

What doctors want patients to know about climate change's health impact

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Climate change is already having devastating consequences that are reverberating across the globe. As temperatures continue to rise, extreme weather events, melting ice caps and shifting ecosystems underscore the urgent need for decisive action. But it is also important to recognize the health impact of climate change on an individual level so that patients can take steps to protect themselves and their families.

The AMA's What Doctors Want Patients to Know™ series gives physicians a platform to share what they want patients to understand about today's health care headlines.

In this installment, three physicians took time to discuss what patients need to know about the health impact of climate change. These AMA members are:

- Colin Cave, MD, an otolaryngologist and medical director of external affairs, government relations and community health for Northwest Permanente in Lake Oswego, Oregon. He also represents the Oregon Medical Association in the AMA House of Delegates.
- Saba Lodhi, MD, a critical care physician and pulmonologist at Confluence Health in Wenatchee, Washington. She is also the medical director of their intensive care unit.
- Bindu Nayak, MD, an endocrinologist at Confluence Health in Wenatchee, Washington.

Confluence Health and Northwest Permanente are members of the [AMA Health System Program](#), which provides enterprise solutions to equip leadership, physicians and care teams with resources to help drive the future of medicine.

It's about temperature change

In 2022, the [AMA declared climate change a public health crisis](#) that threatens the health and well-being of everyone. Climate change contributes to injuries and premature deaths related to extreme weather events as well as heat-related deaths due to continued warming. To address this, [the AMA adopted policy in support of the goal](#) to “reduce U.S. greenhouse gas emissions aimed at a 50% reduction in emissions by 2030 and carbon neutrality by 2050.”

“The concern is about what happens when global temperatures rise greater than a key benchmark: 1.5 degrees Celsius above pre-industrial times,” Dr. Cave explained. “We know that even below that threshold there are damaging effects of the climate on this world.

“Above that level, the damaging effects are irreversible,” he said. “When we talk about climate change, we’re actually talking about a temperature change that cascades into a myriad of detrimental outcomes that affect where we live, how we live, and our lives themselves.”

There's an impact on public health

That effect comes “in two main ways: By changing the severity of their existing health problems and by creating new unanticipated health problems,” said Dr. Lodhi. “Changes in temperature extremes, vector-migration patterns, and air and water pollution have been linked to increased morbidity from heat-related illnesses, cardiovascular diseases and infectious diseases.”

Additionally, “there are countless facets to what we mean by public health and climate change affects them all,” Dr. Cave said. “It does so in a way that is disproportionate, affecting” patients from historically marginalized racial and ethnic groups, children, pregnant people, older adults, rural communities, and those who are economically or socially marginalized.

“The [health effects last longer](#) in these communities and are causing people to lose their houses, their jobs, their incomes, their sense of safety and their health,” he said.

Certain communities are at risk

“As with most health inequities, those most at risk are the poor and populations of color,” Dr. Cave said. “This is for a variety of reasons, but these populations are more likely to live in inner city heat sinks—areas that have little or no trees and large amounts of concrete where the measured ambient temperature is greater than the surrounding areas. Or they live closer to power facilities, which spew pollutants.

“Children and the elderly in these communities are also harder hit. Often, there's no air conditioning or these individuals have other health problems that are inadequately treated, such as asthma,” he explained. “You can literally look at a ZIP code map and most of the time you'll see an overlap between communities of color and poor communities and heat sinks and poor health outcomes.”

Additionally, “some groups are more at risk of exposure to wildfire smoke than others. All children—regardless of underlying lung disease—people with asthma, chronic obstructive pulmonary disorder [COPD], or [heart disease](#), people who are pregnant, outdoor workers ... are more vulnerable to the effects of wildfire smoke,” Dr. Nayak said.

“Outdoor workers, including agricultural workers or landscape workers, must spend time outdoors even in wildfire smoke season so they are more vulnerable to the health impacts of wildfire smoke because they are spending extended periods of time exposed to high concentrations of smoke, which can lead to increased risks of health effects,” Dr. Nayak said.

Air quality changes are detrimental

“From strictly a pulmonary standpoint, changes in air quality are the most detrimental,” Dr. Lodhi said. For example, an “increase in ground-level ozone—a key component of smog—is associated with diminished lung function, and increased hospital admissions and emergency room visits for asthma.

“Changes in precipitation patterns and more frost-free days can impact the duration and intensity of pollen production,” she added, noting “higher pollen concentrations and longer pollen seasons can increase allergen sensitivity and trigger asthma exacerbations in individuals with asthma.”

“Excessive rainfall in conjunction with rising temperatures and extreme precipitation resulting in flooding can create indoor air quality problems by supporting growth of indoor mold, which can make adequate asthma control challenging and contribute to other lung diseases such as allergic bronchopulmonary aspergillosis,” Dr. Lodhi explained. “Drought, on the other hand, can lead to an increase in wildfires and dust storms contributing to degraded air quality due to particulate matter.

“Exposure to this particulate matter increases respiratory and cardiovascular hospitalizations, clinic and emergency department visits, and medication dispensations for asthma and COPD,” she added.

Wildfire smoke is particularly harmful

“Wildfire smoke consists of a mixture of air pollutants, including particulate matter, carbon monoxide, nitrogen oxides, acrolein, formaldehyde, benzene, benzo[a]pyrene, and dibenzyl anthracene,” Dr. Lodhi said, noting “composition can vary from fire to fire, depending on the fuel—the type of vegetation, whether it burns through a town or structures—temperature and aging in the atmosphere.

