HEI
HEALTH EFFECTS INSTITUTE
update
FALL 2022

In Person, In Pictures: Annual Conference 2022

JAY MALLIN

HEI Vice President Bob O'Keefe thanks EPA Deputy Administrator Janet McCabe after her keynote address at HEI's Annual Conference 2022. McCabe spoke on EPA initiatives and how scientific research informs regulatory decisions. The three-day conference was held in June in Washington, D.C. *See pages 2–3 for more photos.*

Experts Conduct New Assessment of Traffic Pollution Exposure

Detailed Review of Scientific Evidence Finds Stronger Links to Adverse Health Effects

HEI special panel reviewed more than 350 studies spanning 40 years

A comprehensive HEI scientific review, published in June, found growing confidence in the links between several adverse health effects and traffic-related air pollution (TRAP). The review, the largest of its type to date, was conducted by a panel of 13 renowned experts who evaluated 353 scientific

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Canadian Study Reports Health Effects at Very Low Air Pollution Levels

A comprehensive new HEI study in Canada examining potential health risks from low levels of fine particulate matter air pollution ($PM_{2.5}$) exposure found increased risks of mortality – even at levels below current U.S. and other ambient air quality standards. Within a cohort of millions of Canadian citizens, the investigators found that long-term outdoor $PM_{2.5}$ exposures as low as 2.5 μg/m^3 were associated with an increased risk of death.

In the study, detailed in Research Report 212, *Mortality–Air Pollution Associations in Low-Exposure Environments (MAPLE): Phase 2,* Michael Brauer at The University of British Columbia, School of Population and Public Health, Vancouver, and his colleagues combined satellite data, air monitor sampling, and atmospheric modeling to estimate outdoor $PM_{2.5}$ exposures across Canada

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Tradition and Innovation at HEI Annual Conference

Hybrid Event Welcomes In-Person and Virtual Engagement in Leading-Edge Science, Policy Topics

In late June, an appreciative – and masked – audience representing academia, government, and industry joined HEI staff for the first in-person HEI Annual Conference since 2019. The event, featuring discussions of the latest science on air pollution's health effects and its implications for environmental policy, was held June 26–28 at the Westin Washington, D.C. City Center. A few of the two dozen speakers presented remotely; the event was also livestreamed and recorded.

"It was great to see the 'sparks fly' when HEI's investigators, sponsors, staff, and other attendees had a long-delayed chance to meet in person, trade ideas and data, and identify new ways to answer important questions on air pollution and health," said HEI President Dan Greenbaum.

Visit *www.healtheffects.org/annual-conference* for recordings of the conference presentations, slides, and poster abstracts. HEI

Attendees included scientists and others from academia, the U.S. EPA, industry sponsors, NGOs, and HEI staff.

Christina Hemphill Fuller, Georgia State University.

More than 40 studies were presented during the poster sessions.

Angie Shatas, U.S. EPA.

CONFERENCE PHOTOS BY JAY MALLIN

Kalpana Balakrishnan, Sri Ramachandra Institute of Higher Education and Research, India.

Kari Nadeau, Stanford University.

Photos continue on page 3

MARK YOUR CALENDAR!

HEI ANNUAL CONFERENCE April 30–May 2, 2023 • Renaissance Boston Waterfront Hotel, Boston, MA

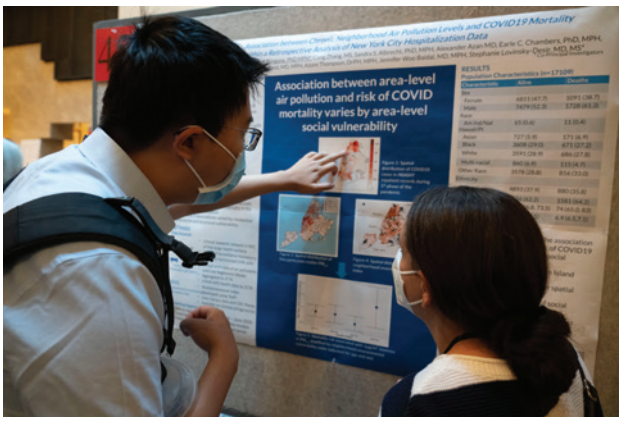
Registration materials and a preliminary program available in early 2023 at *www.healtheffects.org/annual-conference*.

