

Low levels of air pollution deadlier than previously thought

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The World Health Organization's [most recent estimates](#) (2016) are that over 4.2 million people die prematurely each year due to long-term exposure to fine particulate outdoor air pollution (often referred to as

PM2.5). A recent study involving McGill researchers now suggests that the annual global death toll from outdoor PM2.5 may be significantly higher than previously thought. That's because the researchers found that mortality risk was increased even at very low levels of outdoor PM2.5, ones which had not previously been recognized as being potentially deadly. These microscopic toxins cause a range of cardiovascular and respiratory diseases and cancers.

"We found that outdoor PM2.5 may be responsible for as many as 1.5 million additional deaths around the globe each year because of effects at very-low concentrations that were not previously appreciated," said Scott Weichenthal, an Associate Professor in the Department of Epidemiology, Biostatistics, and Occupational Health at McGill University and the lead author on the recent paper in *Science Advances*.

Canadian data advances global understanding of effects of outdoor pollution

The researchers arrived at this conclusion by combining [health](#) and mortality data for seven million Canadians gathered over a twenty-five-year period with information about the levels of outdoor PM2.5 concentrations across the country. Canada is a country with low levels of outdoor PM2.5, making it the perfect place to study [health impacts](#) at low concentrations. Knowledge gained in Canada was then used to update the lower end of the scale that is used to describe how [mortality risk](#) changes with outdoor PM2.5 levels. The result? An improved understanding of how air pollution impacts health on a global scale.

The WHO recently set out ambitious new guidelines for annual average outdoor fine particulate air pollution, cutting its earlier recommendations in half, from concentrations of 10 to concentrations of 5 micrograms (ug) per cubic meter. The current United States Environmental

Protection Agency standard of 12 (ug) per cubic meter is now more than double the value recommended by the WHO.

"One take away is that the global health benefits of meeting the new WHO guideline are likely much larger than previously assumed," adds Weichenthal. "The next steps are to stop focusing only on particle mass and start looking more closely at particle composition because some particles are likely more harmful than others. If we can gain a better understanding of this, it may allow us to be much more efficient in designing regulatory interventions to improve [population health](#)."

"How low can you go? Air pollution affects mortality at very low levels" by Scott Weichenthal et al was published in *Science Advances*.

More information: Scott Weichenthal et al, How low can you go? Air pollution affects mortality at very low levels, *Science Advances* (2022). DOI: [10.1126/sciadv.abo3381](https://doi.org/10.1126/sciadv.abo3381)

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