

MODELLING OF THE ASSOCIATION OF HEALTH IMPACTS OF EXPOSURE TO 2007-HEATWAVE AND THE EFFECT MODIFIERS AT SMALL AREA LEVEL IN HUNGARY

Anna Paldy, National Institute of Environmental Health Budapest, Hungary

Attila Juhasz, Public Health Organization of Government Office of the Capital City Budapest, Hungary

Janos Bobvos, Research group "Adaptation to climate change" of the Hungarian Academy of Science, Hungary

Csilla Nagy, Public Health Organization of Government Office of the Capital City Budapest, Hungary

Background and Aims: There is few evidence of the association between socio-economic factors and human adaptive capacity to climate change. The authors studied, whether the 2007 heatwave had different health impacts on sub-regional levels.

Methods: Daily total and cardiovascular mortality data were gained from the Central Statistical Office. The daily mean temperature data at 25km grids were derived from the European Climate Assessment & Dataset. Using Kriging, a continuous surface was interpolated from grid data to predict a daily mean temperature surface across the country for every summer day in 2007. Time clusters of mortality were studied by SatScan, excess mortality at small area level by Rapid Inquiry Facility module of ArcGis, the association between mortality, temperature, socioeconomic factors by spatial regression analysis using WinBUGS. Age-specific national death rates were used for standardized mortality rates. Small-area factors were defined by using population-weighted averages of temperature, socio-economical factors.

Results: A time cluster of daily mortality was identified between 18-25th July for the total and ≥ 50 years population. A 30% of excess mortality was detected during the heat wave period compared to the summer mortality rates excluding the heat wave period. Risk of excess total mortality (SMR 1.78) was the highest on the hottest day. No significant differences were seen in the spatial distribution of excess mortality, spatial fraction was 0.2086. A significant association was detected between excess mortality (for both causes) and socioeconomic status adjusted for density of population, whilst there was no statistically significant association between excess mortality and population density adjusted for deprivation.

Conclusions: During the heatwave high temperature, regardless to spatial differences, caused significant excess mortality, the impact was modified by socio-economical status.

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