

### **About the report methodology**

The data, climate models and analysis in this report reflect a conservative approach intended to produce the most accurate possible projections possible and to minimize the chance of over-inflating the mortality projections.

#### *Behavior changes in response to extreme heat*

Individuals change their behavior to reduce their exposure to extreme heat events, a change called acclimatization.<sup>1</sup> This analysis factors in acclimatization in generating the mortality projections. Ignoring acclimatization would produce mortality estimates about 25-30% higher than those presented in the study.

#### *The study assumes incremental temperature increases, rather than wild swings*

The study also leans toward conservative results because it assumes a relatively steady increase, with temperatures rising incrementally over the period of study. Actual warming is likely to be much more variable over the next several decades, with gradual increases punctuated by larger and more intense deviations from normal meteorological conditions. The climate projections for this analysis may not fully reflect the potential for these sudden temperature swings. Thus, the cities in this study may experience sudden intense heatwaves that go significantly beyond the “thresholds” developed for this analysis. This will possibly result in more heat-related mortality than the analysis projects.

#### *Population growth is removed from the analysis*

The study clarifies the role of global warming on heat-related deaths by assuming that population does not change in coming decades. The mid-century mortality projections are therefore based on current population figures. Given that the U.S. population is likely to continue to grow, actual heat-related mortality would also be likely to be greater than presented in this study, depending on the changes in individual cities.

#### *The climate change scenario used in the analysis assumes slower emissions growth*

The emissions scenario used to project future climate, the IPCC’s “A2,” is one of several developed by the IPCC to reflect a “business-as-usual” path for climate change pollution. The IPCC’s other business-as-usual scenario, the “A1” scenario, assumes a faster rate of economic and technological growth and thus results in higher emissions of greenhouse gases, contributing a more upward pressure on temperatures. Use of an A1 scenario would likely have resulted in higher temperatures and thus higher heat-related mortality.

### **About the Report Authors:**

Applied Climatologists, Inc. is a corporation that specializes in evaluating the impacts of weather on a large variety of societal issues, including human health, plants and animals, and climate change problems. In addition, the company has developed a variety of indices and warning systems for clients in the public and private sector. The president, Dr. Laurence S. Kalkstein, has worked on climate impacts problems for over 30 years and has published well over 100 peer-reviewed manuscripts.

Some of the active clients of Applied Climatologists include, among others, the NOAA/National Weather Service, the U.S. EPA, the U.S. Forest Service, the Department of Health and Human Services, the California Air Resources Board, the Attorney General's offices of New York and California, the governments of Canada, Italy, and South Korea, the cities of Chicago, Philadelphia, San Jose, and others, several utility companies, a variety of NGOs, and private companies such as Swiss RE and Combe, Incorporated.

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<sup>i</sup> K. Knowlton *et al.*, "Projecting heat-related mortality impacts under a changing climate in the New York City region," *American Journal of Public Health*, in press (2007) and K. Hayhoe *et al.*, "Emissions pathways, climate change, and impacts on California," *Proceedings of the National Academy of Sciences*, 101:34 (2004), pp. 12422-427.