School aged children (5–14 years) had the lowest risk of going to hospital. Among males, children aged 1–4 years had higher public hospital discharge rates than young adults aged 15–24 and 25–44 years.

Māori infants were around 20% less likely than non-Māori infants to be admitted to hospital. At all other ages Māori discharge rates were higher than non-Māori rates, ranging from around 5% higher among children under 15 years to twice as high at middle age (45–64 years). Among those aged 65 and over, Māori rates were 80% higher than non-Māori (age-standardised). Pregnancy and childbirth accounted for 80% of the difference between Māori and non-Māori females at ages 15–24 years and 14% at ages 25–44 years.

All-cause hospitalisations by deprivation and age group

Figure 5.1 shows Māori and non-Māori age-specific public hospital discharge rates by NZDep2001 quintile during the period 2003–2005. NZDep2001 is the New Zealand Index of small-area socioeconomic deprivation based on Census data. The Māori population is disproportionately represented in the most deprived areas.

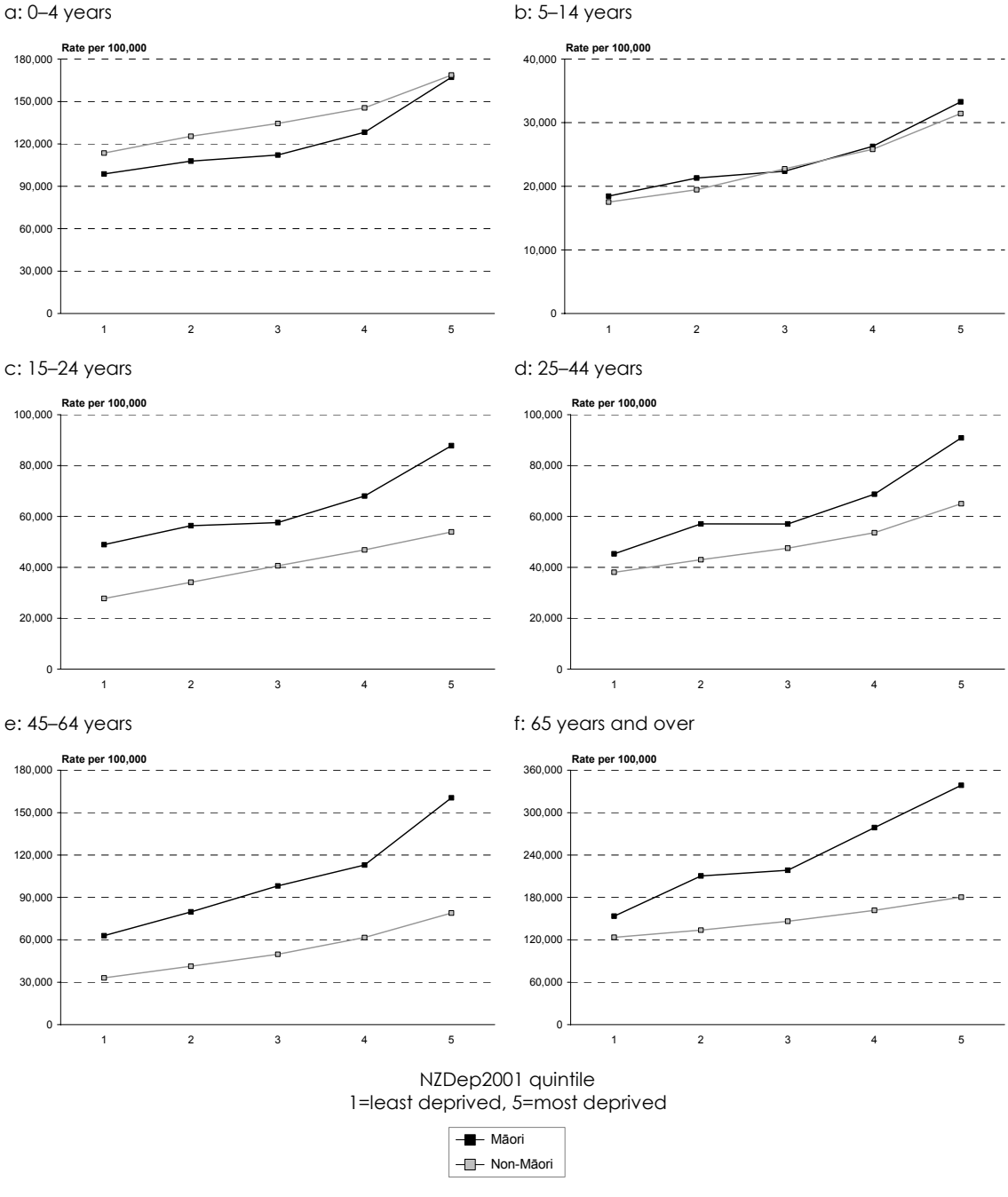
In each age group the risk of being admitted to hospital increased with increasing socioeconomic deprivation among both Māori and non-Māori. Public hospitalisation rates in the most deprived areas were two or more times higher than those in the least deprived areas among Māori adults aged 25 years and over. In the younger age groups hospitalisations were around 70% to 80% higher in the most deprived areas compared to the least deprived areas.

In the adult age groups (15–24 years and over) public hospital discharge rates were higher for Māori than non-Māori at each level of deprivation. Among preschoolers Māori rates were lower than those of non-Māori at each level of deprivation except the most deprived quintile where they were similar. Among children aged 5–14 years Māori and non-Māori rates were similar in each quintile.

While the magnitude of rates was different by gender, the patterns of difference between Māori and non-Māori by deprivation were generally similar for males and females.

[2] The crude rates for non-Māori aged 65 years and over were 43,500 per 100,000 for females and 51,000 per 100,000 for males. The standardised rate for Māori approximates the crude rate.

Figure 5.1: Public hospitalisations by NZDep2001 quintile and age group, 2003–2005



All-cause public hospitalisations by year, 2000 to 2005

Trends in hospital admission rates provide information on changing health need, and, in some cases, the effectiveness of primary care and population-based initiatives. The number of Māori and non-Māori hospital admissions is also useful for planning services to meet the needs of increasing populations and changes in age structure. Therefore, we report increases in the *number* of admissions among Māori and non-Māori by age group, as well as changes in *rates* of admission.

The previous volume *Hauora: Māori Standards of Health III* showed a rising rate of hospital admissions. This trend continued in the 1990s for both Māori and non-Māori in each age group. However during the years 2000 to 2005 substantial increases in rates occurred only in the older age groups (45–64 years and 65 years and over) among Māori. Māori rates in the younger age groups and non-Māori rates in all age groups remained fairly steady during the first half of this decade. This resulted in an increase in the Māori/non-Māori age-sex-standardised rate ratios that was mostly driven by increasing gaps in the middle and older age groups (Table 5.2).

- Between 2000 and 2005 the age-sex-standardised *rate* of hospital admission increased by 7.0% for Māori and 2.2% for non-Māori.[3] The *number* of public hospitalisations, on the other hand, increased by 20% among Māori and by 7% among non-Māori.
- Among Māori aged 65 years and over hospitalisation rates increased by 13%, with a 3% decrease in non-Māori rates (age-standardised), resulting in an increase in the rate ratios between 2000 and 2005. The number of Māori admissions grew by 49% and non-Māori by 7%.
- Māori rates of hospitalisation in the 45–64 year age group increased by 15% between 2000 and 2005, while there was little change in non-Māori rates. Rate ratios increased from 1.91 to 2.12. The number of admissions increased by 44% for Māori and 18% for non-Māori.
- There was little change in the rates of admission among 25–44 year olds but the number of Māori hospital admissions increased by 9% (non-Māori increased by 2%). Rate ratios remained similar through the six-year period at a third higher for Māori.
- In the 15–24 year age group admission rates increased slightly for Māori and decreased slightly for non-Māori, resulting in a small increase in rate ratios. The number of admissions increased by 20% among Māori and 11% among non-Māori.
- Among children aged 5–14 years and 1–4 years there was little change in rates of admission or in rate ratios, with Māori rates remaining similar to or slightly higher than non-Māori rates. There was an increase of 12% in the number of Māori admissions aged 5–14 years (4% in non-Māori). In the 1–4 year age group the number of Māori admissions grew by 4%, with a small decrease in the number of non-Māori admissions.
- There was little change in the infant hospitalisation rates over the six years for either Māori or non-Māori. Māori rates remained over 20% lower than those of non-Māori babies.

[3] The population standard affects apparent increases in age-standardised rates. Using the WHO standard, Māori rates increased by 8.3% and non-Māori by 1.3%. Segi's standard produced similar increases to using the WHO standard.

Table 5.2: Public hospitalisations, all causes, by age group and year, 2000–2005

Age group	Year	Māori		Non-Māori		Rate ratio (95% CI)
		Number	Rate	Number	Rate	
All ages	2000	127,799	22,019.9	652,090	17,376.5	1.27 (1.26–1.28)
	2001	135,494	22,866.0	687,517	18,234.4	1.25 (1.24–1.27)
	2002	137,703	22,758.4	678,570	17,877.9	1.27 (1.26–1.28)
	2003	142,336	23,038.4	676,350	17,621.8	1.31 (1.30–1.32)
	2004	148,603	23,440.3	694,912	17,637.8	1.33 (1.32–1.34)
	2005	152,861	23,553.4	697,039	17,756.6	1.33 (1.31–1.34)
Under 1 year	2000	20,026	132,619.5	65,301	156,448.1	0.85 (0.82–0.88)
	2001	20,353	132,508.2	65,810	162,653.8	0.81 (0.79–0.85)
	2002	19,337	128,828.4	66,067	170,143.9	0.76 (0.73–0.79)
	2003	20,087	132,327.1	65,842	163,989.4	0.81 (0.78–0.84)
	2004	20,764	129,774.8	66,739	159,319.7	0.81 (0.78–0.85)
	2005	21,079	130,277.5	65,580	161,090.9	0.81 (0.78–0.84)
1–4 years	2000	10,153	17,237.1	27,453	16,372.4	1.05 (1.01–1.10)
	2001	10,448	17,637.5	28,374	17,098.6	1.03 (0.99–1.08)
	2002	11,016	18,396.1	29,158	17,574.8	1.05 (1.00–1.09)
	2003	11,128	18,553.5	28,305	17,245.2	1.08 (1.03–1.12)
	2004	10,384	17,145.9	27,289	16,642.9	1.03 (0.99–1.07)
	2005	10,579	17,219.0	26,982	16,490.4	1.04 (1.00–1.09)
5–14 years	2000	10,725	7,729.4	33,874	7,419.2	1.04 (1.01–1.07)
	2001	11,757	8,306.6	35,604	7,830.5	1.06 (1.03–1.09)
	2002	11,436	7,977.0	35,202	7,697.5	1.04 (1.01–1.07)
	2003	11,896	8,197.9	34,733	7,551.3	1.09 (1.05–1.12)
	2004	11,890	8,147.0	34,034	7,446.8	1.09 (1.06–1.13)
	2005	12,054	8,224.4	35,069	7,766.4	1.06 (1.03–1.09)
15–24 years	2000	19,259	18,853.2	53,448	12,551.6	1.50 (1.47–1.54)
	2001	20,861	20,155.8	57,212	13,312.8	1.51 (1.48–1.55)
	2002	20,643	19,504.1	54,882	12,300.1	1.59 (1.55–1.62)
	2003	21,464	19,811.4	55,609	11,919.5	1.66 (1.62–1.70)
	2004	21,851	19,664.2	56,520	11,890.5	1.65 (1.62–1.69)
	2005	23,206	20,201.6	59,519	12,390.8	1.63 (1.59–1.67)
25–44 years	2000	34,392	20,758.4	155,600	15,596.0	1.33 (1.31–1.35)
	2001	36,325	21,549.1	162,599	16,526.3	1.30 (1.28–1.32)
	2002	36,326	21,230.6	157,261	15,964.7	1.33 (1.31–1.35)
	2003	35,691	20,541.6	156,324	15,832.2	1.30 (1.28–1.32)
	2004	37,193	21,145.5	158,229	15,966.9	1.32 (1.30–1.34)
	2005	37,375	21,051.5	158,378	16,049.7	1.31 (1.29–1.33)
45–64 years	2000	21,288	28,570.2	113,358	14,921.7	1.91 (1.88–1.95)
	2001	23,513	30,145.1	124,339	15,960.9	1.89 (1.86–1.92)
	2002	25,558	31,312.8	123,201	15,380.6	2.04 (2.00–2.07)
	2003	26,423	30,991.2	124,348	15,061.7	2.06 (2.02–2.09)
	2004	29,718	33,133.8	129,313	15,262.9	2.17 (2.14–2.21)
	2005	30,759	32,770.6	134,141	15,458.7	2.12 (2.09–2.15)
65 years and over	2000	11,960	64,359.6	203,074	41,063.6	1.57 (1.53–1.60)
	2001	12,249	62,336.2	213,613	42,211.2	1.48 (1.45–1.51)
	2002	13,394	64,601.4	212,812	41,195.1	1.57 (1.54–1.60)
	2003	15,651	71,683.0	211,200	39,863.4	1.80 (1.76–1.83)
	2004	16,808	73,475.9	222,794	41,218.5	1.78 (1.75–1.82)
	2005	17,811	73,043.0	217,379	39,723.9	1.84 (1.81–1.87)

Notes: Rates are calculated per 100,000; rates for 'all ages' and 65 years and over were age-sex-standardised to the 2001 Māori population.