Erika Sasser, U.S. EPA.

Gloria Jeff, University of Michigan.

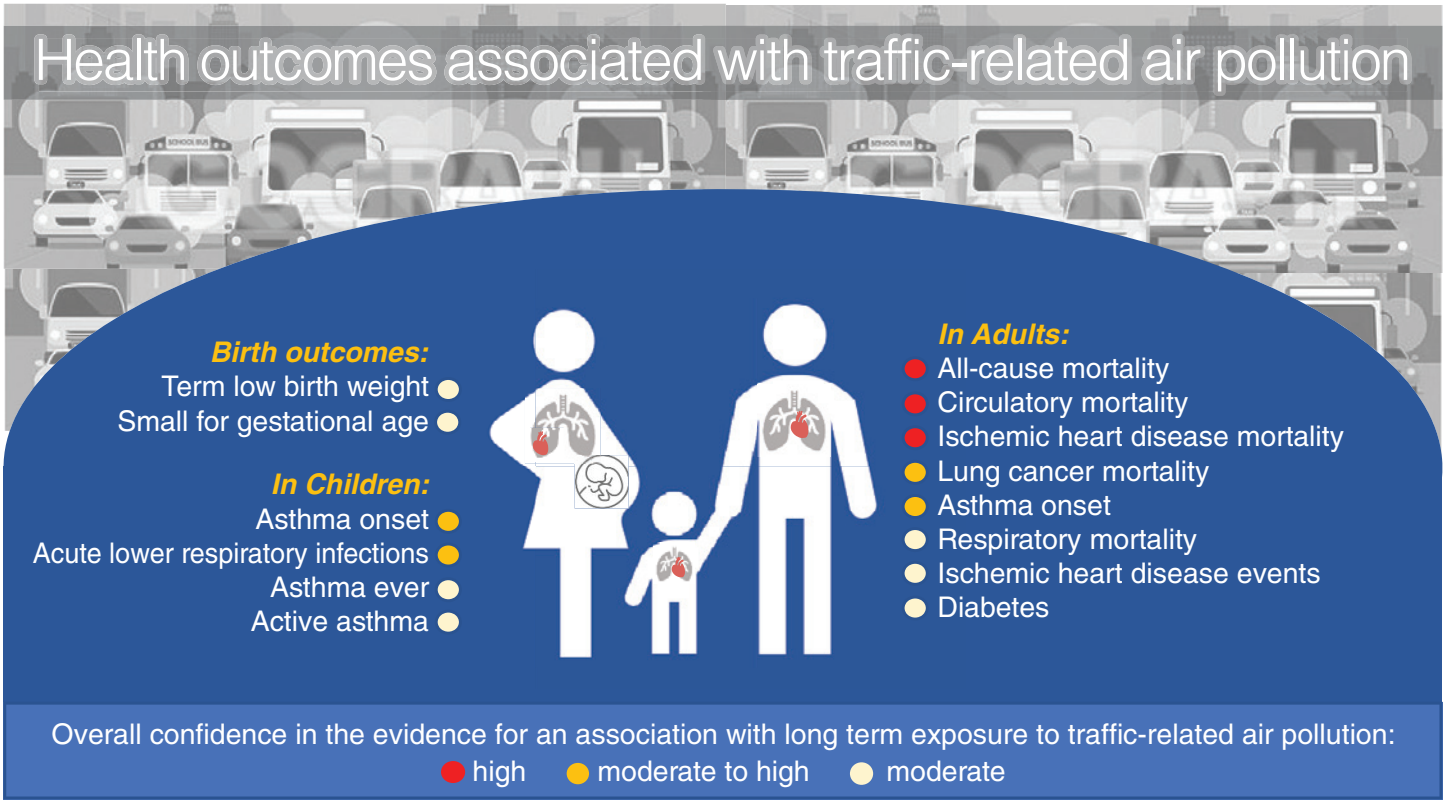
Ilona Jaspers, University of North Carolina at Chapel Hill.

