



Trends in the effects of hot spells on mortality in central Europe: adaptation to climate change?

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Europe has recently been affected by several long-lasting and severe heat waves, particularly in July-August 2003 (western Europe), June-July 2006 (central Europe), July 2007 (southeastern Europe) and July 2010 (western Russia). The heat waves influenced many sectors of human activities, with enormous socio-economic and environmental impacts. With estimated death tolls exceeding 50,000, the 2003 and 2010 heat waves were the worst natural disasters in Europe over the last 50 years, yielding an example of how seriously may also high-income societies be affected by climate change.

The present study examines temporal changes in mortality associated with spells of large positive temperature anomalies (hot spells) in the population of the Czech Republic (around 10 million inhabitants, central Europe). Declining trends in the mortality impacts since 1986 are found, in spite of rising temperature trends. The findings remain unchanged if possible confounding effects of within-season acclimatization to heat and the mortality displacement effect are taken into account, and they are similar for all-cause mortality and mortality due to cardiovascular diseases. Recent positive socio-economic development, following the collapse of communism in central and eastern Europe in 1989, and better public awareness of heat-related risks are likely the primary causes of the declining vulnerability in the examined population (Kyselý and Plavcová, 2012).

The results are also consistent with those reported for other developed regions of the world (the US, western Europe, Australia) and suggest that climate change may have relatively little influence on heat-related deaths, since changes in other factors that affect vulnerability of the population are dominant instead of temperature trends. It is essential to better understand the observed non-stationarity of the temperature-mortality relationship and the role of adaptation and its limits, both physiological and technological, and to address associated uncertainties in studies dealing with climate change projections of temperature-related mortality. It is also obvious that impacts of major and unprecedented heat waves such as the 2003 heat wave in western Europe and the 2010 heat wave in Russia may far exceed estimates extrapolated from the observed relationships between thermal environment and human morbidity and mortality, and 'broke' the observed (positive) changes in time.

Reference:

Kyselý J., Plavcová E., 2012: Declining impacts of hot spells on mortality in the Czech Republic, 1986–2009: adaptation to climate change? *Climatic Change* 113: 437–453, doi 10.1007/s10584-011-0358-4.