Do age-standardised dementia incidence rates really increase in England and Wales?

Authors' reply

We thank Sara Ahmadi-Abhari and Mika Kivimäki for their comments on our Article.[1] We agree that there are methodological complexities in estimating the dementia incidence trend and projecting future dementia cases.[2] One aspect is the different sources of bias involved in estimating dementia incidence trends. The multistate model used in our Article is useful to account for death as a competing risk. It allows for unobserved dementia cases to occur in those who died between survey waves, and for the increased death rate in patients with dementia compared with those without dementia. However, the multistate model does not address potential bias due to informative drop-out from the survey, in contrast to the joint model method.[3]

We used consistent algorithmic dementia case definition across nine waves. Verbal fluency was not assessed at wave 6 and we imputed it using information at waves 5 and 7. Although we recognise that this approach might not entirely mitigate bias, our sensitivity analysis, in which survey weights were applied, showed a similar incidence time trend. [1]

We used the 4-year epoch method for point estimates, as it is relatively robust to incidence fluctuation at individual waves (table).[4,5] Epoch estimates are not adjusted for missing dementia cases because of death bias. The magnitude of this bias is likely to differ across epochs, owing, for example, to the slowdown in the mortality rate decline in the UK after 2010. The multistate model uses the epoch estimates as input data to generate the non-linear trend that is the main novel finding in our study.

Another important aspect of uncertainty arises in future dementia projection. Increasing public awareness has contributed to a diagnostic trend and an artefactually increasing dementia incidence rate since 2010.[6] Our sensitivity analysis based only on the algorithmic case definition[1] estimated a slower upward trend between 2010 and 2018. Recognising the uncertainties, we generated three contrasting predictions of dementia burden to 2040.

We echo Nichols and Lee that it is always important to update our findings when new waves of data are available.

We declare no competing interests.

	2002–06	2004–08	2006–10	2008–12	2010–14	2012–16	2014–18	2016–18
4-year subcohorts								
Events	371	305	284	291	269	324	341	..
Person-years	42 528	33 432	33 895	39 071	36 361	37 305	33 227	..
Crude	8·7	9·1	8·4	7·4	7·4	8·7	10·3	..
Standardised*	10·7	11·1	10·6	10·3	8·6	10·2	11·3	..
2-year subcohorts								
Events	185	161	139	171	125	142	175	153
Person-years	21 844	17 136	17 336	19 928	18 538	19 071	17 024	14 820
Crude	8·5	9·4	8·0	8·6	6·7	7·4	10·3	10·3
Standardised*	10·3	11·1	10·1	11·8	7·5	8·7	10·8	10·5

*Age-standardised and sex-standardised rates based on England and Wales 2011 Census population estimates.

Table: **Dementia incidence rates (per 1000 person-years) based on 4-year and 2-year epochs**

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