

Air pollution could be worsening children's vision, study says

The research found that extended exposure to air pollutants could be contributing to high rates of myopia.

Today at 6:00 a.m. EDT




By [Amudalat Ajasa](#)

It's well established that air pollution causes a wide variety of harms to the human body, raising the risk of heart disease, respiratory diseases and strokes. But new research has highlighted yet another damaging impact: to our vision.

The research found that extended exposure to air pollutants, specifically nitrogen dioxide and fine particulate matter, could be contributing to high rates of myopia, also known as short- or nearsightedness, in schoolchildren in China.


The study, published Tuesday by PNAS Nexus, combined genetic, lifestyle and environmental data in a machine learning model and determined that while genetics remained the strongest driver of poor vision, children in regions with poor air quality tended to have worse vision, while better air quality was associated with better vision.

“We showed that air pollution contributes to myopia development in children. What this means is that if their exposure to air pollution is high, the risk to become shortsighted is higher,” said Zongbo Shi, one of the lead authors and a professor of atmospheric biogeochemistry at Britain's University of Birmingham.

[Lifestyle factors — including sleep deprivation and increased screen time — also posed a significant risk to vision.](#) 


“There are factors that you cannot change,” Shi said. “But you can change habits. You can reduce air pollution so that would improve eyesight.”

By simulating “clean air” scenarios, the team showed that reducing levels of fine particles (PM_{2.5}) and nitrogen dioxide (NO₂) to the lowest exposures seen in the study was associated with better eyesight across the student population. Primary-school children benefited the most, with nearly double the improvement compared with older students. The findings suggest that air quality could be an important, modifiable factor in protecting children’s eyesight, alongside genetic and lifestyle influences.

The research surveyed nearly 30,000 schoolchildren in Tianjin, China. 

It did not assess the impact of short-term air pollution exposure on eye health. In the United States, wildfire smoke is one of the leading sources of PM_{2.5} exposure. Experts have said that once the particles — which are 1/30th the width of a human hair — enter the bloodstream, they can affect every organ in the body, triggering short respiratory problems and irritating eyes, sinuses and the throat.

Donald Mutti, an optometry professor at Ohio State University who was not involved in the China study, said that some of its findings were “out of step” with the existing literature on myopia — which generally concludes that more time outdoors reduces the chances that a child will develop the optical disorder. The study, however, determined that time outdoors was the least significant risk factor.

Mutti was also skeptical about the machine learning mechanism used to determine risk factors.  He noted that it promoted the use of nighttime lights as a significant risk factor, when there was no statistical difference in use between students with myopia and those without.

“I worry about this unconventional approach giving us an unconventional answer,” Mutti said.

The study adds to a limited body of research linking ambient air pollution to vision complications. One study, conducted in Denver, found that air pollution was associated with an increase in ophthalmology visits and inflammation of the outer membrane of the eye. A clinical practice study, published earlier this year, found that exposure to air pollutants increased the risk of myopic progression in children. Other experts have just started to understand the effects of air pollution on the brain.

Shi said the policy change is needed to slow air emissions and pollutants that have caused mounting health effects.

“Improving air quality will not only benefit or reduce disease burden, but it can also improve eye health,” Shi said. “Reducing exposure is the key.”
