Peer Review Report

Review Report on Effects of fine particulate matter on cardiovascular disease morbidity: A study on seven metropolitan cities in South Korea

Original Article, Int J Public Health

Reviewer: Heresh Amini
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EVALUATION

Q 1 **Please summarize the main findings of the study.**

However, I have some minor, but also a few major comments.
Methods:
1. Lines 92-97: Could the exclusion of about 1/4 of the data lead to a selection bias as maybe the missingness of the individual data is not at random? Maybe the authors could try a propensity score approach for the participation in the study with full data.
2. Lines 114-116: Please describe in more detail how the data was matched when people had moved. Was it e.g. weighted by the time spent at the specific addresses per year?
3. Line 133: I am not sure that air temperature is needed in this case as this is a study on long-term effects of air pollution and there I don't think that air temperature is really a confounder of the association. Maybe the authors could as least try a sensitivity analysis without air temperature.
4. Sentence in lines 181-181 is grammatically not correct, please revise!
5. Line 190: Please drop "the" in front of "average".
6. Figure S1 and line 77: Why were only CVD events from 2018 used and not also events between 2015 and 2017? Why do the authors exclude all incident events of 2015-2017 while they consider the exposure in these years and could easily consider the time of each individual to the event (or the censoring)?
7. In other similar studies, the authors often use age as the underlying time-variable instead of just adjusting for age. It might not make a big difference, but maybe the authors could try a sensitivity analysis.
Results:
1. Table 2: Please put the explanation for the different periods (1-4) also in the footnote of the table.
2. Figure 1: In the introduction you wrote that the level when the alert becomes active changed over time (before vs. after 2018), so I am not sure one can compare these two different periods then easily as with the changed level certainly the number of alerts changed. Please at least indicate in the figure when the alert level was changed.
3. Tables S1/S2: Are the cities equal to the regions, is this used as a synonym? So this analysis then only includes city population? I may have overlooked it, but this did not become clear to me when reading the description of the study population.
Discussion:
1. There is usually a small paragraph summarizing in brief the most important results of the study, and I think something like this is missing here. Overall, I suggest restructuring the discussion a bit as I think it is not ideal to have the discussion on the effect modification results right at the very beginning and compare them to existing literature. I think, this should only come after the discussion of the main results for the overall study population. Also the strengths and limitations should be a clear paragraph at the end of the discussion, before the conclusion (which is currently to my understanding in lines 245-251 under "meanings of the study" (which is a slightly unusual term).
2. Please tone down a bit your hypothesis (lines 248-251) about the FH55 findings as it is only a hypothesis or a speculation (although quite plausible), I would say. I suggest declaring it as your hypothesis to explain your findings.
3. Somehow, I think that the first point under limitations is actually a novelty of this study and could also be mentioned as an advantage of the study.

Q 2 **Please highlight the limitations and strengths.**

Please see my detailed review.

Q 3 **Please provide your detailed review report to the authors. The editors prefer to receive your review structured in major and minor comments. Please consider in your review the methods (statistical methods valid and correctly applied (e.g. sample size, choice of test), is the study replicable based on the method description?), results, data interpretation and references. If there are any objective errors, or if the conclusions are not supported, you should detail your concerns.**

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PLEASE COMMENT

Q 4 **Is the title appropriate, concise, attractive?**

No.

Q 5 Are the keywords appropriate?

Depends on the study design, which is not clear.

Q 6 Is the English language of sufficient quality?

Yes.

Q 7 Is the quality of the figures and tables satisfactory?

Yes.

Q 8 Does the reference list cover the relevant literature adequately and in an unbiased manner?)

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QUALITY ASSESSMENT

Q 9	Originality	■■■□□
Q 10	Rigor	■□□□□
Q 11	Significance to the field	■■□□□
Q 12	Interest to a general audience	■■□□□
Q 13	Quality of the writing	■■■□□
Q 14	Overall scientific quality of the study	■■□□□

REVISION LEVEL

Q 15 Please make a recommendation based on your comments:

Reject.