

Activity summary of CIAS research fellow in Budapest

Grant category: junior senior non-resident senior



Name: Marcus Dillender

Home institute (name, position, country): Vanderbilt University, Assistant Professor of Medicine, Health, and Society (with joint appointment in Economics Department), USA

Academic Year / Semester: May 2023 – July 2023

Duration: two months

Project title: The Impact of Air Pollution on Occupational Health

Project description*: Because workers are routinely required to perform dangerous tasks, many workers face unique risks from exposure to air pollution. Long-term exposure to air pollution has the potential to lead to long-term health issues, like cancer and heart disease. In addition to having long-term health effects, certain pollutants have immediate cardiovascular and respiratory effects that have the potential to reduce workers' mental and physical capacities. By reducing mental and physical capabilities of people performing high-risk physical tasks, pollution has the potential to increase the prevalence of workplace injuries. With U.S. workers experiencing approximately 9 million workplace injuries and illnesses each year at a total annual cost of over \$300 billion (in 2020 dollars), workplace injuries are a major issue in the United States. Likely in part because people with lower levels of human capital are more likely to work in physical jobs than people with

higher levels of human capital are, the burden of workplace injuries is borne disproportionately by socioeconomically disadvantaged groups, including those without a college degree and racial and ethnic minorities.

This project estimated the impact of two important types of pollutants on workplace injuries: particulate matter 2.5 (PM2.5) and wildfire smoke. We chose to focus on these two pollutants because recent research has demonstrated considerable harm from PM2.5 in non-work settings and because concerns about wildfire smoke, which is an amalgam of different harmful compounds (including PM2.5), have grown in recent years as climate change has increased the number and severity of wildfires. Moreover, occupational health stakeholders—including the Occupational Safety and Health Administration, the National Institute for Occupational Safety and Health, and various state occupational health and environmental agencies—recognize the potential harm of these pollutants for workers. Understanding the effect of air pollution on occupational health is necessary for setting optimal pollution policy, for establishing protocols to mitigate the adverse effects of pollution, and for understanding the implications of pollution for health and financial disparities. However, no previous research to our knowledge has estimated the impact of pollution on workplace injuries using information on a broad set of workers or accounting for potential confounding relationships.

Achieved result(s)*: The analysis revealed that smoke exposure leads to a significant increase in workplace injuries. Our findings indicate that the workplace injury rate increases by 0.196 injuries per 100,000 workers on a day of wildfire smoke exposure, or by 2.3% relative to the mean daily claim rate. We conduct back-of-the-envelope calculations to estimate the mean cost of these additional injuries, and we note that these additional costs borne by the workers' compensation program are likely to substantially understate the total social cost of these additional injuries, as the willingness to pay to avoid injury might be substantially larger than the medical reimbursement costs and lost wages associated with these injuries.

Connected publications*

1.

Title: Air Pollution and Workplace Safety: Evidence from Wildfire Smoke

Date of submission/acceptance/publication: Planned 2023 submission

Journal: National Bureau of Economic Research Working Paper Series

Journal category (if applicable): Q1 Q2 Q3

Status: accepted/published in progress planned

2.

Title: Air Pollution and Workplace Safety: Evidence from Wildfire Smoke

Date of submission/acceptance/publication: Pending

Journal: *Review of Economic Studies*

Journal category (if applicable): Q1 Q2 Q3

Status: accepted/published in progress planned

Professional collaborations, partnerships*

1.

Name: Valentin Brodzsky

Institution: Corvinus University

Field of research: Health Economics

Future plans for joined research: I discussed research with Valentin and provided comments on some ongoing projects. We agreed to be in touch about collaborating in the future.

2.

Name:

Institution:

Field of research:

Future plans for joined research:

Additional activities* (public lectures, presentations, professional meetings, media connections etc.):

1. On June 5, I attended a book launch for the Ideal River.
2. On June 14, I presented my research in the Research Week.
3. On July 19, the CIAS Inn published an [interview](#) with me.

Future plans, planned return (if any):

- I plan to return to Hungary later
- I plan to maintain my professional contacts via e-mail
- Any other comment: It was a great visit. I made good connections and enjoyed learning more about Hungary and Corvinus University. I have great things to say to anyone who will listen about the university and the program.

*Please give us a properly detailed summary.

Date: 13 September 2023

Signature: 