Reviewer's report

Title: Methodological challenges when estimating the effects of season and seasonal exposures on birth outcomes

Version: 2 Date: 25 January 2011

Reviewer: Rupa Basu

Reviewer's report:

This paper is interesting, as it covers the topic of a potential fixed cohort bias in studies considering season/seasonal exposures on adverse birth outcomes. However, I am unsure of whether this study is enough to warrant an entire paper, and there are some flaws in the authors’ assumptions that need to be addressed.

On P. 3, the authors state that “if there was unusually hot month in the first trimester…high temperature could be wrongly associated with longer gestations.” In epidemiologic studies, it is important to include more than one year of data, so that extreme events are not heavily weighted, but the results are instead based primarily on average exposures. Therefore, one hot month should not influence or bias the results of the overall distribution. Often, that hot month/heat wave is studied in a separate analysis.

On P. 4-5, the authors excluded conception dates prior to 19 weeks and post 43 weeks. However, these exposures should have a minor impact on the overall results, as the bias should almost balance out. Even the results of this study suggest that the bias only influences the extreme temperatures, but since effect estimates are often depicted for the entire distribution, the bias, if any, would be minimal. This should be stated in the discussion section (which is missing—see specific comment below) in detail.

On P. 6 (top), the estimates for the conceptions in July and January are essentially the same. Was there a statistically significant difference? Please include that.

Specific comments:

On P. 4, please list and cite the statistical program that was used to simulate the data.

On P. 5, are the variables listed in the model all confounders? Infant sex, for example?

Was it possible to get information on education and socioeconomic status?

On P. 5 (bottom), it is not clear whether Figure 3 refers to the entire data set or to the simulated data set. Please clarify.

On P. 6, the Brisbane results would be better depicted a figure to show
gestational weeks by month.

There should be a discussion of the strengths and limitations of the study, biological mechanisms, etc. That entire section is missing.

The Figures in this study are generally not very informative and difficult to interpret. I suggest deleting most of them, or making some major alterations.

Figure 3 needs a label on the X axis titled, “Month of conception.” Also, J, F, M, etc. needs to be added to the top and bottom of the X axis.

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

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.