

EFFECTS OF HOT AND COLD SPELLS ON CARDIOVASCULAR MORTALITY IN INDIVIDUAL POPULATION GROUPS

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Background and Aims: The study compares impacts of hot and cold spells on cardiovascular mortality in the population of the Czech Republic (Central Europe) over 1986-2006, and examines differences between individual population groups.

Methods: We use analogous definitions for hot and cold spells that are based on quantiles of anomalies of daily average temperature and do not incorporate location-specific thresholds. Epidemics of influenza/acute respiratory infections have been identified and corresponding periods excluded from the analysis in order not to confound results.

Results: We find that both hot and cold spells are associated with significant excess cardiovascular mortality, but there are considerable differences: the effects of hot spells are more direct (unlagged) and typically concentrated on a few days of a hot spell, while cold spells are associated with indirect (lagged) mortality impacts that persist after the end of a cold spell. Although the mortality peak is less pronounced for cold spells, the cumulative magnitude of the excess mortality is larger for cold than hot spells. Differences between mortality impacts in males and females consist mainly in much larger excess mortality of females than males in hot spells, while more lagged effects in females than males in association with cold spells.

Conclusions: The comparison suggests that the relative importance of warm and cold temperature extremes depends on the population group (age and gender), and cold extremes are relatively more harmful in the middle-aged population while warm extremes in the elderly. For both hot and cold temperature extremes, preventive measures implemented by means of warning systems and biometeorological forecast alerts should take the varied effects in individual population groups into account. In the context of climate change, it is probable that reductions in cold-related mortality will be more important than possible increases in heat-related mortality, at least in developed countries that have capacities for reducing the negative effects of hot weather conditions.