Reviewer's report

Title: The effects of ambient temperature on cerebrovascular mortality: an epidemiologic study in four climatic zones in China

Version: 1 Date: 30 January 2014

Reviewer: Geoffrey Morgan

Reviewer's report:

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

This paper reports the association between ambient temperature and cerebrovascular mortality in different climate zones in China. This is an important description of the relation between temperature and mortality and how this relation is influenced by climate region. This question is well defined and reports results from locations not previously investigated in this way.

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

The methods are described in sufficient detail in the paper and are appropriate to this type of time series data with a non-linear response function and lag effect. While the study uses complex statistical methods these have been previously applied by the authors in published papers in high profile journals. While I do not feel adequately qualified to assess the statistics in detail I think the application of the methods used is supported by previous research.

3. Are the data sound and well controlled?

The data are sound and well controlled and are reported appropriately.

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

Yes

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

The paper is well written and the discussion and conclusions are balanced and supported by the data and the title and abstract convey what has been found.

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

Yes

7. Is the writing acceptable?

Yes

MAJOR COMPULSORY REVISIONS
1. Methods, Data Collection, par 2: it would be helpful to include the populations of these cities and some information of the geographic extent of the city specific study regions.

2. Methods, Data Collection, par 2: it would be helpful to include more information on the completeness of the death registrations and any issues that may complicate comparisons between cities, if available.

3. Results, par 1: I'm a little confused by the numbers of cerebrovascular deaths in each city. Without information on the city specific study regions I assume Shanghai and Beijing have study populations around 20 million, with Guangzhou, Tianjin and Wuhan around 10 million. If this is the case then I'm confused as to why Beijing and Shanghai have substantially smaller numbers of cerebrovascular deaths compared to the other three cities. This is not necessarily a problem, but needs to be clarified.

4. Results, par 4: The thresholds chosen to apply the model are extremely different, ranging from around 0 degC to around 25 degC. My interpretation of the modelling strategy is that this would compare a unit change in risk for cold temperature below 0 degC in Beijing and Tianjin with a unit change in risk for cold temperature below 25 degC in Wuhan and Guangzhou. While this may be what the modelling suggests it does not seem reasonable to compare cold temperature risk across such very different temperature ranges. Acclimatisation may account for some of this difference, and there is some evidence of a linear response, but difference in thresholds between the cities does seem extreme. Paragraph 4 of the discussion section includes comparisons of with these results and other cities where the thresholds ranged from 15 degC to 29 degC, much less than the range from 0 degC to 25 degC reported in this study. Please provide some discussion of these issues to support your comparisons between the cities in this study, and between the results of this study and previous studies.

MINOR ESSENTIAL REVISIONS

1. Abstract: Results. Northern cities (with low mean temperature) had …
   - List cities

2. Abstract: Results. … southern cities (with low mean temperature).
   - List cities

3. Ref 11:
   - Capitalise first letter of Tianjin, China:

4. Methods, Data Collection, par 1: More supporting information,
   - Including references would be helpful to support the statements about the differences in the climates of the five cities and the justification for the groupings. The descriptive statistics provided in Table 1 do not provide sufficient detail to
verify the unreferenced statement about the types of climates of the cities and the different climate categories assigned to the cities.

5. Methods, Data Analysis, par 1; We used 20 lag days for temperature, as most studies have shown that…
- The only ref provided to support this general statement is of a single city study. Suggest either qualifying the statement or supporting with additional references

6. Methods, Data Analysis, par 1; ..according to previous studies.[11]
- Once again the reference supporting this statement is of one single city study. Suggest either qualifying the statement or supporting with additional references.

7. Results, par 4: Generally, there were J-shaped relationships between temperature and cerebrovascular mortality in all cities, with a threshold below (above) which the cost (hot) effect is linear.
- The wide range for the Relative Risk scale in Figure 3 makes is difficult to assess this statement. It would be helpful to provide more supporting evidence for the application of a J-shaped relationship for each city.

DISCRETIONARY REVISIONS

1. Background, par 2: … relations appear J-, V- or U- shaped…
- Suggest including refs covering more than just one location for such a broad statement.

2. Background, par 4: Previous studies have identified that elderly and women are more vulnerable to extreme temperatures than youth and men
- Improve grammer

3. Figure 3:
- Reduce the range of the Relative Risk axis (eg: 0 to 4 or 0 to 6) so that the plots show more detail and the comparisons between plots are easier. A footnote could be added to clarify the UCI limit for Beijing that would be outside this range.

4. Figure 4:
- Reduce the range of the Relative Risk axis (eg: 0.98 to 1.02 or 0.98 to 1.04) so that the plots show more detail and the comparisons between plots are easier. A footnote could be added to clarify the UCI limit for the RR’s outside this range.

5. Discussion, par 4: … adapted for cold weather by have heaters and warm clothes.
- ...by having...

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable
Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests’