

Pollution exposure linked to stroke risk in people with common heart rhythm disorder

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People with one of the most common heart disorders who are exposed to greater levels of pollution have a 1.2-fold higher risk of stroke than their peers who live with less pollution, according to a *JAMA Network Open*

study published recently by researchers at the UPMC Heart and Vascular Institute and University of Pittsburgh School of Medicine.

The study is the largest of its kind to include neighborhood-specific pollution data—rather than simply hospitalization data—and further emphasizes the importance of air pollution alerts in advising the activities of people with certain heart conditions.

"We measured [pollution exposure](#) at people's doorsteps by using geocoding and then determined their annual exposure to [particulate matter](#). This approach and the sample size make our study particularly powerful," said Jared W. Magnani, M.D., M.Sc., UPMC cardiologist and associate professor of medicine at Pitt. "We can use this information to guide our patients by advising them to limit exposure to pollution. For example, we can notify those with atrial fibrillation to avoid being outside on days with unhealthy air quality, which may reduce their risk of stroke."

Magnani and his colleagues followed more than 31,000 people living in Allegheny County since 2007 with [atrial fibrillation](#) (AFib), a common heart rhythm disorder affecting at least 2.7 million Americans. Using suitcase-sized air pollution monitors mounted on telephone poles, the team was able to measure the exact levels of fine particulate pollution—soot—that the participants were breathing on a daily basis. The Pittsburgh region is ranked by the American Lung Association as one of the 10 most polluted in the U.S.

The researchers found that stroke risk steadily increased with higher daily exposure to air pollution. People with AFib already are at five times the risk of stroke, so the additional risk posed by fine particulate pollution is particularly concerning, Magnani noted.

"Our results advance the understanding of how air pollution impacts

[public health](#) and strengthens the argument for continued advocacy to curb pollution," he said. "Fine particulate pollution is very small—it is able to get into our bodies through our lungs and into our blood stream where it can trigger heart events."

The team went on to examine the impact of pollution on different demographic and socioeconomic groups. They found that fine particulate exposure is 1.5-fold higher in blacks compared to whites, and 1.3-fold higher in those living below poverty versus above.

"Pollution exposure correlates with socioeconomic position, as people living closer to industrial sources tend to be lower income and minoritized. Hence, air pollution worsens racial disparities in [health outcomes](#), due to the increased residential exposure," Magnani said. "Our study indicates the importance of modifying pollution as a risk factor for adverse health outcomes."

Magnani said future research will explore how individual factors—such as physical activity, diet, health care access and medication—might interact with [pollution](#) levels to modify stroke risk for people with AFib.

More information: Zachary J. Rhinehart et al. Association of Fine Particulate Matter and Risk of Stroke in Patients With Atrial Fibrillation, *JAMA Network Open* (2020). [DOI: 10.1001/jamanetworkopen.2020.11760](#)

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