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Airport and city-centre temperatures in the evaluation of the association between heat and mortality.

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A variety of ambient exposure indicators have been used to evaluate the impact of high temperature on mortality and in the identification of susceptible population sub-groups, but no study has evaluated how airport and city centre temperatures differ in their association with mortality during summer. This study considers the differences in temperatures measured at the airport and in the city centre of three Italian cities (Milan, Rome and Turin) and investigates the impact of these measures on daily mortality. The case-crossover design was applied to evaluate the association between daily mean apparent temperature (MAT) and daily total mortality. The analysis was conducted for the entire population and for subgroups defined by demographic characteristics, socioeconomic status and chronic comorbidity (based on hospitalisation during the preceding 2 years). The percentage risk of dying, with 95% confidence intervals (95% CI), on a day with MAT at the 95th percentile with respect to the 25th percentile of the June-September daily distribution was estimated. Airport and city-centre temperature distributions, which vary among cities and between stations, have a heterogeneous impact on mortality. Milan was the city with the greatest differences in mean MAT between airport and city stations, and the overall risk of dying was greater when airport MAT (+47% increase, 95%CI 38-57) was considered in comparison to city MAT (+37% increase, 95%CI 30-45). In Rome and Turin, the results were very similar for both apparent temperature measures. In all cities, the elderly, women and subjects with previous psychiatric conditions, depression, heart and circulation disorders and cerebrovascular disease were at higher risk of dying during hot days, and the degree of effect modification was similar using airport or city-centre MAT. Studies on the impact of meteorological variables on mortality, or other health indicators, need to account for the possible differences between airport and city centre meteorological variables in order to give more accurate estimates of health effects.