



Prevalence of Multiple Sclerosis in New Zealand

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Multiple sclerosis (MS) is thought to result from a complex interplay of genetic and environmental factors. The degree to which genetic factors contribute and the existence of a latitudinal gradient in the prevalence of multiple sclerosis remain controversial. The studies that have shown geographical differences in prevalence have varied widely in terms of the size and ethnicity of the populations surveyed; the way in which MS was diagnosed; and in the completeness of case ascertainment. Knowledge of MS prevalence across a whole country therefore, could provide valuable information about the presence of a latitudinal gradient and about the genetic factors which contribute to the risk of developing MS. New Zealand is ideally suited to an observational study examining these factors as it has a geographically well defined population of manageable size (4,027,938) with a national healthcare system and geographical extent over 13 degrees of latitude (34-47 degrees south).

We undertook a nationwide study to identify all persons with MS resident in New Zealand on census day 7th March 2006 to determine whether there is a correlation between age-standardized prevalence of MS in New Zealand and latitude. We also sought to describe the level of disability associated with MS in New Zealand.

A cross-sectional study was carried out using multiple sources of notification, including MS societies and hospital databases, direct advertising and private practice records. All cases were confirmed as MS by a study neurologist, using the McDonald criteria (McDonald et al 2001). Persons with Neuromyelitis-Optica or Devic's disease were excluded.

Prior to this study there was an absence of national data on the prevalence of MS in New Zealand. The most systematic study was carried out in the mid 1980's and showed that the prevalence of MS in Otago and Southland (69 per 100 000) was 2½ times the prevalence in the Waikato (24 per 100 000) (Skegg et al 1987). This study identified no Maori with MS and the non-Maori population was used as the denominator. A recent survey in the Bay of Plenty indicated that the prevalence of MS in the upper North Island is probably higher than had been previously reported at 50 per 100 000 of the total population and 67 per 100 000 of the non-Maori population (Chancellor et al 2003). In that study 3 persons with MS were noted to have Maori ancestry but no details are given. Older studies have indicated that the prevalence of MS in the lower North Island (Wellington) is similar to that of the South Island (Chancellor et al 2003).

Results

We identified **2,896** people with MS living in New Zealand on census day (7 March 2006). Of the 2,896 people with MS, **2,176 (75%)** were women and **720 (25%)** were men; giving a female to male ratio of **3:1**.

- **The overall prevalence of MS in NZ is 71.9 per 100,000.**

For males the age-standardised prevalence is **37.0 per 100,000** (34.3 to 39.7). For females the age-standardised prevalence is **104.3 per 100,000** (99.9 to 109).

Maori have a substantially lower prevalence rate than NZ Europeans as reported in previous studies. Of the **2896** people with MS we identified only **61** who classified themselves as Maori.

- **For Maori the age-standardised prevalence of MS was 17.5 (12.7 to 22.4).**

Prevalence by regions

Region	Number with MS	ASP - NZ population Rate/100,000(95% CI)	ASP - NZ population Rate/100,000 (95% CI) (Historical data)
North Island			
Northland	82	50.8 (39.7 to 61.8)	
Auckland	732	59.0 (54.7 to 63.3)	
Waikato	177	46.4 (39.6 to 53.3)	24 (1981)
Bay of Plenty	132	50.0 (41.4 to 58.5)	50.0 (40-62) (2001)
Gisborne	20	46.7 (26.6 to 67.2)	
Hawkes Bay	82	54.3 (42.5 to 66.1)	
Taranaki	72	66.8 (51.3 to 82.4)	
Manawatu-Wanganui	120	54.0 (44.3 to 63.7)	
Wellington	383	86.2 (77.6 to 94.9)	57 (1983)

Region South Island	Number with MS	ASP - NZ population Rate/100,000(95% CI)	ASP - NZ population Rate/100,000 (95% CI) (Historical data)
Nelson-Tasman	75	77.7 (60.0 to 95.3)	
Marlborough	42	86.8 (60.2 to 113)	
Canterbury	557	103.0 (94.4 to 112)	42 (1971)
West Coast	40	119.2 (81.9 to 157)	
Otago	234	119.3 (104 to 135)	69 (1981)
Southland	148	134.6 (112 to 157)	69 (1981)

Table 1.

