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Winter-time mortality in the Czech Republic in relation to weather

L. Pokorná, J. Kyselý

Institute of Atmospheric Physics, Academy of Sciences of the Czech Republic, Prague (pokorna@ufa.cas.cz)

Human morbidity and mortality is influenced by weather conditions. Episodes of both extremely hot and cold temperatures increase mortality, and time-series analyses show associations between weather and mortality across a range of temperatures. Mortality exhibits a strong seasonal cycle in mid-latitudes, with winter mortality rates significantly elevated relative to summer. Up to now, most studies have focused on relations between weather and mortality in warm season when these links are less obscured by confounding factors (e.g. influenza and acute respiratory infections), and relationships between weather and mortality in winter have been studied less frequently.

The aim of this paper is to identify links of mortality to winter temperature and extreme weather conditions in the Czech Republic. Daily total (all-causes) mortality and mortality due to cardiovascular diseases in the entire population of the Czech Republic are examined, separately for genders and individual age groups. The analysis covers months from November to March of the period 1986-2005. Estimates of mortality due to influenza/acute respiratory infections during large outbreaks are used to adjust the daily mortality data, in order to suppress their influences on results. Excess daily mortality is established, separately for total mortality and mortality due to cardiovascular diseases and for each age group and gender, by calculating deviations of the observed number of deaths from the expected number of deaths for each day of the examined period. The expected number of deaths takes into account effects of the long-term trend in mortality, the annual cycle and the weekly cycle. The influence of maximum, minimum and mean daily temperature, as well as average daily wind chill index on excess mortality is investigated. We focus on discussing some of the previous results reported on weather-mortality links in winter: (i) maximum impacts of extremely low

temperatures on total mortality occur 7-8 days after a temperature extreme, (ii) mortality during the extremely cold days is higher than average, (iii) total mortality during the cold spells increases as they occur later in winter, (iv) the highest mortality rates occur in the elderly and (v) differences between genders are relatively minor in winter.

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