Reviewer’s report

Title: The association of early-life exposure to ambient PM2.5 and later-childhood height-for-age in India: An observational study

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Reviewer: Gerard Hoek

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The authors report an analysis of the association between air pollution exposure and height in a large population of young Indian children. Air pollution is assessed at the district level scale, primarily based on satellite data. Data on height for age and a set of individual level confounders supplemented with area indicators is analyzed. The analytical strategy is largely based upon econometric ideas. The authors find a small decrease in height associated with increased PM2.5 exposure.

Main concerns

1. The main problem with the analysis is its econometric philosophy where you analyze associations between air pollution and health. The paper needs to be better rooted in epidemiology. You may consider to involve an epidemiologist in the rewrite of the paper. Below some specific comments related to this are given. As an example, you use the term causal too easily; same for effect where you study association; ecological analysis in line 371.

2. You need to put much more focus on controlling for individual-level confounders which should be the first line of adjustment. You seem to miss potentially important individual level data on socio-economic status and also on smoking habits. This as a minimum should be flagged in the discussion and makes the paper hard to interpret. Further adapt your table 2 to always include a full set of individual level confounders. The term extended controls is vague and not too useful.

3. Adjusting for area indicators may take care of some of the missing individual data. You put in a very large number of terms, which make it difficult to judge what exposure contrast you are evaluating. Since you put in 7700 district-months indicators, the air pollution contrast is not spatial, but the deviation in a specific year of the monthly average from the average month in the period you evaluate. It is not clear whether you have sufficient temporal confounder sin your model. This needs to be explained better to
the reader. You should also consider analytical strategies exploiting more the spatial contrasts, possibly at the expense of confounding.

4. Exposure assessment is spatially crude, the average district being about 5000 km2. Discuss this in the paper

5. Based your choice of non-parametric more on the epidemiological literature (e.g. Crouse, 2012 in EHP; Cesaroni, 2013, EHP).

6. You have too many figures, move some to a supplement. The figures should show associations adjusted for individual and area-level confounders, not crude associations. Not sure what is now in the figure. In the figures it is not acceptable to leave out all data below 5th and above 95th percentile.

Minor

1. In abstract add how much the 0.05 SD is in cm.

2. Use more descriptive titles than "regression results" in table 2

3. Drop sampling weights in table 1, show what you analyzed (you also ignore sampling weight in the further analysis)

4. Use either z-scores or residuals in tables and figure as endpoint

5. All figures should have confidence limits.

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

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