

# Exposure to air pollution increases risk for anxiety or depression. What can you do?

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A growing body of evidence suggests that the air we breathe could be affecting our mental as well as our physical health.

It has been clear for decades that [pollution](#) from cars, heavy industry and

wildfires contributes to lung and heart disease. Death rates are higher on days when and where the air is at its worst.

But those same tiny particles also get into our brains, potentially driving up stress hormones and seeding inflammation that can lead to dementia, as well as [mental health challenges](#).

Studies have linked [short-term exposure](#) to [severe air pollution](#) with an increased risk of outpatient visits or hospitalization for depression or anxiety.

New research out last week finds a link between these conditions and years of exposure to relatively low levels of pollution.

Pollution is "looking more and more like a contributing force" to [mental health problems](#), said Marc Weisskopf, an epidemiologist at the Harvard T.H. Chan School of Public Health, who was not involved in the new research but has conducted similar studies.

"Any one study I might not hang my hat on, but we're seeing it more and more."

## What the study found

The study, published in the journal *JAMA Psychiatry*, examined [health information](#) from nearly 400,000, mostly white adults in the United Kingdom. It combined information about where they lived at the start of the decade-long study with medical records, lifestyle and air pollution data.

Researchers then broke participants into four groups according to their air pollution exposures.

They found that those exposed to the least amount of air pollution were least likely to be diagnosed with depression or anxiety.

The risk did not go up smoothly with an increase in air pollution. Instead, the group with the second-highest exposure saw the biggest increase in both conditions—roughly 15%.

Men in the study seemed more susceptible to the effects of small particulate matter than women. Animal research shows similar results; one study found that male mice are more likely to develop neuroinflammation than female mice after being exposed to diesel exhaust.

## **How big of an impact could air pollution have on mental health?**

It's not clear how much influence air pollution might have on [mental health](#). It's certainly not as big a factor as the coronavirus pandemic has been on increasing rates of depression and anxiety.

In an individual the effect might be small, but across a whole population, "you're talking about quite a large increase," said Dr. Joseph Hayes, a psychiatrist and associate professor at University College London, who was not involved in the study but does similar work.

## **Putting the study in context**

No study can be perfectly designed to capture the effects of air pollution on mental health. Researchers can't separate people into two groups and expose one to air pollution to see if one ends up with more mental health challenges.

Urban living or access to green space rather than air pollution might be driving changes in mental health, Hayes said.

But many studies have found a connection between air quality and mental health, which makes the link more believable. "These studies all point in the same direction," he said.

In Hayes' own research, he used a phone app called juli to measure levels of air pollution and correlated that with the user's reports of mood changes. One not-yet-published study showed that as air quality declined, depression symptoms worsened.

Another study in the U.S. looked at the ability of people to make decisions after being exposed to smog. It found they were less likely to decide in their own self-interest after exposure.

Yale University health economist Xi Chen studies the mental health toll of pollution in developing countries, such as India and China, where the air quality is far worse than in the U.S. In his own research, he has found that high levels of pollution reduce short-term happiness and increase symptoms of depression.

Chen said he was surprised that the new British study detected a change in mental [health](#) with such a relatively low level of pollution.

"A lower dose of exposure but for a longer time period can still make a difference and may have an adverse affect on mental wellbeing. I think that's the key message," he said.

## **How you can limit your exposure to pollution**

People can do a few things to limit their exposure to pollutants:

- Know that being near cars raises your risk. Hayes relocated farther out of London for financial reasons, which helped reduce his exposure. An avid bicyclist, he also avoids riding to work because he'd have to take the busiest road in London. "It's the highest level of pollution you could be exposed to," he said. Jogging in a park is better than alongside a road, Weisskopf added, and "certainly, avoiding places where cars idle is a good thing to do."
- Filter indoor air. Use high-quality air filters for HVAC units and make sure the air handling systems in apartment buildings and offices are well maintained, Weisskopf said.
- Consider [electric cars](#). Electric vehicles seem to be making a difference in pollution levels. A new study from the University of Southern California's Keck School of Medicine showed that for every extra 20 electric vehicles per 1,000 people, asthma-related emergency visits fell by 3.2%.

These individual measures will be financially out of reach for many people, though. And fundamentally, improving [air quality](#) has to be done through public policy, the experts said.

"You can try and limit it to some degree (through personal action)," Weisskopf said, "but it's the kind of thing at the population level that really needs regulatory action."

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