The Challenge:
Multiple Sclerosis (MS) is a chronic, inflammatory, neurological disease which affects the nervous system. It is caused when a person’s immune system isn’t working properly. The disease has physical and mental effects and is extremely fatiguing.

Several factors including insufficient sun exposure (resulting in low levels of vitamin D) and smoking are reported to increase the risk of Multiple Sclerosis.

Previous studies have shown that:
- A diet rich in fatty seafood helps to increase UV absorption levels in winter months.
- Sun exposure during pregnancy (and throughout the lifetime) is necessary for vitamin D production.

Studies have also indicated that Scotland has higher rates of MS than Wales (and England).

With the UK having one of the highest rates for MS in Europe, it is important to refine and update the incidence rate (the number of new cases per population at risk in a given time period) of this degenerative disease.

The Research:
The aim of this study was to estimate the number of cases of MS in Wales and examine its association with sun exposure, coastal living, and geographical location.

The study used a database of MS hospital visits and admissions in Wales between 2002 and 2013.

Information on coastal position, population, longitude/latitude (vertical and horizontal geographical coordinates/locations), and average sunshine hours per day were gathered from across Wales.

The study also collated data on the distribution of births by months and the age-specific occurrence of MS – areas rarely explored in Wales before.

The Results:
- Wales has an incidence rate of MS similar to that of Scotland.
- There were 3,557 new MS cases between 2002 and 2013.
- There were almost twice as many females with MS than males.
- The highest number of numbers of MS cases for both male and female occurred in the 85 and over age group.
- It revealed that lower levels of exposure to daily sunshine were associated with the increased incidence of MS.
- Locations above 52 degrees latitude (e.g. Aberystwyth, Wales) have insufficient UV light to produce vitamin D during the winter months.
- Residing in a coastal area was associated with lower MS incidence in more easterly areas.
- There was a higher than expected number of MS births for April, suggesting that sunshine exposure during pregnancy is an influencing factor.

The Impact:
The cause of MS is unknown and currently there is no known cure. The overall burden of the disease is considerable on the individual, their family, social care and the NHS.

There is a serious lack of data and information about MS in the UK. This is the first study of MS incidence covering all of Wales. Importantly, this research helps further advance our understanding into the condition and the non-inherited factors that can affect MS.

For further information on this study visit: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0155181

This study was carried out by a team of researchers based that the UK MS Register. To find out more about the register, visit: www.ukmsregister.org

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