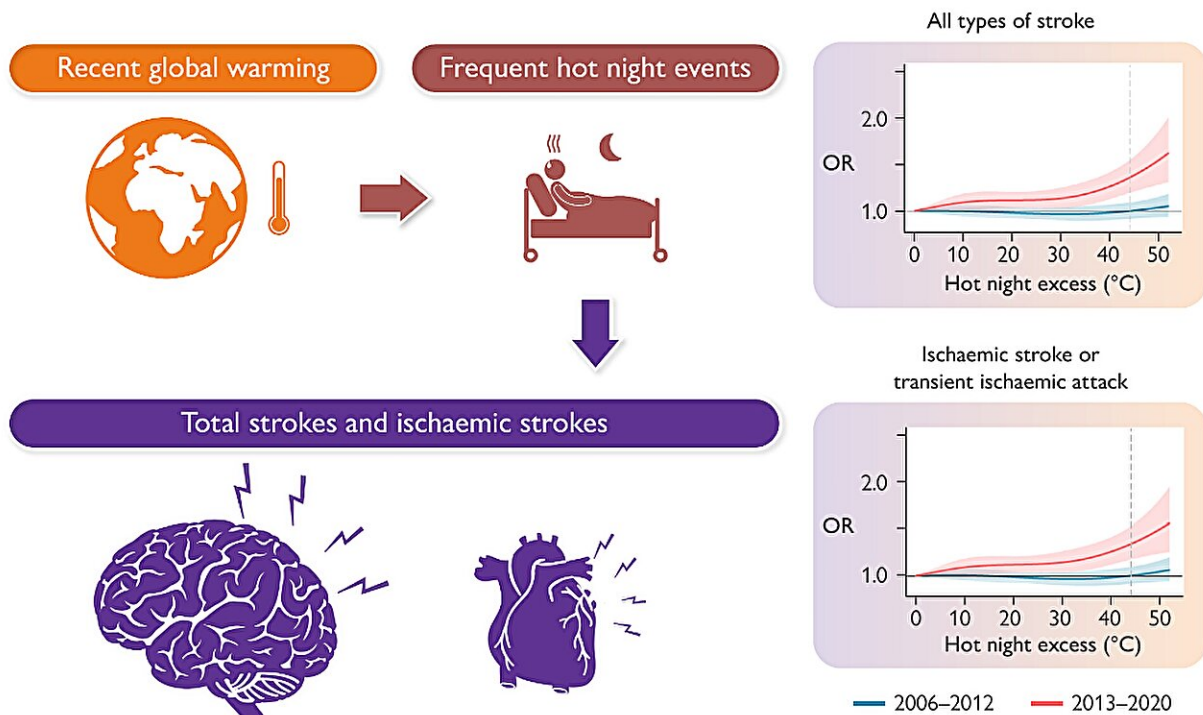


Nighttime heat significantly increases the risk of stroke, study shows

May 21 2024, by Verena Coscia



This 15-year time-stratified case-crossover study provides robust evidence that nighttime heat exposure is associated with increased stroke risk. Urgent action is needed through targeted prevention and urban planning interventions to mitigate its impact, particularly among vulnerable populations. Credit: *European Heart Journal* (2024). DOI: 10.1093/eurheartj/ehae277

In a recent study, researchers from Helmholtz Munich and the Augsburg

University Hospital led by Dr. Alexandra Schneider show that nocturnal heat significantly increases the risk of stroke. The findings can contribute to the development of preventive measures: With them, the population can better protect themselves against the risks of climate change with increasingly frequent hot nights. In addition, knowledge of the consequences of hot nights can improve patient care.

"We wanted to understand the extent to which high nighttime temperatures pose a health risk," says the head of the working group Environmental Risks at Helmholtz Munich. "This is important because [climate change](#) is causing nighttime temperatures to rise much faster than daytime temperatures."

Data on 11,000 strokes from 15 years

In their [study](#), published in the *European Heart Journal*, the researchers analyzed data from Augsburg University Hospital. Its Department of Neurology has collected data on about 11,000 strokes over 15 years. The analysis shows that extreme heat at night increases the risk of [stroke](#) by 7%.

"Elderly people and women are particularly at risk, and it is mainly strokes with mild symptoms that are diagnosed in clinics after hot nights," says the study's lead author, Dr. Cheng He. "Our results make it clear that adjustments in [urban planning](#) and the health care system are extremely important to reduce the risks posed by rising night-time temperatures."

"We were able to show that the risk of stroke associated with high nighttime temperatures increased significantly in the period 2013 to 2020 compared to the period 2006 to 2012," as Prof. Michael Ertl, head of the Stroke Unit and the neurovascular working group at Augsburg University Hospital, emphasizes. From 2006 to 2012, hot nights resulted

in two additional strokes per year in the study area; from 2013 to 2020, there were 33 additional cases per year.

Recommendations for adaptation strategies and urban planning

The researchers plan to make their findings applicable in practical settings. To this end, they are working on recommendations for public adaptation strategies and urban planning, such as reducing the intensity of urban heat islands. The aim is to better protect the population from the effects of nighttime heat.

The study will also serve as a basis for further research to develop targeted preventive measures against stroke-promoting factors. "The earlier these [preventive measures](#) are implemented, the better," says Schneider.

The results of the study are also of great importance for hospitals. They will be able to better adapt to the frequency of strokes in the future: If the weather forecast predicts a hot night, it can be expected that more cases will come to the clinics. This allows clinics to provide more staff to care for patients as a precaution, explains Prof. Markus Naumann, Director of the Neurological University Hospital in Augsburg.

Background: What are tropical nights?

"Tropical nights" are defined using the so-called "Hot Night Excess Index" (HNE). It measures how much temperatures rise above a certain threshold value at night. The threshold value is the temperature that is only exceeded on the 5% warmest nights during the entire study period.

In this study, this value is 14.6°C. If temperatures rise above this value at

night, this is categorized as a tropical night. The HNE index adds up how many degrees the temperatures are above this threshold during the night hours to determine the intensity of the heat.

More information: Cheng He et al, Nocturnal heat exposure and stroke risk, *European Heart Journal* (2024). [DOI: 10.1093/eurheartj/ehae277](https://doi.org/10.1093/eurheartj/ehae277)

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