



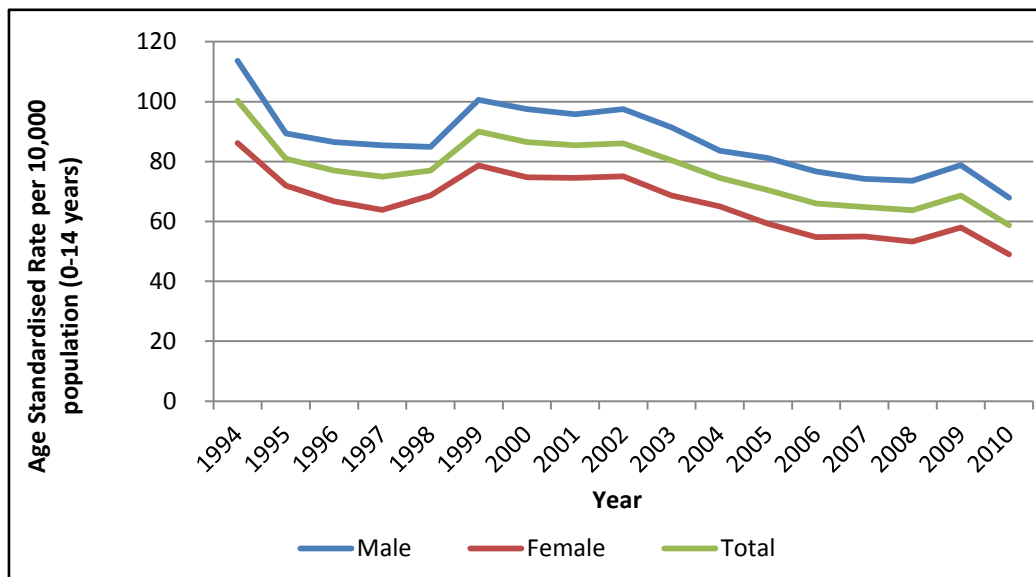
## Environmental Health Indicators for New Zealand

### Indicator: Otitis media incidence among children aged 0-14 years from 1994 to 2010

#### Background

Otitis media (also known as 'glue ear') is an infection involving a buildup of fluid in the middle ear. It can be present in two forms: acute otitis media when the presence of fluid is in combination with signs of acute illness, and otitis media with effusion where the fluid is not accompanied by signs of any other infections<sup>[1]</sup>. Otitis media (OM) is one of the most common infections affecting children worldwide and is a leading cause of doctor visits. Up to 90% of all New Zealand children are estimated to suffer at least one episode before they reach school age<sup>[2]</sup>. Left unchecked OM may result in temporary or permanent hearing loss and have a detrimental effect on learning.

A number of individual and environmental risk factors have been linked to the development of OM. Younger age groups, males, children in low socioeconomic status groups, and the presence of underlying disease have been identified as major individual level risk factors associated with onset of OM. Environmental risk factors include seasonal effects, poor living conditions such as dampness and household crowding due to a shortage of housing<sup>[3]</sup>, second hand smoke exposure, lack of breast feeding and environmental air pollution<sup>[4]</sup>.



#### National temporal trends

Between 1994 and 2010, the overall age-standardised rate (ASR) for OM hospitalisations among 0-14 year olds has decreased by 41%, from 100 admissions per 10,000 population to 59 (Figure 1). During the mid-1990s there was a downward trend in OM rates, followed by an increase in rates between 1997 and 1999. Rates then generally decreased with the exception of a small peak in 2002 and 2009. In 2010, 5428 children were hospitalised with OM, down from the 6298 children in 2009 (Table 1).

Figure 1: Age-standardised otitis media incidence rates by sex, 1994-2010



### Age and sex differences

In 2010 males and females have a similar pattern of OM hospitalisations with the highest rates occurring at age one and substantially dropping off after age six (Figure 2). Males have higher rates than females at all ages with the exception of 10 year olds where the rate for females is marginally higher. The observed differences by sex are more pronounced between the ages of one to seven years and the increased burden of disease among males shown in Figure 1 is driven by variation in this age group. The highest hospitalisation rate for both males and females during 2010 was at age one, being 179 and 106 admissions per 10,000 population respectively. The median age of patients admitted to hospital for OM was 4 years for both males and females. Since 1994 males have consistently had a higher incidence rate of OM than females with little variation in the gap between the two groups. The male to female ratio has ranged from a low of 1.25:1 in 1995 to 1.4:1 in 2006 and 2010 (Figure 1).

