



A man fishes near a DTE coal plant in Detroit. Photograph by Ami Vitale, Nat Geo Image Collection

Air pollution linked to bipolar disorder, depression

A new study adds to research showing a link between pollution and poor mental health.

By [Sarah Gibbens](#)

PUBLISHED August 20, 2019

Air pollution takes a massive toll on our health. The World Health Organization links it to deadly diseases like lung cancer and stroke, and [new research](#) suggests that polluted regions see more cases of neurological disorders like depression and bipolar disorder.

In the United States, scientists found counties with the worst air quality, as indicated by the

Environmental Protection Agency, had a 27 percent increase in bipolar disorder and 6 percent increase in depression, when compared to the national average.

Study author and University of Chicago geneticist Andrey Rzhetsky is careful to note that the study doesn't definitively prove [air pollution](#)

causes mental illness, but he says it shows where a person might be slightly more at risk.

Similar studies in [London](#), [China](#), and [South Korea](#) have similarly found a link between polluted places and poor mental health.

Rzhetsky says their study shows that where U.S. counties are being polluted, neurological disorders are taking a toll.

Mapping pollution

The researchers looked at data from the U.S. and Denmark to establish their link.

In the U.S., they first looked at 11 years of health insurance data for 151 million people who filed claims for four psychiatric disorders: bipolar disorder, major depression, personality disorder, and schizophrenia. They also looked at epilepsy and Parkinson's disease.

They then analyzed EPA air, water, and land quality data by county and looked at where insurance claims and rates of intense pollution overlapped. Air pollution and bipolar disorder emerged as the strongest overlap.

To replicate their U.S. findings, the researchers also collaborated with Danish scientists to study the effect of pollution in Denmark. Unlike the U.S., Danish data looked not at regional data but instead at how much an individual is exposed to air pollution during childhood. Similar to the U.S., exposure to air pollution was associated with higher rates of bipolar disorder and depression.

“These findings add to the current evidence from previous studies of a possible link between air pollution and psychiatric disorders,” says Ioannis Bakolis, an epidemiologist from King's College London who was not involved with the study.

Yet, he says the study's reliance on countywide data has too many variables to conclusively say air pollution might be causing bipolar disorder and depression.

[Sarah Gibbens](#) is a digital writer at National Geographic.

Effects on the human body

Much of what scientists know about how air pollution affects the brain is from studies performed on dogs and rodents. A study done in 2002 looked at the effect traffic-related pollution had on feral dogs. Lung, nasal, and brain damage was observed.

“What happens in the brain is something resembling inflammation,” says Rzhetsky. “It results in symptoms that look like depression [in dogs].”

In research published last year, scientists in Beijing found that inhaling particulate matter robbed people of their smarts, leading to lower verbal and math test scores.

Study author Xin Zhang [speculated at the time](#) that the pollution was damaging white matter in the brain.

Your brain on nature

In England, scientists are currently monitoring [how the city's air quality may be affecting 250 children](#). Children will wear air monitoring backpacks made by Dyson that note when and where they encounter the most pollution.

City officials say this information will help them improve public health.

Rzhetsky too hopes environmental risk factors will be seriously looked at by mental health professionals treating neurological disorders.

Using a clean environment to treat such disorders would be “the holy grail” he says.

While scientists are still trying to firmly establish a link between pollution and mental health issues, the [psychological benefit of being in nature](#) is already firmly established: When we spend time in nature—whether it's untouched wilderness or a local park—we do our overstressed brains a favor.