Q&A: What to know about air quality alert days

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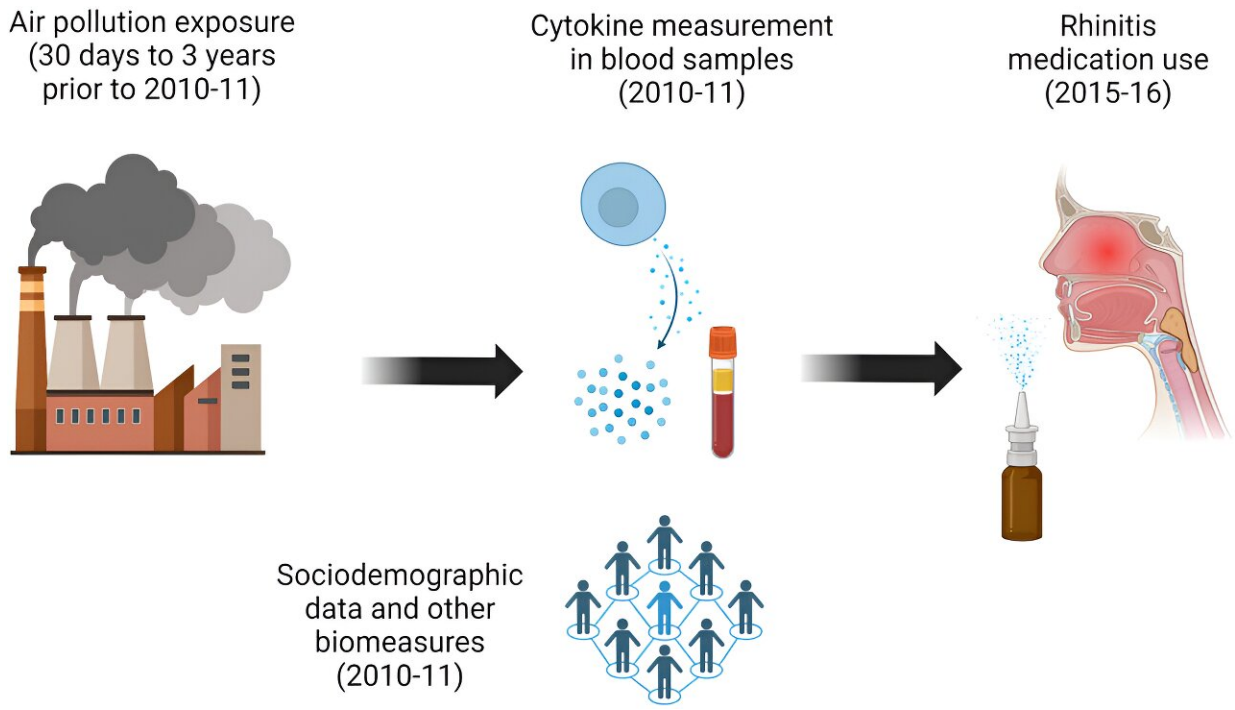

Study design. Credit: *International Forum of Allergy & Rhinology* (2023). DOI: 10.1002/alr.23225

Wildfire smoke, smog and pollution are increasingly present in the air we breathe. What is this polluted air doing to our bodies? Two University of Chicago Medicine pulmonary experts—Director of Rhinology and Allergy Jayant Pinto, MD, and Chief of the Section of Pulmonary and Critical Care Medicine Gokhan M. Mutlu, MD— have

published extensive research on this topic.

"It has an enormous effect on people," Pinto said. "When the sky is gray and the sun is weirdly orange, it's scary to think about what we're breathing in. We really need to work on this as a problem and find the mechanisms to solve it."

Pinto, along with leaders from UChicago Medicine's South Side Pediatric Asthma Center, shared advice on what people can do to protect themselves and alleviate health problems during air quality alert days.

What does an air quality alert mean?

It means the air contains elevated levels of ozone and fine particles. Health officials issue these alerts to notify people that the air quality could pose health risks, especially to people with respiratory issues.

When I breathe in these particles and ozone, what happens?

Exposure to high levels of particles can disrupt the cardiovascular system and cause heart attacks and stroke. The smaller the particles you breathe in, the worse they are, with ultrafine particles being the most toxic. They cause inflammation, activating the immune system to release chemicals that can interfere with lung and heart function. The body's defense systems (antioxidants) can block the effects, but smog, smoke and soot can overwhelm these defenses and induce oxidative stress, in which free radicals can injure cells and tissues in the body.

What symptoms can people get from breathing polluted air?

