Reviewer’s report

Title: How many people will need palliative care in 2040? Past trends, future projections and implications for services.

Version: 0 Date: 20 Dec 2016

Reviewer: Martin O'Flaherty

Reviewer’s report:

While I found the paper proposing an interesting idea, I think that substantial work is needed to clarify several key aspects of the justification of the research, methods and results.

Background

* The background needs more structure. In the first paragraph, more than four topics are discussed at once: mortality trends, palliative care expenditure, trends in chronic diseases and palliative trends.

* Palliative care needs to be defined in the first paragraph.

* It is not clear for the reader why projection of place of death are important in this context. This point needs to be further developed and it was not mentioned again in the rest of the manuscript.

* I would suggest to rewrite the conclusion by defining first palliative care, then trends of principal contributors (long term illness, multimorbidity), importance and challenges of projections of palliative care and objective.

* Lines 28-31 in page 4 need to be rewritten as they are not clear. Palliative care need defined as "the ability of benefit from palliative care services" provides no information. Authors need to explain in a couple of lines which is the Stevens and Raftery approach and why it is relevant.

* Line 40 in page 4 "However, not everyone who needs palliative care dies quickly" is not academic writing.

Methodology

* Why the authors chose the Murtagh et al minimal estimate? Definitions needs to be provided. Authors should not assume readers are expert in the topic.
* Results of the sensitivity analysis using 2014-2015 population data shouldn't be reported in the methodology but results section.

* The methodology section does not flow smoothly. The section "palliative care need" mainly describes methods 2 (and 3). But then the reader just find out this three pages later. I would suggest to describe the three methods first and then go to specifics.

* If "the prevalence of palliative care need was calculated as the percentage of deaths from those codes out of all deaths in a calendar year"(line 15-20 page 5), I am not sure why this proportion or percentage was then applied to population projections. It should be applied to deaths projections instead (method 2 and 3). Unless, the original statement is wrong and prevalence of palliative care is the proportion of deaths from those codes out of population estimates in that year. If that is the case, mid-year population estimates should be converted to start-of-the-year population estimates.

* ONS and other studies have provided mortality projections up to 2040. It is not clear why the authors decided not to use this instead of population projections.

* The authors could also use other widely methodologies such as Lee-Carter models or Age period cohort models to project the number of deaths from those ICD codes up to 2040.

* Same wrong logic in method 1. It is not clear which is and how is calculated the proportion of all-cause deaths out of the population projections to which the 75% is applied to.

* The section "impact of age" is very ambiguous and does not provide details of how actually they investigated the age distribution.

* The fact that the authors report having values with zeros suggests that they just applied the percentage annual change between one year and the next one, and then projecting up to 2040 (or some sort of extrapolation). These methodologies are not suited to forecast mortality. As I mentioned before, there are well established methodologies to forecast disease-specific deaths which are easy to implement and analyse.

* Again, no results (lines 23-24 and 45-47 page 8) should be reported in the methodology.

Results

* Annual changes seem to be very statistical insignificant. This can be quantified by adding a p-value to the change.

* Limitations, the fact the authors are estimating palliative care need at the end of life (line 43 page 4) as proxy of palliative care needs has many limitations that need to be acknowledged and discussed. Remaining lifetime or the length of time a patient would require palliative care is an important variable that has not been discussed. Some patients may need long term palliative care which obviously is costlier.
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?
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Unable to assess

Are the conclusions drawn adequately supported by the data shown?
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