

Cognitive and social activities and long-term dementia risk

Authors' reply

The pathological processes that culminate in dementia tend to be gradual, with preclinical manifestations developing slowly over some years. Consistent with this slow progression, weight loss and reductions in physical activity can be seen at least a decade before any definite record of dementia.^{1,2} In prospective studies, reverse causation bias (whereby preclinical dementia causes behavioural and other changes) would be greater during the first decade after activities were recorded, particularly during the first 5 years, than during the second decade of follow-up.

In the 20-year UK Million Women Study, with more than 30 000 incident cases of dementia, we found strong evidence of such reverse causation bias, in that associations during the first decade after physical, cognitive, and social activities were recorded largely disappeared during the second decade of follow-up (figure).³ The apparent excess of dementia during the first decade after the reporting of inactivity is likely to be a consequence of the gradual onset of inactivity, and not because inactivity causes dementia. During the second decade, however, when such reverse causation bias is minimised, there is little or no long-term effect of inactivity on dementia incidence. Similar evidence of reverse causation bias was found for physical, cognitive, and social activities (figure).

Robert Friedland quotes two small studies to support the claim of the long-term risk of dementia associated with cognitive activities. One study included just ten nuns with dementia,⁴ and the other included 193 people with probable or possible Alzheimer's disease and 358 controls, in which retrospectively reported historical behaviour information was compared for those and without the disease.⁵

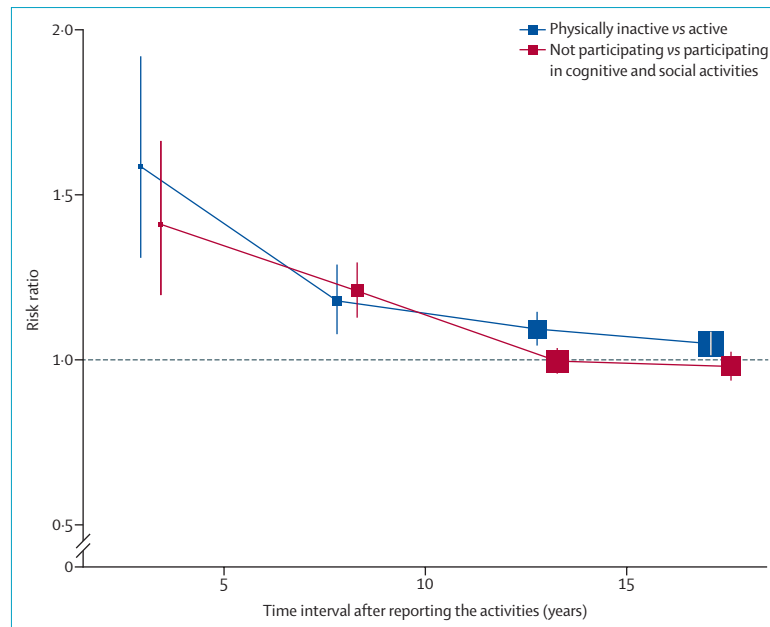


Figure: Dementia detection risk ratios associated with not participating versus participating in certain activities, during various time periods after the activities were reported in the Million Women Study. Risk ratios for cognitive and social activities were stratified by year of birth, year of reporting the exposure, and region of residence, and were adjusted for education, area deprivation, smoking, body-mass index, alcohol consumption, physical activity, and use of menopausal hormones. For physical activity, risk ratios were stratified by year of birth and year of reporting the exposure, and were adjusted for region of residence, education, area deprivation, height, smoking, body-mass index, alcohol consumption, and use of menopausal hormones. Error bars show 95% CIs. The size of each square is proportional to the amount of statistical information.

Asking about past activities after it is known who has and who does not have Alzheimer's disease is prone to differential recall and hence is unreliable. By contrast, a major strength of prospective studies is that activities are recorded years before the onset of a particular disease and can provide unbiased evidence about their long-term effects.

UK prospective studies have the good fortune, largely by virtue of the extensive National Health Service databases, to achieve virtually complete follow-up for hospital visits for dementia and other conditions over many decades, by electronic linkage to its nationwide health records. This greatly facilitates the ability of the UK Million Women Study to show that short-term associations with inactivity are likely to reflect the consequences of the gradual onset of dementia, as well as reliably showing the lack of long-term effects of various activities on dementia incidence.

We declare no competing interests.

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