Reviewer's report

**Title:** A cross sectional survey of determinants of serum concentrations of polybrominated flame retardants among healthy pregnant women in an urban environment

**Version:** 1 **Date:** 5 July 2012

**Reviewer:** Alicia Fraser

**Reviewer's report:**

Review of “A cross sectional survey of determinants of serum concentrations of polybrominated flame retardants among healthy pregnant women in an urban environment.”

Overall, while I find the paper’s topic and findings to be of some interest, there are serious deficiencies with the manuscript which require attention before a decision regarding publication could be made. I have made an effort to make comments as detailed as possible and to divide them appropriately between those that are major and those that are minor. However, the sheer number of errors in this paper, whether minor or major, brings me to question the level of attention paid to this manuscript by the authors. The multitude of grammatical errors, typos, and lack of clarity and attention to detail, in general, is surprising. Nevertheless, the study’s findings are relevant to the field and would be of some interest if the manuscript is revised sufficiently.

**Major Compulsory Revisions:**

1. Needs a thorough grammatical cleaning. Listed under Minor Essential Revisions are some, but not all, of the items to be addressed. While many of these are minor issues, taken together, they represent a more significant issue.

2. If removal of the woman with extremely high PBDE concentrations made no difference in the regression results, then why was she removed? This should be explained better or else she should not be removed.

3. Methods, Exposure questionnaire data, 2nd paragraph: In the description of how various diet items were examined, the authors need to give more detail. Did the questionnaire include anything about serving size? If not, this needs to be identified as a weakness in the discussion. How were items summed? Again, was serving size considered or just serving frequency? For dairy, was fat content considered in summing items?

4. Methods, Exposure questionnaire data, 3rd paragraph: Please give more detail on how cut-points were chosen for dietary categories. When you say that you selected the cut-points in an attempt to have equally sized levels, do you mean that you created true tertiles? If not, how did you make the determinations? Did you inspect histograms? I understand wanting to have evenly sized levels, but 5 servings/week seems high for a “low” category. Did you try other
cut-points? Did you get different results?

5. In statistical methods, the authors need to describe how determinations of significance were made for predictors. Table 4 has a footnote that suggests an alpha=0.1 was used, but it’s unclear.

6. Also, in stat methods, please explain that values <lod were substituted with lod/sqrt 2.

7. Table 4 does not show “prediction models”. It shows no regression results except for the ** symbol for p<0.1. Please re-label the table for accuracy. Something such as, “Median and interquartile ranges of lipid-adjusted PBDE concentrations (ng/g lipid) in maternal blood collected upon delivery by demographic, dietary, and lifestyle characteristics.” The table should also make it clear which group is the reference group for regression analyses if these are to be shown or alluded to with the **.

8. Results, “Single predictor models”: This section needs more detail and the description needs to match the data presented in the table. When the authors say that something is associated with PBDE concentrations, they need to say how large the association is and in what direction. These data are not presented in the table or text.

9. The presentation and description of Table 5 needs work. It’s unclear to me why, for example, the text states that having a college education is associated with increased PBDE-47 in maternal serum, but not having a high school education or a graduate education. How were determinations made as to what was a predictor and what wasn’t? Please give an example of how to interpret the Beta estimates.

10. The discussion is very long considering how few results are presented. It needs to be shortened and made more directly related to the results presented in the current study.

11. In general, the authors need to explain why predictors of PBDE body burdens may be different in pregnant women compared to non-pregnant women. They make a strong case for the importance of understanding exposure in pregnant women, but not why exposure studies of non-pregnant women are not generalizable to pregnant women.

12. The conclusion in the abstract is not wholly supported by study results or discussion. Women can modify diet, reduce use of electronics, wash hands more frequently. While none of these may eliminate exposure, I don’t think the statement that “there may be little women can do at the level of the individual to limit exposure” is supported by the study…or at least the way it is written. On the contrary, the study finds associations between specific foods and electronics use and PBDE body burdens. Please revise the conclusion to match the study’s findings. The statement in the conclusion of the body of the paper is more accurate and I would suggest a version of it, “While maternal education and reporting of household electronics predicted exposure…we did not observe a single predictor or a consistent pattern of predictors representing a significant source of exposure for any individual congener.” (the statement in the abstract also appears in the body of the paper conclusion, but it is in context there, and so
does not present the same issue).