Joseph Antonelli of the University of Florida, a Walter A. Rosenblith New Investigator, answers questions about his statistical methodology study during a poster session.



Attendees view a poster on one of HEI's ongoing studies examining possible links between air pollution exposure and COVID-19 health outcomes.

Recipients of the 2022 Jane Warren Trainee Conference Award, from left: **Joshua Rivera,** American University; **Joyce J.Y. Lin**, Johns Hopkins University; **Garima Raheja**, Columbia University; **Ajit Singh**, University of Birmingham, UK; **Yifang Wang**, Emory University; and **Wenlu Ye**, University of California, Berkeley. Video recordings of the awardees' poster presentations can be viewed on the HEI YouTube Channel; see conference playlist.



TRAFFIC POLLUTION EXPOSURE *(Continued from page 1)*

reports on traffic pollution and related health effects published between 1980 and 2019 that assessed diverse populations, with a majority based in Europe and North America.

Following HEI's widely cited 2010 TRAP report, HEI appointed a new panel in 2018 to evaluate evidence of long-term exposure to TRAP and selected adverse health outcomes. The panel found a high level of confidence that strong connections exist between TRAP and early death due to cardiovascular diseases. A strong link was also found between TRAP and lung cancer mortality, asthma onset in children and adults, and acute lower respiratory infections in children, with somewhat lower confidence noted in other health outcomes.

"Traffic pollution clearly remains an important public health concern across the globe," said Hanna Boogaard, HEI consulting principal scientist and project manager of the overall review. "This report provides the evidence to inform policymaker actions to consider ways to mitigate the consequences of traffic pollution."

Traffic-related air pollution is a complex mixture of gases and particles resulting from the use of both heavy-duty and light-duty vehicles, buses, passenger cars, and motorcycles. Motor vehicles emit a variety of pollutants including nitrogen dioxide (NO_2), elemental carbon (EC), and particulate matter ($PM_{2.5}$). Vehicles also produce non-tailpipe emissions resulting from resuspension of road dust, abrasion of the road surface, and the wear of brakes and tires that leads to emissions of heavy metals such as iron and copper. To date, almost all traffic pollution regulations are targeting tailpipe emissions.

In its report, the panel noted that many higher-income countries around the world have seen tailpipe emissions and ambient concentrations of some air pollutants decrease steadily over the past several decades, and air quality regulations and improvements in vehicular emission-control technologies that have contributed to these decreases will continue. However, those improvements do not fully offset the growth and increased congestion of the world's motor vehicles due to population growth, urbanization, and economic activity, especially in low- and middle-income countries. Older, higher-emitting vehicles also remain on the roads of many of those poorer countries. The introduction of new technologies such as electric vehicles promises reductions of some components of TRAP, especially if the electric grid is decarbonized.

Emissions from traffic affects air quality at the local, neighborhood, urban, and regional scales. The panel found that epidemiological studies focusing on exposures at the local level (less than one kilometer from a major roadway) and neighborhood level (one to five kilometers) offered the greatest potential in determining the effects of TRAP. The panel concluded that TRAP will continue to have important health effects globally, especially in urban settings and areas close to busy roads.

The full TRAP review and executive summary can be found here. For more information, contact Johanna Boogaard, *jboogaard@healtheffects.org*.

