

# Risk of death during heat waves in Brazil linked to socioeconomic factors

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The study suggests that heatwaves are exacerbating socioeconomic inequalities in Brazil. Credit: Evandro Kluge, Pexels, CC0 ([creativecommons.org/publicdomain/zero/1.0/](https://creativecommons.org/publicdomain/zero/1.0/))

A new study suggests that heat waves are exacerbating socioeconomic

inequalities in Brazil, with people who are female, elderly, Black, Brown, or who have lower educational levels potentially facing greater risk of death during heat waves. Djacinto Monteiro dos Santos of Universidade Federal do Rio de Janeiro, Brazil, and colleagues present these findings in *PLOS ONE*.

As [climate change](#) progresses, heat waves are becoming hotter, longer, and more frequent in many regions worldwide, including in Brazil. Heat waves can increase the risk of dying from a chronic condition, such as heart disease or pneumonia.

Prior research has linked heat waves in Brazil to higher risk of death. However, few studies have explored the role played by socioeconomic and demographic factors in [heat-related deaths](#) in Brazil.

To help clarify, Monteiro dos Santos and colleagues analyzed death rates during heat waves between 2000 and 2018 in 14 major urban areas of Brazil, representing more than one-third of the national population.

In line with prior research, they found that Brazil experienced three to 11 heat waves per year in the 2010s, up from zero to three per year in the 1970s. Between 2000 and 2018, 48,075 deaths could be attributed to heat waves, with the most frequent causes of death being circulatory diseases, respiratory diseases, and cancer.

Heat wave-related death rates varied between [geographical regions](#) within Brazil, which the researchers linked to known North-South inequalities pertaining to socioeconomic and health indicators, including life expectancy. Heat-wave-related [death rates](#) were higher among people who were female, elderly, Black, Brown, or who had lower educational levels.

The researchers also found that a technique known as event-based

surveillance analysis—which looks for emerging signals in social media rumors or other sources—would have been unsuccessful in providing early warning of high rates of heat wave-related deaths, suggesting that extreme heat waves are neglected disasters in Brazil.

These findings could help inform efforts to reduce deaths during future [heat waves](#). Further research could address some of this study's limitations by covering a longer time period, incorporating more socioeconomic indicators, and using data from more than one weather station for each urban area.

The authors add, "Heat waves were responsible for more than 48,000 deaths in urban areas in Brazil. Women, black and brown people, the elderly and those with a lower level of education are the most affected, reinforcing how human-induced climate change has exacerbated the [socioeconomic inequalities](#) in the country."

**More information:** Twenty-first-century demographic and social inequalities of heat-related deaths in Brazilian urban areas, *PLoS ONE* (2024). [DOI: 10.1371/journal.pone.0295766](https://doi.org/10.1371/journal.pone.0295766)

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