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Connections of urban and rural mortality with daily weather in Hungary (1971-2005)

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Possible effects of weather anomalies on mortality in cardiovascular and respiratory illnesses are investigated in Hungary. Long-term (1971-2005) archives of ca. 2.8 million fatalities are analysed. The mortality data are compared with seven diurnal meteorological parameters. They are the mean, maxima and minima of temperature, cloudiness, wind speed, relative humidity and sea-level pressure. Since the statistical connections between the mortality frequencies and the latter variables are weak and non-linear in some cases, we also applied four different circulation types in comparison with the diurnal fatalities. All investigations are performed for Budapest, with its ca. 2 million urban dwellers (the 'city') and for the other parts of the county (the 'rural control'), populated by over 8 million inhabitants. Our results support the well-known decreasing effect of temperature in winter) and increasing effect (in summer) on cardiovascular mortality in the rural environment. On the other hand, however, this latter effect for summer is not at all evident in Budapest. Higher temperature in winter statistically coincides with lower number of respiratory fatalities both in the urban and the rural communities. Connections with the different circulation types are less unequivocal, but proportion of significant effects is 2-3 times higher than a random occurrence. Majority of these significant connections fit our a priori guess relations, but it is still not clear why these significant effects of macro-circulation are so hectically changing between significant and non-significant effects, both in the city and out of it.
Key words: mortality, cardiovascular and respiratory illnesses, weather effect, macro-synoptic types, Hungary