Reviewer's report

Title: A Repeated Measures Study of Phenol, Paraben and Triclocarban Urinary Biomarkers and Circulating Maternal Hormones during Gestation in the Puerto Rico PROTECT Cohort

Version: 0 Date: 10 Oct 2018

Reviewer: Carmen Messerlian

Reviewer's report:

Summary: This study seeks to evaluate the association of pregnancy urinary phenol concentrations in relation to maternal serum hormone concentrations at 2 times points (16-20 and 20-24 weeks gestation) in the Puerto Rico Birth PROTECT Cohort. This study is an update on a previously published manuscript from the same authors in 2016. The present work uses a more complete cohort and includes additional hormone (estriol, testosterone, and total T3 and T4). Although this study is quite comprehensive, it also reads like a list of exposures and outcomes with little cohesiveness or structure. There are several inconsistencies as described in the discussion and it is unclear how to interpret the present results in relation to the previous work. The results and discussion are also unnecessarily lengthy and need to be streamlined and better synthesized. I would also recommend a table in the appendix comparing the first paper results with the second and a column with interpretation notes. Overall, I found this paper difficult to follow. I think it requires a more synthesized results and discussion section, focusing on the most pertinent results rather than listing each individual finding one by one. It is also unclear which among the results are most interesting/relevant and why.

Other points to consider:

- I don't readily see the need to include both the copious results in the tables as well as the figures. I would recommend adding the tables to the appendix and using the figures to display the main results.

- I cannot easily discern why you need to conduct two separate analyses LMM and MLR. Why not focus your analysis and results on one particular method that is clearly justified based on your research question? What is the added benefit of reporting both? Are they answering different questions? What question do the results from LMM "Regressing hormones vs. exposure biomarkers" answer? Perhaps I am missing something but I think it makes for an unnecessarily exhaustive manuscript that is difficult to interpret. Please also indicate in the footnotes of the tables/figures what covariates were included in these models. Are these the results of the adjusted analysis? Please indicate this as well in the title.
- Inclusion of covariates in your models are based on >10% change. However, it is preferable to use an a priori selection based on knowledges of exposure - outcome confounders known in the literature. Please consider basing your covariate selection to be more sensitive to potential collider stratification. Furthermore, it is unclear why you add specific gravity to the models when the concentrations have already been adjusted for urinary SG? Please clarify the discrepancy in described methods in the paper (e.g., lines 22-29 p. 8 vs. lines 49-51 p. 6) and justify this decision. Lastly, nowhere in the paper have you described your covariates and how they were measured. Typically, manuscripts should have a section for exposure and outcome assessment as well as 'covariate assessment' but this has been omitted here. Please describe how data on covariates were collected and operationalized.

- I would de-emphasize the focus of the introduction on personal care products (PCP). Some of the chemicals examined can have multiple sources and PCP are only one of many others. Please consider reframing and strengthening the introduction. At the moment it seems quite cursory and sophomoric. Please be more targeted and hypothesis driven. Why are you interested in these chemicals in relation to hormones in pregnancy? What do we know already? What do we NOT know? And, what gap are you trying to address and how? State your primary and secondary objectives.

**Level of interest**
Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

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

Needs some language corrections before being published
**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.

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.