Major causes of hospitalisation

Table 5.3: Public hospitalisations by major cause of admission (ICD-10 chapter), 2003–2005

ICD chapter	Māori		Non-Māori		Rate ratio (95% CI)
	Number	Rate	Number	Rate	
All public hospital discharges	443,800	23,442.0	2,068,301	17,781.9	1.32 (1.31–1.33)
Factors influencing health status	94,974	5,038.1	293,773	3,456.3	1.46 (1.44–1.48)
Pregnancy, childbirth and puerperium*	60,832	6,423.6	213,596	4,544.1	1.41 (1.40–1.43)
Injury and poisoning	43,091	2,311.1	206,887	1,822.3	1.27 (1.25–1.28)
Respiratory disease	42,182	2,249.8	138,034	1,367.2	1.65 (1.62–1.68)
Digestive system disease	29,428	1,556.3	173,892	1,299.4	1.20 (1.18–1.22)
Symptoms and signs	24,723	1,284.5	157,645	1,133.9	1.13 (1.12–1.15)
Circulatory system disease	22,326	1,119.9	183,516	643.2	1.74 (1.71–1.77)
Genitourinary system disease	17,940	922.8	97,348	738.1	1.25 (1.23–1.27)
Cancers	14,209	720.4	148,405	671.7	1.07 (1.05–1.09)
Skin diseases	12,445	664.8	47,132	395.2	1.68 (1.64–1.72)
Mental and behavioural disorders	12,376	658.1	49,373	364.0	1.81 (1.77–1.85)
Musculoskeletal diseases	11,874	617.7	88,137	532.4	1.16 (1.14–1.19)
Infectious and parasitic diseases	11,430	620.8	48,370	636.9	0.97 (0.95–1.00)
Perinatal conditions	10,432	582.9	44,278	923.1	0.63 (0.61–0.65)
Ear diseases	9,463	522.3	23,367	367.6	1.42 (1.38–1.47)
Nervous system diseases	7,158	374.7	44,408	314.4	1.19 (1.16–1.23)
Endocrine, nutritional and metabolic	7,007	356.3	31,030	188.5	1.89 (1.83–1.95)
Congenital anomalies	4,690	259.7	18,660	340.7	0.76 (0.73–0.79)
Diseases of the eye	3,867	196.5	34,896	164.3	1.20 (1.15–1.24)
Diseases of the blood	3,269	168.9	25,251	148.0	1.14 (1.10–1.19)

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

Table 5.3 shows the total number of hospital discharges among Māori and non-Māori by major cause (ICD chapter) for the three-year period 2003–2005 with age-sex-standardised rates. The rate ratio column shows the relative risk of hospitalisation for Māori compared to non-Māori.

- "Factors influencing health status and contact with health services" was the most common category of hospital admission among both Māori and non-Māori (21% and 14% of total admissions respectively). This category covers a broad range of admissions that are not a disease or injury or covered by other ICD chapters. These include admissions for examinations and investigations; live births (comprising nearly 30% of Māori and non-Māori admissions in this chapter); and admissions for specific procedures (comprising 54% of Māori and 40% of non-Māori admissions in this chapter) (see Table 5.6 for specific procedure rates). A higher proportion of non-Māori admissions in this chapter were for rehabilitative and convalescent care (17%) compared to Māori (3%). Admissions for dialysis made up a larger proportion of Māori admissions (43%) than non-Māori admissions (8%).
- The second most frequent cause of hospital admission among Māori related to pregnancy and childbirth (14% of the total discharges and 24% of the female

discharges), followed by injury and poisoning (6% of female and 14% of male discharges), and respiratory disease (11% of male and 8% of female discharges).

- Among non-Māori pregnancy and childbirth was the second most common cause of admission (10% of the total and 18% of the female discharges), followed by injury and poisoning (10% of the total), and circulatory system disease (9% of total admissions).
- Māori rates of admission for pregnancy and childbirth were 41% higher than those of non-Māori. This accounted for a third of the overall difference in hospital admission rates between Māori and non-Māori females.
- Rates of hospitalisation for respiratory disease were 65% higher among Māori than non-Māori (accounting for 16% of the total disparity), admissions due to injury and poisoning were 27% more frequent (comprising 9% of the total difference), and those caused by circulatory disease 74% more common (contributing 8% of the total disparity).
- Rates of admission for skin diseases were 68% higher for Māori than non-Māori, and mental and behavioural disorders 81% higher, but each accounted for only 5% of the all-cause rate difference.
- Admissions for endocrine, nutritional and metabolic disorders were 89% higher among Māori but were responsible for only 3% of the difference in all-cause discharge rates. However, admissions related to complications arising from diabetes are included in other chapters. For example, renal failure admissions are included in the genitourinary system chapter, and renal dialysis in "factors influencing health services".
- Non-Māori had higher rates of hospitalisations than Māori for perinatal conditions (58% higher), congenital anomalies (31% higher), and certain infectious and parasitic diseases (3% higher).
- Māori admission rates for diseases of the ear were 42% higher than those of non-Māori, and musculoskeletal disease, nervous system diseases, eye diseases and diseases of the blood around 15–20% higher.

Table 5.4: Public hospitalisations, selected causes of admission, by gender, 2003–2005

Cause of admission	Females					Males				
	Māori		Non-Māori		Rate ratio (95% CI)	Māori		Non-Māori		Rate ratio (95% CI)
	No.	Rate	No.	Rate		No.	Rate	No.	Rate	
Respiratory disease										
Asthma	4,408	474.0	9,120	235.7	2.01 (1.92–2.11)	4,052	440.5	7,933	254.8	1.73 (1.64–1.82)
Pneumonia	3,397	351.2	13,517	203.4	1.73 (1.64–1.82)	3,537	381.9	15,123	240.5	1.59 (1.51–1.66)
COPD	3,167	293.1	12,413	69.6	4.21 (4.01–4.42)	2,164	229.0	13,378	77.8	2.94 (2.80–3.10)
Bronchitis, bronchiolitis	2,867	327.1	3,416	124.3	2.63 (2.42–2.86)	4,040	440.0	4,979	191.4	2.30 (2.14–2.47)
Acute URTI	2,649	295.4	7,774	252.0	1.17 (1.11–1.24)	2,959	322.1	8,712	296.9	1.09 (1.03–1.14)
Tonsils and adenoids	1,003	111.8	5,242	171.0	0.65 (0.61–0.70)	835	90.9	4,070	139.4	0.65 (0.60–0.71)
Bronchiectasis	431	42.7	1,146	13.5	3.16 (2.69–3.70)	380	40.7	577	9.6	4.23 (3.48–5.16)
Circulatory system										
Ischaemic heart disease	3,048	283.2	27,143	140.8	2.01 (1.93–2.10)	3,822	401.8	45,194	337.1	1.19 (1.15–1.23)
Heart failure	1,523	136.9	8,635	30.2	4.53 (4.22–4.86)	2,154	228.4	8,919	48.5	4.71 (4.44–4.99)
Stroke	1,337	123.0	11,294	55.4	2.22 (2.08–2.37)	1,030	109.1	10,933	71.1	1.54 (1.43–1.65)
Chronic rheumatic heart disease	301	29.5	585	6.1	4.84 (3.96–5.90)	195	20.9	419	4.8	4.34 (3.39–5.55)
Hypertensive disease	272	26.4	1,299	9.8	2.68 (2.29–3.15)	182	19.5	801	8.7	2.25 (1.87–2.70)
Acute rheumatic fever	114	12.8	137	4.4	2.90 (2.05–4.10)	205	22.2	148	4.6	4.88 (3.39–7.03)
Cancers										
Breast: female*	959	92.3	6,203	55.8	1.65 (1.54–1.78)					
Lung	718	67.9	2,470	17.3	3.93 (3.57–4.33)	597	62.6	3,790	25.1	2.50 (2.27–2.74)
Prostate						297	31.7	4,513	25.6	1.24 (1.09–1.40)
Cervix	214	20.9	834	9.7	2.15 (1.81–2.54)					
Colorectal	216	20.1	5,233	29.8	0.67 (0.58–0.78)	300	31.7	5,243	34.1	0.93 (0.82–1.05)
Stomach	181	17.3	602	3.6	4.83 (3.86–6.04)	247	26.3	952	6.5	4.04 (3.42–4.79)
Infectious diseases										
Intestinal infection	1,645	184.2	7,613	230.5	0.80 (0.75–0.85)	1,778	193.4	7,616	241.1	0.80 (0.75–0.85)
Meningococcal	144	16.4	401	12.4	1.33 (1.06–1.66)	221	23.9	445	14.1	1.70 (1.39–2.08)
Viral hepatitis	127	12.8	648	10.3	1.25 (1.02–1.53)	266	28.7	1,267	19.5	1.47 (1.28–1.70)
Skin infections	4,204	443.4	12,930	216.0	2.05 (1.96–2.15)	5,197	563.7	16,888	316.9	1.78 (1.71–1.85)
Middle ear, mastoid	3,767	426.3	7,676	286.4	1.49 (1.42–1.56)	4,853	528.8	10,174	370.7	1.43 (1.36–1.49)
Digestive system										
Dental caries	2,775	316.8	5,591	193.6	1.64 (1.54–1.74)	2,839	310.5	6,214	204.5	1.52 (1.43–1.61)
Gastric ulcers	1,100	106.6	5,680	58.7	1.82 (1.69–1.96)	1,219	130.2	5,942	67.8	1.92 (1.79–2.06)
Mental disorders										
Mood disorders	1,796	180.3	9,671	131.6	1.37 (1.30–1.45)	1,171	128.4	5,452	80.9	1.59 (1.48–1.70)
Schizophrenia	1,650	168.3	2,597	39.3	4.28 (3.93–4.66)	3,192	356.0	5,011	90.1	3.95 (3.72–4.20)
Diabetes mellitus										
IDDM (type 1)	523	54.7	2,655	60.0	0.91 (0.82–1.01)	340	37.1	2,476	50.5	0.73 (0.65–0.83)
NIDDM (type 2)	1,743	164.1	6,145	37.2	4.42 (4.13–4.72)	2,110	222.8	7,245	51.6	4.32 (4.07–4.58)
Epilepsy	935	99.1	2,797	61.7	1.61 (1.47–1.76)	1,029	112.5	3,773	80.0	1.41 (1.30–1.52)
Renal failure	365	35.2	1,781	13.9	2.52 (2.20–2.90)	496	52.9	2,457	24.0	2.20 (1.97–2.46)

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

Table 5.4 presents age-standardised rates of hospitalisations for selected specific causes of admission during 2003–2005, grouped by major disease category. Most of these

causes are considered either preventable through population-based health promotion strategies or responsive to treatment in primary care settings (ambulatory-sensitive).[4]

Respiratory disease

Asthma was the most common cause of admission for respiratory disease among Māori. Māori asthma admission rates were twice those of non-Māori among females and 73% higher among males. Admission rates were fairly similar across all ages apart from a very high rate among 0–4 year olds (see Figure 5.3e). Māori rates were consistently higher than non-Māori rates across all age groups (see the Respiratory Disease chapter for more on asthma).

Pneumonia admissions were higher among Māori than non-Māori (73% for females and 59% for males). This disease is strongly associated with age and was the most frequent cause of admission for respiratory disease among non-Māori.

Rates of admission for chronic obstructive pulmonary disease (COPD) were very high among Māori – over four times higher than non-Māori rates for females and nearly three times higher than those of non-Māori males. This disease is more common among older people. However, Māori rates reach those of non-Māori at about 20 years younger, and far exceed those of older non-Māori from the age of 65 years on (see Figure 5.3f).

Bronchitis and bronchiolitis are also common causes of respiratory disease admissions, more than twice as common among Māori as among non-Māori.

Māori and non-Māori were admitted at fairly similar rates for acute upper respiratory tract infections. For diseases of the tonsils and adenoids Māori admission rates were significantly lower than those of non-Māori (65% the non-Māori rate).

Bronchiectasis admissions were three times more frequent among Māori women than non-Māori women and four times more common among Māori men than non-Māori men. Although this disease is less common than other respiratory diseases, the disparities are extreme, with Māori death rates 5.9 times higher than those of non-Māori among females and 7.6 times higher among males (see the Respiratory Disease chapter for more on bronchiectasis).

Circulatory system

Ischaemic heart disease (IHD) was the most common cause of admission for circulatory system disease, accounting for 29% of Māori cardiovascular admissions and 32% of the non-Māori cardiovascular admissions. Males were more likely than females to be hospitalised for IHD.

Despite having over twice the risk of death from IHD, Māori males were admitted to hospital at a rate only 19% higher than non-Māori males. Māori females have 2.5 times

[4] See Ministry of Health (2006) for the aggregated Māori and non-Māori avoidable and ambulatory sensitive hospitalisation rates, and full list of categories.

the mortality rate of non-Māori females from IHD but admissions were only twice as high (see the Cardiovascular Disease chapter for more on IHD).

Heart failure admissions were four and a half times more common among Māori females and males than among their non-Māori counterparts.

Stroke admissions were over twice as high for Māori women compared to non-Māori women. Māori males were admitted for stroke at a rate 54% higher than non-Māori males. Māori rates of admission for hypertensive disease were more than twice those of non-Māori (see the Cardiovascular Disease chapter for more on stroke).

The disparities between Māori and non-Māori rates of admission for chronic rheumatic heart disease were very high (4.8 times higher in females, and 4.3 times higher in males). The continuing disparity in admissions for acute rheumatic fever is very concerning as it an indicator of ongoing and future disparities in chronic rheumatic heart disease.

Cancer

Among females, Māori admission rates were higher than those of non-Māori for lung, breast, cervix, and stomach cancers, and lower for colorectal cancer. This aligns with the relative cancer incidence patterns among Māori and non-Māori, although it is likely that non-Māori women were more likely than Māori to be admitted to private hospitals for breast, colorectal, and cervical cancer.

Among males, lung cancer and stomach cancer admission rates were considerably higher for Māori than non-Māori, commensurate with the higher incidence of these cancers among Māori. Conversely, colorectal cancer admissions were similar. Admissions for prostate cancer were 24% higher among Māori, although prostate cancer is less common among Māori males than non-Māori. This may be a reflection of higher levels of private treatment among non-Māori and/or that Māori males are more likely to be diagnosed at later stages of disease spread.

Certain communicable diseases

During 2003–2005, Māori were 20% less likely than non-Māori to be admitted to hospital for intestinal infections, more likely than non-Māori to be admitted for meningococcal infection (males 70% more likely, females 33% more likely), viral hepatitis (females 25%, males 47% more likely), skin infections (females twice as likely, males 78% more likely). Middle ear disease admissions (mostly glue ear – a result of infection) were over 40% more common for Māori. Within each population males were more likely than females to be admitted for these causes.

Digestive system

Dental caries hospitalisations are most common in the very young and the disparity between Māori and non-Māori admission rates is highest in children, but also significant in the middle age groups. The higher rate of admission among Māori may

be a sign of lower levels of access to private dental care (see the Oral Health chapter for further discussion).

Admissions for stomach ulcers were around 80% more common for Māori than non-Māori.

Mental disorders

Māori females were 37% more likely than non-Māori females to be admitted to hospital for mood disorders and Māori males 59% more likely than non-Māori. For both males and females, Māori were four times more likely than non-Māori to be admitted for schizophrenia. Admissions for schizophrenia were more common in males than females. For mood disorders females were more likely to be admitted than males. The mental health chapter discusses psychiatric admissions in more detail.