“But the most harmful of these, and perhaps the most studied, are the small particles—PM 2.5. ... These particle sizes are harmful to human health because they are sufficiently small enough to be inhaled deep into the lung,” she added. “Some common effects people may experience include eye, nose, and throat irritation and aggravation of preexisting heart and lung diseases.”

“People with asthma or COPD are more vulnerable to the health effects of wildfire smoke because we know that the smoke has a greater effect on the lungs ... causing more difficulty breathing and increased risk of infection,” Dr. Nayak said. Meanwhile, “people with

heart disease can experience a greater chance of heart attack or [stroke](#) after wildfire exposure.”

Vector-borne diseases are on the rise

“What is happening in the United States right now is the confluence of longer, warmer summers on top of wetter rainy seasons creates the breeding grounds that mosquitoes love,” Dr. Cave said. “Climate change has also expanded the habitat where ticks live and thrive with [Lyme disease](#) nearly doubling since 1991.

“The El Niño cycle is known to be associated with increased risks of some diseases transmitted by mosquitoes and we are seeing greater effects from it these days,” he said, noting “the mosquitoes that carry dengue viruses are extending their range and more than 4.5 million cases were reported in the Americas in 2023. And global climate models project an additional 2 billion people could be at risk by 2080.

“Global warming is creating the breeding grounds for the vectors that bring diseases to humans and in the United States, often we’re not used to these diseases,” Dr. Cave said. “That has tremendous implications for training our infectious disease colleagues, our primary care colleagues, and in mitigating the problem.”

The water supply is unpredictable

Dr. Cave said climate change also has an unpredictable effect on water supplies.

“For years we will have drought situations and then one year we’ll see atmospheric rivers that literally pour more water out of the sky than we can store,” he said. “There are immediate health dangers from flood waters, but the danger doesn’t end when flood waters recede. Mosquito-borne infections, breathing issues from mold, loss of housing and income, and anxiety and depression are health-related effects that can happen in the weeks or months after a flooding event.

“Flooding results in health effects directly from drownings, hypothermia, loss of homes, and potential injuries from submerged structures or dangerous animals present in and under

flood waters,” Dr. Cave added. “Indirectly, flooding can overflow a region’s wastewater treatment abilities.

Food and nutrition are affected

“Climate change can disrupt food availability, reduce access to food and affect food quality,” Dr. Cave said. “For example, increases in temperature, changes in precipitation patterns, changes in extreme weather events and reduction in water availability may all result in reduced agricultural productivity.”

“Sea level rising and storms can lead to erosion and land loss,” he said, adding “we also see saltwater intrusion in coastal agricultural communities, which can contaminate water supplies.”

“It’s the unpredictability that we are facing now and it’s hard for farmers to know when to plant and it’s hard for cattle owners to know when the next fire is going to put their herd at risk,” Dr. Cave said. “That unpredictability is affecting the food supply chain as we know it.

It takes a toll on health care

“Climate change is affecting health care infrastructure and the delivery of health systems in a couple of ways. First, by increasing the demand for health services while—at the same time—impairing our system’s ability to respond,” Dr. Cave said. For example, “within Kaiser Permanente ... in 2017 as fires in Sonoma, Napa and Lake County were raging, we had to [evacuate 122 patients from our Santa Rosa hospital](#). We had to evacuate patients again for another fire in 2019.

“These events put the hospitals that care for patients at risk. These events also destroy the homes of the doctors, nurses and health care professionals who care for these patients,” he added. “And when the fire is done, we hope they’re able to stay in the area to continue to provide care.”

Identify personal risk

To protect yourself and your family, “identify personal risk and household risk to determine what level of preparedness is required,” Dr. Lodhi said. For example, patients with asthma or COPD, “and some people who have airway hyperresponsiveness to environmental stimuli—such as after an upper respiratory infection—can develop asthma-like symptoms from smoke exposure.”

“It’s important, if you live in a fire zone, to have a go-bag and a plan,” Dr. Cave said. “If you live in a flood zone, pay attention to the weather, and have flood insurance. And make sure you have backup medications and an evacuation plan as needed.”

Review medical management plan

Patients should also make sure to “review their medical management plan with their physician if they have a pre-existing lung or heart disease,” Dr. Lodhi said. From there, “stock up on essential medications before the fire season begins so they are readily available when needed.”

Additionally, “always travel with your rescue medications during wildfire season,” she said.

For example, “patients can make sure that they have all their asthma medications at home and make sure that they have an asthma action plan in place with their physician,” Dr. Nayak said.

Monitor the Air Quality Index

“Smoke levels can change quickly and significantly during the day,” Dr. Lodhi said. “Using and understanding the [Air Quality Index](#) can help people plan their activities when smoke is in the air.”

For example, when the Air Quality Index “indicates unhealthy air quality—red category—everyone should take precautions and try to minimize time outdoors, limiting it

to essential tasks while using appropriate mask protection,” she said, emphasizing that “all strenuous activities should be avoided during these times.”

Treatments focus on condition

“Treatment focuses on their underlying health issues that have been exacerbated as a result of the exposure,” said Dr. Lodhi. “Once treated, though, extra care is taken to ensure minimization of subsequent ongoing exposure to poor air quality.”

Educate yourself on climate change

“It is extremely important to increase public awareness,” Dr. Nayak said. For example, “many people don’t know that wildfire smoke causes real health problems that many people experience.

“People may also not be aware that all children, regardless of whether they have underlying health problems, are more vulnerable to the effects of wildfire smoke,” she added, noting whether it is flooding, wildfires, or other disastrous events, important “information is shared by local public health departments and city governments.”