SHORT REPORT

The geography of the highest mortality areas in Spain: a striking cluster in the southwestern region of the country

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Mortality inequalities across geographical localities have been well documented in various developed countries. Our research in Spain has shown that mortality inequalities at the small area level are a widespread phenomenon. Here we report a striking observation in Spain.

METHODS

To assess the mortality risk by locality, we estimated age-adjusted relative risk of death by gender in each of the 2218 small areas of the country using a non-parametric empirical Bayes method. To determine areas with “significantly increased risk” a Poisson based score test was used.

Results: Mapping of the highest risk areas showed a striking geographical clustering in the southwestern region of the country. This region, comprising 8% of the Spanish population, accounts for about one third (2884 deaths) of the total excess mortality.

Main messages

- Small area studies are a valuable tool to identify areas with the highest mortality.
- Mapping of the highest risk areas revealed a striking geographical clustering in the southwestern region of Spain.
- These high risk areas have a statistically significant increased risk of death which imposes a large public health burden.

Policy implications

- Results suggest the need for in-depth multidisciplinary investigations of various potentially damaging environmental, occupational, and social risk factors on mortality.
- Findings have important implications for health policy, suggesting that high risk areas should be the highest priority of public health policies in Spain.

Mapping of the highest risk areas reveals a striking geographical clustering in the southwestern region of the country. For men, half of the areas (n = 88) with the highest mortality levels are located in the southern region of Andalusia; a third (n = 60) are in the southwest provinces of Huelva, Seville, and Cadiz (fig 1). For women, a little less than half of the areas (n = 98) are in the region of Andalusia; a quarter (n = 56) are located in the same three provinces (fig 2). Among the 152 small areas located within the three provinces, 60 areas (40%) for men and 56 areas (37%) for women are in the highest mortality levels. Huelva, Seville, and Cadiz, comprising 8% of the Spanish population, account for about one third (2884 deaths) of the total excess mortality.

**DISCUSSION**

The clustering of the worst mortality areas in the southwestern region of Spain, especially in the provinces of Huelva, Seville, and Cadiz, for both men and women, is consistent and astonishing. The data reveal that these “dangerous” areas have a statistically significant increased risk of death that imposes a large public health burden which urgently demands attention and action.

This result raises a number of important research questions: What does it mean to have a regional clustering of such worst areas? What is the significance of both men and women sharing many of the worst areas in the same region? Why can such clustering occur? This analysis does not show the causes of this clustering of increased mortality. Some evidence exists, however, that in some of these areas there is a high level of damaging environmental (for example, river transported heavy metals and urban air pollutants), occupational (for example, asbestos), and social factors (for example, unemployment and overcrowding) which may increase the risk of death.

Our results should lead to in-depth multidisciplinary investigations of various individual and contextual potentially important environmental, occupational, and social risk factors on mortality. In addition, the results also have important implications for health policy, suggesting that these mapped high risk areas should be the highest priority of social and public health policies in Spain. Researchers and policy decision makers are called to pay attention to these findings.

**REFERENCES**

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