The main symptoms are rhinitis (runny nose), congestion, eye irritation, cough and difficulty breathing. When people are exposed to higher concentrations of polluted air over time, the problems worsen. The longer you're exposed, the odds of having chronic sinus issues and lung and heart diseases increase. Inhaling dirty air day after day, and year after year, has been associated with increased heart and lung disease.

What should I do if there's an air quality alert?

Pay attention to air quality alerts. You may feel OK, but there's no safe amount of particles in your body at any level. Obviously, you have to go outside to go to work and do important things in your life, but you can minimize the time you're outside. Keep the windows closed when you're in the car and run the air conditioner to filter the air. If you have to be outside for a lengthy period of time, an N95 mask is worthwhile.

For those really bad air quality days, we're most concerned about vulnerable people who are at risk of death. These tend to be very young or very old people, or those with major health problems like serious respiratory or cardiac diseases. At dangerous air quality levels, they are more likely to end up in the hospital, have worsened lung disease, or experience a heart attack or stroke. Studies dating back to the 1990s show that emergency room visits rise when pollution spikes during the day.

What studies have UChicago Medicine researchers done on air quality's health effects?

Several UChicago researchers have studied pollution's impact on health. Among the most recent, Pinto's June 2023 study shows that pollution causes rhinitis in older patients and has a cumulative effect on nasal passages and in the lungs. There's still work to be done to identify the

exact chemicals that trigger rhinitis in seniors, but it's a first step toward developing treatments to prevent it. Pinto and colleagues have also associated pollution with chronic sinusitis.

In Mutlu's research, one study showed exposure to pollution particles caused lung inflammation, which led to increased risk of blood clots. Another study linked exposure to stress responses and increased adrenaline levels, which contributed to the risk of developing blood clots. However, beta-blockers such as blood pressure and heart medications can mitigate these effects. A third study by Mutlu found that metformin—a diabetes drug—can potentially alleviate the unwanted effects of air pollution.

Mutlu said epidemiological studies have shown that individuals living in polluted areas are more likely to have cardiopulmonary disease and more likely to die from heart disease (heart attacks, heart failure and stroke). Particle pollution can lead to heart attacks and strokes by inducing blood clots.

Additionally, Pinto's close colleague, Briseis Aschebrook-Kilfoy, Ph.D., an environmental, molecular, and chronic disease epidemiologist at UChicago, is investigating how indoor pollution can impact health, and the importance of air filters and indoor ventilation.

What should I do if I have symptoms on air quality alert days?

No specific pollution-related treatments exist, but saline sprays that wash out the nose can prevent or reduce irritation. They keep nasal passage linings moist and remove particles that can inflame your immune system. Regular nasal rinses are safe and aids (such as misting sprays, squirt bottles and neti pots) are inexpensive and available over the counter.

Over-the-counter medicines also can help. Medications with guaifenesin (such as Mucinex) thin out your mucus and make it less bothersome. Or you can take anti-inflammatory treatments for the nose, such as steroid or antihistamine sprays, which block certain inflammatory chemicals and reduce nasal symptoms.

Does air quality affect allergies and asthma?

Yes, and smoke from wildfires has the worst impact because of the high density of particles in the air. People with allergies can use over-the-counter medications, and people with asthma should take regular inhalers or steroid inhalers to stay ahead of problems (or use rescue inhalers for acute problems).

Anyone experiencing severe problems should seek medical attention. For high-risk individuals with COPD, heart disease and asthma, polluted air can be a serious threat.

How does air quality affect children with asthma?

Poor air quality poses a challenge for children with asthma, according to managers of the South Side Pediatric Asthma Center, a multi-institutional partnership run by the Urban Health Initiative.

Mary Kate Wagner, LCSW CADC, manager of the community health workers program, and Dameka Edwards-Hart, CHW, supervisor of community health workers and special programs, said they've taken a proactive approach during air quality alert days. Their team reaches out to parents and encourages them to follow the news and make daily air quality checks on their phones, using websites like AirNow.gov.

On air quality alert days, they advise children with asthma to:

- Stay indoors when possible
- Use air conditioning in the house
- Wear a mask when outdoors, preferably an N95 mask
- Keep rescue inhalers and spacers nearby.

They invite parents of children with asthma to reach out to them as a resource. Their services are free to people in their South Side service area and health insurance is not required.

If the wildfire smoke, smog and pollution goes away, am I automatically better?

Once those immune system pathways are riled up, they take a while to settle back down to normal. Your immune system protects you against infection, and when the pollutants are gone, the immune system is primed for their return. It will take a week or two at the minimum for your nose to settle down to normal.

Provided by University of Chicago Medical Center

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