Health Effects of Roadway Pollution

Joint Research Project by the U.S. Environmental Protection Agency and University of Michigan

What is the research?

Automobiles, trucks, and other vehicles on our roadways are an important source of air pollution. With more than 45 million Americans living less than 300 feet from a highway, there is growing concern about the health impacts of living near heavily traveled roads.

To address this important issue, the U.S. Environmental Protection Agency (EPA) and University of Michigan (U-M) are conducting NEXUS — the Near-Road EXposures to Urban Air Pollutants Study — a collaborative research project to study the impact of vehicle emissions on near-road air quality, human exposures, and potential health effects. Through a cooperative agreement, this study brings together specialized expertise and skills in exposure and health effects research from these two organizations. This research supports EPA's priorities to improve air quality, and to work for environmental justice by protecting vulnerable groups of people.

How will the research be conducted?

The study will be conducted in Detroit, Michigan, as part of EPA's larger research program on roadway air pollution and its potential health effects. Up to 105 children, 6 to 16 years old with persistent asthma who live close to different kinds of roadways, will be asked to participate in this study. Partnering with EPA and U-M in this research is Community Action Against Asthma (CAAA). This community-based participatory research partnership is working to improve the health of asthmatic children in Detroit.

In this collaborative research study, EPA scientists will measure levels of traffic-related air pollution near roadways and in the neighborhoods of study participants. Air pollutant levels will be measured inside and outside of up to 30 homes in the study.

During weeklong measurement periods in fall 2010 and spring 2011, the children's parents or guardians will also be asked to complete activity diaries and questionnaires. Air pollutant measurements and information collected about the children's activities, including the amount of time the children spend near roadways, will be used to estimate their exposures to air pollution. U-M researchers will collect information concerning the children's respiratory health, including measurements of lung function and airway inflammation.

Researchers will then use the exposure measurements, along with the health effects measurements, to determine how exposure to traffic-related air pollutants affects the health of

children — including whether these pollutants induce more frequent or more severe asthma attacks. The study is designed to help answer critical scientific questions, including:

- Which measures of traffic-associated pollution are most closely associated with aggravated asthma?
- Do children with asthma who live near major highways show more inflammation and other biological responses than those who live further from the highway?
- Does traffic exposure influence the likelihood of respiratory viral infections in children with asthma?

How will the research benefit the community?

Answering the study questions will help federal, state, and local governments and organizations make public health decisions about community development near roads. State highway planners and environmental agencies can use the science to assess the local impacts of vehicle emissions and determine the impacts of future road projects. Study results will be useful for policy makers developing plans to reduce exposures to air pollution for people living near roadways. The results will also be useful for individuals making decisions about where to live.

Study results will be shared with Detroit community members in collaboration with the Community Action Against Asthma, whose partners include numerous community-based organizations in the Detroit area, including Detroiters Working for Environmental Justice, the Detroit Department of Health and Wellness Promotion, Community Health and Social Services Center, Detroit Hispanic Development Corporation, Arab Community Center for Economic and Social Services, Friends of Parkside, Henry Ford Health System, Latino Family Services, and Warren Conner Development Coalition.

For more information about EPA's roadway research, visit: www.epa.gov/airscience/quick-finder/roadway.htm.

EPA Technical Contact

Dan Costa, Sc.D.,
National Program Director
Clean Air Program
Office of Research and Development
919-541-2532 or costa.dan@epa.gov

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