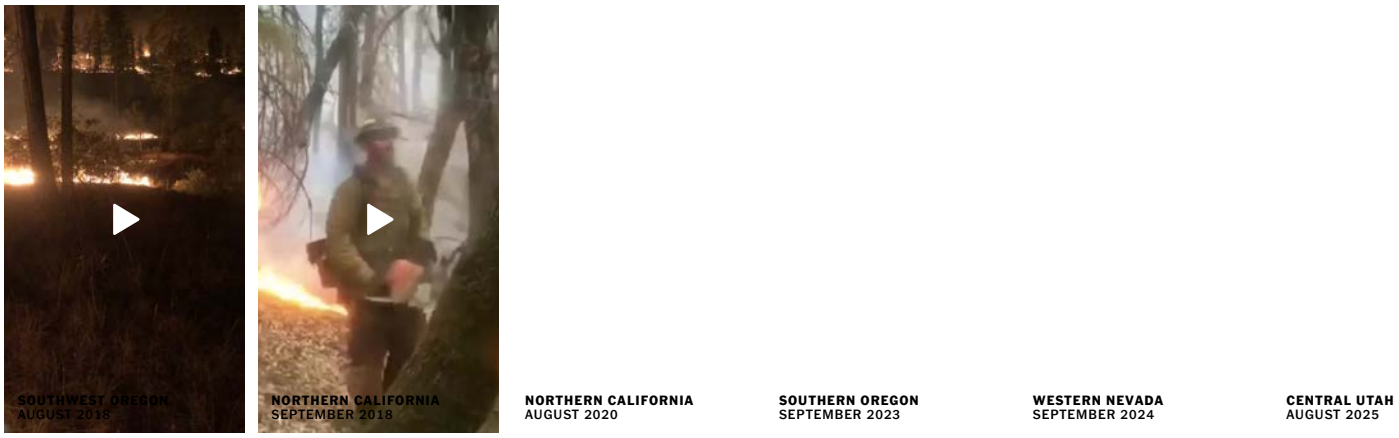
Wildfire Fighters, Unmasked in Toxic Smoke, Are Getting Sick and Dying

The U.S. Forest Service has fought decades of efforts to better protect its crews — sending them into smoke without masks or warnings about the risks.



Hazardous fumes Firefighters who have fallen ill shared videos from their time on the front lines. In chronological order, Alex Plascencia; Brian Wangerin; Duane Boyd; Mr. Plascencia; Darren Clifford; and a firefighter who wished to go unnamed.

