

# Air pollution linked to increased mental health outpatient visits

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More pollution in the air could be linked to higher rates of mental health service use, researchers at the Yale School of Public Health found in a new study.

The findings, which were recently published in the journal

*Environmental Research*, stem from nearly six years of outpatient visits data collected at two major hospitals in Nanjing, China—a heavily polluted major city in China. After comparing the numbers with the amount of particulate matter found in the air every day, researchers discovered that visits were generally higher when the air quality was particularly poor.

More research is needed to fully understand why—and how—air quality impacts the rate at which mental [health](#) services are used. But according to YSPH Assistant Professor Sarah Lowe, Ph.D., who was the first author of the study, the findings underscore the need for further investments in mental health services when air pollution gets worse.

"Here, we show that particulate matter is having these more general effects, not just on symptoms but also on service use," she said.

Air pollution is made up of many different components, from the carbon monoxide emitted by vehicles to the sulfur dioxide found around industrial plants. But Lowe and her collaborators decided to focus on particulate matter—small bits of soil, organic compounds and liquid—because it poses the biggest danger to human health. These micron-sized specks of dust can rip through [lung tissue](#) and even enter the bloodstream, through which they can influence mental health.

"These [tiny particles](#) not only have effects on the lungs, the heart and the brain," said YSPH Assistant Professor Kai Chen, Ph.D., who worked on the study as its senior author, "but they also have effects on other organs of your body."

And in Nanjing, the concentration of particulate matter exceeded China's air-quality standards for almost one-fifth of all days the researchers observed. Its impact on [psychological disorders](#) could be clearly reflected in a subsequent uptick of visits to the city's two

hospitals, they found.

Notably, researchers found that this uptick was more pronounced for men and older populations. Lowe said this unequal distribution may be because of societal and behavioral differences across different parts of Chinese society, but more research is needed to truly find out why.

Still, this new study stands as one of the only articles dedicated to the link between particulate matter and the demand for specifically outpatient mental health services. Lowe and Chen hope their research spurs further investigation into the subject—and into the ways in which [particulate matter](#) impacts health.

"There could be other reasons that we simply couldn't explore with the data we had," Lowe explained.

For example, on a heavily polluted day, there might be fewer competing activities, such as outdoor social or sporting events, which may lead people to show up at their appointments. Or it could be that air pollution leads to increases in physical symptoms such as difficulty breathing, which could lead someone to seek out mental services for help.

"We don't know that level of detail, and I think that would be a really interesting direction for future research," she said.

**More information:** Sarah R. Lowe et al. Particulate matter pollution and risk of outpatient visits for psychological diseases in Nanjing, China, *Environmental Research* (2020). [DOI: 10.1016/j.envres.2020.110601](https://doi.org/10.1016/j.envres.2020.110601)

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