Diabetes

Māori were more likely to be hospitalised for type 2 diabetes mellitus (NIDDM) than non-Māori, and less likely than non-Māori to be admitted for type 1 diabetes mellitus (IDDM). Around 80% of the Māori admissions and 75% of the non-Māori admissions were for type 2 diabetes (see the Diabetes chapter for more detail).

Genitourinary system

Hospital admissions for renal failure were over twice as frequent among Māori as among non-Māori. More than half the deaths from genitourinary system disease were due to renal failure. Renal failure increases with age, but the age gradient was much steeper among Māori. For example, the rate of admissions for Māori in the 25–44 year age group was similar to that of non-Māori aged 45–64 years. Likewise, the rate for Māori at 45–64 years was similar to the non-Māori rate at 65 years and over.

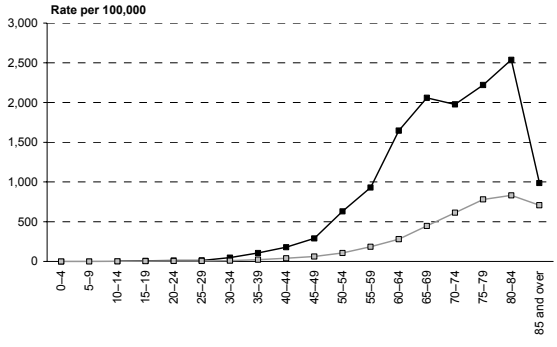
Selected causes of public hospitalisation by five-year age group

Figure 5.2 shows age-specific rates of hospitalisation by five-year age group during the years 2003–2005 for certain causes of admission considered sensitive to effective primary care.

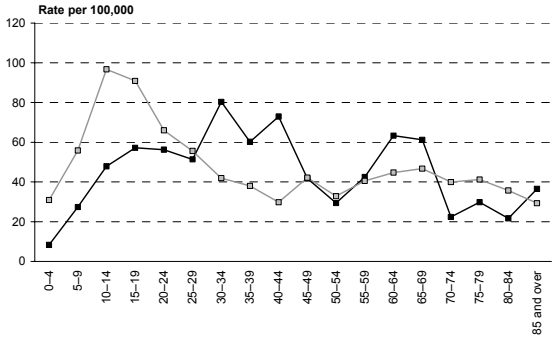
- Among the causes more likely to develop in later life (i.e., type 2 diabetes, hypertensive disease, heart failure, COPD) Māori hospitalisation rates at middle age reached those of non-Māori 15–25 years older. For example, the admission rate for type 2 diabetes among Māori aged 50–54 years was higher than that of non-Māori aged 70–74 years. The age-shift for heart failure admissions and COPD was about 15 years.
- Māori rates of admission for type 2 diabetes from the age of 55 years and for COPD from the age of 65 years exceed those of non-Māori at any age.
- For other conditions more likely to be experienced life-long, such as epilepsy and asthma, Māori rates exceeded those of non-Māori across most ages.
- The pattern of admissions for type 1 diabetes shows lower rates among Māori during childhood and youth, but higher rates in adulthood. This raises a question as to whether blood sugar levels are more tightly controlled among young non-Māori (resulting in hypoglycaemic attacks) and whether Māori with type 1 diabetes are more likely to experience complications from diabetes in adulthood.
- Policies and funding for primary care and age-related services need to recognise the higher levels of need among Māori at younger ages, and the need to improve Māori access to best practice management of chronic conditions.

Figure 5.2: Public hospitalisations by five-year age group, selected causes, 2003–2005

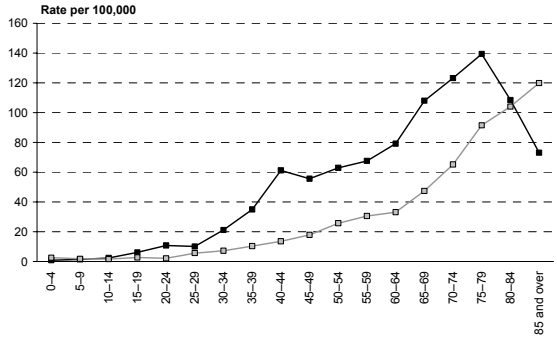
a: Type 2 diabetes mellitus



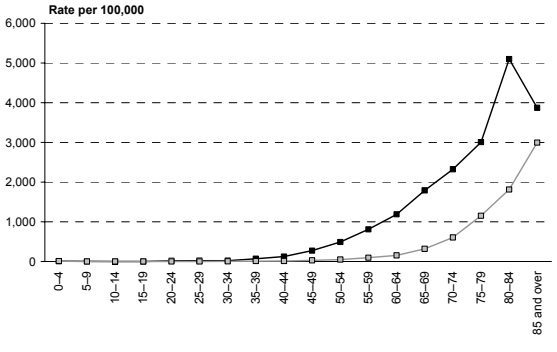
b: Type 1 diabetes mellitus



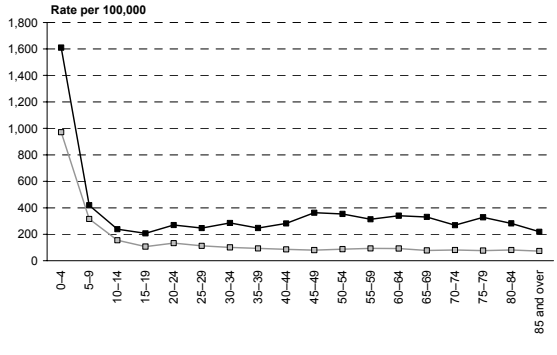
c: Hypertensive disease



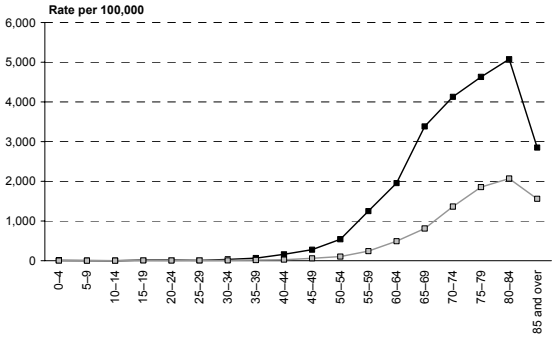
d: Congestive heart failure



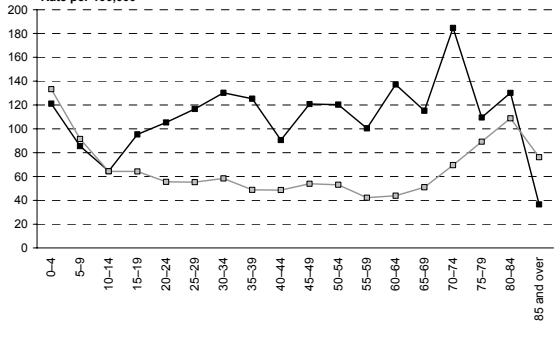
e: Asthma



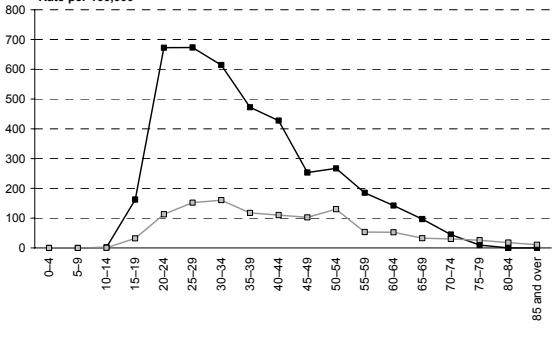
f: Chronic obstructive pulmonary disease



g: Epilepsy



h: Schizophrenia



Age group (years)

Māori
Non-Māori

Public hospitalisations by cause of injury or poisoning

Table 5.5: Public hospitalisations for injury, by cause of injury, 2003–2005

Circumstance of injury	Māori		Non-Māori		Rate ratio (95% CI)
	Number	Rate	Number	Rate	
Total injury and poisoning discharges	**43,075**	**2,310.3**	**206,730**	**1,820.9**	**1.27 (1.25–1.29)**
Transport accidents	**7,036**	**377.9**	**31,532**	**329.7**	**1.15 (1.11–1.18)**
Pedestrian	680	37.0	2,340	24.3	1.52 (1.37–1.68)
Pedal cyclist	965	52.9	4,839	60.1	0.88 (0.81–0.95)
Other land transport accidents (traffic)	4,840	258.2	20,488	200.3	1.29 (1.24–1.34)
Other transport accidents	552	29.9	3,864	45.0	0.66 (0.60–0.73)
Other accidental causes	**24,053**	**1,300.1**	**123,056**	**1,090.1**	**1.19 (1.17–1.21)**
Falls	9,805	527.7	65,439	487.8	1.08 (1.05–1.11)
Exposure to mechanical forces	9,580	520.7	36,228	390.7	1.33 (1.30–1.37)
• inanimate mechanical forces	8,863	481.7	33,740	366.0	1.32 (1.28–1.35)
• animate mechanical forces	717	39.1	2,488	24.7	1.58 (1.43–1.75)
Poisoning	1,088	59.0	4,420	56.0	1.05 (0.98–1.13)
Drowning	71	3.9	197	2.8	1.41 (1.03–1.95)
Accidental threats to breathing	70	3.8	385	4.6	0.83 (0.62–1.10)
Fires	258	13.9	847	8.8	1.57 (1.34–1.85)
Other accident	3,181	171.0	15,540	139.3	1.23 (1.18–1.28)
Complications of medical and surgical care	**5,502**	**285.1**	**32,143**	**198.7**	**1.43 (1.39–1.48)**
Assault	**4,222**	**227.4**	**7,858**	**84.2**	**2.70 (2.58–2.83)**
Intentional self-harm	**2,018**	**106.8**	**11,360**	**110.4**	**0.97 (0.92–1.02)**
Event of undetermined intent	**189**	**10.1**	**736**	**7.3**	**1.38 (1.15–1.65)**
Legal intervention	**55**	**3.0**	**46**	**0.5**	**6.56 (3.52–12.22)**

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

Table 5.5 includes only hospital admissions involving injury or poisoning during the period 2003–2005, and reports rates of hospitalisation by cause of the injury or poisoning. The data was obtained from external cause codes ('e-codes') associated with each admission.

- During 2003–2005 there were approximately 14,360 Māori and 68,900 non-Māori admissions on average per year due to injury or poisoning. Māori age-sex-standardised rates of hospitalisation were 27% higher than non-Māori rates overall (Table 5.5).
- Falls, exposure to mechanical forces, transport accidents, and complications of medical and surgical care were the most common causes of hospitalisation for injury or poisoning. Māori admission rates were higher than those of non-Māori for each of these causes.
- The main causes that contributed to the overall difference in hospitalisations for injury between Māori and non-Māori included assault (accounting for 30% of the rate difference), exposure to mechanical forces (27%), and complications of medical and surgical care (18%).
- Of the transport accidents, motor vehicle accidents (other land transport accidents) accounted for the highest number of hospitalisations, with Māori at

29% higher risk than non-Māori. Māori admissions due to pedal cyclist accidents were 12% lower than those of non-Māori, while pedestrian accident admissions were 52% higher.

- Admissions for assault exceeded admissions for self-inflicted injury among Māori, while the pattern was the reverse for non-Māori.

Publicly funded surgical procedures

Table 5.6: Selected publicly funded surgical procedures, 2003–2005

Procedure	Māori		Non-Māori		Ratio (95% CI)
	Number	Rate	Number	Rate	
Myringotomy (grommets)	6,788	379.1	15,772	304.5	1.24 (1.20–1.29)
Myringoplasty (repair of eardrum)	1,071	57.4	1,580	20.3	2.83 (2.55–3.14)
Mastoidectomy	204	10.7	530	5.4	1.97 (1.62–2.39)
Tonsillectomy and adenoidectomy	3,036	168.3	12,510	216.4	0.78 (0.74–0.81)
Angiography	5,029	253.9	44,084	186.0	1.36 (1.32–1.41)
Heart valve replacement	375	19.2	2,015	9.2	2.10 (1.85–2.38)
Angioplasty	826	41.9	11,577	47.7	0.88 (0.81–0.95)
Coronary artery bypass and graft	876	44.5	9,591	36.7	1.21 (1.13–1.30)
Endarterectomy	91	4.5	1,508	4.4	1.01 (0.81–1.26)
Stripping of varicose veins	492	25.5	1,666	9.5	2.67 (2.38–3.00)
Hemodialysis	42,514	2,175.0	27,907	145.5	14.95 (14.51–15.41)
Peritoneal dialysis	1,781	90.7	2,041	10.9	8.28 (7.48–9.16)
Kidney transplant	36	1.8	276	2.2	0.83 (0.58–1.20)
Amputation of lower limb	663	33.9	3,117	11.8	2.87 (2.59–3.19)
Cataract surgery	2,629	128.5	21,824	56.5	2.28 (2.17–2.38)
Cholecystectomy (gallbladder removal)	1,701	87.0	10,139	59.5	1.46 (1.38–1.55)
Hernia repair	1,759	95.6	9,065	80.2	1.19 (1.12–1.27)
Total hip replacement	931	46.3	8,895	29.3	1.58 (1.47–1.70)
Partial hip replacement	62	2.6	2,941	3.7	0.69 (0.53–0.91)
Mastectomy*	417	39.9	2,779	23.6	1.69 (1.51–1.89)
Total reconstruction of breast	76	7.4	740	9.5	0.78 (0.61–0.99)
Prostatectomy	317	33.6	5,809	34.4	0.98 (0.87–1.10)
Diagnostic procedures on cervix	444	45.6	2,374	41.5	1.10 (0.99–1.23)
Conisation of cervix	141	14.1	836	12.9	1.09 (0.91–1.32)
Other excision of lesion of cervix	979	101.0	4,260	77.6	1.30 (1.21–1.40)
Diagnostic procedures on uterus	1,928	188.8	9,553	129.0	1.46 (1.39–1.54)
Total abdominal hysterectomy	953	92.5	4,439	54.3	1.70 (1.58–1.84)
Vaginal hysterectomy	292	28.4	2,701	32.1	0.88 (0.78–1.00)
Tubal ligation (female sterilisation)	2593	270.7	6535	121.7	2.23 (2.11–2.35)
Insertion of intrauterine contraceptive device	2518	261.7	5556	105.7	2.48 (2.34–2.62)
Vasectomy (male sterilisation)	79	8.8	484	8.8	1.00 (0.78–1.29)
Caesarean section	5,218	10,263.9	33,826	18,156.1	0.57 (0.45–0.72)

Notes: Rates are calculated per 100,000 and were age-sex-standardised to the 2001 Māori population; *rates for each procedure from mastectomy down to caesarean section are sex-specific; caesarean section rates were calculated per 100,000 deliveries in hospital.

