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# Impacts of the 2015 Heat Waves on Mortality in the Czech Republic

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This study aimed to assess the impacts of heat waves during the summer of 2015 on mortality in the Czech Republic and to compare them with those of heat waves back to the previous record-breaking summer of 1994. We analyzed daily natural-cause mortality across the country's entire population. A mortality baseline was determined using generalized additive models adjusted for long-term trends, seasonal and weekly cycles, and identified heat waves. Mortality deviations from the baseline were calculated to quantify excess mortality during heat waves, defined as periods of at least three consecutive days with mean daily temperature higher than the 95th percentile of annual distribution. The summer of 2015 was record-breaking in the total duration of heat waves as well as their total heat load. Consequently, the impact of the major heat wave in 2015 on the increase in excess mortality relative to the baseline was greater than during the previous record-breaking heat wave in 1994 (265% vs. 240%). Excess mortality was comparable among the younger age group (0–64 years) and the elderly (65+ years) in the 1994 major heat wave while it was significantly larger among the elderly in 2015. The results suggest that the total heat load of a heat wave needs to be considered when assessing its impact on mortality, as the cumulative excess heat factor explains the magnitude of excess mortality during a heat wave better than other characteristics such as duration or average daily mean temperature during the heat wave. Comparison of the mortality impacts of the 2015 and 1994 major heat waves suggests that the recently reported decline in overall heat-related mortality in Central Europe has abated and simple extrapolation of the trend would lead to biased conclusions even for the near future. Further research is needed toward understanding the additional mitigation measures required to prevent heat-related mortality in the Czech Republic and elsewhere.