Reviewer’s report

Title: Potential cost savings to be made by slowing cognitive decline in mild Alzheimer's disease dementia using a model derived from the UK GERAS observational study

Version: 0 Date: 20 Sep 2017

Reviewer: Mark Oremus

Reviewer’s report:

I have no fundamental issues with the conduct of the secondary data analysis. My primary concern revolves around the higher-level question of the manuscript's overall contribution to the scientific literature. The notion that slowing cognitive decline will entail cost savings appears intuitive; however, establishing a valid quantitative estimate of the savings is largely impossible given the available data (not just in GERAS, but in economic evaluations in general). Regarding this study, the GERAS participants come from a highly select group of participants whose resource utilization may well be different from the average person with AD. Thus, the estimated cost savings reported in the manuscript are unlikely to reflect the true cost savings in the UK population. Given differences in healthcare systems across jurisdictions, the study's quantitative results will also be of limited applicability to other European countries, Australia, the United States, or Canada. Further, the full cost question is not considered in the manuscript because moderate and severe persons with AD are omitted from the analysis; also, the time horizon is limited to 18 months, which is far short of the average time from diagnosis to death in persons with AD.

In the discussion, the authors mention the potential advantages of early treatment in persons who are at risk of dementia (prior to diagnosis!) (p. 14, lines 39-44). The evidence for the efficacy of early treatment, especially prior to diagnosis, is quite weak and the authors should acknowledge this point in the discussion (or, better yet, remove this content from the discussion entirely).

The methods do not clearly describe the valuation and calculation of societal costs, nor do the results provide any details of the participants' resource utilization. Overall, the resources and costs take on a bit of a 'black box' quality in how they are reported in this study.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**

If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**

Please indicate the quality of language in the manuscript:

Acceptable

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