

# DOUBLE TROUBLE: HOW HEATWAVES MAKE US MORE SENSITIVE TO AIR POLLUTION



Protecting our communities from the "one-two punch" of environmental change

## WHY NOW?

When it gets scorching hot and the air is dirty, our health takes a double hit. Climate change is making these "bad air" and "extreme heat" days happen more often. While we know they are dangerous, we are still learning how they work together to trigger hospital visits for breathing and heart problems, especially in children.

## WHAT WE DID

This editorial outlines a plan for how researchers can put together knowledge on the health effects of heat and the health effects of poor air quality to better understand how they jointly affect health. A recent study was used as an example. It analyzed data from several cities to examine how high temperatures and formaldehyde affect children's hospital visits for breathing issues and highlighted ways future research could improve.

## WHO WAS INVOLVED?

The authors learned from the task force members lived experiences, and these were part of the inspiration of this work



## WHAT WE KNOW NOW

This work\* hints at a surprising "one-two punch" effect. The highest risk for children wasn't always when it was hot and polluted at the same time. Instead, the danger peaked when a major heatwave (lasting at least two days) happened just before a spike in air pollution. This suggests that extreme heat can "weaken" our defenses, making us much more sensitive to air chemicals shortly after, but more research needs to be done to understand these interactions. Additionally, weather patterns like "stagnant air" can trap these pollutants near the ground, making the air even more toxic during these shifts. Instead of just looking at hot days, one should look at timing—did the heat come before, during, or after the pollution spike? This could help us understand if a heatwave "primes" our bodies, making us more likely to get sick when the air quality drops a day or two later. It is also important to think about how the type of heat affects communities: experiencing hot temperatures on a sticky, humid day with no shade can make the health impacts worse than on a dry day with access to shade. Understanding these effects can help leaders plan better warning systems, take mitigative actions, and construct infrastructure and facilities that reduce heat stress and ventilate indoor air in order to protect the communities' health.

\* Cheng, Y., et al. (2025). Ambient formaldehyde combined with high temperature exposure and respiratory disease admissions among children: A time-series study across multiple cities. *Thorax*, 80(7), 457–465. <https://doi.org/10.1136/thorax-2024-222709>

### MORE ABOUT SETX-UIFL

The Southeast Texas Urban Integrated Field Lab (SETx-UIFL) is one of four projects funded in 2022 by the U.S. Department of Energy to study how climate, environment, and urban changes affect cities. A team of over 80 researchers from UT, Lamar University, Texas A&M, Prairie View A&M, Oak Ridge National Lab, and Los Alamos National Lab has collected data and conducted modeling across hazards including flooding, hurricanes, heat stress, and air quality. Our Why: Southeast Texas faces numerous hazards, yet smaller communities like this one have often felt forgotten compared to larger cities. The SETx-UIFL was designed to explore the complex dynamics of disaster vulnerability for this economically and culturally vibrant region. We believe Southeast Texas is a bellwether for the entire Gulf Coast, and an exemplar for strategies that protect people and places. We hope this effort supports your path toward lasting resilience.



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