Author's response to reviews

Title: Meta-analysis and The Cochrane Collaboration: 20 years of the Cochrane Statistical Methods Group

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Author's response to reviews: see over
Dear Editor

Thank you for considering our manuscript for the special issue of Systematic Reviews celebrating the 20th Anniversary of the Cochrane Collaboration. We have carefully considered the reviewers comments and your suggested changes. Our point-by-point response to the reviewers’ comments follow, and we attach a revised tracked change version of our manuscript which addresses the comments.

We feel that many of the criticisms raised relate to issues that lie outside of the scope of the paper. The paper was an invited commentary that forms part of a “special collection on methodology developments in The Cochrane Collaboration …”. The paper aims to highlight the work of the Cochrane Statistical Methods Group (SMG). As such, the paper, which is written by present and past convenors of the SMG, provides an internal perspective of the SMG’s contributions to The Cochrane Collaboration and, more broadly, the meta-analysis literature. Many individuals and organisations outside of the Collaboration have made significant contributions to the development of statistical aspects of systematic review methods in health care; however, consideration of the contribution of other groups was not in the scope of the current paper. We have added text in the second paragraph of the Introduction to clarify the purpose of the paper.

Reviewer: Edward Mills

Major essential revisions:

1) In general, you need to tone down the support for the organization and simply state the facts. The paper has been edited to limit subjective comments.

2) Please avoid making this about personalities and do not mention what individuals said what in meetings twenty years ago.

The paper is intended to provide an historical account of the beginnings of the SMG and we believe that it is appropriate to name individuals when we are describing the early history.

3) I similarly this quoting this from early guidance documents is an unprofessional style of writing. Page 4.

We are not aware of any standards for scientific writing that indicate the use quotes is unprofessional. We feel that the use of quotes accurately captures historical events. No changes have been made in relation to this comment.

4) It seems a bit pointless to me to quote an entire section of a grant, especially one that was unsuccessful. Page 6.

Funding the work of the SMG, and more broadly, methodological research in evidence synthesis has been, and remains, an important challenge. We have quoted text from an early funding application to
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demonstrate that the types of challenges faced in 1997 still remain today. This quote succinctly reflects these challenges, and the issue of funding is again raised in our thoughts about the future direction of the SMG.

Minor essential revisions:

5) On page 8 and 9 you continue to state that the SMG made major contributions to meta-analysis, and indeed some of them did. But there were also major contributions to the field made by non-SMG that also deserve recognition. The work of Alan Donner, for example (who you reference) isn’t really SMG work. I think this reflects a complete absence in this paper of critical reflection on the level of success of the collaboration.

As noted in our introduction to this letter, the scope of the paper was to reflect the contributions of the SMG and its members to The Cochrane Collaboration and the meta-analysis literature. We agree that there are major contributions from individuals and other organisations, but these contributions fall outside the scope of this paper. In ‘The Statistical Methods Group and methodological developments in meta-analysis’ section, we highlight contributions of SMG members to the meta-analysis literature (“The contribution of SMG members to the meta-analysis literature ...”), but do not claim that these are SMG work.

6) Page 9. I agree that the I² measure is the most widely used statistic for heterogeneity but it is probably also the most incorrectly used measure and many authors fail to note that the I² works moderately well for relative measures, but extremely poorly for continuous measures where a high value is often taken as evidence of problematic heterogeneity that would not be found had a relative effect measure been used.

As with all statistics, the I² statistic has advantages and disadvantages, which, ideally systematic reviewers should be aware of when interpreting the statistic. However, we are not aware of research justifying the reviewer’s statement. Two simulation studies (Rucker et al. BMC Med Res Methodol 2008, 8(79):1471-2288; Friedrich et al. BMC Med Res Methodol 2008, 8(32):1471-2288) and an empirical study (Friedrich. J Clin Epidemiol 2011, 64(5):556-564) have evaluated the I² statistic. The Friedrich studies compared the I² statistic across three effect measures for continuous outcomes (two absolute: mean difference, standardised mean difference; one relative: ratio of means). In both the simulation study and the empirical study, estimates of the I² were not importantly affected by the effect measure used.

7) The fact that Revman doesn’t allow meta-regression is a huge drawback to the successful use of revman and is really a sign of the out of date approaches of most reviews.

Most Cochrane Reviews include few studies (Davey et al. BMC Med Res Methodol 2011, 11:160) which precludes the use of meta-regression. For this reason, meta-regression has not been implemented in RevMan. In addition, RevMan is primarily software used for the preparation of systematic reviews, and is not a statistical package. However, results and graphs from meta-regressions fitted in statistical packages can easily be imported into RevMan. We have added the following text in the manuscript to address the reviewer’s comment “While meta-regression has not been implemented in RevMan, since this method is rarely appropriate in Cochrane reviews which typically include few studies [47], results and graphs from meta-regression fitted in statistical packages can be easily imported into RevMan.”

8) Page 10. While I agree that some members of SMG have made massive contributions to the field of MTCs, I think it is a stretch to state that “account for the vast majority.” Jeroen Jansen and people within industry have published the most on MTCs (even of some of them don’t end up on pubmed).

We have altered this sentence to “SMG members have contributed many methodological and applied publications on this topic in the scientific literature (see for example [60-69]).”
9) Page 11. The fact that the SMG received 11 awards from their own organization doesn’t really convey confidence that this has been widely taken up outside of the collaboration.

This statement was not intended to convey confidence in the uptake of the methods outside of the organisation, but to highlight contributions that were assessed by the Collaboration at the time as being novel and having the potential to advance the science of systematic reviews. We have made no changes in relation to this comment.

10) Table 2 is useless.

Table 2 provides a list of recipients of the Thomas C Chalmers award for statistical issues related to systematic reviews. We would like to keep this table since it provides an historical account of novel contributions that were recognised by The Cochrane Collaboration.

Reviewer: Robert Platt

Discretionary revisions:

1) It would be nice to see a list (either in appendix or online) of members of the SMG, particularly at the first meeting.

We have included a link to the list of current contributors on the SMG website in the ‘Statistical Methods Group and methodological developments in meta-analysis’ section. We have also included as an additional file the minutes and list of participants from the first Cochrane meeting on statistics.

2) The list of important contributions and the text on important contributions is slightly out of sync, and I think I’d add more here. Make it clear, too, that the I^2 stat was developed by the SMG.

We were not sure what the reviewer meant by the text on important contributions being slightly out of sync, but hope that our edits have improved this. The development of the I^2 statistic, although led and driven by members of the SMG was funded by the United Kingdom Medical Research Council. We have therefore not changed the text.

We look forward to hearing from you.

Yours sincerely,

Joanne McKenzie (on behalf of Georgia Salanti, Steff Lewis, and Doug Altman)