Statistical analyses

Age-adjustment procedure

To estimate age-adjusted relative risks of mortality and their trends in the study period, in the 2,218 Spanish small areas, we previously computed E_{it}, the expected count of a specific cause of death for ith area and tth 3-year time-period, based on internal age-specific "reference rates" calculated from the data. Subsequently, a space-time model employing an empirical bayes method was fitted for (D_{it}, E_{it}), the pairs of observed and expected counts of each specific cause of death, for each area i = 1, ..., 2,218 and for each 3-year time-period t = 1984-1986, ..., 2002-2004. The reference rates used to compute expected counts, E_{it}'s, were obtained from a GEE (Generalised Estimating Equation) Poisson regression model with eighteen 5-year age group indicators as covariates (0-4, 5-9, ..., 80-84, 85+) (25). The GEE Poisson regression and empirical Bayes method were applied to each specific cause of death of each sex.

Similarly, to study the geographical distribution of relative risk of mortality in 2,218 areas of Spain jointly with the census tracks units of the cities analysed, we computed previously expected causes of death using the GEE Poisson regression model.

It should be noted that, in order to handle the confounding effect of age, we opted for the prior calculation of expected death counts. This approach greatly reduced computational time for the estimation process, compared to the method of including age in the bayesian model.