By Hannah Dreier

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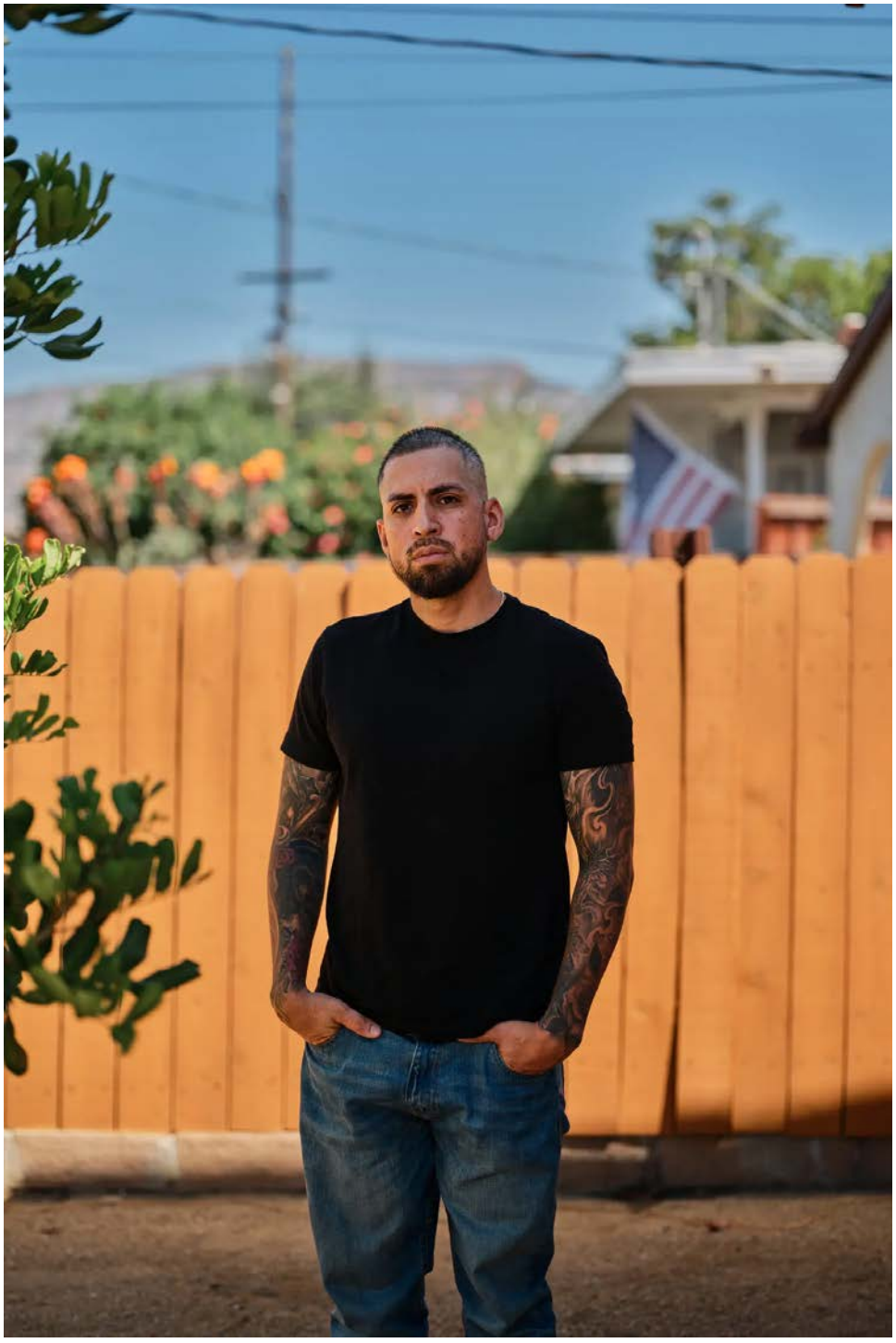
The smoke from the wildfires that burned through Los Angeles in January smelled like plastic and was so thick that it hid the ocean. Firefighters who responded developed instant migraines, coughed up black goo and dropped to their knees, vomiting and dizzy.

Seven months later, some are still jolted awake by wheezing fits in the middle of the night. One damaged his vocal cords so badly that his young son says he sounds like a supervillain. Another used to run a six-minute mile and now struggles to run at all.

Fernando Allende, a 33-year-old whose U.S. Forest Service crew was among the first on the ground, figured he would bounce back from his nagging cough. But in June, while fighting another fire, he suddenly couldn't breathe. At the hospital, doctors discovered blood clots in his lungs and a mass pressing on his heart. They gave him a diagnosis usually seen in much older people: non-Hodgkin lymphoma, an aggressive cancer.

It would be unthinkable for urban firefighters — those American icons who loom large in the public imagination — to enter a burning building without wearing a mask. But across the country, tens of thousands of people who fight wildfires spend weeks working in toxic smoke and ash wearing only a cloth bandanna, or nothing at all.



Fernando Allende, 33, whose U.S. Forest Service crew responded to the January fires in Los Angeles, was diagnosed with non-Hodgkin lymphoma. Philip Cheung for The New York Times

Wildfire crews were once seasonal laborers who fit in deployments between other jobs. They might have experienced only a few bad smoke days a year and had the winter and spring to recover. Now, as the United States sees more drought and extreme heat, forest fires are starting earlier in the year, burning longer and expanding further. Firefighters often work almost year-round.

And many of them are getting very sick.

Some struggle to walk up a flight of stairs after seasons spent in smoke. Others have become permanently disabled after breathing in concentrated plumes of ash, fungus or poison oak. They are getting cancer in their 20s, developing heart disease in their 30s, waiting for lung transplants in their 40s.

“I’ve been on eight of the 10 biggest fires in California history. Now I can’t even push a shopping cart without having chest pain,” said Brian Wangerin, a former crew boss who fought wildfires for a decade until heart problems put him out of work at 33. “I can’t hold my kids.”