Table 1 and Figure 1 show the age-standardised prevalence of multiple sclerosis in New Zealand by region (from north to south). These results suggest a gradient in prevalence, with the age-standardised prevalence increasing from north to south.

Age-standardised prevalence estimates for Bay of Plenty, Waikato, Wellington, Christchurch and Otago/Southland (combined) are also provided in Table 1, to facilitate comparisons with earlier prevalence estimates as previous studies in New Zealand concentrated on those regions. (Miller et al 1986; Skegg et al 1987, Chancellor et al 2003).

New Zealand statistical regions with ASP

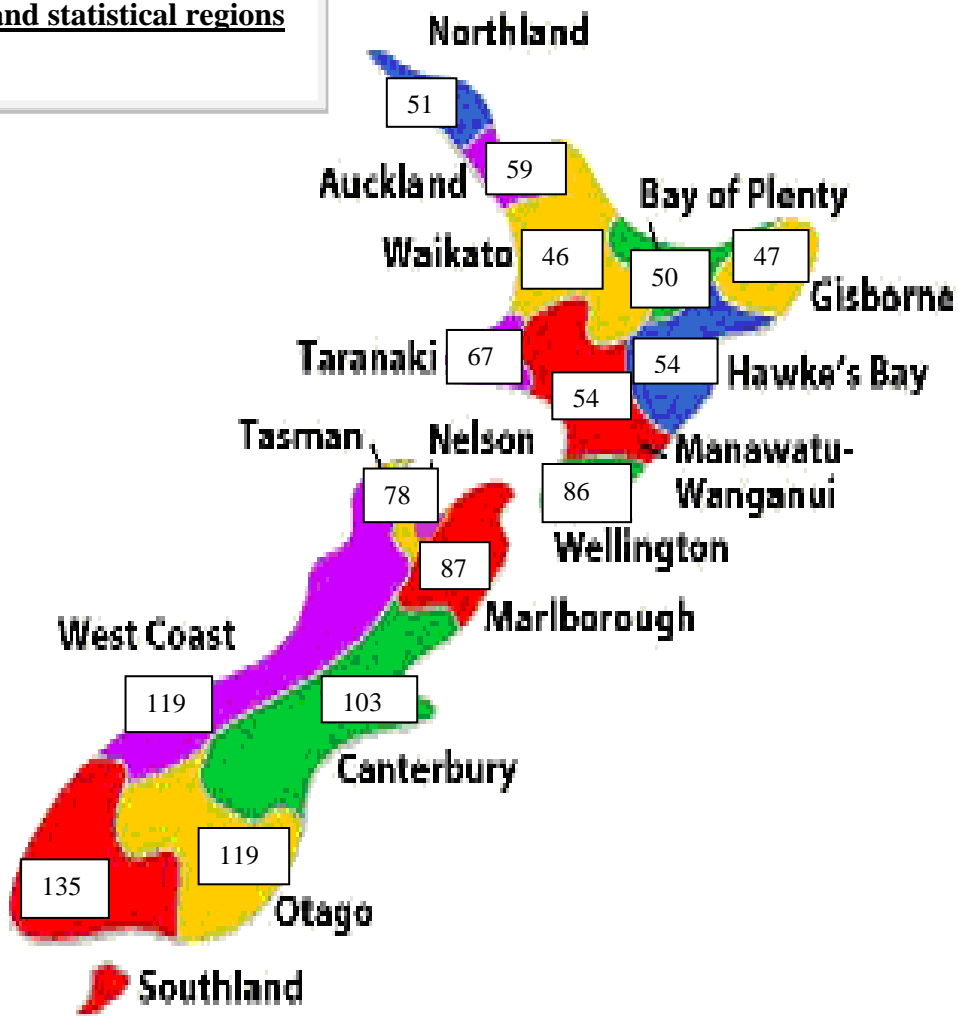


Figure 1.

