Reviewer’s report

Title: Reproducibility of Clinical Research in Critical Care: A Scoping Review

Version: 1 Date: 25 Dec 2017

Reviewer: Lex M Bouter

Reviewer's report:

The authors responded adequately to my comments with three exceptions.

1. They persist in lumping together RCTs and systematic reviews with and without meta-analysis. The reproducibility of SRs is quite a different topic. The data points in SRs are the outcomes of RCTs, not individual patient data. And the overlap of publications between primary SRs and its replication attempt will be large, unlike the overlap in data between the RCTs you compare. Thus replications of SRs are re-analyses of the same data mainly, and not the retest or approximately reproducibility attempts the authors claim them to be. So my advice would be to remove the SRs from the data set.

2. I can still not understand why also RCTs on diagnostic interventions were included while excluding the very large majority of non-randomized diagnostic accuracy studies. Combining data on the reproducibility of therapeutic and diagnostic RCTs makes very little sense to me. An analysis of the reproducibility of both randomized and non-randomized diagnostic accuracy studies would be really informative and seems to deserve a separate article. Consequently I would strongly advise to remove the diagnostic RCTs from the data set for the current publication.

3. The authors do not seem to understand why I was so surprised that they do not mention non-publication (publication bias) and selective publication (outcome reporting bias or 'cherry picking') as the likely most important cause of lack of reproducibility. They argue that they focus on high quality reproducibility attempts in high impact journals and say that's improbable that such studies would suffer from publication bias. But that was not my point at all. My remark concerned the initial publications. It's quite likely that these are the 'tip of the iceberg' and are for a large proportion the result from publication bias and (outcome) reporting bias. Both biases lead to an exaggerated positive picture in the public track record. One should not be surprised at all that these effects partly disappear or diminish on replication.

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?
If not, please explain in your comments to the authors.

Yes

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.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests.
Statement on potential review bias
Please complete a statement on potential review bias, considering the following questions:

1. Did you co-author any publication with an author of this manuscript in the last 5 years?

2. Are you currently or recently affiliated at the same institution as an author of this manuscript?

If you can answer no to all of the above, write 'I declare that I did not publish with these authors in the last 5 years and also meet the affiliation criteria”. If your reply is yes to any, please give details below.

I declare that I did not publish with these authors in the last 5 years and also meet the affiliation criteria.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal