Author’s response to reviews

Title: How to spot a statistical problem: advice for a non-statistical reviewer

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Author’s response to reviews:

We thank both the reviewers and the Editor for your thoughtful and constructive suggestions. We have tried to take into account as many of these comments as possible, and respond to each one in turn:

Reviewer #1 (Andrea Tricco):

1. Abstract: sentence beginning with "we consider this policy,,,," delete the "a manuscript is evaluated by a statistician reviewer.

*** We recognise that there was some repetition in our wording, but want to keep our aims clear. We have therefore reworded this sentence.

2. Replace last 2 sentences with: "Reviewers are required to ensure that the manuscript is methodologically sound, clear, and concise. Within that context, they are expected to provide constructive feedback and opinion on the statistical design, analysis, presentation, and interpretation. If reviewers lack the appropriate background to evaluate any of the manuscript statistical aspects, they are encouraged to submit it for expert statistical review."

*** Thank you for this suggestion. We have reworded our abstract along the lines suggested, adapting it to keep our suggestion for statistical review as something to positively opt out of rather than opt into.

3. Introduction: Line 9 delete the world necessarily between therefore and become.

*** Done.

4. Line 14 add a period after the word necessary. Begin the next sentence with "For". 
*** Done. We have also added a comma after the “for example”.

5. Line 17 replace have with has.

*** Corrected.

6. Line 22, delete "it is essential for", delete "to be seen by" and replace with "should be reviewed by an expert statistician" and delete the word "adequately" and the end of the sentence "themselves in their report. Insert "manuscript's" after the "the" and in front of "statistics"

*** Thank you for these suggested clarifications. We now realise that the wording of the reviewers’ report has recently changed (see editor’s comments below) so we have reworded the last sentence in the paragraph to reflect this.

7. Line 29 - delete the words However, major, and insert "and they" instead of a period.

*** Thank you. We have deleted the redundant words.

8. Line 34 insert "in this area" after "formally qualified" and delete the rest of the sentence.

*** We recognise that the suggested changes result in more straightforward advice. However, providing advice for the non-statistical reviewer, we wanted to make clear what we meant by “non-statistical”. Some *numerate* reviewers may consider that this qualifies them as *statistical* reviewers, so we wanted to be specific that we mean some formal qualification or professional accreditation in a branch of statistics. [Declaration of interest: JVF is a Chartered Statistician and both authors have been, or still are, involved in running their national professional body, the Royal Statistical Society, which provides both qualifications and accreditation]. We hope our rewording reflects this in a more straightforward manner.

9. Line 37 revise to : "subject reviewers may be competent in a specific range of statistical methods applicable to their area of expertise, but may not necessarily be aware of more general statistical issues or recent methodological developments and best practices. The subject reviewer may be able to spot the most egregious errors but are likely to miss subtle inappropriate statistic.

*** Thank you. We have reworded these sentences broadly in line with these suggestions.
10. Line 53 - delete "some pointers".

*** We have reworded this phrase.

11. Line 2-4 - delete the first sentence.

*** We have deleted this sentence and incorporated the point briefly in the next sentence.

12. Line 10-11, delete "more broadly to other aspects tht the statistical expert may have a helpful view on" and replace with "but to areas such as"

*** Done.

13. Line 18 - delete the word however.

*** Done.

14. Line 19 - delete the word "these".

*** Done.

15. Line 24 - delete the sentence beginning "A guiding principle should be..."

*** Done. We have incorporated the key points from this sentence in the following sentence, as suggested.

16. Line 31 - sentence should read "Rather, the subject reviewer should consider expert consultation review if they are able to confirm that there are no statistical problems or issues with design, presentation of results and interpretation"

*** Done. We have incorporated the key points from the previous sentence, as suggested.

17. Line 36 - delete the sentence that begins "absence of evidence".

*** Done.

18. Line 44 - revise to "since statistical issues arise from time-to-time, consider some of the following indicators."
*** We have reworded this sentence, but indicating the link with the topic of the previous paragraph.

19. Line 56 - delete the word likely.

*** Corrected.

20. Line 7 - replace "with no" with "without"

*** Done.

21. Line 37 - replace with "Although there might be alternative approaches to statistical analysis or presentation, this does not necessarily imply the author's methods are invalid. What is important is that the methods chosen are appropriate for the research question and have been done correctly. BMC Medicine allows comments under "discretionary revisions" where such observations can be made.

*** Done.

22. Line 45 - delete the first sentence

Begin with: "Statistical methods are many and varied, particularly in a general medical journal such as BMC Med. Thus reviewers who are not familiar with the statistical approach utilized in a manuscript or not confident in their ability to answer the validity of the statistics are encouraged to seek the assistance of an expert statistical reviewer."

*** Thank you. We have rephrased our paragraph for clarity, but taking account of the Editor's comment (below) about the first sentence and their reminder about confidentiality and due process.

