CLIMATE CHANGE AND HEAT-RELATED MORTALITY IN BUDAPEST - COMPARATIVE METHODS OF IMPACT ESTIMATION OF TEMPERATURE CHANGE

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Background and Aims: Regional climate models (RCM) allow to assess health impacts. The authors studied how climate-change modify heat-related mortality by different validation methods.
Methods: We assessed 1961-1990 and 2021-2050 heat-related mortality impacts in Budapest by applying temperature projections from 20 RCMs (ENSEMBLES project) and for validation the Budapest station data of the Hungarian Meteorological Service. Based on a previous study, daily mortality increases by 1.03(1.02-1.05) cases/1^{o}C increase resp. by 1.06(1.04-1.07) in the age groups of <75 resp. ≥75-year old population on days with mean temperature above 95% percentile.
Four computation methods were used: only reference and scenario of climate models; observed data compared to scenarios; assuming that excess mortality occurred on equal number of days, resp. assuming the same number of excess deaths occurrred in the observed and reference datasets.
Results: In three models 95% percentile daily mean temperature of the reference period was higher than the maximum values of observed data; in two models the maximum temperature of predicted future was less than the observed maximum. The number of hot days above threshold temperature (23.9^{o}C - 548 days) in observed data fell between 49-1787 days in the reference data. Increase of excess mortality due to climate change was between 16-780%, 7-680% , 21-314%, 21-320% in the computation models. In the last model the yearly heat-related excess mortality was 87(58-145) resp. 174(116-203) in the younger vs. older age group in 1961-1990. The yearly excess mortality predicted by the models will be between 106-366 resp. 212-733 for the younger resp. older age groups between 2021-2050.
Conclusions: When the effect of heat can be modelled for the real past period, the validation should be based on it to produce more reliable prediction.
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