

# Heat now more lethal than cold for people with respiratory diseases in Spain

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A new study by the Barcelona Institute for Global Health (ISGlobal), a center supported by the la Caixa Foundation, has analyzed deaths linked to respiratory disease in Spain between 1980 and 2016. The study, which

analyzed data on more than 1.3 million deaths, found that the seasonality of temperature-attributable mortality from respiratory diseases has shifted from the coldest to the hottest months of the year. The authors concluded that the decrease in temperature-attributable mortality during the winter months is driven not by the rising temperatures associated with climate change, but by the adaptation of the population to lower temperatures.

The study, published in *Nature Communications*, analyzed daily [temperature](#) data and mortality counts from respiratory diseases—disaggregated by sex, age group and place of residence—from 48 Spanish provinces. Analysis of the data on mortality due to respiratory diseases revealed an average decline in deaths of 16.5% per decade for the colder months compared to relatively stable figures for the warmer months of the year over the 37-year study period. Temperature-attributable deaths from respiratory diseases went from being most frequent in January and December to reaching their peak in July and August.

"Two or three decades ago, respiratory diseases caused by low temperatures represented an additional risk of death in Spain," said lead author Hicham Achebak, a researcher at ISGlobal and the Autonomous University of Barcelona's Centre for Demographic Studies. "The findings of this study show that this risk has gradually been declining. Thanks to adaptive measures, such as the more widespread use of heating and improved treatment of these conditions, respiratory [disease](#) mortality is no longer driven by cold temperatures and we are seeing a complete reversal in the seasonal cycle."

Although this inversion was observed across all sex and age groups, there were differences between the groups. Vulnerability to heat increased with age and was greater in women than in men. Conversely, the effects of cold decreased with age and were less pronounced in women than in

men, although the differences between groups were much less striking in this case. "In the later years of our study period, the differences in mortality risk between groups were almost imperceptible for cold temperatures, whereas the differences for the summer months were significant," said ISGlobal researcher Joan Ballester, co-author of the study. "These observations reflect a remarkable process of adaptation to cold, but not to heat."

## Climate Change and Health Policy

Climate change is associated with numerous health effects. Extreme temperatures, for example, correlate with cardiovascular and respiratory diseases. "This study shows that the projected decrease in the number of cold days due to [global warming](#) over the coming decades will not contribute to a further reduction in [mortality](#) from [respiratory diseases](#)," said Achebak.

"Deaths attributable to hot or [cold temperatures](#) are caused by a combination of exposure to [extreme temperatures](#) and the vulnerability of the population," explained Ballester. "Reducing this vulnerability may require policies associated with socioeconomic development, such as those aimed at improving health services."

**More information:** Hicham Achebak et al. Reversal of the seasonality of temperature-attributable mortality from respiratory diseases in Spain, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-16273-x](https://doi.org/10.1038/s41467-020-16273-x)

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