

New research method determines health impacts of heat and air quality

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The planet experienced the hottest day on record earlier this month and climate projections estimate the intensity of heat waves and poor air quality will increase and continue to cause severe impacts. Researchers from the University of Waterloo and Toronto Metropolitan University

have refined and expanded a method of data collection to assess their health impacts.

They discovered that even moderate temperature increases, for example night-time temperatures starting at 18.4° Celsius, can lead to increased hospital visits and death for older adults and those with cardiorespiratory conditions. The research study, "Heat and air quality related cause-based elderly mortalities and emergency visits," appears in the journal *Environmental Research*.

The new method will help municipalities make a strong case for choosing which mitigation and adaptation measures to pursue to effectively respond to climate changes. The options could include planting more trees for shade, investing in our emergency warning programs, or planning to have more staff available to run ambulances, support hospitals and long-term care homes.

"Heat waves cause more deaths in Canada than any other climate hazard," said Dr. Mohamed Dardir, postdoctoral researcher in the School of Environment, Enterprise and Development at Waterloo. "We are getting better at being proactive and planning for climate emergencies, but we still aren't responding to temperatures in the same way we respond to big weather events, such as floods and fires."

The study analyzed the spring and summer in Mississauga and Brampton, Ontario. By integrating data on air quality and heat, the researchers achieved the most detailed picture of the short-term health risks impacting the vulnerable population on a municipal level. The findings confirm there was an increase in the total deaths and hospital visits in these areas with the highest impact happening on the day of the heat and [poor air quality](#) and extending two days after these events.

In the future, the team plans to expand their analysis to include more

environmental hazards, such as storms and floods, and factors including ambulatory calls across municipalities in Ontario and other provinces. The researchers say that this work will help [civil society](#) and [policy makers](#) grasp the magnitude of these climate events and equip decision makers to justify investments in climate resiliency.

"Much of the [financial burden](#) to mitigate the impacts of hot temperatures is left to municipalities, but the health system savings are largely experienced by provinces," said Dr. Jeffrey Wilson, professor in the School of Environment, Enterprise and Development in Waterloo's Faculty of Environment. "Being able to detail the [cost savings](#) and benefits for society to implement these measures will help the two levels of government understand why working together to address heat events is important."

More information: Mohamed Dardir et al, Heat and air quality related cause-based elderly mortalities and emergency visits, *Environmental Research* (2022). [DOI: 10.1016/j.envres.2022.114640](https://doi.org/10.1016/j.envres.2022.114640)

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