### Ethnic variation

There are marked ethnic differences in OM hospitalisations (Figure 3). During 2006 Māori children had the highest rate (78.6 per 10,000,) followed by Pacific children (64.1 per 10,000,). Rates for Māori and Pacific children were substantially higher than European (46.3 per 10,000,) and Asian (22.4 per 10,000,) children.

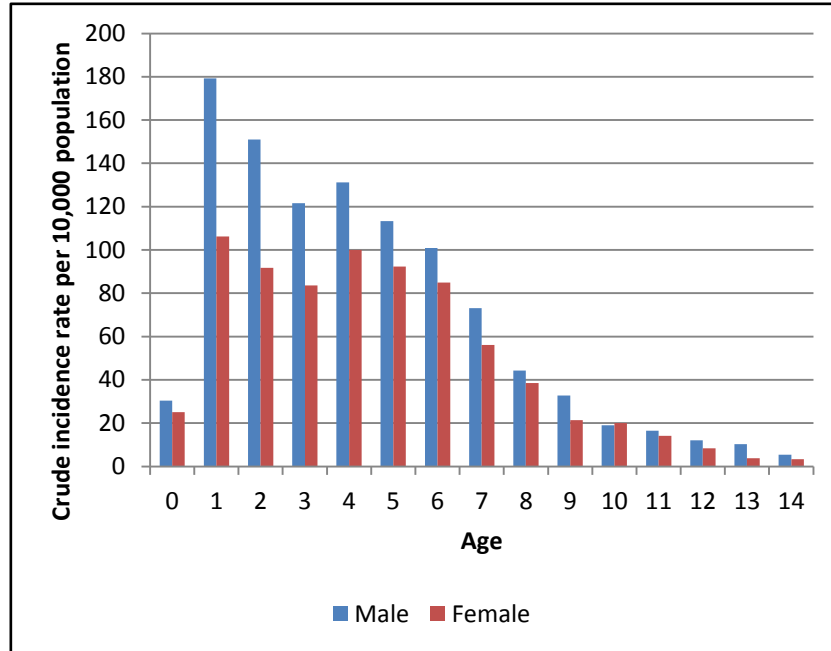


Figure 2: Age-specific incidence rates of otitis media by sex, 2010

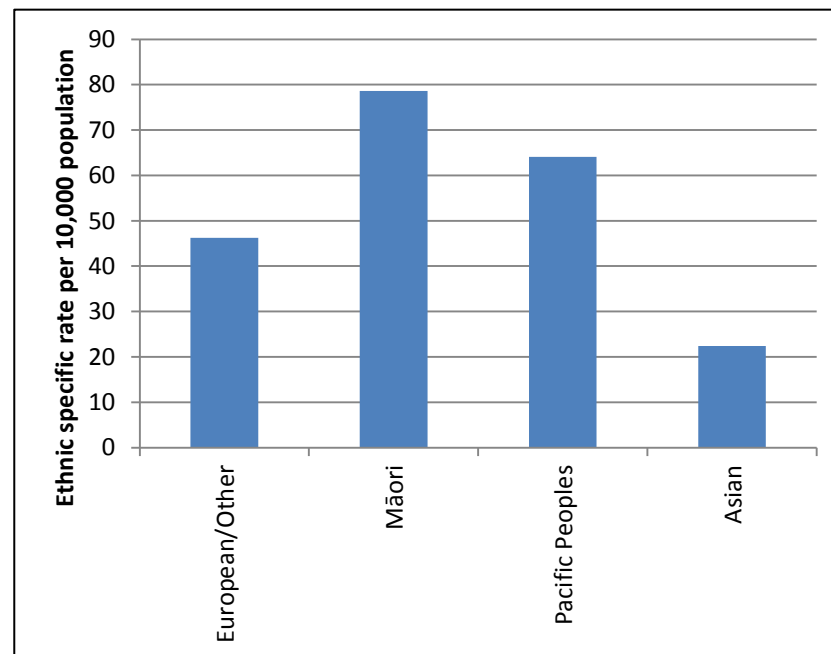


Figure 3: Ethnic specific incidence rates of otitis media by ethnicity, 2006

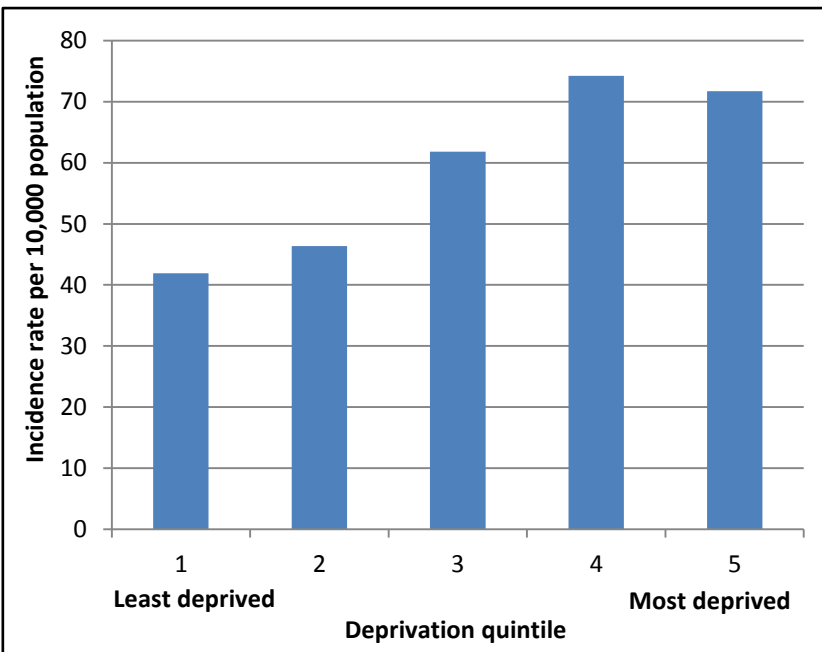


Figure 4: Hospitalisation rates of otitis media by area deprivation, 2010

### Socioeconomic differences

There is evidence of large variations in rates of OM as measured by the New Zealand Deprivation Index (NZDep2006)<sup>[5]</sup> (Figure 4). An upward gradient was observed between rates of OM and levels of socioeconomic deprivation; rates were lowest in the least deprived areas (41.9 per 10,000, quintile 1) and highest in the most deprived areas (74.2 per 10,000, quintile 4, 71.7 per 10,000, quintile 5).

### Geographic differences

OM ASRs in 2010 vary across the country (Figure 5), with the average national rate being 62 admissions per 10,000 population). ASRs calculated by territorial authority range from 7 per 10,000 in the Central Hawkes Bay District (n=2) to 132 per 10,000 in Dunedin City (n=255).

### References

1. Klein, J.O., *Otitis Media*. *Clinical Infectious Diseases*, 1994. **19**(5): p. 823-32.
