

Heavy traffic makes breathing a burden in children

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Exposure to traffic pollution may increase respiratory problems and reduce lung volumes in children with asthma, according to researchers who studied the effects of road and traffic density on children's lung function and respiratory symptoms in the border town of Ciudad Juarez in Mexico.

“Our results show that close proximity to vehicular traffic-related emissions, either at home or at school, can lead to chronic effects in the respiratory health of children with asthma,” said Fernando Holguin, M.D., M.P.H., assistant professor of pulmonary medicine at Emory University School of Medicine, and lead author of the study, which appeared in the second issue for December of the *American Journal of Respiratory and Critical Care Medicine*, published by the American Thoracic Society.

Traffic-related pollutants are known to be associated with asthma severity, but to what extent they affect airway inflammation and lung volume in both asthmatic and nonasthmatic children was unknown. “Major cities along the northern and southern US borders often have high levels of vehicular traffic flows, especially at the border crossing points. Vehicular traffic emissions from the high density of border crossing traffic may be negatively affecting the health of populations who live in nearby areas,” said Dr. Holguin.

To investigate how specific traffic-related pollutants affected children's lung function and respiratory symptoms, the researchers recruited 200

age- and sex-matched asthmatic and non-asthmatic schoolchildren from ages six to 12. Over the course of a year, they measured road and traffic density and traffic-associated pollutants near the children's homes and schools, and evaluated each child's lung function and respiratory symptoms consecutively for four months.

Asthmatic children, but not children without asthma, were affected by living in homes in areas with high road density. They had higher levels of exhaled NO, as well as reductions in both lung volume and airflow. Living within 50 meters of high density road areas increased the chances of respiratory symptoms in asthmatic children by more than 50 percent.

"These results may have implications for asthmatic children residing in these conditions—especially among those who may not be adequately controlled with medications—for they may be more susceptible to vehicular emissions," said Dr. Holguin.

While increased traffic and road density near schools also indicated respiratory effects in both asthmatic and nonasthmatic children, the data did not attain statistical significance in this study. Nonetheless, Dr. Holguin noted, "this finding could have significant public health policy implications because a significant proportion of schools in many countries are located in close proximity to major roads."

This is the first study of its kind to evaluate traffic-related emissions exposure in a large group of children with and without asthma over an entire year. The findings support and add to previous studies which have looked at the effects of traffic emissions on children, but it may have been underpowered to detect significant associations between respiratory outcomes and specific pollutants.

"These results are significant because they quantitatively demonstrate that closer exposure to roads lead to chronic airway inflammation and

reductions in lung function,” said Dr. Holguin. “This study points the way for future research to determine what preventive measures may be taken to reduce exposure and or the health effects of vehicular emissions in susceptible children.”

Source: American Thoracic Society

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