Reviewer's report

Title: The Impact of Long-Term PM2.5 Exposure on Specific Causes of Death: Exposure-Response Curves and Effect Modification among 53 million U.S. Medicare Beneficiaries

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Reviewer: Keita Ebisu

Reviewer's report:

The authors revised/added text for the interpretation of previous studies (e.g. Di et al. (2017)), but it makes me confused. In the response letter, the authors said, "Figures 3, S7 and S8 from the Di et al. (2017) paper support our interpretation of their findings. Di et al. (2017) figures show slightly lower associations when PM2.5 exposures were below as compared to above approximately 8 ug/m3, similar to our study." However, in the text, it also said, "our finding of lower non-accidental mortality risks at low PM2.5 levels is contrary to previous studies of Medicare beneficiaries (5, 50), who reported higher and linear all-cause mortality risks at low PM2.5 concentrations." The authors need to clarify this interpretation. The reviewer 2 suggests citing some results from Global Burden of Disease, and I strongly agree with this suggestion. For instance, Cohen et al. (Lancet 2017), found steep exposure-response curve in lower PM2.5 level, which is different from this study. The authors are encouraged to interpret these inconsistent results with potential explanation. I believe this part is one of the most important part of the paper, and the authors had better develop the discussion with caution. As a minor note, the sentence "RRs were non-linear, with lower, but positive and significant, RRs when exposures were lower as compared to higher than 10ug/m3 (Figure 1)" needs to be revised to clarify.

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