



RESEARCH NEWS

Asthma: traffic pollution is blamed for one in eight new cases in children

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London

Air pollution from traffic is responsible for four million new cases of childhood asthma worldwide every year, says a study that links local measures of air pollution to incidence rates of the disease.¹

On average around one in eight new cases of the disease in children is attributable to traffic pollution, but in Shanghai, one of the worst affected cities, the proportion rises to nearly half. Of the 10 areas with the highest numbers of cases attributable to traffic pollution, eight are in China; the other two are Moscow and Seoul.

London ranks lower down the list, in 35th place, with 29% of new cases attributable to pollution. This is slightly lower than in Paris (33%) and New York (32%). The lowest rate was found in Orlu, Nigeria, where only 6% of new cases were attributed to pollution.

Nitrogen dioxide

The study was carried out by a team from the US and Canada, led by Susan Anenberg of George Washington University in Washington, DC, and published in the *Lancet Planetary Health*.¹ They used measures of nitrogen dioxide (NO₂) as a proxy for traffic pollution, as vehicles are a principal source, responsible for 80% of NO₂ in urban areas. Other damaging components in urban pollution include small particulates, but NO₂ provides a convenient surrogate because its concentration in local areas around the world has been estimated from air monitors, satellite observations, and modelling based on land use.

The team then calculated the proportion of cases diagnosed in the previous 12 months that were attributable to NO₂ in each area, using concentration-response factors derived from epidemiological studies. They estimated that 64% of the cases attributable to pollution were found in urban centres, rising to 90% if suburban areas were included.

Although pollution seems to be strongly linked to childhood asthma, the great majority of cases (92%) occur in areas where NO₂ levels are below the World Health Organization's guidelines. Anenberg said that these guidelines may need revision.

Ploy Achakulwisut, lead author of the study, said, "Our study indicates that policy initiatives to alleviate traffic related air pollution can lead to improvements in children's health and also reduce greenhouse gas emissions. Recent examples include Shenzhen's electrification of its entire bus fleet [in southern China] and London's ultra-low emission zone congestion charges."

Matthew Loxham, fellow in respiratory biology and air pollution toxicology in medicine at the University of Southampton, UK, who was not a member of the study team, commented, "A similar study published in 2017 looking at the effects of air pollution in over 60 million people in the US saw something similar, but with different pollutants—that exposure to PM2.5 [fine particulate matter] and ozone below concentrations very similar to WHO guidelines was associated with a risk of death which, per amount of pollutant, was no less than the effects above the WHO guidelines.

"That air pollution causes adverse health effects below these guidelines, which are often significantly lower than legal limits, is beyond doubt. The issue is how we generate the data to decide what the guideline levels should be or, perhaps more fundamentally, get across the message that there is no appropriate guideline level."

1 Achakulwisut P, Brauer M, Hystad P, Anenberg SC. Global, national, and urban burdens of paediatric asthma incidence attributable to ambient NO₂ pollution: estimates from global datasets. *Lancet Planetary Health* 2019 Apr 10. 10.1016/S2542-5196(19)30046-4.

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