

Air pollution via wildfire smoke takes toll on labor markets

June 27 2023, by Phil Ciciora



Credit: Unsplash/CC0 Public Domain

Wildfires emit large amounts of smoke containing harmful pollutants that can drift for hundreds or thousands of miles away from their source, as shown by this summer's Canadian wildfires, which created air quality problems as far afield as New York City. A paper co-written by a team of University of Illinois Urbana-Champaign researchers analyzes how

drifting wildfire smoke impacts the U.S. labor market.

The study analyzes variation in [wildfire](#) smoke exposure across the continental U.S. from 2007–2019 and finds that increases in smoke exposure cause significant decreases in earnings and employment outcomes for U.S. workers.

Wildfires have increased in frequency and intensity in recent years, accounting for about 20% of the [fine particulate matter](#) emitted in the U.S. But [air pollution](#) through wildfires causes more than just direct damage to life and property, said David Molitor, a professor of finance at the Gies College of Business at Illinois and study co-author.

"We found that smoke exposure can decrease labor income, employment and labor force participation rates across a wide variety of sectors, including manufacturing, crop production, utilities, health care, real estate, administration and transportation," he said. "Although the diffuse nature of wildfire smoke hurts people of all ages throughout the continental U.S., the impact is worse among older workers, suggesting that age or poor health may amplify its [harmful effects](#)."

"Wind can carry wildfire smoke for thousands of miles, thereby generating air [pollution](#) events that are geographically widespread and far from the fires themselves," said Mark Borgschulte, a professor of economics at Illinois and study co-author. "In this paper, we quantified the broader effects of air pollution on [labor market](#) outcomes both to understand how pollution affects [human welfare](#) and for designing optimal air quality policies."

The paper, which was published in *The Review of Economics and Statistics*, relied on linking three primary data sources: high-resolution remote sensing data from satellites that show the locations of wildfire smoke plumes in the U.S.; air quality data from ground-level pollution

monitors; and labor market data for all counties in the continental U.S.

A challenge for assessing how air pollution impacts the labor market is that healthy labor market activity can itself generate air pollution through vehicle traffic, manufacturing and electricity generation, Molitor said.

"You can't just compare periods of time, because pollution tends to be low when the economy is slowing down, and vice versa, with increased economic activity causing more pollution," he said. "But wildfires present an opportunity to sidestep that challenge by focusing on the variation in air pollution caused by drifting wildfire smoke plumes."

After benchmarking the welfare costs of lost earnings due to pollution by comparing them to mortality costs derived from previous research, the researchers found that, between 2007–2019, an additional day of smoke exposure reduced quarterly earnings by about 0.1% or by an average of \$125 billion per year.

They also found that earning losses from smoke exposure were about 60% larger in counties whose populations have an above-median proportion of Black residents.

The results have broad implications for environmental policy.

"Our analysis suggests that the cost of lost earnings due to wildfire smoke is similar to or larger than the costs of increased mortality," said Molitor, also the RC Evans Data Analytics Scholar at Illinois. "By contrast, many agencies that engage in environmental policymaking, such as the World Bank and the U.S. Environmental Protection Agency, have traditionally treated pollution damages arising from lost labor market hours and earnings as considerably smaller than the mortality cost of air pollution. Our findings indicate that [environmental policies](#)

that ignore or downplay the labor market effects of air pollution are insufficient and fail to take into account significant costs due to lost economic activity."

The findings also have direct implications for wildfire policy and management, and the importance of labor market channels in air pollution policy responses, the researchers said.

"A primary implication of our results is that wildfire smoke creates large externalities, which is economist-speak for actions whose consequences are borne by someone else," Molitor said. "For example, decisions about land use and fire management in California or Canada can affect those living in the Midwest or on the East Coast."

The diffuse, widespread effects of air pollution via wildfires call for greater coordination of fire policies, including a focus on preventing the start and spread of wildfires, according to the paper.

"Policies should consider factors that go beyond traditional goals of defending land and property exposed to fires in a given region to incorporating issues such as the amount of smoke produced by the fire and whether the smoke plumes may reach areas with large populations," Molitor said.

"While [wildfires](#) and wildfire smoke can't—and shouldn't—be completely eliminated, we should design policies that take into account the full scope of their effects—namely, that ambient air pollution imposes large costs on human well-being and labor market outcomes. This reality was thrown into stark relief this summer as the East Coast grappled with an acute air-quality crisis, leading to event cancelations and New Yorkers being forced to stay inside," he said.

More information: Mark Borgschulte et al, Air Pollution and the

Labor Market: Evidence from Wildfire Smoke, *The Review of Economics and Statistics* (2022). [DOI: 10.1162/rest_a_01243](https://doi.org/10.1162/rest_a_01243)

Provided by University of Illinois at Urbana-Champaign

Citation: Air pollution via wildfire smoke takes toll on labor markets (2023, June 27) retrieved 27 April 2024 from <https://phys.org/news/2023-06-air-pollution-wildfire-toll-labor.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.