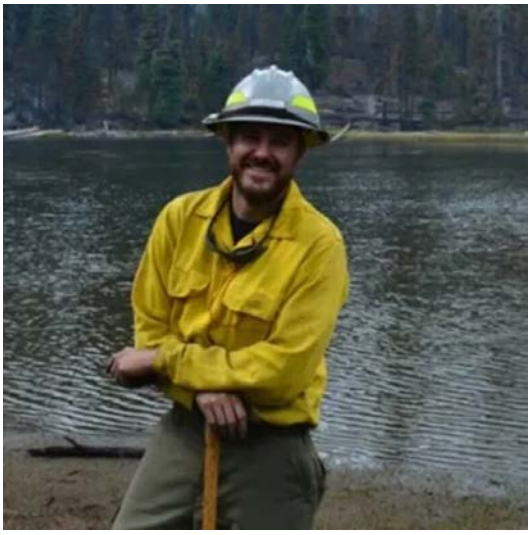
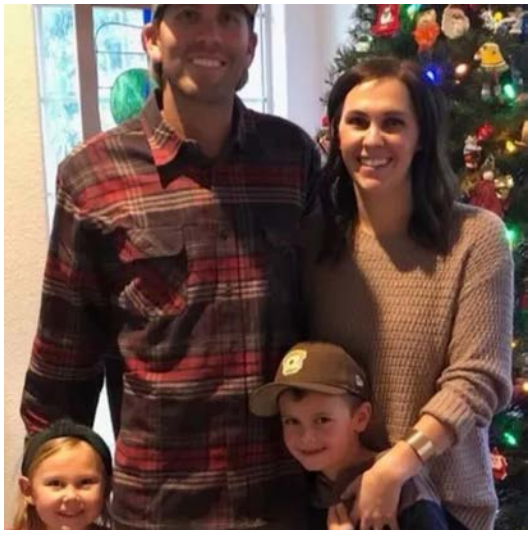
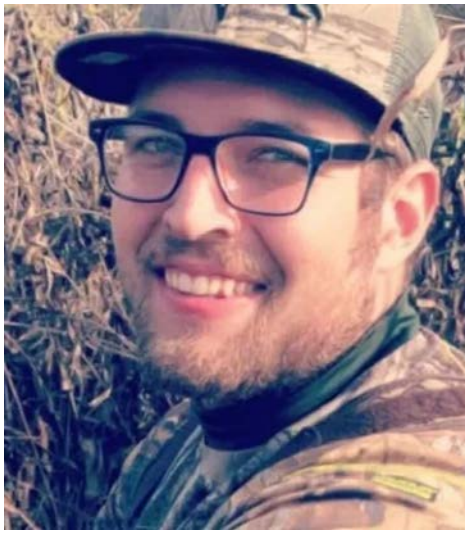
Online forums for wildfire workers are crowded with appeals to help fund chemotherapy and radiation for young firefighters. These messages are often updated months later with death announcements and funeral details.

A 32-year old with terminal brain cancer, pictured looking at peace in the woods. A 37-year-old killed by a rare small-cell carcinoma, whose wife wrote, “Health is quickly declining,” and shared a final photo of him and their toddler. A 27-year-old former high school football star, who had channeled his athleticism and team spirit into firefighting, then developed cancerous lung tumors and left behind a fiancée, a stepson and parents who wished they had steered him into other work.

For decades, studies have consistently linked higher wildfire smoke exposure to increased cardiovascular and lung issues, cancer and premature death. The Forest Service’s own researchers have warned for years about the effects of smoke, calling on the agency to provide masks, monitor exposures and track long-term health outcomes for firefighters.

Countries with major wildfire seasons, including Canada, Australia and Greece, have begun to hand out half-face respirator masks with replaceable filters, like those worn by painters and demolition teams. In laboratory tests, they block about 99 percent of the toxic particles in smoke. Disposable N95 masks are nearly as effective.

But year after year, the Forest Service sends crews into smoke with nothing to prevent them from inhaling its poisons. The agency has fought against equipping firefighters with masks. It issues safety handbooks that make no mention of the long-term hazards of smoke exposure. And its workers are not allowed to wear masks on the front line, even if they want to.

Photos from online fund-raising pages for Brian Wolgamott, Aaron Beucus and Devin Howard, firefighters who died of cancer.

