I am delighted to introduce this excellent collection of contributions to our Round Table on Neuroepidemiology. With an ageing population, neurological diseases are increasingly adding to health care costs and disability. Epidemiological research is critical to establishing their prevalence and incidence, and providing information from which to estimate the burden of disease, health care costs and identify potential prevention strategies. Like any research practice, however, neuroepidemiological studies pose specific challenges, in terms of methodology, resources, and disentangling causal factors. The contributions included in this Round Table provide some insights into the idiosyncratic domains within which the studies are conducted, as well as some methods which might be extrapolated and applied in other areas.

Methodological issues discussed by the contributors to the Round Table are far reaching. The most fundamental one cited in these contributions is the sheer lack of Australian epidemiological data on some neurological disorders such as Parkinson’s disease and younger-onset dementia. Australia also lacks national data on dementia prevalence using clinical diagnoses. Second, a key issue for neuroepidemiology is the need for specialised infrastructure and biobanking for storing tissue and blood samples and brain banking, the need to invest in skills and infrastructure to ensure that samples are not wasted and that cutting edge techniques are used. This requires strategic investment at a national level so that large scale data networks are supported to facilitate research. An example of this is described in the National Stroke Audit program. Nosological issues were raised in the discussions of multiple sclerosis, where the definition of the disease and its onset are critical for conducting research. As epidemiological research often relies on interviews and surveys, and cognitive function is often impaired in neurological disorders, neurological diseases often present issues in terms of measurement of symptoms and disability unless informant interviews are conducted.

In terms of content areas covered, the Round Table discussion is unique in highlighting areas of dementia research that are often overlooked in large-scale epidemiological work, including younger-onset dementia and apathy. Younger-onset dementia (e.g. dementia diagnosed before the age of 65) poses a unique set of diagnostic and clinical issues, and has often been misdiagnosed or undiagnosed. Similarly, apathy, a common symptom of several neurological disorders but of particular import in obscuring the diagnosis of dementia, is also understudied, and should be recognised as a significant aspect of dementia that may aid in diagnosis and impact on quality of life.

Another domain covered by authors of the Round Table was the linking of neuroepidemiology to other chronic conditions and risk factors and the identification of potentially shared mechanisms. For example, the link between diabetes and dementia was explored with putative links via dysglycaemia, insulin resistance and hypertension. This raises the issue of the extent to which neuroepidemiology can be studied in isolation from chronic disease and lifestyle more generally.

Finally, a strong theme emerging from these contributions is the importance of accurate causal reasoning in neuroepidemiology. By nature epidemiological research is observational and hence findings lead to inferences about possible causal sequences of events. This issue of causality was explored with the evidence in the link between vitamin D and risk of multiple sclerosis, with Lucas and Taylor identifying evidence both and for and against the hypothesised association. In this article, they point out that just as sun exposure is associated with increased vitamin D, vitamin D can also be a proxy for sun exposure.

Overall, the Round Table highlights that there are themes in neuroepidemiology that are common with other domains of epidemiology, but there also exist specific challenges that are relevant and specific for this field, particularly for low-prevalence disorders, and for disorders requiring specialised biological samples to be collected and stored.

References