Reviewer’s report

Title: Many continuous variables should be analyzed using the relative scale: a case study of β2-agonists for preventing exercise-induced bronchoconstriction

Version: 2 Date: 20 Jul 2019

Reviewer: Gerta Rücker

Reviewer's report:

I read the revised paper by Hemilä and Friedrich and the authors' response to my comments, and I have some remaining comments.

1. page 5, Statistical Methods, lines 19-29: Why don't the authors write their three models as model equations in the usual way? It would be much easier to understand. With $X = FEV_1$ and $Y = FEV_2$ the model with intercept and slope (for example) would look like

$$Y_i = \alpha + \beta X_i + \epsilon_i.$$ 

2. page 12, line 12 (and probably also other places): Please adhere to the correct notation in R. For example, metacont() is a function, not a procedure.

3. page 12 and Table 5: I now see that the authors calculate the standard errors and confidence intervals on the relative scale in the same way as on the absolute scale such that they obtain symmetric CIs also on the relative scale. The question, however, is whether this makes sense. A relative scale is chosen just in cases where effects are thought to impact values in a multiplicative way. In my view it does not make sense then to calculate standard errors like on an absolute scale and thus mixing a multiplicative model with additive procedures. The authors should reflect this objection and give a justification, instead of giving lengthy instructions for use. See also points 4 and 7.

4. page 18/19, Legends to Figures. These legends are much too long. A figure legend is thought to precisely describe what is seen in the figure, not more. Particularly, it is not the place for adding extensive reflections to the text, to describe multiple single individual points on the figure, or to comment, interpret or discuss the results. Particularly, the legend to Figure 2 should be tightened.

5. page 18/19, legends to Figures 2 and 4: continuous line -&gt; solid line (four times).

6. page 19, legend to Figure 4: "Each circle indicates one study and the area of the circle is proportional to the square root of the number of participants and represents the weighting of the study": This doesn't make sense to me. The usual weighting in a meta-analysis is by inverse variance, which for a continuous endpoint is proportional to the sample size, $n$. To have the area of the circles proportional to the weights, they must be proportional to $n$, that is, the *radius* should be proportional to $\sqrt{n}$ (not the area!).
7. page 22, Table 5 seems unnecessary. My problem with the symmetric CIs was not that I was not able to calculate them. Rather, I doubt that they make sense. See point 3 above.

(A minor point. You wrote in your response: "We do not add the reference suggested by the reviewer since we should renumber all the later references and there would be a high risk of some errors remaining in such a process ...". OK, this reference was not thought to be added to the paper. But in case it would have been important, this doesn't convince me as an argument - first, because no effort to amend a paper should be spared, and secondly: Did you never ever hear of literature management systems?)

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