

Hot spots of scarcity

Extreme heat will kill more people as the world warms. Poorer countries will bear the brunt of that burden.

By Hana Kiroos / Map by Arthur Mount

Extrême heat kills. Your body works nonstop to keep its core temperature around 98 °F, but searing heat can push it beyond its ability to self-regulate. Your cardiovascular system works furiously to cool your body by redirecting blood flow, making heart attacks and strokes much more likely. And intense sweating can dehydrate organs so much they begin to fail.

Deaths from heatstroke will only grow as temperatures climb because of climate change. But the danger is not the same for everyone: poorer countries will suffer a far greater share of temperature-related deaths, even though richer countries are responsible for 90% of carbon emissions.

Late last year, leaders at COP27 agreed to establish a fund, which richer countries will bankroll, to compensate poorer countries for damages caused by climate change.

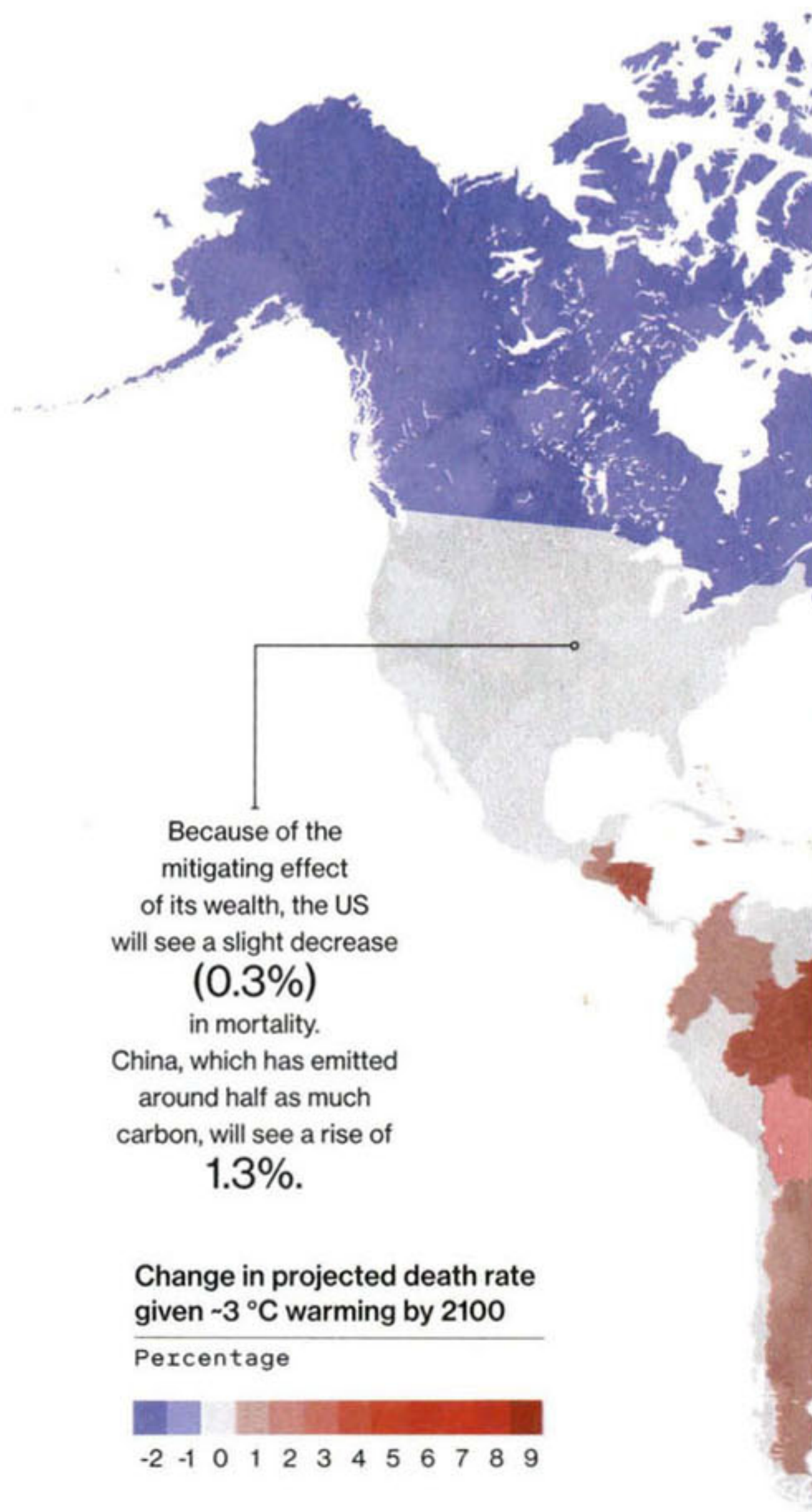
This map shows one aspect of that burden—how many more people heat will kill. The data here builds on work done in 2021 by R. Daniel Bressler, a sustainable-development researcher at Columbia University, and his colleagues. The researchers started with data from the United Nations that projects countries' crude death rates—the total number of deaths divided by the population—for the next 80 years. Those estimates don't consider how mortality could be affected by climate change. Bressler and his colleagues updated the figures, taking increased temperatures into account.

The team considered deaths caused directly by heat exposure—not by droughts, hurricanes, and disease, which are all fueled by rising temperatures. This map shows the group's projections for a “realistically bad” scenario, as Bressler puts it, where there's been some progress to curb greenhouse-gas emissions but global temperatures still rise around 3 °C by 2100.

Crucially, they found that the death rate depends not only on where a country is with respect to the equator but also on its wealth. When it feels as hot as 125 °F, turning on the AC or avoiding strenuous activity can be lifesaving. “If you're in a richer place, perhaps you could take a day off if it's a really deadly hot day,” Bressler says. “If you're in a poor place, you might not have that ability.”

Take Greece and Jamaica. The World Bank projects that the two countries will face similar hot weather in 2100. Without taking income into account, both are predicted to have the same increase in mortality—1.6%. But factoring in income cuts Greece's increase in death rate to just 0.09%, while Jamaica's will be 0.9%.

As the century marches on, heat-related deaths will only exacerbate poverty's already profound impact on mortality. A 30-year gulf already exists between the highest national life expectancy (about 85 in Japan) and the lowest (54 in the Central African Republic, where over 70% of the population lives below the international poverty line). ■



A world of difference

The 10 countries that will see the greatest death rate increase are all lower-income countries in Africa, Asia, or the Middle East.

Each of the hardest-hit countries produces less than 1% of the world's carbon emissions.

Colder, wealthier countries will fare better. Some will see a decrease in mortality, in part because there will be fewer cold-weather-related deaths.

Norway's death rate is predicted to **drop 1.2%** if the planet warms by -3°C , thanks to a decline in cold-related deaths.

By 2100, when factoring in income, Niger's death rate is projected to increase by an estimated **8.7%** if global temperatures rise by around 3°C —the greatest increase across all 163 countries studied.

Countries with greatest **INCREASE** in projected deaths by 2100

Rank	Country	Change (%)	Deaths per year by 2100
1	Niger	8.7	92,710
2	Mali	6.6	54,820
3	Chad	6.0	45,130
4	Pakistan	5.4	280,870
5	Iraq	5.3	53,010

Countries with greatest **DECREASE** in projected deaths by 2100

Rank	Country	Change (%)	Deaths per year by 2100
1	Norway	-1.2	-970
2	Finland	-1.2	-750
3	Iceland	-1.2	-50
4	Sweden	-1.0	-1,390
5	Canada	-1.0	-5,670