Apply to Be a Mentor in New, Inclusive Fellowship Program

In partnership with the International Society for Environmental Epidemiology (ISEE) and International Society of Exposure Science (ISES), the Health Effects Institute is launching a new paid summer fellowship program to encourage undergraduate students from backgrounds that are underrepresented in the environmental health sciences to pursue research in this area.

Fellowship areas can include environmental exposures, epidemiology, bench science, data analysis, and field work. Potential mentors at academic or nonprofit institutions and state or local governments are invited to apply to mentor and host an undergraduate student in their group during the summer of 2023.

Interested in mentoring a fellow? Find out how here

Initial enthusiasm for the program within ISEE and ISES was very high, and a joint committee has been formed with HEI to oversee the program and manage the applications. Several potential mentors have already reached out ahead of HEI launching the mentorship application process.

Mentor applications and more information about the program are available at *www.healtheffects.org/research/funding/fellowship*. Applications will be due October 28, 2022. The fellowship application process will open in mid-December.

If you have questions about the program, contact *fellowship@healtheffects.org*.

Progress in HEI's DEI Initiatives

Five HEI staff members recently volunteered to become part of the organization's new Diversity, Equity, and Inclusion (DEI) Committee. The Committee follows in the footsteps of a task force that engaged in deepening HEI's DEI initiative over the past two years.

The new committee, which began meeting in July, will help finalize the official DEI plan, set annual goals, establish communications objectives, facilitate all-staff community dialogues and learning, and evaluate HEI's progress in implementing these measures. It will meet regularly, and HEI staff members will serve either 9- or 12-month terms on a rotating basis.

HEI expresses gratitude to the original task force and thanks the inaugural members for stepping forward to launch the new DEI committee:

Amy Andreini (co-chair), Communications Assistant

Anna Rosofsky, Senior Scientist

Martha Ondras, Research Fellow

Lissa McBurney (co-chair), Senior Science Administrator

Jackie Rutledge, Director of Finance and Administration.

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Richard F. Celeste, *Chair, Board of Directors*
Daniel S. Greenbaum, *President*

HEI is a nonprofit organization funded jointly by government and industry to research and evaluate the health effects of air pollution. An overview of HEI, information on its current research program, and all published HEI reports are available for downloading, free of charge, from the website.

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Staff News

Amy Andreini joined HEI in May as the organization's first communications assistant. The position was created to help HEI more widely share news from its rapidly growing scientific programs via digital media and, consequently, expand engagement with HEI by scientists, policymakers, sponsors, journalists, NGOs, and the public at large. Andreini previously worked as a site manager and educator at Yosemite National Park. She earned a BA in biology at Colby College, majoring in ecology and evolution and environmental science.

Ayusha Ariana is the new research assistant for the separately funded HEI Energy affiliate. Ariana, who began at HEI in June, will be running the program's literature management database and will also work with the rest of the Energy team to oversee and grow the Energy research program. She recently graduated from Wellesley College with a BA in architecture and environmental studies.

Jason Desmond joined HEI in March as deputy director of finance and administration. Desmond shares responsibilities with Jacqueline Rutledge, director of finance and administration, and Rob Davidson, staff accountant, to serve HEI's core program on health effects of air pollution, the Global Health program, and HEI Energy.

Desmond began his career working for the accounting, tax, and advisory services firm CBIZ Tofias (now CBIZ & MHM New England). He earned an MBA and an MS in accounting from Bentley University.

Ada Wright, a new research assistant working on the Global Health team, arrived at HEI in July. She earned a bachelor's degree from Carleton College in environmental studies with a focus on public policy and geographic information systems (GIS). Her research interests include the impact of industrial waste management on communities and using GIS to convey key environmental and health data.

