Reviewer's report

Title: Effects of air pollution on neonatal prematurity in Guangzhou of China, a time-series study

Version: 1 Date: 9 June 2010

Reviewer: Matthew J Strickland

Reviewer's report:

This article contains results from a time-series investigation of associations between NO2, SO2, and PM10 and preterm birth. The authors investigate very acute effects of air pollution (lags 0-7), which is somewhat different from much of the literature on this topic, wherein it is more common for folk to investigate associations with average pollutant concentrations over a longer gestational window (e.g., the 3rd trimester). The study was conducted in a large city in China that has very significant air pollution issues.

Major Essential

1) The authors did not account for the number of gestations “at risk” for preterm birth. See the pair of recent articles by Darrow et al. in Epidemiology.

Seasonality of birth and implications for temporal studies of preterm birth.

Ambient air pollution and preterm birth: a time-series analysis.
Epidemiology. 2009 Sep;20(5):689-98

Essentially, the problem is that the daily count of preterm births will be a function of the number of gestations “at risk” for preterm birth. If there is seasonality in births then there will also be seasonality in the rate of preterm births. If this happens when pollutant concentrations are high then it will appear that pollution causes preterm birth. Note that the smooth function of time included in the GAM does not account for this issue.

2) The approach for “final model selection” was based on AIC, which is a practice typically avoided when the goal of the analysis is to control for confounding. Also, the readers need to know what covariates are in each of the final models. The approach of selecting the model with the strongest results is also a generally discouraged practice in epidemiology. It's difficult to evaluate the models without knowing which terms were in them. I am interested to see how different the models were for NO2, SO2, and PM10.

Minor Essential

3) There are several grammatical edits needed throughout, but overall I could follow the writing fine. There were also places where it says things like “Text for
4) I am interested to know the size of the underlying cohort – how many births were included?

5) Much information was gathered about job level, education, etc. Was any of this information included in the regression model? They play into the issue of seasonality and the tendency for low SES groups and high SES groups to have different seasonal patterns of births.

6) In the statistical model the authors write “alpha – residual error(?)” I don’t understand this…typically alpha is an intercept.

7) The issue with flat noise is applicable to linear models. The author’s model is a Poisson model, and so there is no homoskedasticity assumption – the residuals will get bigger as the counts get bigger. I don’t believe than an attempt to achieve “flat noise” makes sense…that said I could be off-base here.

8) Although I know it’s not the author’s fault (the data are what they are), I don’t understand a lag 0 effect for air pollution on preterm delivery…and lag 0 was by far the strongest effect for all three pollutants investigated. Preterm delivery isn’t an instantaneous event. It generally takes a while between the start of labor and the actual delivery of the child. It would seem that at lag 0 (meaning air pollution levels on the day of the birth) that the woman would already be in the hospital. The authors should comment on this in the Discussion.

Level of interest: An article of limited interest

Quality of written English: Needs some language corrections before being published

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

Declaration of competing interests:

I declare that I have no competing interests’