Reviewer's report

**Title:** On the use of the outcome variable "small for gestational age" when gestational age is a potential mediator: a maternal asthma perspective

**Version:** 0  **Date:** 25 Aug 2017

**Reviewer:** Monica Vasquez

**Reviewer's report:**

The authors present a very interesting and informative simulation study that investigates ICS exposure on the outcome variables "small for gestational age" and birth weight while considering gestational age as a mediator. My comments are provided below.

**Major Comments**

(Comment 1) In the title and throughout the paper, the term "perinatal asthma" is used. I may not be familiar with this term, but it seems like this would suggest a positive asthma status for the child, rather than mother's asthma status (and mother's ICS use) on perinatal outcomes. I would suggest removing this term from the title or to rephrase and to also rephrase "perinatal asthma" throughout the paper, particularly because this paper uses the example of mother's ICS use, rather than asthma status, on the child's birth weight.

(Comment 2) I would also suggest defining terms that might not immediately be familiar to the reader such as direct and indirect effects or collider bias.

(Comment 3) I think it would be beneficial to describe mediation assumptions.

(Comment 4) The title indicates that gestational age is assumed to be mediator. I'm curious as to why scenarios were examined in which ICS has no effect on BW. In order for GA to be a mediator of ICS and BW, shouldn't it be established that ICS is associated with BW? It may be helpful to present results as is and briefly mention this in the methods and/or results.

(Comment 5) On page 11 of the results, it states "Interestingly, we observe that ICS is not associated with SGA, nor was it with BW when we condition on GA." It seems that the second part of the sentence meets the assumptions of a mediating variable. However, for the first part of the sentence, I would expect that ICS to be associated with GA given the model setup. Was ICS associated with GA and not SGA?
Minor Comments

(Comment 6) When describing the effect of exposure on birth weight, it might be beneficial to describe earlier in the text that the exposure variable is ICS.

(Comment 7) On page 11 of the results, where does 0.5635 come from?

(Comment 8) The figures very effectively capture the different scenarios. Although not necessary, you might want to clarify the scenario numbers b1-b4 and c1-c4. For example, perhaps consider using "Scenario Basic 1, Scenario Basic 2, ..." rather than "Scenario b1, Scenario b2, ...". This might also help the reader when interpreting the different models in the tables.

(Comment 9) On page 7 and 9 of the methods, it describes that two weeks were subtracted from the gestational age for babies that were exposed to ICS. Is there a reference to support the two weeks?

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.

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