2. Rosenfeld, R.M., et al., *Clinical Practice Guideline: Otitis Media with Effusion*. *Otolaryngology -- Head and Neck Surgery*, 2004. **130**(5): p. S95-118.
3. Coates, H.L., et al., *Otitis media in Aboriginal Children: tackling a major health problem*. *Medical Journal of Australia*, 2002. **177**(4): p. 177-78.
4. Dhooge, I.J.M., *Risk factors for the development of otitis media*. *Current allergy and asthma reports*, 2003. **3**(4): p. 321-25.
5. Salmond, C., P. Crampton, and J. Atkinson, *NZDep2006 Index of Deprivation*. 2007, Department of Public Health, University of Otago: Wellington.
6. Statistics New Zealand, *Final report of a review of the official ethnicity statistical standard 2009*. 2009, Statistics New Zealand: Wellington.

### Notes

- Data source: National Minimum Dataset (NMDS), Ministry of Health
- ICD10 classification used, one admission per individual counted annually
- Prioritised ethnicity is used as per Statistics NZ coding<sup>[6]</sup>
- ASRs are calculated using 2006 New Zealand Census population as the base



**Table 1: Age-standardised rates of otitis media by sex, 1994-2010 (per 10,000)**

	Females		Males		All	
	Count	Rate	Count	Rate	Count	Rate
1994	3693	86	5163	114	8856	100
1995	3115	72	4111	89	7226	81
1996	2913	67	4026	87	6939	77
1997	2805	64	3985	85	6790	75
1998	3016	69	3951	85	6967	77
1999	3422	79	4636	101	8058	90
2000	3222	75	4459	98	7681	86
2001	3189	75	4339	96	7528	85
2002	3217	75	4407	98	7624	86
2003	2956	69	4143	91	7099	80
2004	2813	65	3803	84	6616	75
2005	2561	59	3688	81	6249	70
2006	2372	55	3488	77	5860	66
2007	2401	55	3413	74	5814	65
2008	2353	53	3431	74	5784	64
2009	2586	58	3712	79	6298	69
2010	2198	49	3230	68	5428	59

