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Cold spell effect on daily mortality in districts in Madrid considering sociodemographic variables

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Background:
While there is much research that focuses on the association between cold spell and their impacts on daily mortality at the city level, we analyze the impact related to social context and demographic variables at levels lower than the municipal.

Methods:
The objective of this study was to determine the role of the percentage of people over age 65, income level and percentage of homes without heating in the analysis of the impact of cold waves on daily mortality between January 1, 2010 and
December 31, 2013 in different districts of the municipality of Madrid. We calculated Relative Risks (RR) and Attributable Risks (RA) for each of 17 districts to determine correlations between the effect of cold waves and daily mortality due to natural causes (CIEX: A00-R99) using Generalized Linear Models (GLM) of the Poisson family (link log). The pattern of risks obtained by district was analyzed using binomial family models (link logit), considering socioeconomic and demographic variables.

**Results:**
In terms of results, an impact of cold on mortality was detected in 9 of the 17 districts analyzed. The analysis of risk patterns revealed that the probability of detecting an impact in a district increases in a statistically significant way (p-value <0.05) with a higher percentage of homes without heating systems and a higher percentage of population over age 65.

**Conclusions:**
The results obtained identify the factors that should be considered in public health policies that target the district level to reduce the impact of cold waves.

**Key messages:**
- Ageing and the absence of heating systems are key variables which explain vulnerability to cold spell.
- Cold spell related mortality risks can be reduced by applying prevention health public plans.