Reviewer’s report

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

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Reviewer: Geoffrey Mitchell

Reviewer’s report:

Thank you for inviting me to review this fascinating paper. The figures that it reports paint a disturbing picture of the UK's lack of readiness to deal with the number of deaths that may require palliative care in 2040. Presumably this will apply to other economically developed countries as well. The paper has been put together very carefully and well. However there are a number of issues I think the authors need to address.

1. The assumption of the number of people needing palliative care is 75% of all deaths needs elaborating. What do Gomez-Batiste et al mean by palliative care? My understanding is that they mean people who have a predictable period of rapidly increasing need in the months leading up to death. This is NOT specialist palliative care in most cases.

2. The authors rightly point out that the data they are using cannot be used to calculate the period of increased need, and so they are calculating the proportion of people who will need (presumably specialist) palliative care in the last weeks of life. The importance of this distinction is that not all people who have rapidly escalating needs, or who die, actually need specialist palliative care as the needs of most people should be well met by well trained generalist clinicians. Hence the numbers they project are those needing end of life care, with only a minority of this group requiring specialist palliative care due to the complexity of needs or the difficulty in controlling particular symptoms or circumstances.

3. They discuss the disproportionate contribution of cancer and dementia to the increased numbers of deaths, and then discuss the need to massively increase the numbers of palliative care physicians and geriatricians to deal with dying caused by these diseases. There is absolutely a place for appropriate numbers of specialist palliative care physicians and geriatricians. However, as it reads now, this is the only policy response to the problem. However, they have made no mention of training in basic palliative care for the people already looking after the target groups - general practitioners, oncologists/ radiation oncologists, general physicians, and organ-based specialists in the medical arena, and their nursing colleagues, particularly domiciliary nurses and aged care facility nurses.

4. Furthermore, the challenge of minimising the impact of progressive disease at the end of life can and should be met months before they reach the end of life, through advance care planning, clinical care planning for expected complications, and preparation of carers to meet these many of these challenges when they arise. Their discussion makes no mention of this
critical period months out from death, and how policy should be focusing on appropriate early recognition of the possibility of death, and appropriate responses from health professionals.

5. The problem of multimorbidity is briefly discussed on p13. Another policy issue that they could discuss is the dissonance between prevalent multimorbid illness in frail older people and the way the health system tends to focus on single organ disease. This puts coordination of the person with multiple problems at risk.

There are a couple of specific points I think the authors should consider.

1. P6 - population level data. The authors test the difference in calculated % of deaths requiring palliative care, using the year before (eg population in July 2012- June 2013) vs (July 2013-June 2014) when looking at the ratio of reported deaths which are for a calendar year. The difference was the latter figure reduced the projected palliative care need by 0.5%. Is this a statement of "error" in each year? Could this 0.5% difference lead to a 12% difference in calculated figure at 2040 if it is present year on year?

2. P9 Table 2 sets out actual population and reported deaths for 2014 and projected deaths for 2020, 2030 and 2040. I calculated the proportion of people in each age bracket projected to die, and found that the proportion fell substantially in each age bracket, including 85+ years. (Table below) This can only mean that the proportion of deaths in the older age brackets must rise dramatically after 2040. I think this is worthy of discussion. The authors point out that mortality projections become more uncertain after 2040. (p6) However, one thing that is certain that everyone who is alive at 2040 will die some time after 2040. Hence the 2040 figures are a pointer to a far greater problem in the decade or two afterwards. I think this should be raised in the discussion. Also the labelling of the bottom two rows is incorrect- should be ≥65 and ≥85.

Table - Proportion of deaths in ages 65-74, 75-84, and 85+

<table>
<thead>
<tr>
<th>Age/Year</th>
<th>Population in age band at 2040 ('000)</th>
<th>Number who did not die per annum who will die at a later time#</th>
</tr>
</thead>
<tbody>
<tr>
<td>65-74</td>
<td>7168 / 1.5% / 1.1%</td>
<td>28762</td>
</tr>
<tr>
<td>75-84</td>
<td>5744 / 4.4% / 2.8%</td>
<td>91904</td>
</tr>
<tr>
<td>85+</td>
<td>3268 / 14.4% / 10.2%</td>
<td>137256</td>
</tr>
</tbody>
</table>

# calculated by multiplying population in age bracket in 2040 by (% deaths in 2014 - % deaths in 2040)

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

Yes

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?**
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No

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I recommend additional statistical review

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