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Discussions

Interactive comment on "The contribution of air temperature and ozone to mortality rates during hot weather episodes in eight German cities during the years 2000 and 2017" *by* Alexander Krug et al.

Anonymous Referee #1

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General comment

The manuscript examines the impacts of hot weather episodes (HWE) along with daily maximum eight-8hour moving average of surface ozone(MDA8) on rates mortality in eight cities in Germany. The study aims to compare the effects of HWE on the variability of mortality rates across the cities. In addition, MDA8 is included to examine the joined effect of both HWE and MDA8 on increase mortality rates. Based on a previous study, the authors used an event-based risk analysis. First, the HWE are iteratively detected using a sequence of thresholds. Then, regression analysis are applied to

evaluate the influence of the predictors (derived from the magnitude of the HWE and MDA8) on the variability of mortality rates. As expected, they found a significant contribution from HWE to mortality rates, as well as the strength of interaction HWE and MDA8. The results indicated that this effect was more pronounced in some specific cities (e.g. Berlin, Cologne). By using a simple methodology the results presented here are consistent with previous studies. Overall, the paper is well written and the methods and results are well presented and clear. The results are not totally surprising, but I think it provides important information regarding the definition of HWE on the basis of different thresholds and the impacts on mortality rates. In my opinion it will be of interest to the reader of NHESS. I have some minor comments that the authors should be able to address.

Specific comments

1. I have a comment regarding the period of the analysis. The study is performed to annual time series, and the authors tested long-term annual trends. But, given the strong seasonality of MDA8, which usually reaches the highest values in summer, I would expect the most important interaction HWE and MDA8 in summer. Did the authors take into consideration this?

2. Line 83: The analysis of HWE is based on daily average of air temperature (TA), and I understand that as in other studies, TA can be a suitable predictor. However, I was wondering if the authors have tested maximum temperature instead.

3. Line 233. In Berlin, it is observed a higher contribution from MDA8M at the lower TAThres, which is somehow surprising, since I would expect a higher contribution from MDA8 at higher TAThres. Why? The authors mention that it could due to stagnant conditions (dry, sunny days..) in early summer, but this is only observed in Berlin, do the authors have further explanations?

Technical corrections:

1. Line 128. It should be 0.5 °C.

2. Line 173. "Except for Berlin and Cologne, r2 is < 20 % for HWE with TAThres < 95th percentile", is that correct? I can see from figure 2 that r2 is larger for lower TAThres.

3. Line 180. "these HWE can partly explained", it should be "these HWE can be partly explained"

4. Line 228. "MDA8 explains more of the mortality rate at low TAt hres than TAMsg". I think it should be added where (e.g. Berlin), and refer to the figure to help the reader.

5. Line 230. As in my previous comment: "A lower TAThres captures more HWE..." where? All cities?

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