

Kyselý J., Kříž B., 2003: High summer temperatures and mortality in the Czech Republic in 1982-2000. *Epidemiol. Mikrobiol. Imunol.* (in press) [in Czech, with summary in English]

The heat-stress-related mortality, which is among main impacts of periods of high summer temperature on society, was reported in many European countries but analyses focusing on central European population have been rare. Results of the analysis for the period of 1982-2000 in the Czech Republic indicate that heat stress leads to a considerably increased all-causes mortality and mortality due to cardiovascular diseases. Periods with the highest deviations of the daily number of deaths from a baseline (in all-year data) are influenza epidemics and heat waves; the distribution of days with the highest excess mortality in a year is clearly bimodal, showing a main peak in winter and a secondary one in summer. Summer days with a considerably increased mortality are almost entirely days with a positive temperature deviation from the seasonal course. Deviations of mortality from the baseline exceed 100 deaths daily (more than 30% relative increase) in heat wave peaks, and the excess total mortality during the severe 1994 heat waves was +456 deaths (+10.3%) for June 17 to 30, and +598 deaths (+12.3%) for July 24 to August 8. The relative increase in mortality due to cardiovascular diseases was even more pronounced. The mortality displacement effect played an important role since it was estimated to account for as much as 52% of the total number of victims for the June 1994 heat wave and 48% for the July-August heat wave. People who would die soon without oppressive weather conditions make about half of the total number of deaths, which is a larger value compared to what other studies reported. The increased mortality is observed at maximum (average, minimum) daily temperatures higher than 25°C (18°C, 14°C) and their anomalies from mean seasonal courses larger than 3°C. The same values hold for both the total and cardiovascular mortality. The mortality response at high temperatures is more pronounced in females than males. Correlations between mortality and temperature variables (including heat index) are positive and statistically significant ($p=0.01$), stronger for deviations of meteorological variables from seasonal courses than for raw values, in females than males, and for heat index than for any temperature variable and summer summer index. The unlagged correlations are stronger than correlations with lags 1-3 days; positive values of correlation coefficients hold for lags 0 to 3 days only while at lags of 4 to 25 days, the link is negative (mostly statistically significant) which demonstrates the mortality displacement effect and its time extent.