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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Effects of AIR pollution on cardiopuLmonary disEaSe in urban and peri-urban reSidents in Beijing: protocol for the AIRLESS study" *by* Yiqun Han et al.

Anonymous Referee #1

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This paper presented a methodology/protocol of an epidemiological study during two large air pollution monitoring campaigns (APHH) in both urban and peri-urban areas in Beijing during two seasons (winter and summer). The author elaborated on the study design for both exposure and health measurement. The design of this study is quite complex in terms of the usage of portable monitors for personal exposures, in coordination with the intensive monitoring campaign period, and comprehensive examinations of health outcomes. The protocol shows the strength of combining the panel study with monitoring campaigns which provide the potential to investigate the health effect of detailed chemical compositions and biological mechanisms. It would be useful for other researchers to carry out further studies.

Although it's a protocol paper, it's still necessary to present some preliminary results to show the quality of the data collection and general information of the study. The current result part has summarized the information of participation, and the calculation of sample size, but it would be helpful to add more results to both exposure and health measurements. The following is the main concerns for this paper: 1. For the health part, it's important to know the basic demographic statistics of the participants in both urban and peri-urban sites. E.g. the attended clinical visits, distributions of age, gender, socioeconomic status, baseline exposure status, etc. Is there any significant difference between the two groups? Are you going to compare to the two groups of participants or treat them as two different cohorts? In addition, it would be useful to have some descriptive results related to the measurements of health outcomes.

2. For personal exposure, it's crucial to have some results to validate the performance of PAM with reference instruments. How did you calibrate the instruments, and how well they agree with the reference instruments? What's the measurement range and error? What's the performance of PAM for different microenvironments (i.e. indoor and outdoors)? It's also important to know the completeness of personal exposure monitoring (e.g. how many validate days for the personal dataset, etc), as carrying personal monitors for 7 days is not common in an epidemiological study which would cause a lot burden.

3. A summary of key air pollutants in both urban and rural sites during the health campaign periods in two seasons would lead the readers with a better understanding of the background AP settings, which can be useful to compare with other health studies around the world.

4. The results of comparing personal and ambient exposure with examples from certain participants would be interesting to see the exposure difference, which is one of the main contributions to the uncertainties in the exposure-health relationship.

5. The application of personal measurements is increasing in the epidemiological stud-

ies, it's good to add some reviews on the progress in this area to highlight the advantage of this design.

In summary, the paper has shown the uniqueness and detailed methodology of this panels study under the intensive monitoring campaign, however, I suggest the authors restructure the manuscript and add more results for further review and for considerations of ACP publication.

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