Table 5.6 shows age-sex-standardised rates of publicly funded surgical procedures for the period 2003–2005. Data on procedures performed privately was not available and it is important to note that non-Māori are more likely to receive private care than Māori.

Key findings include:

- Māori had higher rates of procedures for diseases of the ear and mastoid process (grommet insertions, myringoplasty, and mastoidectomy) but lower rates of tonsillectomy and adenoidectomy;
- some cardiovascular procedures were more common among Māori (angiography, heart valve replacement, CABG, stripping of varicose veins), but angioplasties were less common and endarterectomy rates were similar;
- rates of procedures potentially related to complications of diabetes and renal failure (hemodialysis, peritoneal dialysis, and lower limb amputations) were higher among Māori, but rates of kidney transplant were lower (although not significant);
- gallbladder removals were 46% more frequent among Māori than non-Māori;
- hernia repairs were 19% more common among Māori;
- total hip replacement rates were higher among Māori but partial replacements were lower;
- mastectomies were more frequent among Māori women but total breast reconstruction rates were less frequent;
- prostatectomy rates were similar for Māori and non-Māori men;
- cervical procedures were around 30% higher for Māori women, although rates of diagnostic procedures and conisation were similar;
- total abdominal hysterectomies were more common among Māori women but rates of vaginal hysterectomies were lower;
- tubal ligations and insertion of intrauterine contraceptive devices were more than twice as common for Māori women as for non-Māori women;
- vasectomy rates were similar for Māori and non-Māori men;
- Māori women giving birth in public hospital were two-thirds as likely as non-Māori women to deliver by caesarean section.

Figure 5.3 presents rates of publicly funded procedures performed for cardiovascular disease over the period 2000 to 2005.

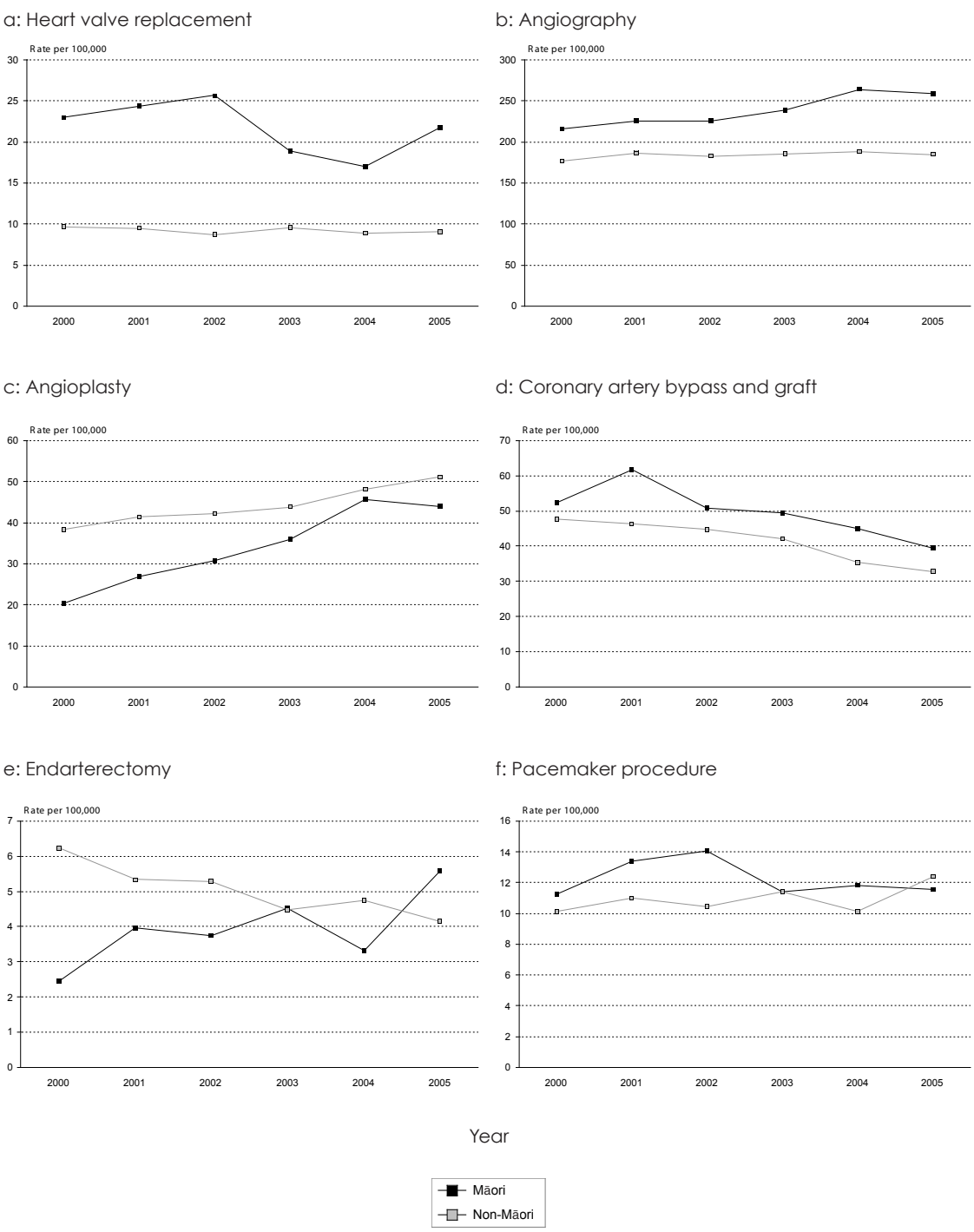
The rate of heart valve replacements for Māori remained around twice the rate for non-Māori. However, during this period Māori mortality from chronic rheumatic heart disease was over seven times the rate of non-Māori.

Ischaemic heart disease procedures increased in general during the 1990s, in line with changing knowledge of best practice management. Prior to the year 2000 Māori were less likely to receive these procedures than non-Māori. However rates of publicly funded angiography have increased at a faster rate for Māori than non-Māori, with Māori rates exceeding those of non-Māori since 2000. Māori rates of angioplasty (also called percutaneous coronary intervention or PCI) also increased at a faster rate than for non-Māori, but in 2005 Māori rates were still lower than non-Māori rates. Receipt of

CABG was less common among Māori in the late 1990s but more common from 2000 to 2005. There was a decline in the rate of CABGs among both Māori and non-Māori during the last five years.

While these data show an improvement in access to cardiac surgical services for Māori, it does not show whether this increase meets the greater need. Māori had 2.25 times the non-Māori mortality rate for ischaemic heart disease in the recent period (see the Cardiovascular Disease chapter for more discussion).

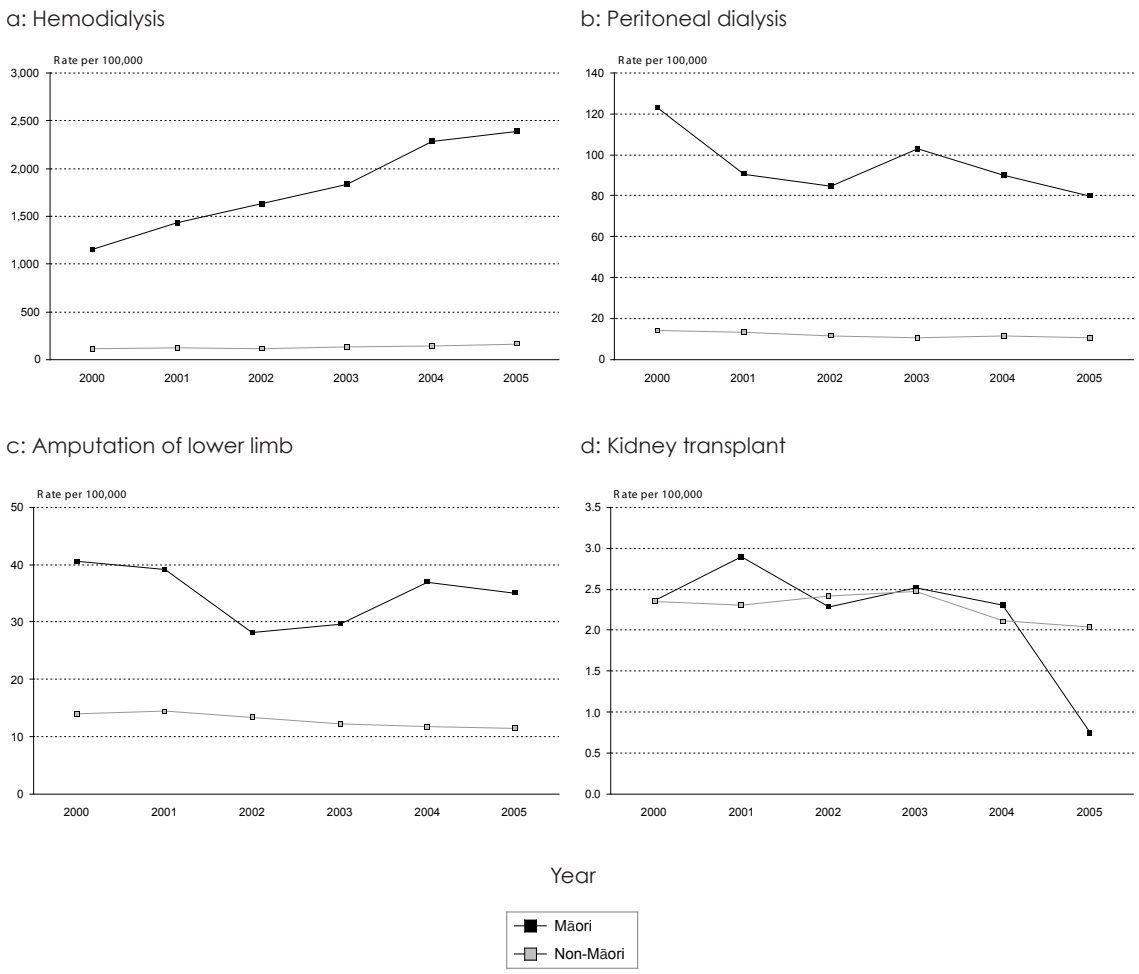
Figure 5.3: Selected cardiovascular procedures by year, 2000–2005



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

Māori rates of endarterectomy (a procedure to reduce the risk of stroke) remained static between 2000 and 2005, while non-Māori rates steadily declined to a level equivalent to that of Māori. There was little change over the six years in rates of pacemaker procedures and little difference between Māori and non-Māori.

Figure 5.4: Procedures related to complications from diabetes, by year, 2000–2005



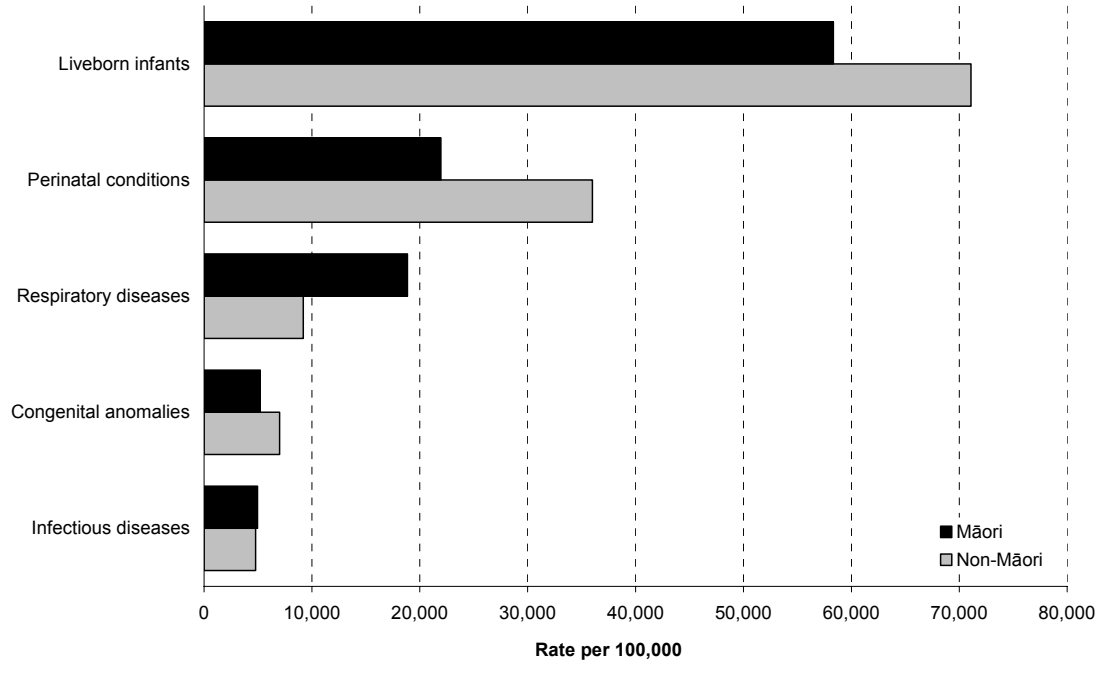
Note: Rates are calculated per 100,000 and were age-sex-standardised to the 2001 Māori population.

Haemodialysis, and peritoneal dialysis are performed when the kidneys have failed. Diabetes is the most common cause of kidney failure and the dominant risk factor for lower limb amputation. Figure 5.4 shows that rates of haemodialysis have steadily increased for Māori, with only a small increase for non-Māori. It is important to note that this data includes multiple admissions for dialysis for the same individuals. Lower limb amputations have declined steadily among non-Māori but remain high for Māori. These can be considered 'hyperdisparities'– those where higher rates indicate less effective medical care. The New Zealand Health Survey 2002/03 estimated that the prevalence of diabetes was around 2.6 times higher among Māori than non-Māori (Ministry of Health 2006). However, these data suggest that complication rates may be disproportionately higher than the prevalence for Māori. The evidence of a much higher rate of kidney failure does not translate to kidney transplantations; Māori transplant rates were similar to those of non-Māori (see the Diabetes chapter for more discussion).

Major causes of hospitalisation by age group

Infants aged less than one year

Figure 5.5: Leading causes of public hospitalisation, infants, 2003–2005



The leading causes of public hospital admission for babies under the age of one year during 2003–2005 were: healthy live births, perinatal conditions, respiratory disease, congenital anomalies, and infectious diseases. In this age group the leading causes were the same for Māori and non-Māori (Table 5.7).

