Author’s response to reviews

Title: The impact of daily temperature on renal disease incidence: an ecological study

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Version: 1 Date: 08 Oct 2017

Author’s response to reviews:

Dear reviewers,

Thank you kindly for your email and for your helpful suggestions. I have included your recommendations in the manuscript, and listed point-by-point responses to each of your suggestions below. I have also made minor changes to the wording, which is included in the tracked changes.

Please do not hesitate to contact me if you have any further comments.

Kind regards,

Prof. Peng Bi
Dr. Matthew Borg
Responses to reviewer 1:

Comment 1.1: I have a question on Figures 2 and 3. I expected many data points (# of days during the study period). It looks like there are less than 50 data points. Please explain. And I see a few outliers with high temperature and low admissions. Adding some description on these points and their influences on estimating the effects would be helpful.

Response: I have added a sentence in the legends of Figures 2 and 3 to state that each data point represents a different maximum temperature separate by 1°C, in addition to a mention in the legends. There are less than 50 points because the data points are separated by 1°C, not by the number of days. There are outliers at high temperatures associated with low admissions (and also outliers with high admission). Their influence on estimating the effects would have been minimal, as they only represented a very small number of days. I added this to the results section (lines 237 to 240).

Comment 1.2: For appendices 2, 3, 4, it important to understand the trends of the effects. So I think presenting graphs would be a much better way to represent these features, especially for lag-structures.

Response: I have added graphs for appendices 2-4 to highlight the trends for lag periods, genders and age. Appendix Figure 1 and 2 graph IRRs for renal outcomes and daily temperature for lag periods – 1 shows maximum temperature, and 2 shows minimum temperature. Appendix Figure 3 and 4 highlight the trends for gender and age respectively. I also added new graphs to show the trends the main regression analysis as Figure 4 - the previous figure on mechanisms is now Figure 5.

Comment 1.3: Negative-binomial is a proper approach for this data. But it's less used than classical Poisson regression. Adding more description for the model is helpful for general readers, I think. Adding [ Log(E(Y))=beta_0 + ..... ] this kind of description is recommended.

Response: I added a description of his model including an equation at the end of the data analyses section in the methodology (lines 180-200).

Responses to reviewer 2:

Comments 2.1: I would suggest using "climate change" in place of "global warming" as a more comprehensive term.

Response: I have changed “global warming” to “climate change” throughout the paper.
Comments 2.2: You might want to mention some fairly recent heat waves that have impacted the Adelaide area to provide additional justification in the setting section, e.g. March 2008, Jan-Feb 2009, Nov 2009, Summer 2013-2014.

Response: I added the sentence “Adelaide has recently had multiple heatwaves including during March 2008, January to February 2009, November 2009 and during the summer of 2013-2014” to the methodology section under “Setting.” It is located on lines 92-94.

Comments 2.3: You mention as a limitation that you use a single station to represent the Adelaide metropolitan area. Perhaps you can quickly look at some monthly climate statistics for nearby stations for support: http://www.bom.gov.au/sa/observations/adelaidemap.shtml

Response: I looked at a few other stations. They showed similar results to Kent Town. Accordingly I added to lines 436-438 in the discussion section “However, other stations with meteorological data from metropolitan Adelaide showed similar temperatures to that of Kent Town [37].”

Comments 2.4: Line 72 - you may want to be careful with using the term "heat exposure" as you may not know the individual's particular exposure. Perhaps replace with "relationship between ambient air temperature and urinary tract infections…"

Response: I replaced “heat exposure” with “relationships between ambient air temperature and urinary tract infections”

Comments 2.5: Line 87 - perhaps rephrase "…renal disease during heat waves…"

Response: I rephrased to “…renal disease during heatwaves…”

Comments 2.6: Line 102 - it may be more accurate to say "meteorological data"

Response: I changed “climate data” to “meteorological data”

Comments 2.7: A recently published article may be useful to cite as it identifies strong links between renal diseases and various metrics of heat and heat waves: Chen, T., S. Sarnat, A.

Response: I have cited your suggested reference on lines 51 and 16