

Multiple Sclerosis Prevalence in New Zealand:
Effects of Latitude and UV

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Abstract

Multiple Sclerosis (MS) is a disease with a complex aetiology and pathogenesis. It is the most common neurologically debilitating disorder to affect young people, but it also affects older people. This dissertation is based on data from the New Zealand National MS Prevalence Study, a project funded by the New Zealand Health Research Council and the New Zealand MS Society which explores the relationship between the prevalence of MS in New Zealand, coincident with the national 2006 population census, and factors including gender, ethnicity, MS phenotype, latitude of residence and UV radiation exposure.

A latitudinal gradient of MS prevalence in New Zealand, which varies according to gender, ethnicity and MS phenotype, has been established previously. This dissertation extends this knowledge by examining the impact of lifetime residential migration in confounding this latitudinal gradient. In order to eliminate effects due to sample size, a prevalence–latitude rate ratio is considered for the prevalence of MS rather than the latitudinal gradient itself. Using GIS analysis, rate ratios have been determined for New Zealand. It is established that the north-south ratios differ according to gender, MS phenotype and case age at residence locations, with particular reference to early life locations. The female RR/SPMS ratio is higher than the male RR/SPMS ratio, however, the female PPMS ratio is lower than the male PPMS ratio. Early life location ratios appear similar to those at census prevalence date, however, differences between rate ratios for different factors are more significant.

The effect of replacing latitude with local ambient UV levels is also explored and the relationship between MS prevalence and UV exposure is seen to be very similar to that observed between MS prevalence and latitude.

The implications of these results for future studies to investigate possible causes of MS are discussed.

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