23. Conclusion: Reviewers are required to ensure that the manuscript is methodologically sound, clear, and concise. Within that context, they are expected to provide constructive feedback and opinion on the statistical design, analysis, presentation, and interpretation. If reviewers lack the appropriate background to evaluate any of the manuscript statistical aspects, they are encouraged to submit it for expert statistical review.

*** Thank you. We agree that the wording of our original concluding paragraph was rather wordy. We have rewritten this paragraph using some of these suggestions.
Reviewer #2 (Jaime Peters):

This paper will be very useful to reviewers, and I agree that an opting-out of statistical review might be a better policy. The authors present clarity on what to look out for, yet make it clear that the existence of these indicators doesn't necessarily mean there is a problem with the statistical aspects of the paper. I just have a few comments/suggestions:

*** Thank you for these positive comments. We have removed the phrase “opt out”, in line with comments from Reviewer #1, but have kept the general principle.

1. Although some of the hints in the manuscript would seem appropriate for any study design, a number refer mainly to statistical aspects of primary studies. I wonder whether this could be made clearer in the Introduction, for instance (using my own area as an example) some aspects relevant to meta-analysis aren't really covered by the manuscript.

*** We agree. DCG also works in this area. Many guidelines for manuscripts do not directly translate to systematic reviews and meta-analysis. We now refer to this point in the second paragraph, and again briefly before the list of pointers. Following the Editor’s suggestion below, we reference a parallel tutorial on meta-analysis to be published in BMC Medicine around the same time.

2. There's a definite link with what is suggested in the manuscript and the purpose of reporting guidelines. Clearly, the audience here is reviewers, but perhaps there is an opportunity for highlighting the usefulness of reporting guidelines in the Introduction, especially as the first set of hints relate to "Is there sufficient detail to review the statistical aspects?"

*** Thank you, we agree. We have included a new hint highlighting the role of reporting guidelines.

3. Line 54-56, last page before Conclusions: Could the sentence be simplified, perhaps to "Indicators for the validity of statistical methods may also be useful to statistical reviewers"?

*** Thank you. We realise that there was a double-negative there, so we have rephrased the sentence to make the point more explicit.

4. Should "mistakes" in the abstract (line 15) be replaced by "issues"? This currently sounds as though you're asking reviewers to identify the mistakes, when actually it's indicators that there might be a mistake that are of interest.
*** Good point. We have corrected this.

5. The first paragraph after the list of pointers (line 37) "It is not uncommon...". In this paragraph it is stated that the reviewer should be open to the use of other statistical methods that they haven't used, as long as these other methods are valid. This implies that the reviewer would know about the validity of statistical methods that they haven't use, and I'm not sure how often that might be the case if this comment is specifically for non-statistical reviewers.

*** We see what you mean. We have rephrased this sentence slightly, along lines suggested by the previous reviewer, and hope that this is better.

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Editorial Requests
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Introduction: At the end of the first paragraph, you clearly state the BMC Medicine two-stage process about where subject reviewers are asked if they have assessed the stats. The phrases you have used are from our previous reviewer forms which have very recently been discontinued. These phrases are:

"(i) if it is essential for the manuscript to be seen by an expert statistician, and (ii) if they are adequately qualified to assess the statistics themselves"

The question we now ask referees is as below:

"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."

Therefore, in light of this you may wish to rephrase the last few lines of the first paragraph in the Introduction.

*** Thank you. We have rephrased these lines to take account of the changes.

Acknowledgements - as we conduct an open peer review process, you can also include the names of the reviewers in the Acknowledgements section.

*** Thank you. We are keen to show our appreciation for the substantial and helpful comments made.
Referee 1, last point before Conclusions:

"Line 45 - delete the first sentence

Begin with: "Statistical methods are many and varied, particularly in a general medical journal such as BMC Med. Thus reviewers who are not familiar with the statistical approach utilized in a manuscript or not confident in their ability to answer the validity of the statistics are encouraged to seek the assistance of an expert statistical reviewer."

In our opinion, the first sentence does not need to be deleted. Also, it is important to clarify that reviewers cannot share the manuscript with other potential reviewers (stats or otherwise) unless they have discussed it with the editorial office first. Manuscripts are confidential documents, so reviewers are encouraged to discuss any concerns directly with the editorial office. They can certainly recommend statistical reviewers. At BMC Medicine we then check all such suggestions before directly inviting additional reviewers.

*** Thank you. We have rephrased the text to take account of the reviewer’s comment, but being clearer about the appropriate process.

Referee 2, point 1 : As Dr Peters raises the point about meta-analyses, you could perhaps add a line to inform the readers that the topic of how to review a systematic review and meta-analysis is being covered in detail another paper, so you have focused mainly on primary studies here.

For your information, David Moher has written the Tutorial article on SR/MA, which is also undergoing review. We fully anticipate that your articles will be published around the same time, so you can refer to his article here and we can include the citation details at a later stage.

*** Thank you. We have been clear that we are focussing on primary research and referenced David Moher’s planned tutorial.