The agency said in a statement that it wanted to protect its crews but masks posed too great a risk that firefighters would overheat while doing the strenuous work needed to contain a wildfire. Instead, supervisors are supposed to move them out of heavy smoke and set up sleeping camps in cleaner air when possible.

“Respirators are a potential tool to reduce smoke exposure, but regulatory and logistical challenges make widespread use impractical,” the statement read.

Researchers in countries already using masks told The New York Times that they had not seen an increase in cases of heatstroke. Firefighters will slow down or remove the masks when they get too hot, they said. The Forest Service said it “continues to monitor international practices and research.”

Internal records, studies and interviews with current and former agency officials reveal another motivation: Embracing masks would mean admitting how dangerous wildfire smoke really is.

That could lead to a cascade of expensive changes. The agency, already underfunded and understaffed, might have to add crews to allow for more breaks, or pay for them to sleep in hotels. Recruitment for the grueling, low-paying jobs could become harder. Spending could increase on an extensive range of health issues among workers and veterans.

The concern was evident, for instance, in a 2014 Forest Service internal presentation that listed pros and cons of masks. At the top of the pros: “Protects respiratory system.” The con list began: “Heat stress/work reduction” and continued, “20% Work Reduction.”

“We need to be honest about what people are signing up for,” said Julian Affuso, who oversaw wildfire risk management for the Forest Service. Jordan Gale for The New York Times

Many wildland firefighters reject masks, which they see as restrictive and uncomfortable, and for some, a sign of weakness. Still, research has found that supplying masks, even without making them mandatory, prompts firefighters to wear them on and off throughout their shifts.

Zebula Hebert, who fought wildfires for 15 years, said he and his crewmates often wished masks were available. Mr. Hebert developed chronic obstructive pulmonary disease in his late 30s. He coughs for weeks at a time and wakes in the night gasping for breath. He now drives a car for a ride-hailing service.

“We need to be honest about what people are signing up for,” said Julian Affuso, who oversaw wildfire risk management for the Forest Service until he retired two years ago.

Mr. Affuso said he pushed to adopt steps like universal testing of lung capacity to track damage over time but was overruled by top leadership, who he believes were invested in a fiction that the work could be done in a safe way. “We’re lying to our people, and we’re lying to the public,” he said.

Digging the Line

About 40,000 Americans, most of them men, fight wildfires for a living. The largest share work for the Forest Service, which carries the most prestige and has the greatest influence on safety standards across the industry. The rest work for a handful of other federal and state agencies, or for private contractors.

The job attracts people who thrive on pushing themselves to their physical limits. Fires that race through thousands of acres and shoot up flames as tall as high-rise buildings cannot simply be snuffed out. They must be trapped.

U.S. Forest Service firefighters from the Sierra Interagency Hotshot Crew battling the Gifford fire this month in rural San Luis Obispo County, Calif. Loren Elliott for The New York Times

Crews bushwhack deep into the forest, carrying upward of 50 pounds of gear, to create what is called the fire line. They cut and burn anything that might feed the flames, and using specialized axes, scrape past roots to reach layers of mineral soil that won't ignite. Firefighters can work 24 hours straight building this line. Afterward, they often crawl into sleeping bags laid out in dirt. Every two weeks, they take a mandatory short break, and then can be sent back in.

Interspersed with the intense work are long, quieter stretches when crews watch the fire to make sure it doesn't jump the line — a time when firefighters in other countries often put on masks but Americans do not.

"None of us really have any information about the inherent risks," said Jacob Dale, a 30-year-old firefighter in Oregon who said he had developed precancerous nodules in his lungs. "It feels like superhero work."

Bandannas shield against heat and flying ash and don't restrict breathing. But they also don't filter out the most dangerous part of smoke: fine particulate matter. These tiny particles can travel deep into lungs, enter the bloodstream and harm the body.

When wildfires encroach on cities — setting cars, buildings and furniture ablaze — the smoke is even more toxic.

The risk can feel abstract, though, especially to new recruits, who sometimes join right out of high school for $15 an hour. Many start with just five days of training.

Darren Clifford, a firefighter from Wyoming, was told at 41 that he would need a lung transplant. Ryan Dorgan for The New York Times

Over the years, Darren Clifford, a firefighter from Wyoming, kept coughing up blood and landing in the hospital with pneumonia and pulmonary embolisms. His doctor told him to give up firefighting, but he needed the money.

