

# More than half a million global stroke deaths may be tied to climate change

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A changing climate may be linked to growing death and disability from stroke in regions around the world, according to a study published in the April 10, 2024, online issue of *Neurology*.

Researchers found over three decades that non-optimal temperatures, those above or below temperatures associated with the lowest death rates, were increasingly linked to death and disability due to stroke. The study does not prove that [climate change](#) causes stroke. It only shows an association. The study also did not examine other [risk factors](#) such as [high blood pressure](#) and [high cholesterol levels](#).

Researchers found that the majority of these strokes were due to lower than optimal temperatures, however they also found an increase in strokes tied to higher than optimal temperatures. With [lower temperatures](#), a person's blood vessels can constrict, increasing blood pressure. High blood pressure is a risk factor for stroke. Higher temperatures may cause dehydration, affecting cholesterol levels and resulting in slower blood flow, factors that can also lead to stroke.

"Dramatic temperature changes in recent years have affected human health and caused widespread concern," said study author Quan Cheng, Ph.D., of Xiangya Hospital Central South University in Changsha, China. "Our study found that these changing temperatures may increase the burden of stroke worldwide, especially in older populations and areas with more health care disparities."

For the study, researchers looked at 30 years of health records for more than 200 countries and territories. They examined the number of stroke deaths and burden of stroke-related disability due to non-optimal temperatures.

They then divided the data to look at different regions, countries and territories. They also looked at age groups and genders.

In 2019, there were 521,031 stroke deaths linked to non-optimal temperatures. There were also 9.4 million disability-adjusted life years due to stroke linked to non-optimal temperatures. Disability-adjusted

life years are the number of years of life lost due to [premature death](#) and years lived with illness.

When looking at low temperatures compared to high temperatures, they found that 474,002 of the total deaths were linked to low temperatures.

Researchers found that the rate of death from stroke from temperature changes for male participants was 7.7 per 100,000 compared to 5.9 per 100,000 for female participants.

When looking at regions, central Asia had the highest death rate for stroke linked to non-optimal temperatures with 18 per 100,000. At the national level, North Macedonia had the highest death rate with 33 per 100,000.

"More research is needed to determine the impact of temperature change on [stroke](#) and to target solutions to address health inequalities," Cheng said. "Future research should aim to reduce this threat by finding effective health policies that address potential causes of climate change, such as the burning of fossil fuels, deforestation and industrial processes."

**More information:** Chunrun Qu et al, Burden of Stroke Attributable to Nonoptimal Temperature in 204 Countries and Territories, *Neurology* (2024). DOI: 10.1212/WNL.0000000000209299 , [dx.doi.org/10.1212/WNL.0000000000209299](https://doi.org/10.1212/WNL.0000000000209299)

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