

Air pollution increases infants' risk of bronchiolitis

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Infants who are exposed to higher levels of air pollution are at increased risk for bronchiolitis, according to a new study.

The study appears in the November 15 issue of the American Thoracic Society's [American Journal of Respiratory and Critical Care Medicine](#).

"There has been very little study of the consequences of early life exposure to [air pollution](#)," said Catherine Karr, M.D. PhD, assistant professor of pediatrics at the University of Washington and the paper's lead author. "This study is unique in that we were able to look at multiple sources including wood smoke in a region with relatively low concentrations of ambient air pollution overall."

The researchers analyzed nearly 12,000 diagnoses of infant bronchiolitis between 1999 and 2002 in southwestern British Columbia, with respect to the individual's ambient pollution exposure based on monitored levels of nitric oxide (NO), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and particulate matter from monitoring stations within 10 km of the infants' homes. They also used land-use regression maps to assess concentrations of ambient pollution with respect to traffic and wood smoke. They analyzed [pollution exposure](#) by dividing subjects into four categories, or quartiles, of concentration.

After accounting for confounding variables including sex, gestational age, maternal smoking and breastfeeding, they found that a diagnosis of bronchiolitis was significantly linked to increased lifetime exposure to

specific pollutants. An interquartile increase in exposure to NO, NO₂, SO₂ and CO increased bronchiolitis risk by 8, 12, 4 and 13 percent respectively. Infants who lived within 50 meters of a highway had an increased risk of six percent; those who lived in a higher wood smoke exposure area had an increase of eight percent in their risk of bronchiolitis.

"In general, we found that traffic-derived air pollutants were associated with infant bronchiolitis as well as wood smoke and industrial emissions," said Dr. Karr. "The magnitude of the effect is modest, but is comparable to most air pollution studies in North America. The importance of these small magnitude effects become significant when you consider that they affect a great number of children because these exposures are so ubiquitous."

"This study adds to a growing body of research showing a link between neighborhood air pollution hotspots and pediatric respiratory disease. We were specifically interested in bronchiolitis, the main reason for children to be hospitalized in their first year, as it is an important and costly childhood illness. Reducing exposure to air pollution may be one approach to decrease bronchiolitis occurrence," said Michael Brauer, Sc.D., professor at the School of Environmental Health at the University of British Columbia and principal investigator on the study.

Dr. Karr, who is a pediatrician, also noted that the current research might help guide the conversations that doctors have with patients. "I think we have a role in educating parents about concerns regarding air pollution and promoting precautionary approaches where feasible. Encouraging avoidance of the use of wood burning appliances or avoiding residing in close proximity to highways would be examples."

Furthermore, she says, policies should address exposure to air pollution in residential settings, school settings, and daycares. "Places where kids

spend a lot of time shouldn't be right next to major highways," said Dr. Karr.

The research strengthens the connection between ambient air pollution and respiratory disease among children, although more research needs to be done to elucidate the precise nature of that link. Dr. Karr noted that the National Children's Study, a new project of the NIH, CDC and EPA, which is designed to follow 100,000 mothers and their children from birth to adulthood will expand our understanding further. This prospective study will allow exploration of the role of environmental exposures such as air pollution in the context of other influences on child health such as genes and gene-environment interactions.

Source: American Thoracic Society ([news](#) : [web](#))

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