

Paris, 30 March 2015

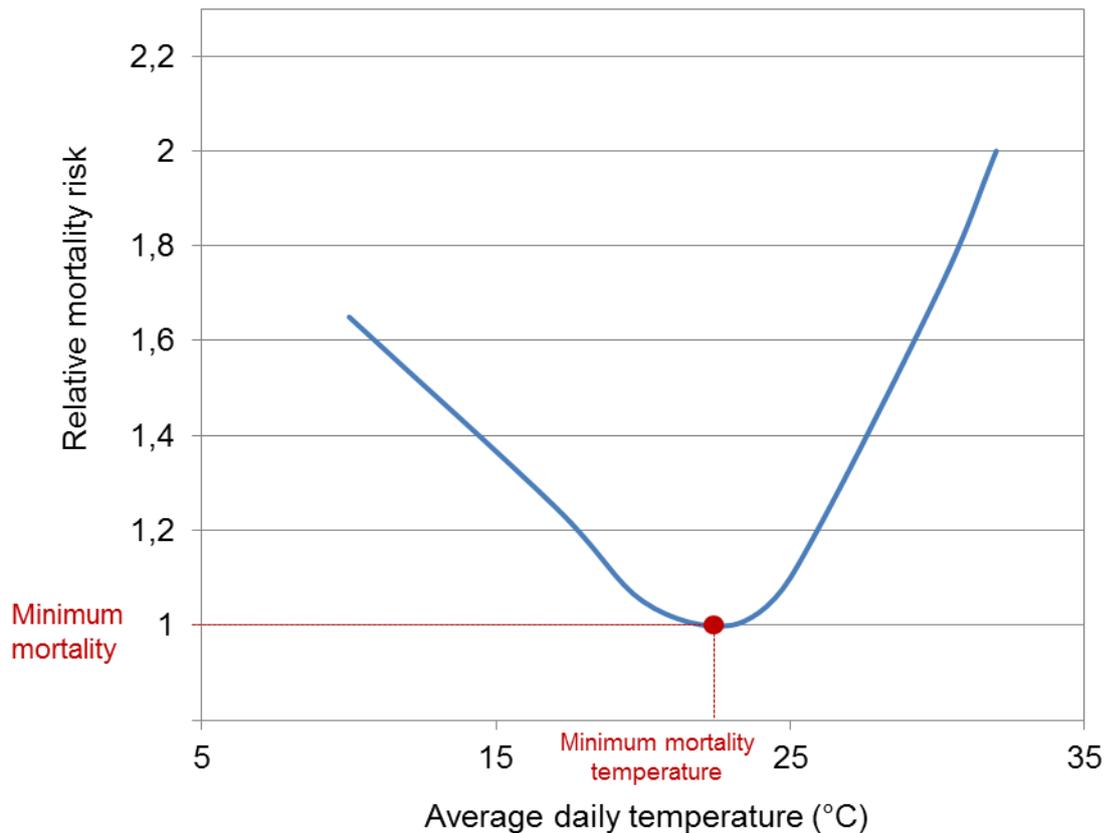
In 40 years the French have adapted their behaviour to climate change.

Against the current background of global warming, the relationship between the temperature and mortality is taking on a totally new significance. Are we getting used to rising temperatures over the years? This is the question that researchers in the Inserm Unit 1169 team 'Epigenetics and Environment' (Inserm/CEA/Paris-South University) are trying to answer. By analysing the link between the mortality of the elderly and daily temperature in France over 42 years, the scientists are providing evidence of our ability to adapt to temperature changes over time. This work is published in [Environmental Health Perspectives](#).

During recent decades, the rise in temperatures has already been observed in France. Furthermore, climatic model forecast that this warming will continue in future years. This observation raises the question of our ability to acclimatise to these changes.

When we plot the change in mortality against temperature on a given day, the graph obtained is generally a parabola ('U'-shaped). The lowest point of this curve is reached for a given value: the minimum mortality temperature (MMT), or the temperature at which the death rate is lowest. Nicolas Todd and Alain-Jacques Valleron based their analysis on these observations and on the examination of 16,000,000 death certificates¹ dated between 1968 and 2009.

¹ Collected by Inserm's CépiDc (*epidemiological centre for medical causes of death*) with authorisation from the French Commission for Data Protection (CNIL)



Example of a graph showing the change in the risk of death against temperature. When the relative risk of death is 1, the death rate is at a minimum. If it is equal to 2 for a given temperature, the risk of death at this temperature is twice as high.

"This study of the link between temperature and mortality covers not only the longest period (42 years) but also the largest number of deaths ever studied on the subject", emphasises Alain-Jacques Valleron, Emeritus Professor at the Pierre & Marie Curie University, and a member of the French Academy of Sciences.

To visualise the change in this relationship, the researchers divided this period into 3 parts: 1968 to 1981, 1982 to 1995 and 1996 to 2009. They quickly discovered that the minimum mortality temperature and the average temperature follow the same trend over these periods. During the 1968-1981 period (average temperature 17.6°C), the MMT rose to 17.5°C. In parallel, between 1982 and 1995 while the average temperature rose to 18.6°C, the MMT reached 17.8°C. Finally, from 1996 to 2009, the MMT followed the rise in average temperature (19.2°C) by reaching 18.2°C. These results suggest that the population has indeed been able to adapt to climate change.

"Although the mechanisms that explain this adaptation are not the purpose of this study, they are probably linked more to improvements in the insulation of homes, air-conditioning and preventive messages broadcast during heat waves than to physiological adaptation", explains the researcher, also formerly the director of two Inserm units.

Sources

Space-Time Covariation of Mortality with Temperature: A Systematic Study of Deaths in France, 1968-2009

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[Environmental Health Perspectives](#), 23 March 2015

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