Medical Xpress

Wildfire smoke could send more seniors to the ER for heart, stroke issues

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Credit: American Heart Association

Smoke from wildfires, particularly for people 65 and older, could cause an increase in emergency room visits for heart and brain-related issues, according to new research.

The study, published Wednesday in the *Journal of the American Heart Association*, was one of the most extensive of wildfire health impacts in California. It looked at the effects of an entire fire season in 2015 that

burned more than 800,000 acres. The research – which combined data on more than a million ER visits with NASA satellite images of the fires – concluded that on dense smoke days ER visits by seniors for all heart-related ailments increased by 15 percent. Visits for heart attacks spiked by 42 percent, and by 22 percent for stroke-related issues.

Previous research has focused mostly on the breathing effects of wildfire smoke, with less clarity about its effects on the heart. But "we found very strong associations with cardiovascular effects," said study co-author Dr. Wayne E. Cascio, director of the Environmental Protection Agency's National Health and Environmental Effects Research Laboratory in Research Triangle Park, North Carolina.

Past studies have suggested that fine particulate matter – the tiny pieces of pollution mixed with liquid droplets from cars, factories, power plants, fires and smoking – could impact cardiovascular health. But just how that happens biologically is unclear. A 2010 AHA statement on air pollution pointed out the association between particulate matter and an increased risk for those already susceptible to heart attack, stroke, irregular heart rhythm and heart failure.

"The link between the two is very important because we don't have to wait until we conduct 4,000 studies in order to know who is at risk and how to protect human health," said Ana Rappold, a senior author on the study and an EPA statistician in the research lab. "When doctors talk to their patients, it is very important to know whether the effects during wildfires are consistent with those based on what we know about air pollution."

One motivation for the research was lead author Zachary Wettstein's experience working at the Veteran's Administration hospital in San Francisco in 2015, during his third year of medical school.

"It was a really bad fire year around the northern Bay Area for a period of a few weeks," said Wettstein, who is graduating next month and moves to Seattle for his residency in emergency medicine. "There was a lot of smoke and what felt like an increase in visits from veterans in the ER. It raised the question for me of whether the smoke exposure was connected to what we were seeing in the ER."

Until recently, wildfires mostly happened in less urban areas, so the smoke's effects were more difficult to track. But now, that's changing.

"As fire seasons change with more intense and longer fires affecting more people across the country," Wettstein said, "we need to make sure people understand there is a health risk from the smoke exposure."

The EPA also issued a guide in 2016 for what public health officials should do to protect the public from wildfire smoke. The public also can go to the agency's AirNow site, which includes the locations of current fires and guidelines for what people can do to protect themselves.

"I would advise patients who have heart or lung disease to be mindful of poor air quality, including smoke from wildfires, and to take prudent measures to avoid exposure to the smoke," Cascio said.

"The basic recommendations are to avoid being outside, keep your windows closed, and run the air-conditioning to keep the air quality better in your house," he said. "If you have to be outside, limit your time as best you can, and don't engage in any activity that would cause you to breathe more heavily. If someone with established disease has to go outside for an extended period of time, using a mask marked N95 or P100 is a good idea."

Rappold said two previous studies, and a third she is working on, indicate being prepared for what to do for your health during fire season

is crucial.

"Having a conversation before the fire season, and having a plan on what to do, could bring real results," she said. "The earlier the intervention, the better, rather than waiting for symptoms to start occurring."

Cascio said there are at least three reasons more and more people across the country will be affected by wildfires, including drought in much of the West.

"The increase of dead trees and fuel, the aging population with a lot of heart disease and human habitation of wildland," he said. "These three things are kind of like the perfect storm that portend a future where we are going to have these large wildfires for a while."

More information: Zachary S. Wettstein et al. Cardiovascular and Cerebrovascular Emergency Department Visits Associated With Wildfire Smoke Exposure in California in 2015, *Journal of the American Heart Association* (2018). DOI: 10.1161/JAHA.117.007492

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