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Heat- and cold-stress effects on cardiovascular mortality and morbidity among urban and rural populations in the Czech Republic

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Several studies have examined heat- and cold-related cardiovascular (CVD) mortality in the Czech Republic. Much less is understood about heat- and cold-related CVD morbidity and possible regional differences. This study compares heat- and cold-stress effects on excess CVD mortality and morbidity in the city of Prague and a rural region of southern Bohemia over 16-year period (1994–2009). Population size and age structure are similar in the two regions. Excess mortality (number of deaths) and morbidity (number of hospital admissions) were determined as differences between observed and expected daily values, the latter being adjusted for long-term changes, annual and weekly cycles, and epidemics of influenza/acute respiratory infections. Several methods for identifying days and spells of days with heat and cold stress are applied, including Physiologically Equivalent Temperature (PET) and the Universal Thermal Climate Index (UTCI).

Generally higher relative excess CVD mortality on warm days was identified in Prague, while on cold days we found higher excess CVD mortality in the rural region of southern Bohemia. In contrast to mortality, weak excess CVD morbidity was observed for both warm and cold days. The differences between Prague and the rural region of southern Bohemia indicate a possible influence of urban heat island effect in Prague together with other factors such as long- and short-term exposure to air pollution, different lifestyle, or different population, which may result in differing vulnerability to heat and cold stress.