

Air pollution linked with elevated risk of fatal heart attacks and strokes

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Deaths from cardiovascular disease are elevated on polluted days and for two days afterwards, according to research presented at ESC Preventive Cardiology 2023 and published in the *International Journal of*

Environmental Research and Public Health.

"Our study suggests that to preserve [heart health](#) it is advisable to plan time outdoors around air quality forecasts," said study author Dr. Michal Swieczkowski of the Medical University of Bialystok, Poland. "When staying home is not an option, wearing a mask during peak pollution hours and avoiding areas with [heavy traffic](#) should be considered."

This study examined the association between [air pollution](#) and death from cardiovascular disease overall, and from two types of cardiovascular disease, namely [acute coronary syndromes](#) and ischemic stroke. The study was conducted in five cities in eastern Poland. Mortality data for 2016 to 2020 were obtained from the Central Statistical Office. Concentrations of particulate matter (PM)2.5, PM10, and [nitrogen dioxide](#) (NO₂) were gathered from the Voivodeship Inspectorate for Environmental Protection. The main sources of these pollutants are [road traffic](#) and household heaters using coal or wood.

A time-stratified case-crossover study design was used where for each participant, the researchers compared levels of each pollutant on the day of the week a death occurred (e.g. Wednesday) with pollutant levels on the same day of the week without any deaths (e.g. all remaining Wednesdays) within the same month. Using within-participant comparisons between days in the same month eliminated the potential confounding effects of participant characteristics and time trends. Similar analyses were conducted for pollution levels one day and two days before a death occurred.

During the five-year study, there were a total of 87,990 deaths, of which 34,907, 9,688, and 3,776 were due to cardiovascular disease, acute coronary syndromes and ischemic stroke, respectively. Regarding death from cardiovascular disease overall, a 10 µg/m³ rise in PM2.5, PM10 and NO₂ was associated with a 3%, 3% and 8% increased risk,

respectively, of dying on the same day. The risks of dying from cardiovascular disease were similar one and two days after the polluted day.

Regarding death from acute coronary syndromes, a $10 \mu\text{g}/\text{m}^3$ rise in PM_{2.5} and PM₁₀ was associated with a 3% and 2% increased risk, respectively, of dying on the same day. Meanwhile, a $10 \mu\text{g}/\text{m}^3$ rise in PM_{2.5}, PM₁₀ and NO₂ was associated with a 3%, 3% and 4% increased risk, respectively, of dying from an [acute coronary syndrome](#) the following day. For ischemic stroke, a $10 \mu\text{g}/\text{m}^3$ rise in PM_{2.5} was associated with a 3% increased risk of death the following day.

Dr. Swieczkowski said, "The results show worrying associations between air pollution and death from [cardiovascular disease](#). Policymakers should consider measures to promote clean air including subsidies for upgrading household heating systems and vehicle-free zones."

More information: Conference: [www.escardio.org/Congresses-Ev ...
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