

ARE HEAT PREVENTION PROGRAMS EFFECTIVE? A PRE-POST ANALYSIS OF THE EFFECT OF TEMPERATURES ON MORTALITY OF THE ELDERLY IN 16 ITALIAN CITIES

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Background and Aims: Since 2004, Heat Health Warning System (HHWWS) and heat prevention programs have been implemented in Italy. This study evaluated changes in the impact of temperature on summer mortality among elders, before and after the introduction of heat plans.

Methods: We analyzed daily all-cause mortality of 65+ years old residents in 16 Italian cities with an active HHWWS at summer 2004. Studied years were 1996-2002 and 2006-2009 for the period preceding and following the HHWWS start, respectively. Exposure was defined as the difference between maximum apparent temperature (tappmax) and a city-specific threshold (90th percentile of June; range 29.9°-35.2°). The lag for exposure was defined for each city using a constrained distributed-lag model. We performed a non-linear city-specific analysis using a generalized Poisson equation, with a penalized cubic smooth function with 6 df for exposure. We predicted the percent (%) change in mortality for three-degree step variations in the exposure. We used a random effect meta-analysis to produce the overall estimate.

Results: No differences in the overall percent increase in mortality were observed between the two periods for increases in the tappmax below the threshold. On the other hand, above this point a significant reduction in the effect of heat was observed in the post-period. An increase in tappmax over the threshold of 3° C was associated with a %change in the pre and post period of 16.73% (IC95%:13.90–19.56) and of 5.26% (IC95%:3.14–7.38), respectively. The reduction was greater when considering more extreme temperatures, ranging from +46% for temperature around the threshold to +70% for higher values.

Conclusions: The study shows a reduction in the effect of high temperature on mortality, when HHWWS are activated, suggesting that heat prevention programs can mitigate the impact of heat on health. Alternative explanations should be evaluated, including use of air conditioning.