

Fans are not a magic bullet for beating the heat, modeling study shows

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A new study by researchers at the University of Ottawa throws cold water on the idea that fans can effectively cool you down during extremely hot weather events.

With severe heat waves becoming more frequent due to [climate change](#), there's a growing need for safe and accessible ways to keep people cool, especially vulnerable populations like older adults. Fans are often recommended as cheap and easy solutions, but this study suggests they might not be as helpful as previously thought.

Post-doctoral fellow Robert Meade led the research, which was conducted at the Human and Environmental Physiology Research Unit at the University of Ottawa, a unit led by Dr. Glen Kenny, who is a professor of physiology at the Faculty of Health Sciences.

"Fans do improve sweat evaporation, but this effect is not strong enough to significantly lower your body's internal temperature when it's already really hot (above 33-35°C). In older adults, who may have a reduced ability to sweat, fans provide even less cooling benefits," explains Meade. "In fact, even in younger adults, fans only provide a small fraction of the cooling power of air conditioning."

The study recommends that [health organizations](#) continue to advise against relying on fans during [extreme heat events](#), especially for [older adults](#) and other groups at higher risk of heat stroke and other adverse health events during heat waves. Instead, the emphasis should be on providing access to alternative cooling solutions, such as air conditioning, and on exploring ways to make these options more accessible and environmentally friendly.

The research was conducted using "human heat balance" modeling techniques developed in 2015. By extending these models to estimate core temperature under a range of conditions and modeling assumptions, the authors were able to compare the expected effects of fan use under a wide range of scenarios.

"Results from the 116,640 alternative models we produced in sensitivity

analyses indicated that fans likely do not significantly reduce core temperature in [high heat](#) or match air conditioning cooling. Comparisons with more advanced modeling techniques and laboratory heat wave simulations supported this conclusion," adds Meade.

Fans are good at providing air circulation and may work in moderate temperatures but are not as effective in extreme heat. Public health authorities have a role to play.

"Keeping indoor temperature cool is important for vulnerable individuals, but cooling strategies like air conditioning can be costly and harmful to the environment. It is crucial that we improve the accessibility and sustainability of [air conditioning](#) and other forms of ambient cooling to protect those in need," says Meade.

"Fans can still have an important role in this, since they can be effective for cooling at [lower temperatures](#), meaning we don't have to set our air conditioners so low. However, when it gets really hot, a fan alone is not going to cut it."

The study, titled "A critical review of the effectiveness of electric fans as a personal [cooling](#) intervention in hot weather and heatwaves," is [published](#) in *The Lancet Planetary Health*.

More information: Robert D Meade et al, A critical review of the effectiveness of electric fans as a personal cooling intervention in hot weather and heatwaves, *The Lancet Planetary Health* (2024). [DOI: 10.1016/S2542-5196\(24\)00030-5](#)

Provided by University of Ottawa

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