

## Controlled burns not only help forest health but human health, study finds

By Kurtis Alexander

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California's efforts to prevent dangerous wildfires through controlled burning have long stumbled on the issue of smoke, with residents, doctors and pollution regulators worried that such burns create too much unhealthy air.

A first-of-its kind study published Thursday, however, suggests this may not be the case. Researchers at Stanford University School of Medicine report that the health impacts of controlled fires are less than those of wildfires that rage out of control.

The study found that children, who are among the most susceptible to the harmful effects of smoke, were exposed to lower levels of pollutants during prescribed fires, and had less subsequent harm to their immune systems and fewer allergy complaints.

While many have always suspected that smoke from controlled burning is less noxious than from unchecked wildfires, the authors hope their new findings will help advance the case for prescribed burns in California, where it is far less common than in some parts of the country.

"What are the alternatives?" said Dr. Mary Prunicki, an instructor of medicine at Stanford and lead author of the paper. "You can't keep having these out-of-control fires."

For years, California wildland managers have committed to burning off more of the dangerous vegetation that has built up in forests and grasslands and set the stage for some of the state's worst fire seasons. However, relatively little land has been subject to preemptive flame.

In the 12 months before last year's busy fire season, when more than 1.6 million acres burned across California, state and federal firefighters ignited less than 100,000 acres. The California Department of Forestry and Fire Protection, or Cal Fire, and the U.S. Forest Service manage a combined 50 million acres statewide.

The reasons for the limited burning range from a historical misconception that fire is bad to fear that controlled fires will spread and become out of control to overextended firefighting staffs being unavailable to anxiety about the effects of smoke.

Breathing smoky air, as many learned in November when the Camp Fire sent a brown haze across much of Northern California, can cause coughing, wheezing and difficulty breathing and even lead to [long-term respiratory and cardiovascular problems](#).

Pollution regulators in the San Joaquin Valley, where air quality is the worst in the state, have worked to make sure controlled burning in the nearby Sierra Nevada is done only when the impacts are minimal, such as on cooler days and those without much wind.

"We have a daily call with our land management agencies: Is the air quality right so we're not going to bring a bunch of smoke to populated areas?" said Jaime Holt, spokeswoman for the San Joaquin Valley Air Pollution Control District. "This goes on year-round."

Holt said the air district has begun to use complaints about smoke, particularly those that come during prescribed burns, to educate the community about the benefits of setting controlled fires.

The Stanford study, published in the European Journal of Allergy and Clinical Immunology, looked at health indicators of two groups of children in the Fresno area, one that had been

exposed to smoke from a prescribed fire and one that had been exposed to smoke from a similar-size wildfire. All of the subjects were ages 7 and 8.

The study also included a control group in the Bay Area that was not exposed to smoke.

The children exposed to wildfire smoke experienced the dirtiest air, as measured by the levels of the pollutants nitrogen dioxide, polycyclic aromatic hydrocarbons, elemental carbon, carbon monoxide and particulate matter, according to the paper.

Blood samples taken from the children who breathed the wildfire smoke, compared with children who breathed smoke from prescribed burns, showed lower levels of Type 1 T helper cells, which strengthen immune response, and reduced activity of the *Foxp3* gene, which regulates the immune system and controls how the body reacts to allergens. Such biological changes are consistent with previous research on the effects of wildfire smoke.

“Our study is very small and preliminary, but it says that just being exposed to prescribed burns may be a better alternative than smoke from a wildfire,” Prunicki said.

In other words, she added, controlled fires not only help keep wildfires from burning as big and destructively, but they protect nearby residents by limiting the unhealthy smoke that a wildfire may otherwise put out.

The study, which was done in cooperation with the Nature Conservancy, did not evaluate why smoke from wildfires may be more harmful. But fire experts say it’s likely because prescribed fires are designed to burn less intensely and are lit amid controlled conditions. They also don’t typically torch homes and communities, where toxic materials can ignite and spew off even more pollution.

“You don’t have control over a wildfire and the smoke conditions, where it’s going and all that,” said Scott McLean, spokesman for Cal Fire. “With a prescribed burn, we’re burning at a slow pace. It’s burning where we want it to burn.”

After last year’s deadly Camp Fire — [the deadliest and most destructive blaze in California history](#) — Gov. Gavin Newsom this spring directed Cal Fire to work with the U.S. Forest Service to boost the amount of land treated with controlled fire in California.