13. Table 1: About.com should not be used as a reference. There are plenty of legitimate sources to cite for the chemical structures. Please find something more appropriate.

Minor Essential Revisions:

1. Grammar, spelling, typos, clarity, etc:
   a. Background, first line: should be “diphenyl” ethers and not “diethyl” ethers.
   b. Background, 3rd sentence: legislation has not addressed the “use and exposure of these compounds.” Perhaps it has addressed exposure “to” these compounds, but I suggest something like, “addressed the production, sale, and use of these compounds.”
   c. Background, 1st paragraph: comma after “In 2003”. Please review paper for similar instances where commas are lacking. There are too many to list individually here.
   d. Background, 1st paragraph: DDE should be spelled out at first use.
   e. Background, 2nd paragraph, 1st sentence: the phrase “body burden of exposure” is strange…suggest “body burden of PBDEs in humans.” The phrase “body burden of exposure” is used incorrectly in this way throughout the paper and should be revised as appropriate.
   f. Background, 2nd paragraph, 2nd sentence: “Like the POPs” should be “Like other POPs”.
   g. Background, 2nd paragraph, 3rd sentence: comma after “Consequently”.
   h. Background, 3rd paragraph, 1st sentence: “body burden exposure to PBDEs in the general public” should read “PBDE body burdens in the general public.”
   i. Background, 3rd paragraph: correct spelling of “synaptogenesis “.
   j. Methods, 1st paragraph: CDC should be spelled out at first use (and it should be CDC “were” not CDC “was”)
   k. Methods, 1st paragraph: sentence beginning with “Aliquots…” needs work towards the end where it gets confusing.
   l. Methods, 1st paragraph: next to last sentence is a run-on. Please put a period after “participants” and begin the next sentence with “However,.”.
   m. Methods, 1st paragraph, last sentence: Tables need to be numbered in sequence. Table 3 comes out of order here since Table 2 hasn't been introduced.
   n. Methods, Exposure questionnaire data, 4th paragraph: “crumpling” should be “crumbling”.
   o. Results, 3rd paragraph: 2nd sentence is confusing. Please revise the phrase “in small, low range”.
   p. Discussion, 1st sentence: Run-on sentence…place period after “neurotoxicants”, remove “thus”, and begin new sentence with “Understanding”.

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q. Discussion, 2nd paragraph: Sentence that begins, “These trends were anticipated…” should probably end with “in Europe” in order to make sense.

r. Discussion, 3rd paragraph: Last sentence is meaningless as written. Revise thus, “This may be due to a higher proportion of foreign-born participants in our cohort.”

s. Discussion, predictors/sources of exposure: Please revise the sentence that includes the phrase, “being classified as obese prior to pregnancy less weight gain predicted…” as it is unclear.

2. Background, 2nd paragraph: last sentence is confusing. It seems to come out of nowhere and it’s unclear why you’re comparing diet to these other factors. Could use a little more context and clarity.

3. It’s confusing that the size of the cohort is given as 315 at the end of the Background section and then as 316 two sentences later in the beginning of Methods. I realize that you explain the missing woman at the end of Methods, but this should come earlier if you’re going to use two different numbers like that. I would suggest using 316 in the Background, as well, to avoid the confusion.

4. In Results, there are two sections devoted to prediction models. One is called, “Single predictor models” and the other is “Gamma regression models.” This is confusing because the methods seem to suggest that all of the prediction models used a gamma distribution. Please, re-label these sections for clarity.

5. Discussion, 2nd paragraph: I’m not sure I understand why it’s relevant that the NHANES population is a non-pregnant population. You could compare your results to young women in the NHANES study because it is given by sex and age.

6. Discussion, 2nd paragraph: Sentence that begins, “These trends were anticipated…” should probably end with “in Europe” in order to make more sense.

Discretionary Revisions

1. Background, 2nd paragraph: in discussion of dermal absorption, you may want to read and reference Watkins, et al (2012) paper in ES&T and/or Watkins, et al (2011) paper in EHP. While data may be scarce on dermal absorption, these papers deal directly with the issue and present results of dermal absorption and contribution to body burdens of PBDEs.

2. Did you have any vegetarians in your study and did you consider a comparison of body burdens between vegetarians and meat-eaters? This would be good to add.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published
Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests.