Pollution

Air pollution linked to increased mental illness in children

New research is first to establish the link and builds on other evidence that children are particularly vulnerable to even low levels of pollution

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Relatively small increases in air pollution were associated with a significant increase in treated psychiatric problems, the research showed. Photograph: Alamy

A major new study has linked air pollution to increased mental illness in children, even at low levels of pollution.

The new research found that relatively small increases in air pollution were associated with a significant increase in treated psychiatric problems. It is the first study to establish the link but is consistent with a growing body of evidence that air pollution can affect mental and cognitive health and that children are particularly vulnerable to poor air quality.

The research, published in the peer-reviewed journal BMJ Open, examined the pollution exposure of more than 500,000 under-18s in Sweden and compared this with records of medicines prescribed for mental illnesses, ranging from sedatives to anti-psychotics.

"The results can mean that a lower concentration of air pollution, first and foremost from traffic, may reduce psychiatric disorders in children and adolescents," said Anna Oudin, at Umeå University, who led the study. "I would be worried myself if I lived in an area with high air pollution."



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Prof Frank Kelly, at King's College London, said the research was important. "This builds on existing evidence that children are particularly sensitive to poor air quality probably because their lifestyles increase the dose of air pollution they are exposed too - ie they are more active - and that developing organs may be more vulnerable until they fully mature."

Air pollution in the UK is above legal limits in many cities and estimated to cause 40,000 early deaths a year, though this only includes illnesses such as lung disease, heart attacks and strokes.

The EU and WHO limit for nitrogen dioxide (NO_2) is 40mcg/m3 (micrograms per cubic metre), but levels can reach many times that in polluted cities like London. The researchers found that a 10mcg/m3 increase in NO_2 corresponded to a 9% increase in mental illness in the children. For the same increase in tiny particulate matter ($PM_{2.5}$ and PM_{10}), the increase was 4%.

One striking aspect of the new research is that Sweden has low levels of air pollution, but the researchers still saw the link even below levels of 15mcg/m3. "Sweden is not a country that suffers from very bad air quality, said Kelly. "This suggests that other countries and cities have an even bigger challenge, as they will have to make significant improvements to their air quality so that it is even cleaner than Sweden's."

It is not possible to say from this study what would happen to rates of mental illness at higher levels of air pollution, but Oudin said they could rise: "In all the air pollution studies I have been involved in, the effects seem to be linear."

This type of research cannot prove a causal link between the air pollution and increases in mental illness, but there is a plausible mechanism. "We know air pollution can get into bodies and brains and cause inflammation," said Oudin. Animal studies indicate that inflammation is associated with a range of psychiatric disorders.

There have also been several earlier studies that found associations between air pollution and autism spectrum disorders and learning and development in children. "This study adds to evidence that air pollution may have detrimental effects on the brains of children and adolescents," the Swedish researchers said.

In May, the Guardian revealed an unpublished air pollution report that demonstrated that 433 schools in London are located in areas that exceed EU limits for NO_2 pollution and that four-fifths of those are in deprived areas. In May, a WHO report concluded that air pollution was rising at an "alarming rate" in the world's cities, while a report in September found 3 million people a year suffer early deaths around the world from air pollution.

The new Swedish paper concludes: "The severe impact of child and adolescent mental health problems on society, together with the plausible and preventable association of exposure to air pollution, deserves special attention."

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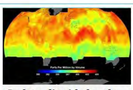
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