Finally, a doctor said too much of his lung tissue had died and he would need a transplant. This spring, at 41, Mr. Clifford began the process of getting on the waiting list. He knows of other wildfire workers who had lung transplants, he said. “But I never thought it would be me at this age.”

Wildland firefighters often have theories about the one bad exposure that cost them their health. Ryan Breen was 30 and fighting a fire in Washington when the smoke around him grew blacker and more acrid. He was in a patch of poison oak. The particles scarred his lungs so badly that months later, a pulmonologist told him he needed to be medically retired. The doctor showed him a drawing of a lung and marked the spots where, he said, his tissue had “crystallized.”

“They treat you like cannon fodder,” said Zack MacMillan, who said he went to the emergency room in Colorado at age 27 after working in smoke so thick that he needed a flashlight to see where he was walking. He left firefighting and said he now has trouble catching his breath.

“Imagine the shortage of workers if they were being completely honest about the hazards,” Mr. MacMillan said.

The illness firefighters fear most is cancer. Researchers have found at least 31 carcinogens in wildfire smoke, along with other harmful particles.

“There are so many of us getting sick like this,” said Adrian Hahn, who was diagnosed with a brain tumor at 45. Tailyr Irvine for The New York Times

“There are so many of us getting sick like this,” said Adrian Hahn, who was diagnosed with a brain tumor at 45, after years of firefighting for the Forest Service, including parachuting into remote fires as part of a highly trained “smokejumper” crew.

He underwent surgery, but doctors could not remove all the cancer. He takes medication to slow his decline, but is losing memories and having trouble walking. “That’s all they can do,” he said. “Now I just take the pills until they don’t work anymore.”

In public comments and conversations with advocacy groups, the Forest Service has tended to dismiss cases like this as tragic outliers. The agency did not act on 25 years of recommendations that it track the long-term health of its crews, so there is no definitive tally of wildland firefighters who have suffered smoke-related illness.

But narrower studies repeatedly have shown a connection between wildfire work and illness. Some new studies have begun to document harms at the cellular level, like cancer markers and immune system abnormalities.

The Times reviewed dozens of scientific papers and spoke with more than 250 wildland firefighters, supervisors and agency officials. Nearly all said the same thing: Smoke damage isn’t the exception — it is part of the job.

‘They Didn’t Want to Know’

It was once thought that smoke from burning trees was basically benign, like a campfire. Then, in 1988, thousands of firefighters developed breathing problems as they fought back a monthslong fire in Yellowstone National Park. The Centers for Disease Control and Prevention sent a team to investigate.

Their researchers found that the crews were breathing in a mix of carcinogens and other harmful chemicals. The C.D.C. advised the Forest Service to ban bandannas — which offer “no degree of protection.” The gear that urban firefighters use isn’t practical for wildfires, but the C.D.C. said the Forest Service should equip crews with respirator masks. The agency rejected that advice and commissioned more studies.

Again and again, the Forest Service asked its own researchers how to better protect firefighters, and they came back with the same recommendation: Give them masks.

1997: “We propose developing a respiratory protection program.”

2000: “There are many lightweight respirators that can protect the respiratory system.”

2007: “Bandannas have been used by wildland firefighters for decades, however, they should not be considered a viable choice.”

2024: Federal safety regulators have “approved respirators that address most hazards.”

Still, Forest Service leadership held off.

Dale Bosworth, former Forest Service chief, at his home in Missoula, Mont. Tailyr Irvine for The New York Times

Of the last seven Forest Service chiefs, only one — Dale Bosworth — agreed to speak with The Times. He said that in retrospect, firefighters should have been given masks to wear when possible, but at the time he worried crews would reject them.

“It’s something else to pack around, and it’s hard to breathe,” said Mr. Bosworth, who retired in 2007. He said agency leaders had not really understood the health risks.

George Broyles, a former firefighter who became a smoke researcher for the Forest Service, remembers that era differently. He is among more than two dozen current and former Forest Service officials who told The Times that they believe the agency willfully resisted acknowledging that smoke was dangerous.

“They didn’t want to know, because then they’d have to do something,” he said.