Māori babies were less likely to be admitted to hospital than non-Māori (80% as likely). The ratio was similar when healthy live births in hospital were excluded.

Healthy newborns accounted for 45% of Māori and 44% of non-Māori infant discharges.

Māori infants had twice the rate of admissions for respiratory diseases of non-Māori infants. The majority of respiratory admissions were for acute bronchitis and/or bronchiolitis, followed by acute upper respiratory tract infections.

Māori babies had only around 60% the non-Māori rate of admissions for perinatal conditions, including lower rates of admission for premature birth.

Māori admissions for congenital anomalies were 74% the non-Māori rate.

Māori and non-Māori infants were admitted at similar rates for infectious diseases.

Table 5.7: Public hospitalisations, leading causes for infants under one year old, 2003–2005

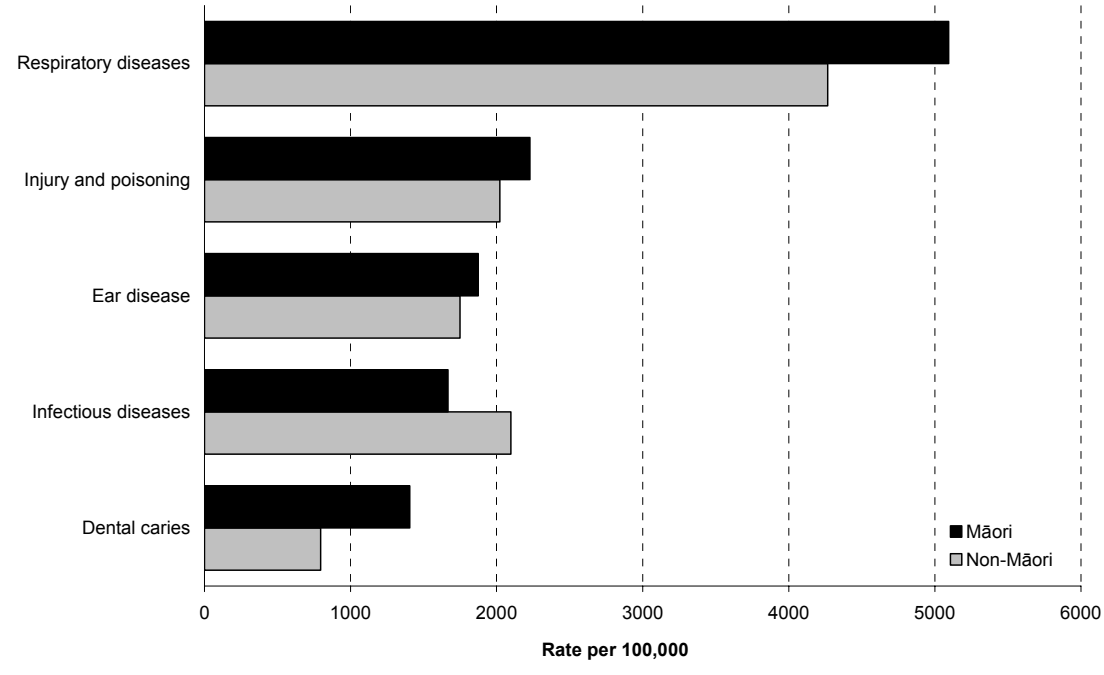
Cause of admission	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**61,930**	**130,764.6**		**198,161**	**161,434.5**	**0.81**
Liveborn infants	**1**	**27,629**	**58,338.0**	**1**	**87,265**	**71,092.7**	**0.82**
Perinatal conditions	**2**	**10,400**	**21,958.5**	**2**	**44,194**	**36,003.6**	**0.61**
• Premature birth		3,028	6,393.9		9,688	7,892.3	0.81
• Respiratory and cardiovascular disorders		2,238	4,724.6		9,380	7,641.9	0.62
Respiratory diseases	**3**	**8,929**	**18,853.6**	**3**	**11,310**	**9,213.8**	**2.05**
• Acute bronchitis and bronchiolitis		5,853	12,358.7		6,150	5,010.1	2.47
• Acute upper respiratory infections		1,524	3,217.2		2,927	2,384.8	1.35
• Pneumonia		811	1,711.9		1,309	1,066.6	1.61
Congenital anomalies	**4**	**2,464**	**5,203.2**	**4**	**8,605**	**7,010.0**	**0.74**
Infectious diseases	**5**	**2,347**	**4,956.0**	**5**	**5,866**	**4,778.7**	**1.04**
• Intestinal infectious diseases		1,034	2,183.7		2,571	2,094.3	1.04
Females: all causes		**28,888**	**125,380.2**		**94,045**	**157,187.7**	**0.80**
Liveborn infants	**1**	**13,859**	**60,150.2**	**1**	**44,182**	**73,846.6**	**0.81**
Perinatal conditions	**2**	**4,733**	**20,541.1**	**2**	**19,569**	**32,708.2**	**0.63**
• Premature		1,402	6,086.6		4,523	7,559.2	0.81
• Respiratory and cardiovascular disorders		920	3,994.6		3,844	6,424.3	0.62
Respiratory diseases	**3**	**3,629**	**15,752.2**	**3**	**4,391**	**7,338.6**	**2.15**
• Acute bronchitis and bronchiolitis		2,338	10,145.9		2,265	3,786.4	2.68
• Acute upper respiratory infections		662	2,872.4		1,242	2,076.2	1.38
Infectious diseases	**4**	**1,057**	**4,585.7**	**5**	**2,646**	**4,423.3**	**1.04**
• Intestinal infectious diseases		477	2,068.9		1,150	1,922.7	1.08
Congenital anomalies	**5**	**1,015**	**4,405.6**	**4**	**3,707**	**6,195.8**	**0.71**
Males: all causes		**33,043**	**135,865.6**		**104,107**	**165,460.1**	**0.82**
Liveborn infants	**1**	**13,770**	**56,621.3**	**1**	**43,079**	**68,465.8**	**0.83**
Perinatal conditions	**2**	**5,667**	**23,301.3**	**2**	**24,624**	**39,135.6**	**0.60**
• Premature		1,626	6,685.0		5,165	8,209.2	0.81
• Respiratory and cardiovascular disorders		1,317	5,416.3		5,537	8,799.7	0.62
Respiratory diseases	**3**	**5,300**	**21,791.9**	**3**	**6,919**	**10,996.8**	**1.98**
• Acute bronchitis and bronchiolitis		3,515	14,455.0		3,885	6,173.8	2.34
• Acute upper respiratory infections		862	3,543.8		1,685	2,678.3	1.32
• Pneumonia		491	2,016.9		769	1,223.0	1.65
Congenital anomalies	**4**	**1,449**	**5,958.8**	**4**	**4,897**	**7,782.6**	**0.77**
Infectious diseases	**5**	**1,291**	**5,306.9**	**5**	**3,219**	**5,116.6**	**1.04**
• Intestinal infectious diseases		558	2,292.5		1,420	2,257.6	1.02

Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level;

Liveborn infants do not include all live births. They are discharges with live birth recorded as the principal diagnosis. These rates use babies born in hospital as the numerator and intercensal estimates of the number of Māori and non-Māori babies as the denominator. They do not reflect the higher birth rates among Māori, where the rate is based on numbers of women giving birth.

Ages 1–4 years

Figure 5.6: Leading causes of public hospital admission, children aged 1–4 years, 2003–2005



The leading causes of public hospital admission during 2003–2005 for children aged 1–4 years included respiratory diseases, injury and poisoning, ear diseases (mainly glue ear), digestive system diseases (mainly dental caries), and infectious diseases (Table 5.8).

Māori all-cause admission rates were 5% higher than those of non-Māori children. Males had higher admission rates than females for each cause, among both Māori and non-Māori children.

Respiratory disease admission rates were a fifth higher for Māori children than non-Māori children. Asthma admissions were 60% more common, bronchitis/bronchiolitis 85%, and pneumonia 15% more common. Acute upper respiratory tract infection admissions were similar to non-Māori rates.

Injury and poisoning was the second major cause of admission for Māori. A third of these admissions were associated with falls and a further quarter associated with exposure to inanimate mechanical forces (at rates similar to non-Māori). Transport accidents and poisoning caused a further 10% each, at higher rates from transport accidents but lower rates for poisoning.

Admissions for glue ear were only 9% higher for Māori children than for non-Māori children. This seems relatively low given the high rates of hearing failure among Māori children at the age of five years (Ministry of Health 2006). Grommet insertion rates were similar for Māori and non-Māori children (1,597 per 100,000 and 1,615 per 100,000 respectively).

Māori children had lower rates of admission for intestinal infectious diseases and viral infections. This may indicate differential access to health care for these conditions.

Table 5.8: Public hospitalisations, leading causes for children aged 1–4 years, 2003–2005

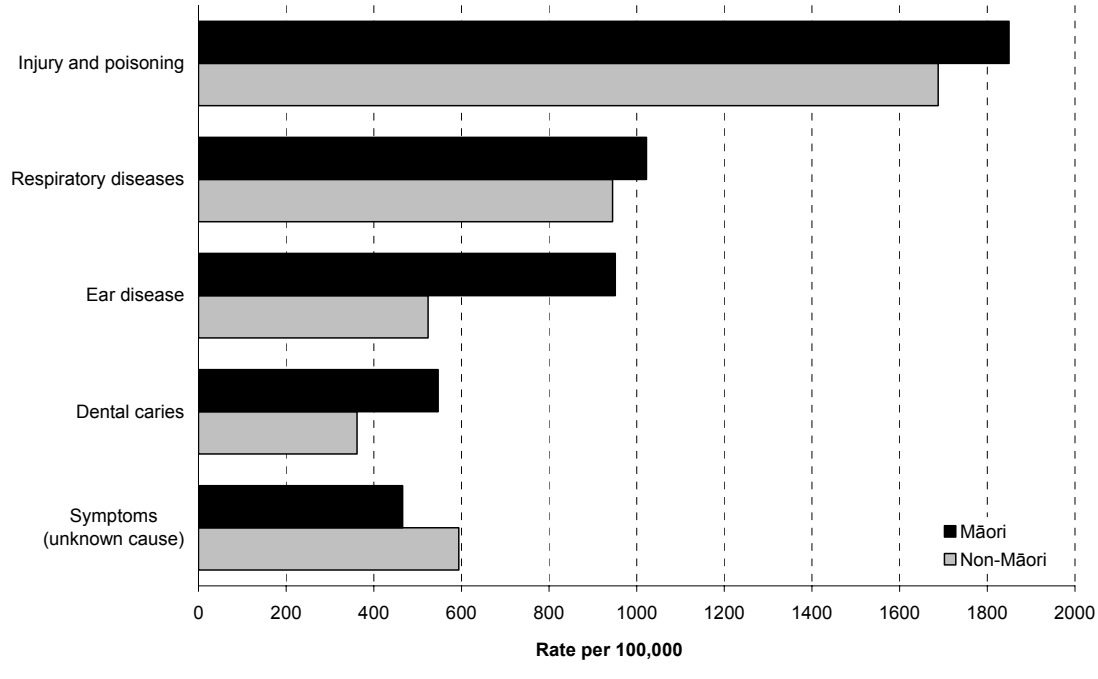
Cause	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**32,091**	**17,634.5**		**82,576**	**16,793.2**	**1.05**
Respiratory diseases	**1**	**9,271**	**5,094.3**	**1**	**20,980**	**4,266.7**	**1.19**
• Asthma		3,417	1,877.4		5,777	1,175.0	1.60
• Acute upper respiratory infections		2,168	1,191.6		6,003	1,220.7	0.98
• Pneumonia		1,689	927.9		3,980	809.5	1.15
• Acute bronchitis and bronchiolitis		783	430.3		1,146	233.0	1.85
Injury and poisoning	**2**	**4,054**	**2,227.6**	**3**	**9,944**	**2,022.3**	**1.10**
• Accidental falls		1,299	713.9		3,480	707.7	1.01
• Inanimate mechanical forces		1,019	560.1		2,551	518.7	1.08
• Transport accidents		439	241.5		602	122.3	1.97
• Accidental poisoning		413	226.9		1,288	262.0	0.87
Digestive system	**3**	**3,645**	**2,003.1**	**5**	**7,270**	**1,478.4**	**1.35**
• Dental caries		2,559	1,406.2		3,909	795.0	1.77
Ear disease	**4**	**3,411**	**1,874.5**	**4**	**8,599**	**1,748.7**	**1.07**
• Glue ear		2,406	1,322.0		5,958	1,211.7	1.09
Infectious diseases	**5**	**3,033**	**1,666.9**	**2**	**10,310**	**2,096.6**	**0.80**
• Intestinal infectious diseases		1,364	7549.6		5,042	1,025.4	0.73
• Viral infection		1,061	582.9		3,919	797.0	0.73
Females: all causes		**13,885**	**15,700.1**		**35,562**	**14,766.3**	**1.06**
Respiratory diseases	**1**	**4,033**	**4,559.7**	**1**	**8,838**	**3,670.0**	**1.24**
• Asthma		1,407	1,590.5		2,278	946.1	1.68
• Acute upper respiratory infections		905	1,023.8		2,518	1,045.4	0.98
• Pneumonia		808	913.1		1,852	769.2	1.19
Injury and poisoning	**2**	**1,716**	**1,940.6**	**3**	**4,208**	**1,747.2**	**1.11**
Digestive system	**2**	**1,651**	**1,867.2**	**5**	**3,169**	**1,315.7**	**1.42**
• Dental caries		1,257	1,420.8		1,862	773.3	1.84
Infectious diseases	**4**	**1,380**	**1,560.4**	**2**	**4,851**	**2,014.3**	**0.77**
• Intestinal infectious diseases		635	718.2		2,418	1,003.9	0.72
Ear disease	**5**	**1,376**	**1,555.6**	**4**	**3,507**	**1,456.3**	**1.07**
• Glue ear		951	1,075.5		2,387	991.1	1.09
Males: all causes		**18,206**	**19,463.4**		**47,014**	**18,738.8**	**1.04**
Respiratory diseases	**1**	**5,238**	**5,599.8**	**1**	**12,142**	**4,839.5**	**1.16**
• Asthma		2,010	2,148.7		3,499	1,394.7	1.54
• Acute upper respiratory infections		1,263	1,350.2		3,485	1,389.1	0.97
• Pneumonia		881	941.8		2,128	848.2	1.11
Injury and poisoning	**2**	**2,338**	**2,499.0**	**2**	**5,736**	**2,286.4**	**1.09**
Ear disease	**3**	**2,035**	**2,176.0**	**4**	**5,092**	**2,029.4**	**1.07**
• Glue ear		1,454	1,554.9		3,572	1,423.5	1.09
Digestive system	**4**	**1,994**	**2,131.6**	**5**	**4,101**	**1,634.6**	**1.30**
• Dental caries		1,302	1,392.3		2,047	815.8	1.71
Infectious diseases	**5**	**1,653**	**1,767.6**	**3**	**5,459**	**2,175.7**	**0.81**
• Intestinal infectious diseases		729	779.2		2,624	1,045.9	0.74

Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level.

