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NEW CANADIAN STUDY REPORTS HEALTH EFFECTS AT VERY LOW AIR POLLUTION LEVELS

Researchers found risk of mortality at levels below many national standards

BOSTON, MASSACHUSETTS, JULY 14, 2022 – A comprehensive new study published today by the Health Effects Institute (HEI) reports increased risks of mortality in millions of Canadian citizens, including at the lowest levels of exposure to fine particulate matter air pollution (PM_{2.5}), levels that fall below current U.S. and other ambient air quality standards. Long-term outdoor PM_{2.5} exposures as low as 2.5 micrograms per cubic meter were associated with increased risk of death, suggesting that lowering regulatory standards could yield further health benefits.

In the study, *Mortality–Air Pollution Associations in Low-Exposure Environments (MAPLE): Phase 2*, Michael Brauer at The University of British Columbia, School of Population and Public Health, Vancouver, and his colleagues combined satellite data, air monitor sampling, and atmospheric modeling to estimate outdoor PM_{2.5} exposures across Canada from 1981 to 2016. The team applied comprehensive epidemiological analyses in 7.1 million Canadian adults to evaluate the risk of death at different PM_{2.5} exposure ranges and to identify the lowest concentration at which associations with health effects could be detected. Finding links between air pollution and mortality at these Canadian air pollution exposure levels, which are typically some of the lowest in the world, strengthens understanding of the extent of potential air pollution effects.

“Our research on large representative samples of the Canadian population provides compelling evidence of harmful effects of air pollution on mortality at levels below current national standards and international

guidelines,” Professor Brauer said, adding, “These findings suggest important public health benefits from continued reductions in air pollution.”

Air pollution has long been viewed as a significant contributor to the global burden of disease, including to risks of heart disease, diabetes, asthma, and respiratory disease. According to HEI’s recent [*Global Burden of Disease – Major Air Pollution Sources*](#) report, a major source of PM_{2.5} comes from the burning of fossil fuels, accounting for more than 1 million deaths globally. In Canada, major sources of PM_{2.5} include wildfires, transportation emissions, and wood fuel combustion for home heating. Although air pollution concentrations have been declining over the past few decades in many higher-income countries, several studies published in the past decade have reported associations between risk of mortality and long-term exposures to relatively low concentrations of PM_{2.5}.

The new Brauer study is the final in a set of three studies funded by HEI to explore health effects from air pollution exposure at levels below government recommended standards. The other two reports were conducted in [*Europe, released in September 2021*](#), and in the [*United States, released in January 2022*](#). All three studies were funded through HEI’s program to investigate the health effects of long-term exposures to low levels of air pollution in very large populations.

The report was subjected to comprehensive independent peer review by the HEI Low-Exposure Epidemiology Studies Review Panel, who had no role in conducting or overseeing the study. The panelists concluded that this report presents a high-quality and thorough investigation into associations between risk of mortality and exposures to ambient air pollution in Canada, applying advanced statistical techniques to rigorously test whether air pollution exposure causes direct impacts on health.

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ABOUT HEI

The Health Effects Institute (HEI) is an independent, non-profit research institute funded jointly by the U.S. Environmental Protection Agency, industry, and foundations to provide credible, high-quality science on air pollution and health to inform air quality decisions. HEI’s research is selected, overseen, and peer reviewed by leading subject matter experts on environment and health without involvement of HEI’s public or private sponsors.