

Researcher studying air pollution and risk for heart attack and stroke

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Credit: University of North Texas

In a report released in 2016, the World Health Organization revealed that more than 90 percent of the world's population live in areas with high levels of air pollution, and that every year, close to three million deaths are linked to outdoor air pollution. Many of those deaths are due to cardiovascular disease or stroke, and now a UNT assistant professor of Biological Sciences, Amie Lund, is researching that connection.

"We know on days of [higher levels](#) of pollution, there are higher admissions of heart attacks and strokes," said Lund. "There are also higher death rates resulting from those two health conditions on days of high pollution."

Lund focuses on the cardiovascular health effects of exposure to traffic-generated pollution and found it is associated with higher levels of oxidized "bad" cholesterol in your body, which can contribute to progression of [cardiovascular disease](#) states.

"I started looking in the blood vessels to see what's changing at a [molecular level](#)," said Lund. "We know both heart attacks and strokes start with fatty plaque buildup. Now we want to understand how exposure to air pollution is making that plaque grow bigger in our [blood vessels](#), because we know when plaque grows bigger, it can lead to the onset of a [heart attack](#) or if the plaque ruptures it can result in a stroke."

Lund said she is now doing experiments to see how different types of air pollutants can change cell signaling patterns on a molecular level to better understand how it may contribute to diseases. She said it's key to this research because once researchers understand that, they can design drugs or other therapies to help treat or prevent the problems. Another goal is to determine if certain individuals may be predisposed to being negatively impacted by pollution, in hopes of trying to get them preventative treatment on days when there could be a problem.

"We know we have ozone alert days here in North Texas," she said. "High ozone levels are caused by other pollutants put out by cars and industry that are combined with heat and UV rays. Research shows that this particular type of pollution is very reactive in the cardiovascular system, so we should always try to reduce our exposure levels."

Lund has high goals for her research. She said she hopes her work will ultimately lead to changes in pollution policy, which could lead to healthier air. She also hopes it will help lead to the designing of drugs that help treat or prevent stroke and cardiovascular problems. In the meantime, she said, we can't control what we are breathing in on a daily

basis, but everyone can take steps to breathe in fewer toxins.

"We must limit exposure to [air pollution](#), especially on high ozone days. We know ozone is bad for the cardiovascular system. We can't eliminate our risks, but we can minimize it," she said.

Provided by University of North Texas

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