Admissions for dental caries were 77% higher among Māori preschool children. These are generally admissions for dental treatment requiring a general anaesthetic and may indicate differential access to private or school dental service care (see Oral Health chapter for more discussion).

Ages 5–14 years

Figure 5.7: Leading causes of public hospital admission, ages 5–14 years, 2003–2005



The leading causes of public hospital admissions for children aged 5–14 years during 2003–2005 were injuries, respiratory diseases, ear diseases (mainly glue ear), dental caries, and admissions for symptoms and signs where the cause was not known. Māori and non-Māori had the same five leading causes, although there were significant differences in rates within each cause (Table 5.9).

Males and females in this age group had the same leading causes but males had higher rates of hospitalisation, for injuries in particular.

A fifth of admissions were due to injuries. Forty percent of these admissions were caused by falls, a fifth by exposure to mechanical forces, and a fifth caused by transport accidents. Transport accidents included pedal cycles (over a third), pedestrians (a tenth), traffic accidents (a third), and other accidents.

Māori children had higher rates of admission for asthma (42% higher), dental caries (51% higher), and glue ear (84% higher) than non-Māori.

Non-Māori children had significantly higher rates of admission for tonsils and adenoids (27% higher), symptoms and signs (27% higher), and for appendicitis (21% higher).

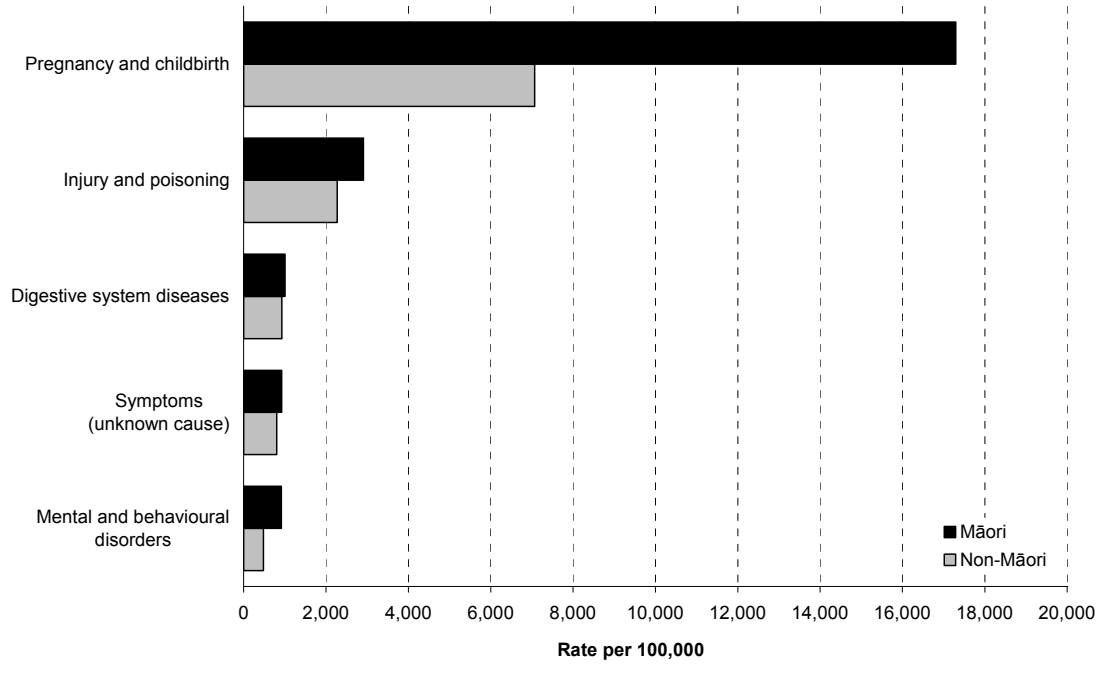
Table 5.9: Public hospital discharges, leading causes for ages 5–14 years, 2003–2005

	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**35,840**	**8,189.8**		**103,836**	**7,587.4**	**1.08**
Injury and poisoning	**1**	**8,097**	**1,850.3**	**1**	**23,096**	**1,687.6**	**1.10**
• Falls		3,333	761.7		9,887	722.4	1.05
• Mechanical forces		1,817	415.1		4,915	359.2	1.16
• Transport accidents		1,725	394.2		4,863	355.3	1.11
Digestive system diseases	**2**	**4,726**	**1,079.8**	**2**	**13,128**	**959.3**	**1.13**
• Dental caries		2,395	547.4		4,959	362.3	1.51
• Appendix		633	144.6		2,413	176.3	0.82
Respiratory diseases	**3**	**4,473**	**1,022.0**	**3**	**12,929**	**944.8**	**1.08**
• Asthma		1,441	329.2		3,174	231.9	1.42
• Tonsils and adenoids		1,014	231.7		4,043	295.4	0.78
Ear diseases	**4**	**4,160**	**950.5**	**5**	**7,167**	**523.7**	**1.81**
• Glue ear		2,521	576.1		4,285	313.1	1.84
Symptoms and signs (unknown cause)	**5**	**2,040**	**466.2**	**4**	**8,124**	**593.6**	**0.79**
Females: all causes		**15,589**	**7,338.2**		**45,948**	**6,918.0**	**1.06**
Injury and poisoning	**1**	**2,987**	**1,406.1**	**1**	**8,544**	**1,286.4**	**1.09**
• Falls		1,345	633.4		3,857	580.6	1.09
• Mechanical forces		576	271.1		1,684	253.5	1.07
• Transport accidents		564	265.6		1,569	236.2	1.12
Digestive system	**2**	**2,161**	**1,017.1**	**3**	**5,907**	**889.4**	**1.14**
• Dental caries		1,157	544.8		2,336	351.7	1.55
• Appendix		261	122.7		999	150.4	0.82
Respiratory diseases	**3**	**2,045**	**962.7**	**2**	**6,076**	**914.8**	**1.05**
• Asthma		613	288.7		1,392	209.6	1.38
• Tonsils and adenoids		514	242.2		2,177	327.7	0.74
Ear disease	**4**	**1,843**	**867.7**	**5**	**3,185**	**479.5**	**1.81**
• Glue ear		1,081	508.7		1,895	285.4	1.78
Symptoms and signs (unknown cause)	**5**	**1,002**	**471.6**	**4**	**4,197**	**631.9**	**0.75**
Males: all causes		**20,250**	**8,992.6**		**57,884**	**8,218.1**	**1.09**
Injury and poisoning	**1**	**5,109**	**2,268.9**	**1**	**14,549**	**2,065.6**	**1.10**
• Falls		1,988	882.8		6,028	855.8	1.03
• Mechanical forces		1,241	551.0		3,230	458.6	1.20
• Transport accidents		1,160	515.0		3,294	467.7	1.10
Digestive system diseases	**2**	**2,565**	**1,139.0**	**2**	**7,221**	**1,025.2**	**1.11**
• Dental caries		1,238	549.8		2,623	372.4	1.48
• Appendix		372	165.2		1,414	200.7	0.82
Respiratory diseases	**3**	**2,427**	**1,077.9**	**3**	**6,854**	**973.1**	**1.11**
• Asthma		828	367.5		1,782	253.1	1.45
• Tonsils and adenoids		500	221.9		1,866	265.0	0.84
Ear disease	**4**	**2,317**	**1,028.7**	**4**	**3,982**	**565.4**	**1.82**
• Glue ear		1,440	639.7		2,390	339.3	1.89
Symptoms and signs (unknown cause)	**5**	**1,038**	**461.0**	**5**	**3,926**	**557.4**	**0.83**

Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level.

Ages 15–24 years

Figure 5.8: Leading causes of public hospital admission, ages 15–24 years, 2003–2005



Note: Rates for pregnancy and childbirth are sex-specific.

The five leading causes of hospitalisation for Māori in the 15–24 year age group during 2003–2005 included pregnancy and childbirth, injury and poisoning, digestive system diseases, admissions for symptoms with unknown causes, and mental and behavioural disorders. For non-Māori the causes were similar, except that respiratory disease was the fifth leading cause of admission (Table 5.10).

Males and females had different patterns of admission in this age group. Māori females had nearly three times as many admissions as Māori males – most of them to do with pregnancy and childbirth, and for 'factors related to reproduction', which includes admissions for contraceptive management, sterilisation, and monitoring of high-risk pregnancies. The other leading causes for both Māori and non-Māori females were injury and poisoning, genitourinary diseases, and general symptoms and signs (unknown causes).

The main contributor to disparities between Māori and non-Māori females was pregnancy and childbirth (2.45 times higher among Māori women and accounting for 80% of the difference in total admission rates). This reflects a pattern of younger childbearing for Māori.

The leading causes for Māori males were: injury and poisoning, mental and behavioural disorders (60% related to schizophrenia), diseases of the digestive system, admissions for specific procedures (58% dialysis procedures), and respiratory diseases. For non-Māori males admissions for symptoms with unknown cause was the fourth leading cause.

Table 5.10: Public hospitalisations, leading causes for ages 15–24 years, 2003–2005

	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**66,520**	**19,896.6**		**171,649**	**12,069.0**	**1.65**
Pregnancy and childbirth*	**1**	**28,977**	**17,296.3**	**1**	**48,876**	**7,066.1**	**2.45**
Injury and poisoning	**2**	**9,727**	**2,909.3**	**2**	**32,320**	**2,272.5**	**1.28**
• Mechanical forces		2,474	740.0		7,014	493.2	1.50
• Transport accidents		2,183	653.1		8,299	583.5	1.12
• Assault		1,588	475.0		3,315	233.1	2.04
Digestive system diseases	**3**	**3,361**	**1,005.4**	**3**	**13,210**	**928.8**	**1.08**
• Appendix		778	232.8		3,523	247.7	0.94
• Teeth and gums		548	164.0		2,149	151.7	1.09
• Gallstones		456	136.5		857	60.2	2.27
Symptoms and signs (unknown cause)	**4**	**3,079**	**921.0**	**4**	**11,388**	**800.7**	**1.15**
Mental and behavioural disorders	**5**	**3,053**	**913.1**	**6**	**6,881**	**483.8**	**1.89**
• Schizophrenic disorders		1,645	492.1		1,668	117.3	4.20
• Mood disorder		471	141.0		1,787	125.6	1.12
• Psychoactive substance use		456	136.3		1,411	99.2	1.37
Females: all causes		**48,837**	**29,151.3**		**112,025**	**16,195.6**	**1.80**
Pregnancy and childbirth	**1**	**28,977**	**17,296.3**	**1**	**48,876**	**7,066.1**	**2.45**
Injury and poisoning	**2**	**3,006**	**1,794.1**	**2**	**10,150**	**1,467.4**	**1.22**
• Transport accidents		784	467.8		2,588	374.2	1.25
• Intentional self-harm		493	294.0		2,477	358.2	0.82
• Mechanical forces		445	265.7		1,265	182.9	1.45
• Assault		390	232.9		396	57.2	4.07
Genitourinary system diseases	**3**	**2,357**	**1,406.6**	**3**	**7,733**	**1,117.9**	**1.26**
Symptoms and signs (unknown cause)	**4**	**2,165**	**1,292.3**	**4**	**7,594**	**1,097.9**	**1.18**
Procedures related to reproduction	**5**	**1,999**	**1,193.1**	**7**	**4,218**	**609.8**	**1.96**
Males: all causes		**17,680**	**10,599.5**		**59,619**	**8,161.1**	**1.30**
Injury and poisoning	**1**	**6,720**	**4,028.8**	**1**	**22,168**	**3,034.5**	**1.33**
• Mechanical forces		2,029	1,216.4		5,748	786.8	1.55
• Transport accidents		1,399	838.5		5,709	781.5	1.07
• Assault		1,198	718.2		2,919	399.6	1.80
• Falls		952	571.0		3,523	482.2	1.18
Mental and behavioural disorders	**2**	**1,973**	**1,182.9**	**5**	**3,469**	**474.8**	**2.49**
• Schizophrenic disorders		1,229	736.7		1,235	169.1	4.36
Digestive system diseases	**3**	**1,433**	**859.1**	**2**	**6,154**	**842.4**	**1.02**
• Appendix		383	229.6		1,948	266.7	0.86
• Teeth and gums		223	133.4		914	125.2	1.07
Specific procedures	**4**	**1,214**	**727.7**	**8**	**2,588**	**354.3**	**2.05**
• Care involving dialysis		705	422.9		663	90.7	**4.66**
Respiratory diseases	**5**	**1,109**	**664.6**	**3**	**4,035**	**552.4**	**1.20**
• Asthma		257	154.3		610	83.5	1.85
• Acute upper respiratory tract infection		184	110.0		823	112.7	0.98
• Pneumonia		159	95.5		501	68.5	1.39

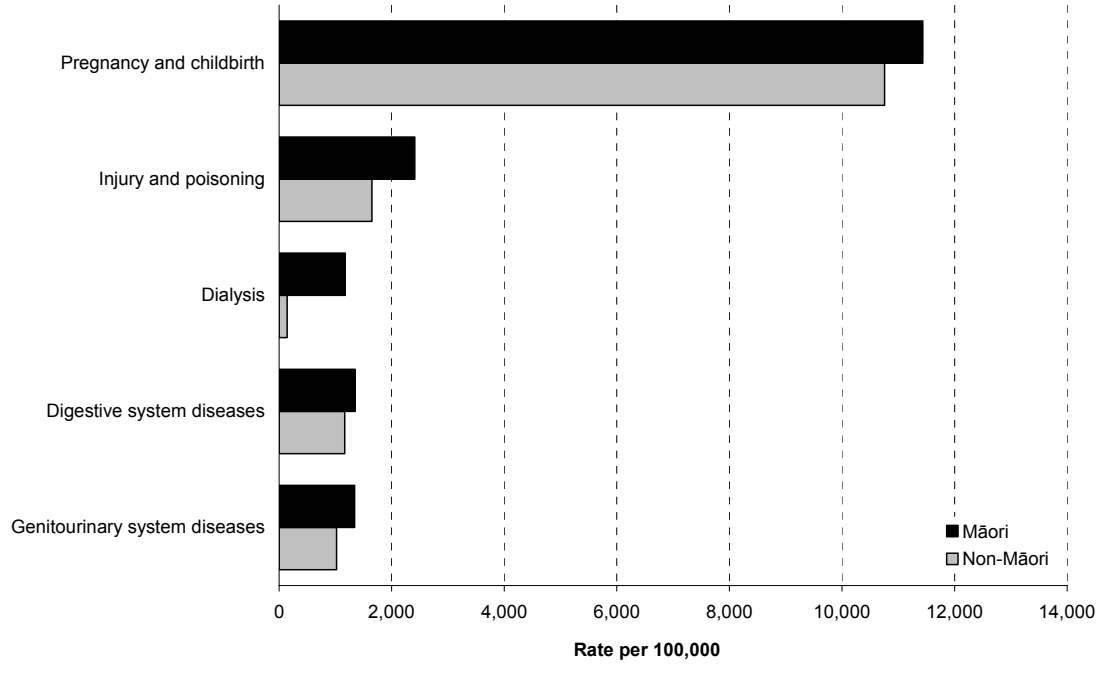
Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level; *rates for pregnancy and childbirth are sex-specific.

