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### [Abstract Title]

The Relationship between Temperature-Days and Mortality in China and Future Mortality Prediction

### [Abstract]

Based on panel data and semi-parametric regression method, we divided the temperature into ten categories to calculate the number of days in these categories from 2000 to 2015 in all regions of China, and established the relationship model between temperature-days and mortality. The results show that there is a significant correlation between the two. Compared with the temperature-days in 80-90°F, one more temperature day in >90°F, 70-80°F and 50-60°F that the mortality rate will increase by 0.023, 0.017 and 0.016 per 1,000 respectively. Based on this relationship model and NEX-GDDP dataset (21 different climate model data under the RCP4.5 and RCP8.5 scenarios), the mortality rate in different regions of China from 2006 to 2050 was simulated and predicted. The results suggest that, under the RCP4.5 scenario, 25.1% regions' mortality rate will increase, which are mainly located in the western China, including Tibet, Qinghai, Inner Mongolia, Gansu, etc. While the regions' mortality rate will decrease that are mainly located in the eastern China and most of Xinjiang. Regions with uncertain changes of mortality rate are scattered in the West of China. Under the RCP8.5 scenario, the distribution pattern is the same



as RCP4.5, but the regions with lower mortality rate will increase slightly in the future. Generally speaking, the future global warming has little impact on the mortality in China. However, it will make the mortality rate of western region, which has high mortality much higher in the future.

**[Keywords]**

Temperature-days, Mortality, Semi-parametric regression, NEX-GDDP