

Living near busy roads may be bad for heart patients' health

1 December 2017



Credit: American Heart Association

While traffic-related air pollution is common worldwide and is the source of many health problems, little is known about its impact on vascular health, particularly among people with cardiovascular disease.

Now, a new study finds that exposure to traffic-related pollution is associated with [peripheral artery disease](#) and [high blood pressure](#) in people at high risk for [heart disease](#). Yet researchers found no association between long-term traffic exposure and heart disease, specifically heart attacks and coronary vessel disease.

The study, published Thursday in the American Heart Association journal *Arteriosclerosis, Thrombosis, and Vascular Biology*, was the first large-scale analysis of airborne traffic-related pollution's effects on both vascular and coronary disease.

The findings corroborate other research indicating that living near major roadways increases the risk of cardiovascular disease, said the study's co-senior author Elizabeth Hauser, Ph.D., a professor in the Department of Biostatistics and Bioinformatics at Duke University in Durham, North Carolina.

Pollution is a killer: It was responsible for an estimated 9 million deaths worldwide in 2015—or one in six deaths, according to research by The Lancet Commission on Pollution and Health. Air pollution alone caused 6.5 million of those deaths, most of which were caused by diseases such as heart disease, stroke, lung cancer and chronic [obstructive pulmonary disease](#).

Cardiovascular disease accounts for about a third of all U.S. deaths. Nearly 800,000 Americans die each year due to heart [disease](#), stroke and other cardiovascular diseases.

The study is a starting point for "a conversation among various stakeholders, such as city zoning staff and insurance companies, about where schools and nursing homes are located," said the study's lead author Cavin Ward-Caviness, Ph.D., a principal investigator for the U.S. Environmental Protection Agency.

"The more we can start discussions about what the risks are for vascular diseases, the more we can inform the public about ways to reduce those risks," he said.

Indeed, although this particular study won't directly influence policy, other research has, said Ana Diez Roux, M.D., Ph.D., dean of Drexel University's Dornsife School of Public Health in Philadelphia, who was not involved in the new study.

"Studies like this have played an important role in how the EPA sets standards on [air pollution](#)," she said, adding that it will be important to follow up on these latest findings with studies that can prove cause and effect.

In the study, Duke-led researchers examined 2,124 people living in North Carolina who received a cardiac catheterization—a procedure to examine how well the heart is working—at Duke University Medical Center. The participants lived within 2

miles of a major roadway.

Overall, people who lived within an average 0.6 miles of a major road were at higher risk for high blood pressure and PAD. The PAD association was most significant among whites and men, while the high blood pressure link was stronger among blacks and women.

High blood pressure, newly defined as a top number of 130 mmHg and higher or a bottom number of 80 and higher, is very common in America. The 46 percent of U.S. adults with hypertension are at risk for PAD, which is a narrowing of peripheral arteries to the legs and arms.

The roughly 8.5 million Americans with PAD are at higher risk of [coronary artery disease](#), [heart](#) attack and stroke.

Previous studies also found associations between traffic-related exposure and Type 2 diabetes, inflammation and a condition called atherosclerosis in which fatty deposits narrow and block arteries going to critical parts of the body.

Ward-Caviness and the research team now plan to examine the impact of tiny airborne particles, toxic gases such as nitrogen dioxide and ozone, and overall neighborhood quality. They also plan to study how traffic-related pollution might alter the function of genes involved in [cardiovascular disease](#).

"This is part of a much bigger program we've developed to look at differences within the [study] group," Hauser said. "We need to put this together to show biological and physiological markers."

More information: Cavin K. Ward-Caviness et al. Associations Between Residential Proximity to Traffic and Vascular Disease in a Cardiac Catheterization Cohort, *Arteriosclerosis, Thrombosis, and Vascular Biology* (2017). [DOI: 10.1161/ATVBAHA.117.310003](https://doi.org/10.1161/ATVBAHA.117.310003)

Provided by American Heart Association

APA citation: Living near busy roads may be bad for heart patients' health (2017, December 1) retrieved 26 June 2019 from <https://medicalxpress.com/news/2017-12-busy-roads-bad-heart-patients.html>

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