Author's response to reviews

Title: Variations in hospital standardised mortality ratios (HSMR) as a result of frequent readmissions

Authors:

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Author's response to reviews: see over
Author’s response to re-reviews

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The BMC Health Services Research Editorial Team

Object: MS: 1892850092592194 - Variations in hospital standardised mortality ratios (HSMR) as a result of frequent readmissions. WF van den Bosch PhD et al.

Thank you for consideration of our manuscript for publication in your journal.

We have re-reviewed the above manuscript according to your reviewer’s comments. We like to confirm that only one out of the three initial reviewers did re-review the manuscript and that a member of the Editorial Board of BMC Health Services Research reviewed the manuscript instead.

Re- reviewer's report
Reviewer # 1: david ben-tovim
No re-review was received from this initial reviewer

Re- reviewer's report
Reviewer # 2: Mette Nørgaard

The paper has improved considerably by the review process. I find that the authors have addressed most of the previous comments.
Still, I have a few major comments to the response:

1) It is unclear whether the outcome is in-hospital mortality or 30-day mortality.
This is of importance because Drye et al quite recently in Annals of Internal Medicine have shown that in-hospital mortality measures may be biased in favour of hospitals with shorter LOS. Therefore the impact of readmissions may differ between these two mortality measures.

We have now clearly mentioned that the Dutch HSMR is based on in-hospital deaths only. Taking into account 30-deaths as well clearly would improve the validity of the HSMR, however these data are not readily available. In the discussion we explain why we think this bias would not significantly change our conclusions.

2) On page 12, last three lines, van den Bosch et al. state that “A more fundamental issue ..... is the fact that two comparable models, such as model 1 and model 2, may deliver such divergent outcomes. Since there is no ‘gold standard’ one cannot state that the one is false and the other true”
Yet, on page 13, middle part, the authors recommend using a model that adjusts for readmissions. These two statements seem to be contradictions and the reasons for
recommending model 2 should be specified.

We have adapted our text and explained why model 2 is preferable.

3) It seems that a five year look-back period results in the best prediction of mortality. Can van den Bosch et al. comment on this finding?

A possible explanation which we have added to the manuscript:
It may take several years before the readmissions of a patient constitute a substantial sequence of admissions. Furthermore a sequence might also have started long before the analysis period started. In these cases apparently one year was not a sufficiently long time period to capture sequences with a substantial amount of admissions. By looking at various years these sequences became better visible.

4) I do not understand the two columns in Table 1 describing mortality significant high. If 1 equals no, and 2 equals yes, how should 0 and all the numbers above 2 then be interpreted? And what is the difference between the two columns? I could recommend to study Table 2 in the paper by Drye et al (Annals of Internal Medicine, 2012:156: 19-27) for inspiration, since they have a nice way of presenting a comparison between two hospital classifications.

We intended to show the number of hospitals per SMR with a significant high score for one model and at the same time a not significant high score for the other model. We have changed the headers of these two columns accordingly.

Discretionary Revisions:
The use of past and present tense is a little inconsistent.

We have brought more consistency by more often using the past.

Level of interest: An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:
I declare that I have no competing interests

Re-reviewer's report
Reviewer #3 : Paul Aylin

No re-review was received from this initial reviewer
Re- reviewer's report

Reviewer #4: Member of the Editorial Board of BMC Health Services Research

Reviewer has stated that the manuscript lacks an adequate interpretation and discussion of the results and therefore asked also to address this point in the revisions.

We have radically improved the interpretation and discussion of the results. We have added where necessary more explanation/interpretation. And we have grouped the Discussion section into four distinct subjects:

- How should we interpret the differences in model outcomes?
- How do readmissions affect H/SMRs and how do they occur?
- Choice of model: consequences for usage of H/SMR as indicator
- Limitations of the study

We would be grateful if you would consider publication of our manuscript in the BMC Health Services Research and are looking forward to your response.

Yours sincerely,

On behalf of all co-authors,

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