

Scientists find two ways to limit the number of heat-related deaths from climate change

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By the 2080s, as many as 3,331 people could die every year from exposure to heat during the summer months in New York City. The high estimate by Columbia University scientists is based on a new model—the first to account for variability in future population size, greenhouse gas trajectories, and the extent to which residents adapt to heat through interventions like air conditioning and public cooling centers. Results appear online in the journal *Environmental Health Perspectives*.

Researchers project that as many as 1,779 annual heat-related deaths could be avoided if the climate adheres to the more moderate of two greenhouse gas trajectories—known as representative concentration pathways 4.5 and 8.5. High levels of adaptation could save an additional 1,198 lives.

"We know climate change is creating more days of extreme heat, putting more people at risk for death in the coming decades," says first author Elisaveta P. Petkova, project director at the National Center for Disaster Preparedness at Columbia University's Earth Institute. "Our study shows that many of these deaths can be averted by limiting greenhouse gas emissions and pursuing measures to help people adapt to high temperatures."

"This model may be useful to advocates and policymakers as they pursue efforts to prevent the worst effects of [climate change](#)," adds senior author Patrick Kinney, director of the Climate and Health Program and

professor of Environmental Health Sciences at Columbia's Mailman School of Public Health.

Projections are based on more than a century of temperature, population, and mortality data for New York City in conjunction with climate projections for the 2020s, 2050s, and 2080s using a set of 33 validated models. The risk of dying from heat-related causes was relatively constant during the first part of the 20th Century, then decreased dramatically from the 1970s to the 2000s, during which time the portion of households with [air conditioning](#) more than doubled, from 39 percent in 1979 to 84 percent in 2003.

Since air conditioning already so pervasive in New York City, adaptation efforts may be at or near their maximum effectiveness, the researchers caution. On the other hand, they say the city could grow even more resilient due to the ongoing efforts to reduce the urban heat island effect—for instance through programs to install reflective roofs and plant trees, as well as to protect vulnerable populations through heat warning systems and the availability of cooling centers. Societal factors like gains in overall population health and economic security also promote adaptation.

The researchers say follow-up studies could explore questions such as what extent demographic changes—especially a larger population of older adults—will have on heat-related mortality, and the effect of specific interventions related to adaptation and [greenhouse gas](#) reductions.

According to a report by the New York City Panel on Climate Change (NPCC), mean temperatures in the city by the 2080s may bear similarities to those of a city like Norfolk, Virginia, today. The middle range of projections show temperatures increasing 5.3°F to 8.8°F by the 2080s. The total number of hot days, defined as days with a maximum

temperature at or above 90°F or 100°F, is expected to more than triple by the 2080s. Kinney and Petkova are both members of NPCC.

Provided by Columbia University's Mailman School of Public Health

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