Reviewer's report

Title: Spatiotemporal patterns of particulate matter (PM) and associations between PM and mortality in Shenzhen, China

Version: 3 Date: 18 November 2015

Reviewer: Mary B. Rice

Reviewer's report:

- Major Compulsory Revisions

N/A

- Minor Essential Revisions

1. The authors are still inconsistent in the manuscript in their definition of outcome. The abstract states "Relative risk percentage changes" but elsewhere in the manuscript this has been defined as excess risk. I agree with the use of the term excess risk, which is appropriate. However, the authors should clearly define their outcome measure in the statistical methods (best place is probably NOT line 214 where the authors briefly mention the outcome after listing the software that was used, but much higher somewhere around line 179 when the mortality analysis is introduced). For example, authors can say: Our primary outcome measure was the percent excess risk (ER%) in mortality, defined as: (Relative mortality risk - 1) x 100.

I personally prefer ER% over ERs, which I think is confusing.

- Discretionary Revisions

1. Authors should explain what is meant by Class 2 standards and how they differ from Class 1.

2. I would favor using a term like National Air Quality Standard rather than GB3095-2012 (a jumble of numbers).

3. Line 125 "discover relationships between daily exposure to PM2.5/PM10 and all-cause mortality" could be construed to mean that the authors only examined the ratio as the exposure. Authors may wish to state "different exposure lags of PM2.5 and PM10"

4. Line 161-162 ending with "The data are representative, continuous and no missing....cannot be ruled out" is a comment about the data that seems out of place. How do the authors know it is representative? I would recommend simply stating that there were no missing meteorological data, if this is in fact true.

5. Under Data Analysis line 186, authors should specify the time and weather variables that were used (calendar time, temperature, barometric pressure,
wind speed and humidity)

6. Line 209 about the few associations with longer lags not being significant is a result and does not belong under methods

7. Lines 259-262 about the HQC and NA sites belongs in methods rather than results'

8. Consider adding to line 306 "relatively clean city compared to other cities in China"

9. The discussion of "major air pollutant" and "primary air pollutant" still makes no sense to me. Other air pollutants, in particular gases like O3 and NOx, were not even considered in this analysis. I would recommend simply putting the number of days in nono-attainment in context

10. Some of the paragraphs in the discussion are extremely long and unfocused (esp lines 344-377). Consider breaking this down