Reviewer's report

Title: Choosing sensitivity analyses for randomised trials

Version: 1 Date: 27 October 2013

Reviewer: Lawrence Mbuagbaw

Reviewer's report:

Discretionary revisions:

The authors propose an interesting approach to sensitivity analysis which is complementary to the material described in Thabane et al.

A few comments arise from this which will offer more clarity and enrich the debate:

For question 1. Does the proposed sensitivity analysis address the same question as the primary analysis? More detail and examples are required to elucidate the difference between the research question (does it work?) versus the analytical question (which analytical strategy will provide the most accurate/believable response). Arguably, the same research questions is answered with ITT or PP, but the analytical approach is different. In the first example provided under the discussion, both questions are really about analysis, as opposed to the overarching research question: does the intervention work?

I would also say that a distinction needs to be made between secondary analysis in general (adjusted/sensitivity/exploratory/subgroup), and analysis of secondary outcomes. The former address the same research question in different ways while the latter is a different research question altogether. As the authors rightly say, if it addresses a different question is shouldn’t be called sensitivity analysis.

For question 2: What if the response is “I don’t know.” Should we proceed with sensitivity analyses or not? This is possible for very small effect sizes or very wide confidence intervals. In this case some might argue that conducting multiple sensitivity analyses will help to respond to question 2.

Question 3: This is particularly strong and would really help to prevent unnecessary conducting and reporting of sensitivity analyses. I agree that less plausible assumptions do not warrant exploration as sensitivity analysis.

What the authors describe as self-congratulatory may be described by others as robustness or lack of sensitivity, and this is actually what some government agencies are looking for.

Do the authors have any counsel to safeguard against the use of sensitivity analysis simply because the primary analysis did not yield favorable results? In this case unscrupulous authors will be willing to answer “yes” to all three questions.

Even though missing data is the common reason for sensitivity analyses, any analytical approach which deals with missing-ness in a similar way as the
technique of imputation will most likely produce similar results. The idea proposed by Thabane et al applies when the primary analytical strategy completely ignores missing data and there is the possibility that the results will differ based on the nature of missing-ness or the technique of imputation. The authors should also consider that simply imputing missing outcome data affects the number of event, hence the power and consequently the power of the study. This can change the results in some instances.

I would rephrase the second-to-last sentence in the summary as such: Three key questions help to identify whether an alternative analysis actually qualifies as a reasonable sensitivity analysis.

**Level of interest:** An article of importance in its field

**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