Reviewer's report

Title: MEDICAL GRADUATE VIEWS ON STATISTICAL LEARNING NEEDS FOR CLINICAL PRACTICE: A COMPREHENSIVE SURVEY

Version: 0 Date: 14 Feb 2019

Reviewer: Ailish Hannigan

Reviewer's report:

This is a generally well-written paper which addresses an important topic - the evidence base for deciding what is important to teach in medical statistics.

The list of topics was primarily decided based on the PI's experience so it would be helpful to describe this e.g. number of years and role and also give some context for the current teaching of medical statistics in the University - how much time is it allocated in the programme, format of teaching (lectures, computer labs, small groups etc.) and broadly what is covered.

The list of topics is comprehensive but others teaching medical statistics may have slightly differing views e.g. cross-over trials are included but not cluster randomised trials. It should be acknowledged as a limitation that this was primarily an informed individual's view of topics and not a consensus across educators in multiple institutions.

It may have been helpful to ask the respondents of the survey about their own learning in medical statistics - for some that may be very little, for others it could be extensive as part of a research programme. That impacts on their knowledge of topics and while some of this is captured in the current role question e.g. postdoctoral researcher, clinician etc., it isn't explicitly covered. This should be acknowledged as a limitation.

The Methods section is very comprehensive but long (nine pages). There is scope for a more succinct description in places e.g. in the data preparation and statistical analysis sections in particular or moving some of this information to appendices. For a general audience, the sections on variable screening, diagnostic testing in the Results were quite dense and used coded variable names e.g. BINARY_r for example instead of includes practice or not. Again, there is a balance between the comprehensiveness and style in the main text and the need to engage a general medical education audience.
The result for 'types of response data' in Table 3 with 32% Don't know was a concern and not commented on. Data type underpins the practice of statistics - was it that respondents didn't relate data type of variables to the phrase 'types of response data'? 

The authors acknowledge that some of the categories of respondents were small which led to wide confidence intervals in Table 4. It is worth considering clinical practice only versus all other categories (which either include academic teaching or research or both) and presenting this comparison descriptively before the model based approach to help the reader to distinguish between the views of both groups.

Were the figures referenced in the paper uploaded? They weren't available in the downloaded files?

The paper would benefit from a more careful, less descriptive discussion and wider view of the general literature on statistics education. The choice of topics to teach should be informed by surveys such as this but there are a variety of different inputs required and including topics solely based on a cut-off in terms of popularity with medical graduates doesn't seem wise. Based on this survey, that would mean, for example, we may not cover data type which is fundamental. It would mean we would ignore findings in the research literature that not addressing missing data or appropriately handling repeated measurement/clumped data are some of the major errors in published medical research. It would mean we ignore the large body of general statistics education literature including guidelines on teaching and assessing statistics at college level (GAISE guidelines).

It would also be helpful for the authors to address the consequences of what they are recommending in medical programmes in the discussion - what are the challenges in getting more curriculum time allocated to medical statistics, particularly to the practice of statistics and the use of statistical software. This can require significant resources including teaching staff. The focus on critical appraisal has often been a pragmatic choice given limitations in resources and a crowded medical curriculum. What is the role for other opportunities to learn statistics i.e. after undergraduate programmes?

Some suggestions for further limitations have already been provided - others include a single institution survey, the timing of the survey (five/six years ago).
Overall, this will contribute to the evidence base but requires a wider view of its role and limitations.

**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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Yes

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

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