In 2018, Mr. Broyles helped produce a video called “Smoke: Knowing the Risks,” which is still shown to thousands of firefighters every year. It warns about short-term hazards like getting lost in the haze, but not cancer or lung damage. Mr. Broyles asked to put out another training to include these dangers, but he said he could not get approval.

The current handbook outlining the risks of the job for Forest Service firefighters also omits any mention of long-term health issues.

The agency said in its statement that “evaluation continues” on a mask that would be appropriate for its firefighters.

Matt Rahn, research director of the Wildfire Conservancy, a nonprofit foundation for firefighter health and safety, said the agency should at least provide N95 masks to its workers, even if they can be uncomfortable.

“In the near term, there is not going to be a perfect mask. But anything is better than nothing,” Mr. Rahn said.

After watching her crew suffer through headaches and nausea for days in heavy smoke, Michelle Herrin ordered a box of masks on Amazon. Jordan Gale for The New York Times

Some supervisors have begun buying and distributing masks without permission. After watching her crew of Forest Service contractors suffer through headaches and nausea in heavy smoke in California, Michelle Herrin ordered a box of masks on Amazon.

Ms. Herrin, who has worked on wildfires for more than a decade, said she encouraged her team to protect themselves. “Most of the old firefighters that I know — and all of my old bosses — they all have cancer,” she said, adding that she had also developed lung damage.

Unions representing wildland firefighters have lobbied for years for greater protections.

In 2022, Congress granted federal firefighters workers’ compensation coverage for more than a dozen kinds of cancer, as well as C.O.P.D., heart attack and stroke. The law was intended to spare them from having to prove a connection between these illnesses and their years fighting fires. But this year, the Trump administration cut the administrative staff, leading to confusion and long waits for approvals.

The claim submitted by Mr. Allende, who was diagnosed with a qualifying cancer after the Los Angeles fires this year, has been delayed. A longtime member of an elite “hotshot” crew, Mr. Allende spent July hunting down paperwork. Without the paycheck and health coverage that workers’ compensation would provide, he kept putting off his second round of chemotherapy while trying to find a doctor who would take his limited insurance.

“I don’t know why they make it so hard. I’m sick and already tired and overwhelmed,” Mr. Allende said. “I always just trusted the agency to take care of us.”

In 2023, after another act of Congress pushed by unions, the work of tracking firefighters’ long-term health outcomes finally began.

Some 4,000 wildland firefighters signed up, including 500 already diagnosed with cancer. This spring, however, the Trump administration abruptly laid off the C.D.C. researchers running the program. Some were later hired back, but they say the research has been disrupted.

‘Look Cool Every Second’

Many wildland firefighters take pride not only in saving communities, but also in their tough image. Union leaders say a macho mind-set can be useful in a job that involves physical endurance and teamwork, but has contributed to a stigma around using protective equipment.

“They have this thing called L.C.E.S. — Lookouts, Communications, Escape Routes and Safety Zones — that’s ingrained into us,” said Rick Swan, who represents the International Association of Fire Fighters, the nation’s largest firefighter union, in groups that set safety standards. “The problem is that we’ve taken L.C.E.S. to mean ‘Look Cool Every Second.’ That culture is not good for our health.”

A firefighter wearing a respirator mask at a wildfire south of Athens, Greece, this month. Aris Messinis/Agence France-Presse — Getty Images

Younger firefighters tend to be more interested in wearing masks, but some say they are scared of being mocked by their crewmates and supervisors.

The federal Department of Labor, which sets workplace safety standards nationwide, stepped in a half-century ago to protect urban firefighters — over their objections.

Until the 1970s, those firefighters rarely wore masks. Then the Labor Department began requiring sealed masks and compressed air tanks. Firefighters immediately protested, according to Jonathan Szalajda, who helped oversee the regulation of masks at the C.D.C. until he retired this year.

“They said, ‘It’s going to destroy the industry,’” he said. “But then they just modified their way of working.”

Since the requirement went into place, elevated cancer rates in urban firefighters have dropped. “But you need the requirement first,” Mr. Szalajda said. “Until there’s a requirement, things are going to stay pretty much the way they are.”

After the Sept. 11, 2001, terrorist attacks, Labor Department officials faced similar resistance to masks from the emergency workers who were recovering bodies and clearing debris in the rubble of the Twin Towers.