These results confirm a latitudinal gradient in prevalence, with the age-standardised prevalence increasing from North to South. The latitudinal gradient is shown below (Figure 2).

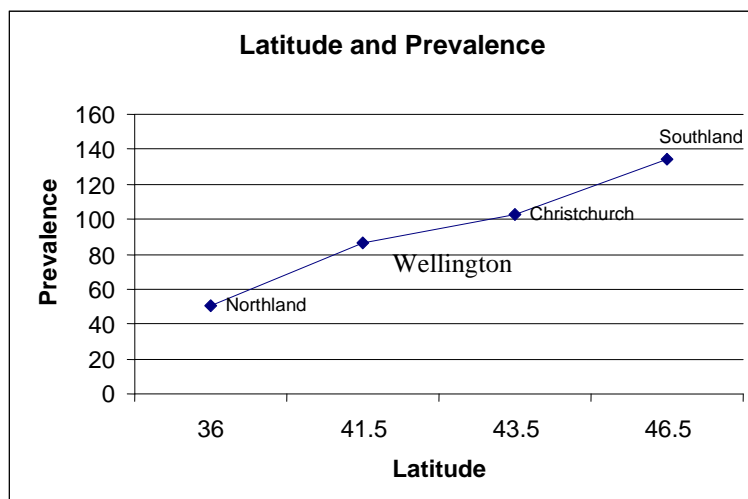


Figure 2.

MS Phenotypes

We identified **1465** people with relapsing remitting multiple sclerosis, **921** with secondary progressive and **457** with primary progressive MS.

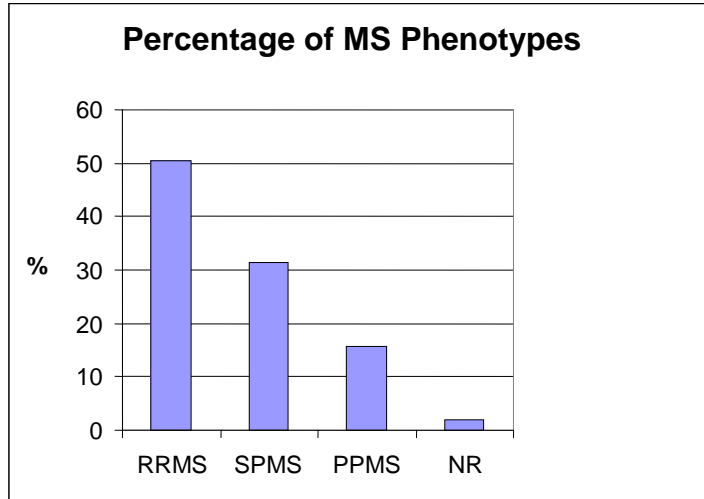


Figure 3.

One interesting and unexpected finding was that while the age standardised prevalence of relapsing remitting multiple sclerosis (RRMS) and secondary progressive multiple sclerosis (SPMS) showed a latitudinal gradient. This gradient was not as clearly seen in patients with primary progressive multiple sclerosis (PPMS).

