

Childhood air pollution exposure linked to early death

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People exposed to significant air pollution in early childhood are more likely to die early than those raised in areas with better air quality, research suggests.

The analysis of nearly 3,000 people born in Scotland in 1936 is the first to shed light on the life-long effects of breathing [dirty air](#) in [early life](#).

Findings show people exposed to high levels of air pollution aged three were more likely to die between the ages of 65 and 86 than those subjected to low levels. Exposure to [high levels of air pollution](#) also increased the chances of dying from cancer, especially from [lung cancer](#) in women.

Previous studies have investigated links between [poor air quality](#) and health over time, but few have investigated the effects beyond 25 years, researchers say.

The new study, led by the Edinburgh researchers and published in [Environmental Research](#), has revealed links between air pollution and deaths over a 75-year period.

Air quality

Data analyzed by the team was taken from the Scottish Longitudinal Study Birth Cohort of 1936, an anonymized, long-term study providing a representative sample of Scotland's population.

Historic air pollution levels were estimated using atmospheric chemistry models and matched to each participant's home address in 1939, when they were 3 years old.

The analysis also used results from a national cognitive ability test taken by each participant aged 11, and national death records from 1947 to 2022.

"We are lucky, in Scotland, to have an increasing number of studies following people from childhood to old age. This is helping us to better understand what type of environments we need now to support healthy aging in the future," says Professor Chris Diben.

Health impacts

Over the 75-year period, 1,608 of the participants died. Exposure to higher levels of fine particle air pollution—known as PM_{2.5}—increased the risk of dying between the ages of 65 and 86 by up to 5%.

Early years exposure increased the risk of dying from cancer. In women, lung cancer was the main cause of cancer-related deaths, linked to an increased risk of 11%.

In men, preliminary findings suggest early exposure could be linked to an increased risk dying from neurodegenerative disorders in older adulthood.

Cognitive skills

The findings indicate about 25% of the total impact of air pollution on death was an indirect result of effects on participants' cognitive ability.

Children exposed to higher air pollution levels tended to score lower in the cognitive ability test. These skills are important for achieving better educational outcomes and higher socioeconomic status, which are ultimately linked to living longer, the team says.

"It is striking to see that children growing up in polluted areas can have consequences that persist throughout their entire life. These findings suggest that the effects of air pollution on our health can endure for decades, even after significant efforts are made to reduce pollution levels," says Dr. Gergő Baranyi.

More information: Gergő Baranyi et al, Early life PM_{2.5} exposure, childhood cognitive ability and mortality between age 11 and 86: A

record-linkage life-course study from Scotland, *Environmental Research* (2023). [DOI: 10.1016/j.envres.2023.117021](https://doi.org/10.1016/j.envres.2023.117021)

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