“There’s always resistance to wearing respirators because they’re not comfortable or easy to work in,” said Jordan Barab, a former top official at the department’s Occupational Safety and Health Administration. In what occupational health experts now widely consider a mistake, the agency did not insist that the workers wear protection. Within a few years, hundreds began to fall sick and die.

Shaken, Labor Department officials again started overhauling workplace standards for firefighters. After many years of fine-tuning, the department formally proposed a requirement last year that wildfire crews be given masks.

In a series of tense video meetings that have not been previously reported, Forest Service officials pushed to kill the mandate, according to three people with knowledge of the meetings who spoke on the condition of anonymity because they were not authorized to discuss internal deliberations.

The National Wildfire Coordinating Group, an association made up of state and federal wildfire agencies and steered in part by the Forest Service, noted that the new safety standards might be ruinously expensive.

In its statement, the Forest Service said it wanted the rules to be more “flexible” and “reflect the unique conditions of wildland firefighting.”

Joe Perez stopped wildfire work in his 30s because of lung damage. Rachel Bujalski for The New York Times

Joe Perez, a California firefighter who was forced to stop wildfire work in his 30s because of lung damage, followed the proceedings closely and urged the Labor Department in a letter not to back down. “We work, eat and rest in these toxic environments with little to no protection,” he wrote. “Something must change.”

He said he was crushed to see the fire services pushing back against masks.

Labor Department officials initially held firm to the requirement, but they are now under pressure from the Trump administration to roll back workplace safety regulations.

A similar dynamic played out in California, where state safety officials began shaping a mask mandate for wildland firefighters in 2022. At an initial meeting, the Forest Service urged regulators not to impose a requirement.

After three more years of meetings, the state still has not proposed a rule.

The Hotshot Crew

Members of the Sierra Interagency Hotshot Crew fighting the Gifford fire this month. Loren Elliott for The New York Times

This month, thousands of firefighters were dispatched to the Gifford fire, California's largest fire of the year, which is burning a few hours north of Los Angeles and has triggered mandatory evacuation orders around the region.

One recent afternoon, the fire suddenly veered toward a cluster of small mountain communities. A Forest Service hotshot crew rushed to help fight it back, hiking toward a ridge where flames were shooting high above the trees as if from a volcano.

The air was smoky, and as the crew worked, it grew smokier. After the line was built, the firefighters stood in a rain of ash and watched. Up and down the fire's perimeter, other crews were doing the same, forming an unbroken line of sentries. Their eyes watered and the backs of their throats stung.

No one wore a mask. No one even had one. Many said they assumed the smoke wasn't dangerous. "It's just organic," said a firefighter in his early 20s. "Your body adjusts," said his crewmate. The thick haze reminded another of the Los Angeles fires, which he had helped fight in January. "But our supervisors keep us safe," he said.

Some of the firefighters came from bases in the Angeles National Forest, where Mr. Allende had worked. After his cancer diagnosis, they sent him a care package with Forest Service stickers and pins and a Smokey Bear stuffed animal, which he put on display at his Los Angeles home.

Mr. Allende with his Forest Service crew at the hospital in Oregon where he received his cancer diagnosis and first round of chemotherapy.

Last week, he finally went in for his second round of treatment. He had decided to shoulder the costs because he could not risk waiting for workers compensation. But the doctors sent him home. The tumor in his chest had grown "huge," they said, and he would need to return so he could be hospitalized to undergo a five-day regimen.

Back home, he sat on the couch with the shades drawn. Sympathy cards on a shelf thanked him for his service. He had been instructed to stay away from the sun and avoid crowds, so he was spending the summer inside.

He scrolled through videos that his friends were posting from the Gifford fire, and then through ones he had taken himself in January's fires, the crew's coughing audible over the Santa Ana winds.

"We were sucking smoke all day," he said. He watched the black plumes in the video in silence for a moment, pulling at his hospital bracelet.

He turned off his phone. The flames and ash didn't look romantic anymore. "It was toxic," he said.

Read by Hannah Drier

Lauren McCarthy and Eli Murray contributed reporting. Julie Tate, Kitty Bennett, Susan C. Beachy and Kirsten Noyes contributed research. Audio produced by Adrienne Hurst.

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