Reviewer’s report

Title: Association between bisphenol A exposure and body mass index in Chinese school children

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Reviewer: George Zhang

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This is an interesting paper to access the possible link between bisphenol A (BPA) exposure and body mass index for 259 school children in Shanghai, China. The study provides broad literature review and discussion and will be of interest to the readers of the journal. There are several issues that require attention before publication.

## Major Compulsory Revisions

1. Abstract - Methods:
   Please explain – How 6 schools were “randomly selected”, and how to “randomly chose” children? How to define “randomly” in the study?

   It seems that the paper is just an “observational” study, instead of a randomized trial.

2. Table 1
   The main outcome variable BMI was not documented well. There is no information (such mean and SD) on BMI distribution among different AGE groups, or among sex.

   Current AGE intervals of 8-11 vs. 12-15 years might be too wide. Is it not clear whether majority of children are dominated at two extreme ages, either 8 or 15 years?

   Note that, the authors also mentioned that “It is known that puberty usually begins between 10 and 13 years of age, and serum levels of endogenous sex hormone in puberty significantly rise than before …” (page 13)

3. Table 2
   The specific gravity-corrected BPA concentration was proposed as an important correction, but not documented enough, such as mean (SD) for all subjects or within Age and Sex groups.

   The significance level of BPA-BMI association could be greatly affected by whether the model was adjusted for “specific gravity”. It might be misleading without mentioning this modeling effect in the ABSTRACT.

## Minor Essential Revisions
1. Methods – Study population

It would be helpful to explain more clearly what was done and why. Lacking of important participant information greatly limits the validation, interpretation, implication and generalization of the findings. How to include participant students should be provided more information.

For example,

What’s the exclusion / inclusion criteria for participants?

How many primary or middles schools are candidate schools?

How many total student counts in each of 6 selected schools?

Among these 6 schools, what’s the frequency distribution of “360 eligible subjects”?

What are the possible variations at baseline participant characteristics and the impact on the BPA exposure-BMI associations?

What year or years are associated with the “yearly regular physical examination data” for the current study? The data was based on 2000, 2011, or others?

What’s time gap between the two data collection phases? E.g., phase I is to identify Height and Weight data from “yearly regular physical examination data”, and phase II is to collect urine samples? -- If each of these 2 phases took “too long” or two phases separated too far away from each other, then the calculated BMI values and the BPA exposure-BMI associations would be questionable for a person aged 8-15.

2. Methods – Outcomes

Why not give or cite some BMI cut-point numbers here to describe how “Normal weight, overweight, and obese individuals were identified according to the BMI-based criteria by age and sex proposed by Working Group on Obesity in China (WGOC)”?

3. Table 1

Please explain – How to construct and calculate the 95% CI for the geometric mean of urine BPA concentration?

Why the listed minimum urine BPA concentration (0.03 ng/m) was less than the limit of detection (LOD = 0.07 ng/mL, claimed), and even less than the “default” imputed value of 0.07/sqrt(2) = 0.49 or 0.06/sqrt(2) = 0.42?

4. Figure 1

Please explain – how to create the plot the figure, whether the error bar is standard deviation or standard error, why no error bar or BMI variation for the subjects at BPA quantile 1 group? What’s the associated subjects at each BPA quantile group?
5. Discussion
“shot time span (one month)” # “short time span (one month)”?

## Discretionary Revisions
1. Methods – Statistical analyses
“LOD divided by the square root of 2” might not be default anymore, where the reference and conclusions in 1990 might be outdated.

Here is a book “Statistics for Censored Environmental Data Using Minitab and R (Statistics in Practice) by Dennis R. Helsel (Feb 1, 2012)”. The study did not cite and use more robust method in the analysis described in the book, but it seems appropriate.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.