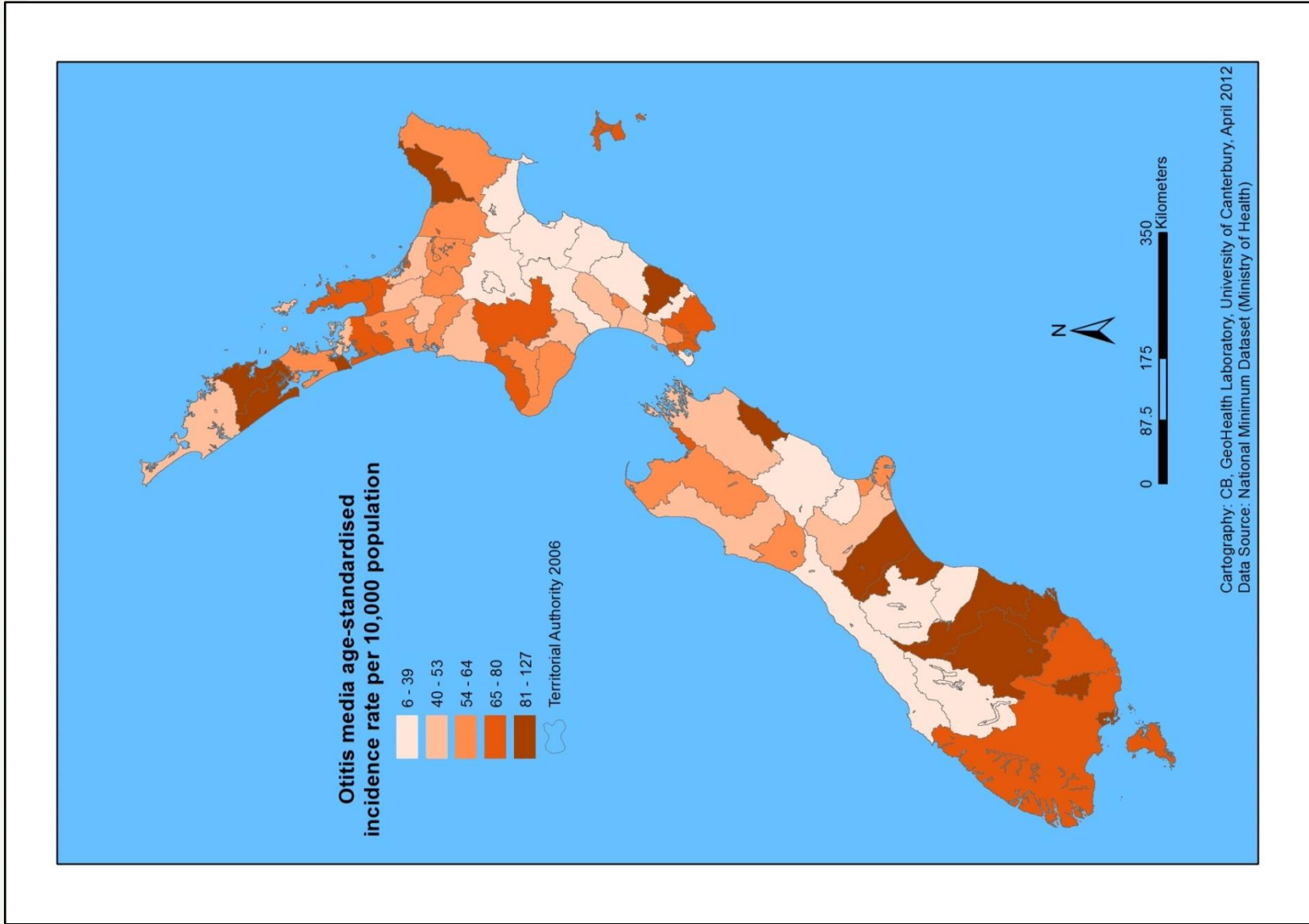


Figure 5: Otitis media age-standardised rates by territorial authority, 0-14 years (2010)