The largest contributors to differences in the overall admission rate between Māori and non-Māori men were injuries and poisoning (accounting for 40% of the difference in total admission rates), and mental disorders (29%). The high rate of admissions for

schizophrenic disorders among Māori males was notable (four times higher than non-Māori).

Ages 25–44 years

Figure 5.9: Leading causes of public hospitalisation, ages 25–44 years, 2003–2005



The leading causes of hospital admission for Māori in the 25–44 year age group were: pregnancy and childbirth, injury and poisoning, admissions for care involving dialysis, digestive system diseases, and genitourinary diseases. The leading causes for non-Māori were: pregnancy and childbirth, injury and poisoning, diseases of the digestive system, symptoms with unknown causes, and genitourinary diseases (Table 5.11).

Males and females had different patterns of admissions, with females admitted at more than twice the rates of males. Pregnancy and childbirth, reproductive health, and genitourinary system diseases were the main contributors to the higher rates of female admissions. Males had twice the rate of admission for injuries compared to females.

Injuries were the third leading cause of admission for Māori women, with a rate 44% higher than that of non-Māori women. The main causes of injury included complications of medical or surgical care, falls, assault, and intentional self-harm. The rate of admission for assault was six times higher for Māori women than non-Māori women. Self-harm admissions were not significantly different.

Injuries were the leading reason for Māori male admission. The main causes of injury were exposure to mechanical forces, assault, transport accidents, and falls. The second leading cause of admission for Māori men was for certain procedures (80% for care involving dialysis), followed by mental and behavioural disorders (60% schizophrenic disorders), diseases of the digestive system, and general symptoms and signs with unknown causes. Non-Māori males had similar leading causes with the addition of musculoskeletal disorders (ranked fourth).

Māori men had a 50% higher rate of admission than non-Māori men. The key contributors to the difference were admissions for dialysis (seven times higher for Māori), injuries, and mental disorders. Māori had higher rates of admission for injuries from assault (2.8 times higher) and schizophrenia (3.6 times higher).

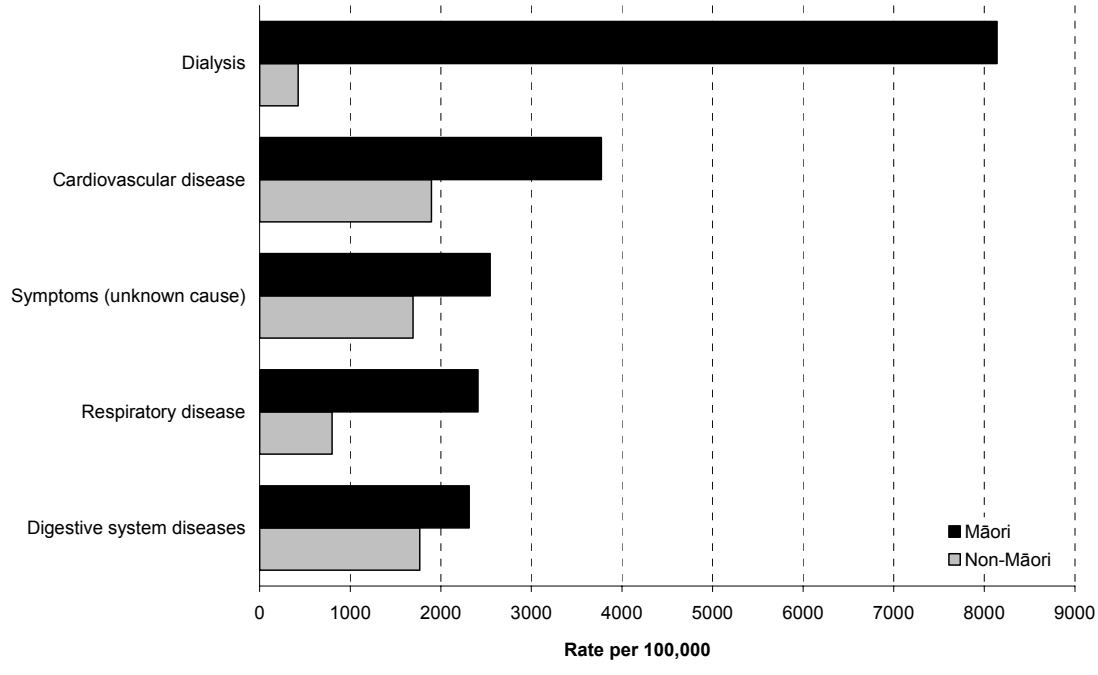
Table 5.11: Public hospitalisations, leading causes for ages 25–44 years, 2003–2005

Cause	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**110,259**	**20,914.8**		**472,931**	**15,949.6**	**1.31**
Pregnancy and childbirth*	**1**	**31,587**	**11,435.8**	**1**	**164,021**	**10,755.7**	**1.06**
Injury and poisoning	**2**	**12,697**	**2,408.5**	**2**	**48,875**	**1,648.3**	**1.46**
• Exposure to mechanical forces		2,988	566.9		11,250	379.4	1.49
• Assault		1,986	376.7		3,219	108.6	3.47
• Falls		1,865	353.7		7,614	256.8	1.38
• Transport accidents		1,848	350.5		9,483	319.8	1.10
Specific procedures and heatlh care	**3**	**8,041**	**1,525.3**	**11**	**11,613**	**391.6**	**3.89**
• Care involving dialysis		6,200	1,176.0		4,243	143.1	8.22
Digestive system diseases	**4**	**7,117**	**1,350.1**	**4**	**34,586**	**1,166.4**	**1.16**
• Gallstones		1,496	283.8		4,627	156.0	1.82
• Gastroenteritis and colitis		692	131.3		5,092	171.7	0.76
Genitourinary system diseases	**5**	**7,092**	**1,345.2**	**6**	**30,239**	**1,019.8**	**1.32**
• Kidney stones		693	131.4		4,169	140.6	0.93
• Urinary tract infection		504	95.7		1,425	48.0	1.99
Females: all causes		**75,616**	**27,376.4**		**341,706**	**22,407.4**	**1.22**
Pregnancy and childbirth	**1**	**31,587**	**11,435.8**	**1**	**164,021**	**10,755.7**	**1.06**
Genitourinary system diseases	**2**	**6,010**	**2,175.9**	**3**	**24,192**	**1,586.4**	**1.37**
Injury and poisoning	**3**	**4,663**	**1,688.3**	**5**	**17,936**	**1,176.1**	**1.44**
• Complications of medical/surgical care		808	292.6		3,362	220.5	1.33
• Falls		699	253.2		2,822	185.0	1.37
• Assault		699	253.2		609	40.0	6.33
• Intentional self-harm		605	219.2		3,541	232.2	0.94
Factors related to reproduction	**4**	**4,276**	**1,548.2**	**2**	**25,518**	**1,673.3**	**0.93**
Digestive system diseases	**5**	**4,168**	**1,508.9**	**4**	**18,567**	**1,217.6**	**1.24**
• Gallstones		1,309	473.8		3,925	257.4	1.84
Males: all causes		**34,641**	**13,803.0**		**131,222**	**9,111.4**	**1.51**
Injury and poisoning	**1**	**8,033**	**3,200.7**	**1**	**30,938**	**2,148.2**	**1.49**
• Mechanical forces		2,337	931.2		8,927	619.8	1.50
• Assault		1,287	512.9		2,610	181.2	2.83
• Transport accidents		1,264	503.5		6,497	451.1	1.12
• Falls		1,164	463.9		4,793	332.8	1.39
Specific procedures and health care	**2**	**31,359**	**3,314.1**	**6**	**60,530**	**642.4**	**5.16**
• Care involving dialysis		4,003	1,595.0		3,268	226.9	7.03
Mental and behavioural disorders	**3**	**3,557**	**1,417.4**	**5**	**8,431**	**585.4**	**2.42**
• Schizophrenic disorders		2,139	852.3		3,434	238.4	3.57
• Mood disorders		633	252.4		2,020	140.2	1.80
Digestive system diseases	**4**	**2,950**	**1,175.4**	**2**	**16,018**	**1,112.2**	**1.06**
Symptoms and signs (unknown cause)	**5**	**2,414**	**961.8**	**3**	**12,700**	**881.8**	**1.09**

Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level; *rates are sex-specific.

Ages 45–64 years

Figure 5.10: Leading causes of public hospitalisation, ages 45–64 years, 2003–2005



The leading causes of hospitalisation for Māori in the 45–64 years age group were: admissions for care involving dialysis, circulatory system disease, admissions for symptoms and signs with unknown causes, respiratory disease, and diseases of the digestive system (Figure 5.10). For Māori females cancer admissions were more frequent than digestive system diseases. For Māori males injury and poisoning was the third leading cause of admission (Table 5.12).

Admissions for 'specific procedures and health care' were the leading cause for both Māori and non-Māori. For Māori and non-Māori most of these admissions involved dialysis. However, many of these admissions were readmissions for the same individuals. When analysed by the number of individual people admitted to hospital each year, a larger proportion of the population were admitted for cardiovascular disease (2.4%) and respiratory disease (1.6%) than for dialysis (0.2%). In 2005 the rate of individuals admitted to hospital for care involving dialysis was 223.6 per 100,000 for Māori and 27.0 per 100,000 for non-Māori, giving a ratio of 8.28 (95% CI: 6.40–10.72).

Ischaemic heart disease was the most common cause of admission for cardiovascular or circulatory system disease, with a rate 59% higher for Māori than non-Māori. Heart failure admissions were extremely high for Māori (over seven times higher than non-Māori rates), and admissions for atrial fibrillation or flutter were nearly twice as high for Māori. Stroke admissions were 2.7 times higher for Māori women than non-Māori women.

A third of respiratory disease admissions among Māori were due to chronic obstructive pulmonary disease (COPD), with Māori rates four times those of non-Māori.

Benign cancers were the most common cause of Māori female cancer admissions, followed by cancers of unknown primary site, breast, and lung cancer.

Table 5.12: Public hospitalisations, leading causes for ages 45–64 years, 2003–2005

