

# ***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 #2**

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The study examines the impact of hot weather episodes (HWE) on mortality counts for various German cities. Besides, the effect of ground-level ozone concentrations was taken into account. Multiple Linear Regressions with variable thresholds were used to establish the association between HWE and mortality counts. The study does not present a novel methodology (the approach has been published already in Scherer et al., and been applied by Fenner et al. and Jänicke et al.), nor does it reveal substantial new insights into the topic (the well-known relationships between heat and mortality). However, since the study gives temperature thresholds/ percentiles of strongest heat-

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mortality connection for the cities under investigation it might be of value for some readers. In order to provide this information accurately, more details have to be given to the choice of the methods.

Specific comments: A major concern is related to the choice of Multiple Linear Regression (MLR) and the fact that all conclusions are based on the MLR test statistics assuming a normal distribution of the data. Crude mortality rates usually do not follow a normal distribution. If they do, please show results of normality testing. Mortality rates are count data and a Poisson distribution can be used as underlying distributional assumption in the scope of generalized linear models.

Furthermore, some of the conclusions have to be reconsidered. At page 11, lines 2018-2019 it is stated that the effect of air temperature on mortality is stronger in comparison to the effect of ozone. I disagree with this conclusion, because only events with high temperature have been selected and MLR is tuned towards this variable. These events do not necessarily go along with the ozone concentrations relevant for mortality. At lines 228ff. you notice that a lower TAThres captures more HWE in which air temperature is relatively low, but ozone concentrations can reach high values. This suggests that the typical non-linear relationship between temperature and ozone has an impact within your analysis. This should also be further investigated.

Technical corrections:

General comment: English should be revised by a native speaker.

Page1, line 21: replace “excessive mortality rates” by “excess mortality rates”.

Page2, line 28: Please add NOx as further precursors.

Page2, line 50: replace “exposition” by “exposure”. Page 5, line 127: remove “Firstly”.

Section 2.2.2: add results of the F-test of the overall significance of the regression models.

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Page 7, line 180: correct to “can partly be explained”

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