

Reviewer's report

Title: PM2.5 metal exposures and night heart rate variability: A panel study of welders

Version: 1 **Date:** 5 March 2008

Reviewer: John Balmes

Reviewer's report:

1. Is the question posed by the authors new and well defined?

The question of which components of fine PM are responsible for observed health effects is important and the authors define well their effort to address the role of specific metal components in the HRV response to fine PM exposures.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?

Yes

3. Are the data sound and well controlled?

Overall, the data presented appear sound and well-controlled. One concern about the data presented is that the authors' previous related report from this cohort of boilermaker welders (manuscript reference 10) used data from 36 subjects where the current manuscript reports data from only 26. Why is there a difference in subject number? What process was used to exclude subjects for the current manuscript?

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?

See concern expressed above. In addition, while the authors do state that they have previously reported (in reference 10) an association of total PM2.5 with a decline in night rMSSD on p. 11 of the Discussion section, they should also note that this association has been previously reported when they first present this finding on p. 9 of the Results section so that the reader is quite clear that this is not a new finding.

5. Are the discussion and conclusions well balanced and adequately supported by the data?

Yes

6. Do the title and abstract accurately convey what has been found?

The title should be changed so there is less confusion about whether the cohort studied here is different than the one reported in reference 10. Reference 10 is entitled "Night heart rate variability and particulate exposures among boilermaker construction workers." This manuscript's title should be changed to "PM2.5 metal

exposures and night heart rate variability: A panel study of boilermaker construction workers.”

7. Is the writing acceptable?

Yes

Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

See suggested revision re: title above.

The authors need to discuss in the Methods section why they only report the results of analysis of only one index of HRV, rMSSD, when their previous report (reference 10) from the same data set used SDNN (SD of normal-to-normal intervals over entire recording), and SDNN(i) (SDNN for all 5-min segments) as well.

While the design of using individuals as their own controls in a crossover design of work and non-work time does control for time-invariant individual factors, there were five subjects with hypertension and five with “cardiac compromises.” Hypertension and ischemic heart disease are known to affect HRV. Were there differences in HRV responses to PM2.5 and PM2.5 metal exposures in these groups compared to the rest of the subjects. In addition, anti-hypertensive or cardiac medication use might vary over the study period. The authors should address these points.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

None

Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

The Discussion section, while well-written, is a bit long.

What next?: Accept after minor essential revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

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