

Global warming already responsible for one in three heat-related deaths

New estimates suggest Central and South America and South-East Asia most affected regions

[sciencedaily.com/releases/2021/05/210531120932.htm](https://www.sciencedaily.com/releases/2021/05/210531120932.htm)

Between 1991 and 2018, more than a third of all deaths in which heat played a role were attributable to human-induced global warming, according to a new article in *Nature Climate Change*.

The study, the largest of its kind, was led by the London School of Hygiene & Tropical Medicine (LSHTM) and the University of Bern within the Multi-Country Multi-City (MCC) Collaborative Research Network. Using data from 732 locations in 43 countries around the world it shows for the first time the actual contribution of human-made climate change in increasing mortality risks due to heat.

Overall, the estimates show that 37% of all heat-related deaths in the recent summer periods were attributable to the warming of the planet due to anthropogenic activities. This percentage of heat-related deaths attributed to human-induced climate change was highest in Central and South America (up to 76% in Ecuador or Colombia, for example) and South-East Asia (between 48% to 61%).

Estimates also show the number of deaths from human-induced climate change that occurred in specific cities; 136 additional deaths per year in Santiago de Chile (44.3% of total heat-related deaths in the city), 189 in Athens (26.1%), 172 in Rome (32%), 156 in Tokyo (35.6%), 177 in Madrid (31.9%), 146 in Bangkok (53.4%), 82 in London (33.6%), 141 in New York (44.2%), and 137 in Ho Chi Minh City (48.5%). The authors say their findings are further evidence of the need to adopt strong mitigation policies to reduce future warming, and to implement interventions to protect populations from the adverse consequences of heat exposure.

Dr Ana M. Vicedo-Cabrera, from the University of Bern and first author of the study, said: "We expect the proportion of heat-related deaths to continue to grow if we don't do something about climate change or adapt. So far, the average global temperature has only increased by about 1°C, which is a fraction of what we could face if emissions continue to grow unchecked."

Global warming is affecting our health in several ways, from direct impacts linked to wildfires and extreme weather, to changes in the spread of vector-borne diseases, among others. Perhaps most strikingly is the increase in mortality and morbidity associated with heat. Scenarios of future climate conditions predict a substantial rise in average temperatures, with extreme events such as heatwaves leading to future increases in the related health burden. However, no research has been conducted into what extent these impacts have already occurred in recent decades until now.

This new study focused on human-made global warming through a 'detection & attribution' study that identifies and attributes observed phenomena to changes in climate and weather. Specifically, the team examined past weather conditions simulated under scenarios with and without anthropogenic emissions. This enabled the researchers to separate the warming and related health impact linked with human activities from natural trends. Heat-related mortality was defined as the number of deaths attributed to heat, occurring at exposures higher than the optimum temperature for human health, which varies across locations.

While on average over a third of heat-related deaths are due to human-induced climate change, impact varies substantially across regions. Climate-related heat casualties range from a few dozen to several hundred deaths each year per city, as shown above, depending on the local changes in climate in each area and the vulnerability of its population. Interestingly, populations living in low and middle-income countries, which were responsible for a minor part of anthropogenic emissions in the past, are those most affected.

In the UK, 35% of heat-related deaths could be attributed to human-induced climate change, which corresponds to approximately 82 deaths in London, 16 deaths in Manchester, 20 in West Midlands or 4 in Bristol and Liverpool every summer season.

Professor Antonio Gasparrini from LSHTM, senior author of the study and coordinator of the MCC Network, said: "This is the largest detection & attribution study on current health risks of climate change. The message is clear: climate change will not just have devastating impacts in the future, but every continent is already experiencing the dire consequences of human activities on our planet. We must act now."

The authors acknowledge limitations of the study including being unable to include locations in all world regions -- for example, large parts of Africa and South Asia -- due to a lack of empirical data.

Story Source:

Materials provided by [London School of Hygiene & Tropical Medicine](#). Note: Content may be edited for style and length.

Journal Reference:

1. Vicedo-Cabrera, A.M., Scovronick, N., Sera, F. et al. **The burden of heat-related mortality attributable to recent human-induced climate change**. *Nat. Clim. Chang*, 2021 DOI: [10.1038/s41558-021-01058-x](https://doi.org/10.1038/s41558-021-01058-x)
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London School of Hygiene & Tropical Medicine. "Global warming already responsible for one in three heat-related deaths: New estimates suggest Central and South America and South-East Asia most affected regions." ScienceDaily. ScienceDaily, 31 May 2021. <www.sciencedaily.com/releases/2021/05/210531120932.htm>.