Neuroepidemiology 2013;40:70
DOI: [10.1159/000341849](https://doi.org/10.1159/000341849)

Multiple Sclerosis and the Iranian Revolution: Reply to the Comment by Magzhi et al.

Julia Pakpoor^{a, b}, Sreeram Ramagopalan^{a–d}

^aWellcome Trust Center for Human Genetics, University of Oxford, and ^bNuffield Department of Clinical Neurosciences (Clinical Neurology), University of Oxford, John Radcliffe Hospital, Oxford, ^cLondon School of Hygiene and Tropical Medicine, and ^dBlizard Institute, Queen Mary University of London, Barts and The London School of Medicine and Dentistry, London, UK

We read with great interest the response to our letter by Magzhi et al. [1]. The authors address a number of plausible hypotheses for the observed increase in the incidence and female predominance of multiple sclerosis (MS) in Iran, in addition to our initial discussion of the potential effect of the Iranian revolution on vitamin D levels of Iranian women [2].

The authors suggest that the fact that most Iranian women were Muslim before the Islamic revolution may have limited the influence of the enforcement of Islamic rules on dress. However, we believe that the enforcement of covering clothing and wearing of a veil in public was a dramatic change in the lifestyle of many Iranian women as Western influences on dress were greater prior to the revolution. Indeed, this is seen when observing the dress of likely influential figures at the time, including the Queen of Iran and other female members of the Royal family who themselves often did not wear the veil. Importantly, the Iranian revolution also resulted in increased emigration from Iran of particularly young individuals who were opposed to the enforcement of the Islamic law. It can be speculated that those emigrating are more likely to have been individuals who, prior to the revolution, did not wear the veil and/or were more influenced by Western clothing and are more likely to have been vitamin D replete.

Further, the authors address the potential role of lifestyle changes such as urbanization, air pollution and use of sun screens

among others. This is indeed very likely to partly underlie the increased incidence of MS worldwide, including Iran. However, we believe that these are unlikely to contribute to the particularly high increase observed in Iran as the mentioned changes occurred across the developed world and there is no evidence to suggest that these were particularly great in Iran.

The authors, moreover, note that Iranian immigrants to Canada and Sweden also show high rates of MS despite the fact that the wearing of the hijab is not compulsory. This observation can be explained in light of the fact that it is proposed that Iranian individuals have a genetic predisposition to MS. It can be speculated that increased vitamin D deficiency in combination with this genetic predisposition may be causative of MS. In Iran, prior to the revolution, potentially greater vitamin D sufficiency may have kept MS rates relatively low. After the revolution, increased vitamin D deficiency in Iran may have resulted in a dramatically increased MS incidence. Similarly, but not as a result of wearing the hijab, but instead as a result of the well-known fact that UVB exposure is much lower in countries at high latitude, such as Sweden and Canada [3], a similar effect of increased MS incidence due to vitamin D deficiency may be observed among those resident in Iran wearing the veil and those resident in countries at high latitude, even if they are not wearing the veil.

In conclusion, the array of changes which have occurred in Iran, as noted by Magzhi et al. [1], which are plausible hypotheses underlying the accompanied great increase in MS in Iran, makes the country a highly interesting region for MS research and the association with vitamin D levels an increasingly important public health issue for its population.

References

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