Reviewer's report

Title: Particulate air pollution on cardiovascular mortality in the Tropics: Impact on the elderly

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Reviewer: Pablo Orellano

Reviewer's report:

The present study evaluates the association between air pollutants and all-cause mortality / cardiovascular mortality in Singapore, an equatorial Asian city showing a tropical climate. There are many strengths of this study. It is well written, with an adequate and properly described methodology, results that are correctly presented, and conclusions adequately derived from data. As the authors noted, there is a gap of studies examining the influence of air pollution on mortality in tropical settings (the majority of studies are from Europe and North America), while these relationships could be highly influenced by meteorological and other environmental factors that are highly dependent on local variables. In this sense, this study contributes with valuable information to fill this gap. My impression regarding this manuscript is positive; however, I have a number of suggestions and concerns.

1) Page 5. Sentence: "Stations which monitored roadside air quality by being located close to the traffic lanes were excluded from the study".

Comment: I don't understand the reasons for this exclusion. I could support this decision of excluding these stations if there are no people living near traffic lanes, or if this population was excluded from the analysis. But if mortality data included people living near these heavy traffic roads, they should be exposed to this air pollution, and these stations should be included in the analysis. Please clarify this point.

2) Page 7. Sentence: "Co-pollutant (containing more than one pollutant) models were not built so as to avoid multicollinearity among variables".
Comment: I see in Table S1 that at least the O3 was not highly correlated with the other pollutants. In this context, maybe analyzing two-pollutant models would be appropriate. Moreover, as in other similar papers, I recommend presenting the results of two- or multi-pollutant models, and then discussing the implications of multicollinearity in the discussion section.

3) I'm surprised that NO2 and O3 were not associated with all-cause mortality. In previous studies, even those carried out in cities with tropical climates from Thailand, Malaysia, Taiwan, and Brazil, these associations were significant in the majority of cases (see for example Bravo et al., 2016; Conceicao et al., 2001; Costa et al., 2017; Goggins et al., 2013; Gouveia et al., 2000; Guo et al., 2014; Tsai et al., 2003; Tsai et al., 2006; Wan Mahiyuddin et al., 2013; Yang et al., 2004; Vichit-Vadakan et al., 2010). Maybe the authors might suggest a hypothesis about why these gases are not showing a significant influence in mortality, taking into account their knowledge about the local environment. In this regard, I observed that the mean values of pollutant concentrations reported in this study are, in general, lower than those reported in the previously mentioned papers.

4) In the same line of the previous point, I don't understand the reason why the influence of NO2 and O3 on mortality was not assessed for elderly adults (>65 years).

5) The number of air monitoring stations should be reported; if possible, reporting the number of days with missing data in at least one station would be important too.

6) Table 2. The association between O3 and all-cause mortality (Lag 1) was also significant, but the authors did not take into account this result.

7) Page 7. Sentence: "Residual autocorrelation and partial autocorrelation charts for the core models were performed and shown in Supplementary Figure S5". Comment: these ACFs and PACFs graphics were mentioned in the methodology, and were shown in the appendix, but they were not referred to again in the text. Please mention in the text the interpretation or the use that was given to these graphics.
8) Page 13. Another possible limitation of this study is the lack of concentration-response function analyses.

9) Pollutant units are missing from Table 1.

References


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