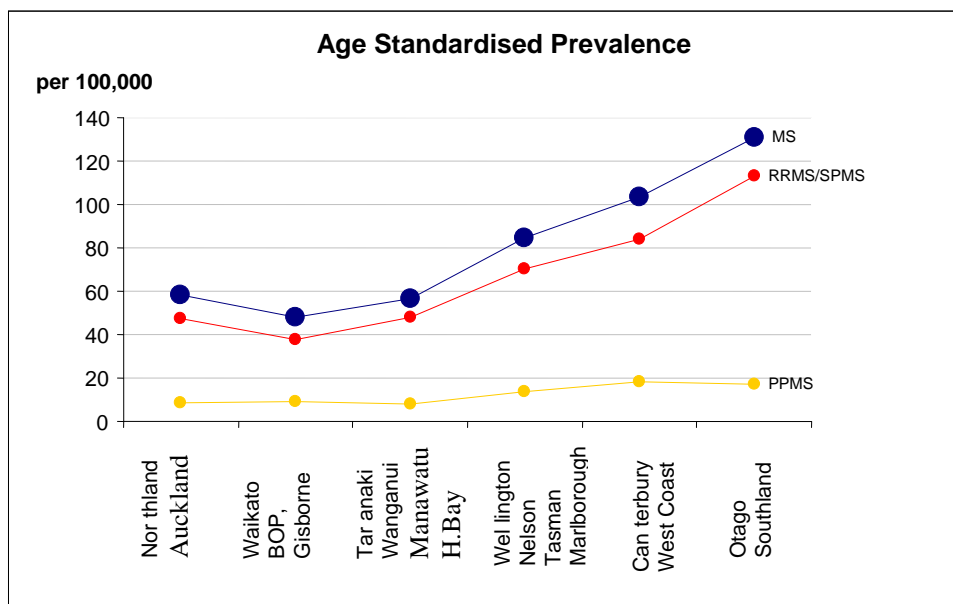


Figure 4.

Disability and MS

Disability in MS is assessed using a scale, the Kurtzke Extended Disability Status Score (EDSS) (Kurtzke 1983). An EDSS of less than 3 denotes “mild” disability. An EDSS between 3 and 5.5 produces “mild” to “moderate” restrictions but patients are able to walk without aids. Between 6 and 7.5 patients require aids to walk, are unable to take more than a few steps, or rely on a wheelchair. Those with an EDSS between 8 and 9.5 are “severely disabled” and are restricted to bed or chair.

This study reports significant levels of disability within the MS community. Over 1,000 (1007) people experience moderate to severe disability and over 400 are confined to wheelchair or bed.

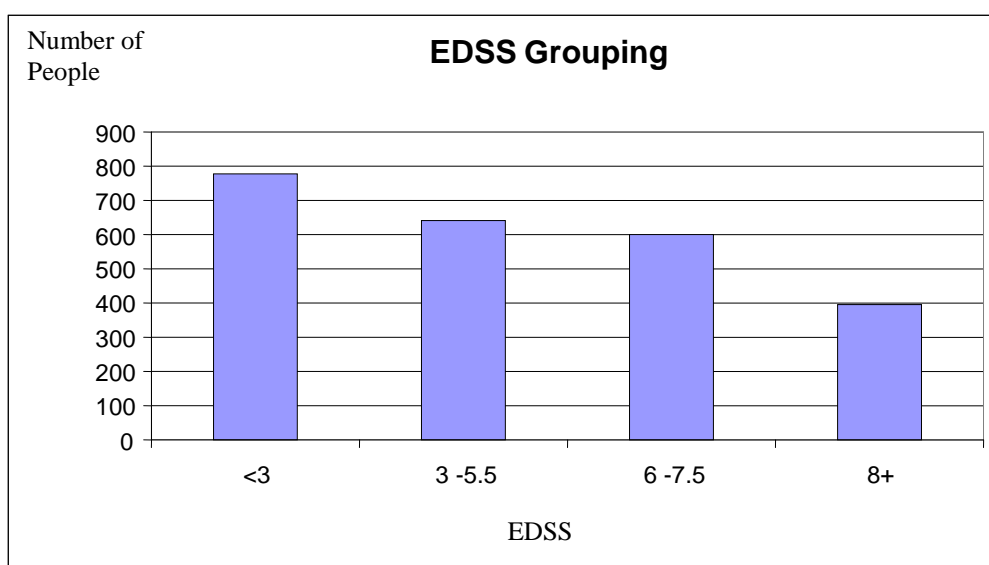


Figure 5.

Acknowledgements

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