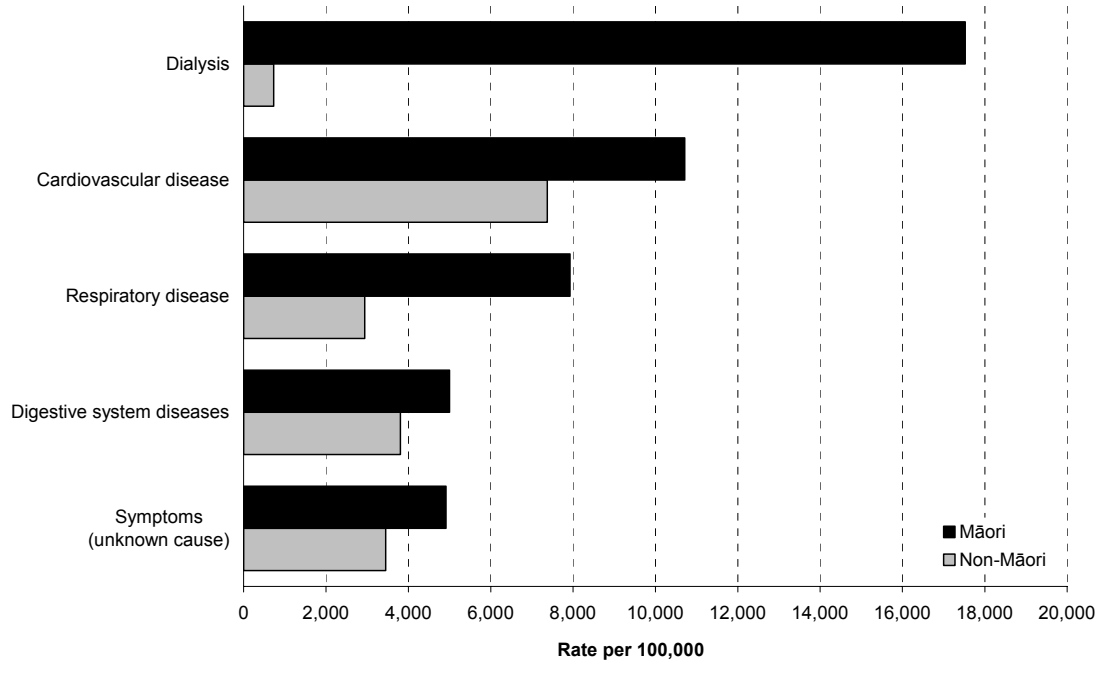
Cause	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: All cause		**86,899**	**32,327.4**		**387,803**	**15,264.4**	**2.12**
Specific procedures and health care	**1**	**24,462**	**9,100.3**	**6**	**27,689**	**1,089.9**	**8.35**
• Care involving dialysis		21,882	8,140.3		10,802	425.2	19.15
Circulatory system	**2**	**10,140**	**3,772.1**	**1**	**48,202**	**1,897.3**	**1.99**
• Ischaemic heart disease		3,861	1,436.4		22,966	904.0	1.59
• Heart failure		1,568	583.2		1,916	75.4	7.73
• Atrial fibrillation and flutter		1,084	403.8		5,261	207.1	1.95
Symptoms and signs (unknown cause)	**3**	**6,841**	**2,544.9**	**3**	**43,061**	**1,694.9**	**1.50**
Respiratory system	**4**	**6,478**	**2,410.0**	**9**	**20,321**	**799.9**	**3.01**
• COPD		2,166	805.6		5,105	200.9	4.01
• Pneumonia		1,301	484.0		4,371	172.0	2.81
• Asthma		932	346.6		2,236	88.0	3.94
Digestive system	**5**	**6,219**	**2,313.6**	**2**	**44,923**	**1,768.2**	**1.31**
Females: all causes		**42,112**	**30,292.2**		**188,183**	**14,690.6**	**2.06**
Specific procedures and health care	**1**	**9,218**	**6,630.9**	**7**	**11,713**	**914.4**	**7.25**
• Care involving dialysis		7,833	5,634.5		2,919	227.9	24.73
Circulatory system	**2**	**4,459**	**3,207.2**	**5**	**15,967**	**1,246.5**	**2.57**
• Ischaemic heart disease		1,646	1,183.8		6,073	474.1	2.50
• Heart failure		559	402.2		656	51.2	7.85
• Stroke		536	385.4		1,846	144.1	2.67
• Atrial fibrillation and flutter		508	365.3		1,700	132.7	2.75
Symptoms and signs (unknown cause)	**3**	**3,839**	**2,761.6**	**3**	**22,065**	**1,722.5**	**1.60**
Respiratory system	**4**	**3,726**	**2,680.5**	**8**	**10,657**	**831.9**	**3.22**
• Chronic obstructive pulmonary disease		1,348	969.5		2,861	223.4	4.34
• Asthma		645	464.0		1,588	124.0	3.74
• Pneumonia		621	446.9		2,033	158.7	2.82
Cancer	**5**	**3,395**	**2,442.4**	**1**	**23,428**	**1,828.9**	**1.34**
• Benign neoplasms		724	520.8		4,484	350.0	1.49
• Breast		523	376.3		2,937	229.3	1.64
• Ill-defined site		470	338.4		3,300	257.6	1.31
• Lung, trachea, and bronchus		394	283.5		979	76.4	3.71
Males: All cause		**44,783**	**34,504.1**		**199,613**	**15,847.3**	**2.18**
Specific procedures and health care	**1**	**15,244**	**11,745.3**	**6**	**15,976**	**1,268.3**	**9.26**
• Care involving dialysis		14,049	10,824.4		7,883	625.8	17.30
Circulatory system	**2**	**5,681**	**4,377.1**	**1**	**32,234**	**2,559.1**	**1.71**
• Ischaemic heart disease		2,215	1,706.9		16,893	1,341.1	1.27
• Heart failure		1,009	777.0		1,260	100.1	7.77
Injury and poisoning	**3**	**3,321**	**2,558.6**	**3**	**22,225**	**1,764.5**	**1.45**
• Complications of medical/surgical care		1,072	825.7		4,547	361.0	2.29
• Mechanical forces		675	520.3		5,539	439.7	1.18
• Falls		542	417.7		4,711	374.0	1.12
Digestive system	**4**	**3,044**	**2,345.5**	**2**	**22,559**	**1,790.9**	**1.31**
Symptoms and signs (unknown cause)	**5**	**3,002**	**2,312.7**	**4**	**20,994**	**1,666.7**	**1.39**

Notes: Rates are calculated as per 100,000; shaded rate ratios are statistically significant at the 5% level.

Complications of medical and surgical care was the most common cause of admission for injury or poisoning for Māori men and women. Māori men had a rate over twice that of non-Māori men. Exposure to mechanical forces (eg. sports equipment, machinery at work or home, glass cuts, etc) and falls were the next most frequent causes associated with an admission for injury among Māori men.

Ages 65 years and over

Figure 5.11: Leading causes of public hospitalisation, ages 65 years and over, 2003–2005



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

The leading causes of public hospital admissions for Māori aged 65 years and over during 2003–2005 were: admissions for care involving dialysis, circulatory system disease, respiratory disease, digestive system diseases, and admissions for symptoms with unknown cause. However, when analysed by the number of individual people admitted to hospital each year, a far larger proportion of the Māori population were admitted for cardiovascular disease (7%) and respiratory disease (5%) than for dialysis (0.4%). When analysed separately by sex, cancer was the fifth major cause of admission for both Māori men and women. The leading causes for non-Māori in this age group were similar but cancer was the second leading cause of admission after circulatory system disease (Table 5.13).

The key contributors to the overall differences in admission rates were: admissions for dialysis (accounting for 52% of the rate difference), respiratory diseases (particularly COPD), and circulatory system disease (particularly heart failure).

Rate ratios for admissions involving dialysis were extreme, with the Māori rate 24 times the non-Māori rate. However, many of these admissions were readmissions for the same individuals. When calculated by individuals rather than by hospital admissions, the rate ratio reduced but was still very high: in 2005 the age-standardised

rate of individuals 65 and over who were admitted for care involving dialysis was 399.1 per 100,000 for Māori and 49.6 for non-Māori, giving a ratio of 8.04 (95% CI: 5.92–10.92). This included 94 Māori individuals and 195 non-Māori individuals.

The leading causes for Māori women in this age group were: admissions for specific procedures (most involving dialysis), circulatory system, respiratory diseases, symptoms and signs, and cancer. The leading causes for non-Māori women were circulatory diseases, admissions for specific procedures, cancer, injury, and digestive system.

The largest contributors to the overall disparity for women were admissions for dialysis, circulatory diseases (particularly heart failure), and respiratory diseases (particularly COPD). Although the admission rate for dialysis was high, the number of people admitted for cardiovascular disease or respiratory disease was higher. For example, in 2005 the rate of individual women admitted for care involving dialysis was 246.9 per 100,000 people for Māori (32 women) and 36.6 per 100,000 for non-Māori (73 women), giving a rate ratio of 6.74.

The leading causes of admission for Māori men were admissions for specific procedures (most involving dialysis), circulatory diseases, respiratory diseases, digestive system diseases, and cancer. Non-Māori men had the same leading causes, but in a different order. Non-Māori men had higher admission rates for ischaemic heart disease and for cancer, particularly for skin cancer. However, Māori men had higher rates for some individual cancers, especially lung cancer. In 2005 the rate of individual men admitted for care involving dialysis was 551.3 for Māori (62 men) and 62.6 for non-Māori (122 men), giving a rate ratio of 8.80.

Table 5.13: Public hospitalisations, leading causes for ages 65 years and over, 2003–2005

Cause of admission	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Total: all causes		**50,270**	**72,752.1**		**651,373**	**40,264.7**	**1.81**
Specific procedures	**1**	**13,833**	**20,643.5**	**3**	**68,449**	**3,805.7**	**5.42**
• Care involving dialysis		11,627	17,525.4		8,934	728.3	24.06
• Rehabilitation procedures		1,334	1,852.1		44,516	2,012.7	0.92
Circulatory system diseases	**2**	**7,505**	**10,712.4**	**1**	**120,543**	**7,382.6**	**1.45**
• Ischaemic heart disease		2,299	3,300.9		46,546	3,050.8	1.08
• Heart failure		1,734	2,472.1		15,242	760.5	3.25
• Stroke		1,003	1,411.2		16,843	937.8	1.50
• Atrial fibrillation and flutter		751	1,062.7		11,696	746.2	1.42
Respiratory diseases	**3**	**5,580**	**7,924.9**	**7**	**48,465**	**2,941.6**	**2.69**
• COPD		2,722	3,866.9		20,032	1,277.2	3.03
• Pneumonia		1,351	1,928.3		13,903	755.3	2.55
Digestive system diseases	**4**	**3,457**	**5,001.9**	**4**	**57,886**	**3,807.4**	**1.31**
• Gastric ulcers		545	789.2		5,143	333.7	2.36
• Gallstones		455	656.1		6,239	420.3	1.56
• Hernia		351	537.3		5,657	413.2	1.30
Symptoms and signs (unknown cause)	**5**	**3,435**	**4,917.7**	**5**	**53,903**	**3,450.5**	**1.43**

Cause of admission	Māori			Non-Māori			Rate ratio
	Rank	Number	Rate	Rank	Number	Rate	
Females: all causes		**242,68**	**63,036.7**		**337,462**	**35,525.6**	**1.77**
Specific procedures	**1**	**5,260**	**14,265.7**	**2**	**37,329**	**3,290.1**	**4.34**
• Care involving dialysis		4,077	11,303.1		2,361	321.3	35.18
• Rehabilitation procedures		741	1,804.7		28,365	2,132.3	0.85
Circulatory system diseases	**2**	**3,902**	**9,944.3**	**1**	**58,313**	**5,800.0**	**1.71**
• Ischemic heart disease		1,174	3,024.8		20,417	2,149.7	1.41
• Heart failure		837	2,078.4		7,827	602.9	3.45
• Stroke		554	1,382.7		8,921	805.7	1.72
Respiratory diseases	**3**	**3,074**	**7,866.7**	**7**	**23,168**	**2,456.2**	**3.20**
• COPD		1,529	3,945.6		9,190	1,056.0	3.74
• Pneumonia		688	1,729.4		6,693	600.2	2.88
Symptoms and signs (unknown cause)	**4**	**1,845**	**4,766.8**	**6**	**28,738**	**3,227.0**	**1.48**
Cancer	**5**	**1,678**	**4,397.0**	**3**	**36,060**	**4,211.4**	**1.04**
• Lung, trachea and bronchus		281	743.3		1,411	197.1	3.77
• Breast		171	459.3		2,372	320.7	1.43
Males: all causes		**26,002**	**82,442.7**		**313,911**	**44,929.0**	**1.83**
Specific procedures	**1**	**8,574**	**27,021.2**	**3**	**31,119**	**4,321.2**	**6.25**
• Care involving dialysis		7,549	23,747.8		6,574	1,135.4	20.92
• Rehabilitation procedures		593	1,899.4		16,151	1,893.1	1.00
Circulatory system diseases	**2**	**3,603**	**11,480.5**	**1**	**62,230**	**8,965.2**	**1.28**
• Ischaemic heart disease		1,125	3,577.0		26,129	3,952.0	0.91
• Heart failure		897	2,865.8		7,415	918.1	3.12
• Stroke		449	1,439.7		7,922	1,069.8	1.35
Respiratory diseases	**3**	**2,506**	**7,983.0**	**5**	**25,297**	**3,426.9**	**2.33**
• COPD		1,193	3,788.2		10,842	1,498.5	2.53
• Pneumonia		663	2,127.2		7,210	910.4	2.34
Digestive system diseases	**4**	**1,827**	**5,804.5**	**4**	**27,595**	**4,092.2**	**1.42**
• Gastric ulcers		292	927.6		2,439	363.1	2.55
• Hernia		282	892.1		4,030	622.9	1.43
Cancer	**5**	**1,628**	**5,157.4**	**2**	**46,454**	**6,678.5**	**0.77**
• Lung, trachea and bronchus		251	793.2		2,662	411.7	1.93
• Ill-defined site		206	651.9		4,105	619.1	1.05
• Prostate		204	649.9		3,665	528.1	1.23

Notes: Rates are calculated as per 100,000 and were age-sex-standardised to the 2001 Māori population; shaded rate ratios are statistically significant at the 5% level.

Discussion

The rates of hospital admissions for Māori were higher than those of non-Māori for nearly every major cause, for both genders, and in all but the youngest age groups. The leading causes of admission did not vary greatly between Māori and non-Māori in the younger age groups and, with a few exceptions (mostly respiratory diseases), the rates were not a great deal higher. However, the patterns of hospitalisation increasingly diverged in the older age groups, with Māori hospitalised for a different range of causes, and at greater rates. This difference was most marked in the 45–65 years age group.

Two types of disparities can be shown by hospitalisation data. There are those where some groups have substantially lower rates of hospital utilisation that may indicate poorer access to health care (or a healthier population). There are also those disparities that can be considered 'hyperdisparities' (La Veist 2002) where greater rates of hospitalisation indicate a poorer quality and outcome of healthcare. Hyperdisparities can include hospitalisation as a result of medical error and missed diagnoses. Ambulatory-sensitive admissions are also hyperdisparities.

Māori were predominantly over-represented in those causes that can be considered potentially preventable with good primary care, health promotion, and injury prevention. Those for which Māori had higher admission rates include diabetes and complications of diabetes, dental conditions, injuries, pneumonia, asthma, infectious diseases, injuries, congestive heart failure, and chronic obstructive pulmonary disease.

Higher rates of hospitalisation indicate a greater need for health services. What this data does not show is whether the greater number of hospitalisations for Māori meets the greater need. Causes, patterns of diagnosis, and treatments, vary for different diseases so it is difficult to generalise from overall rates of hospitalisation. Health rationing policies change over time, as do practices and treatments, with more conditions treated on a daypatient, or on an outpatient basis. These data do not show outpatient visits, which is how hospital treatment is delivered for most patients.

Assessing the quality of health care requires more than just counting the use of services. The type and appropriateness of the services also needs to be considered. For many, if not most, health care services there is an expectation of benefit, and that benefit extends beyond such obviously important outcomes as avoiding death to more subtle quality-of-life values such as physical and social functioning.

By itself, hospital admission data does not give a measure of health status. It needs to be considered alongside other information. Disparate rates in hospital admissions may indicate a disparate need for health services, but not the extent of the need, nor the extent to which that need is being met. However, higher hospitalisation rates for preventable conditions suggest Māori are receiving less than adequate health care, contributing to poorer health outcomes.

For further information on hospitalisations see, for example:

- New Zealand Health Information Service. 2006. *Selected Morbidity Data for Publicly Funded Hospitals*. Wellington: Ministry of Health. www.nzhis.govt.nz
  - includes data on Māori and non-Māori hospitalisations involving injury or poisoning, mean length of stay and bed days, youth hospitalisations for intentional self-harm
- Ministry of Health. 2006. *Tatau Kahukura: Māori health chart book*. Wellington: Ministry of Health. www.moh.govt.nz
  - includes data on preventable hospitalisations, ambulatory-sensitive hospitalisations, and injury-preventable hospitalisations.

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Ministry of Health. 2006. *Tatau Kahukura: Māori health chart book*. Wellington: Ministry of Health.

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La Veist T. 2002. Measuring disparities in health care quality and service utilisation. In: Swift EK (ed). *Guidance for the National Healthcare Disparities Report*. Washington DC: Institute of Medicine, 75–98.