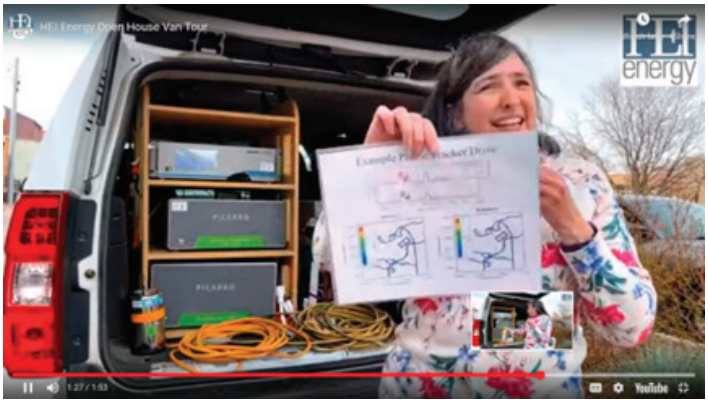
HEI Energy News

Community Open Houses

In conjunction with a new, separately funded research program launched earlier this year, HEI Energy recently hosted two public open-house events to inform and educate communities in the study locations and other stakeholders about the research. Five studies are being funded under the program, which is designed to improve understanding of community exposures that come directly from unconventional oil and natural gas development across the United States.

The first open house, Launching Independent Research on Air Quality and Noise Around Oil and Gas Well Sites in the North Front Range, was held in person in Longmont, Colorado, in April. The second was a virtual event, Independent Research on Air Quality and Noise Around Oil and Gas Well Sites in the Permian and Eagle Ford Regions, held in June.

HEI Energy is planning for additional public events in other locations as research continues.



Amy Sullivan of Colorado State University at HEI Energy's community open house in Longmont, Colorado. Sullivan showed attendees mobile air-quality monitoring instrumentation and discussed the type of data it provides. (Image is from a livestream video interview.)

Workshop Focuses on Air Pollution, Health in Bulgaria

In mid-June, HEI and the Medical University of Plovdiv jointly sponsored a hybrid workshop on air pollution and health in Bulgaria. The meeting, conducted with support from the Clean Air Fund, brought together a range of regional stakeholders across Bulgaria and Europe who are interested in building and using evidence on the health effects of air pollution. These included researchers, healthcare practitioners, professional societies, national and regional nonprofit groups, bi- and multilateral organizations, federal and local government agencies, ministries, and research institutes. Their discussions drew coverage from media organizations such as trafficnews.bg and marica.bg.

From left: Dessislava Petrova-Antonova, GATE Institute, Sofia University; Marianna Murdjeva, Rector, Medical University of Plovdiv; Borislav Sandov, Minister of Environment and Water (all of Bulgaria); Dan Greenbaum, HEI; Alex Simidchiev, member of Parliament of Bulgaria; Angel Dzhambov, Medical University of Plovdiv; Robert O'Keefe, HEI; Veselka Hristamyan, Medical University Plovdiv and Breathe Plovdiv; and Dilyana Vicheva, Vice Rector of International Cooperation, Medical University of Plovdiv.

LOW AIR POLLUTION LEVELS *(Continued from page 1)*

from 1981 to 2016. The team applied comprehensive epidemiological analyses in 7.1 million Canadian adults to evaluate the risk of death at different $PM_{2.5}$ exposure ranges and to identify the lowest concentration at which associations with health effects could be detected. Finding links between air pollution and mortality at these air pollution exposure levels in Canada, which are typically some of the lowest in the world, strengthens understanding of the extent of potential air pollution effects.

The report was subjected to comprehensive independent peer review by the HEI Low-Exposure Epidemiology Studies Review Panel, who had no role in conducting or overseeing the study. The panelists concluded that the study presents a high-quality and thorough investigation into associations between risk of mortality and exposures to ambient air pollution in Canada, applying advanced statistical techniques to rigorously test whether air pollution exposure causes direct impacts on health.

"Our research on large representative samples of the Canadian population provides compelling evidence of harmful effects of air pollution on mortality at levels below current national standards and international guidelines," Brauer said, adding, "These findings suggest important public health benefits from continued reductions in air pollution."

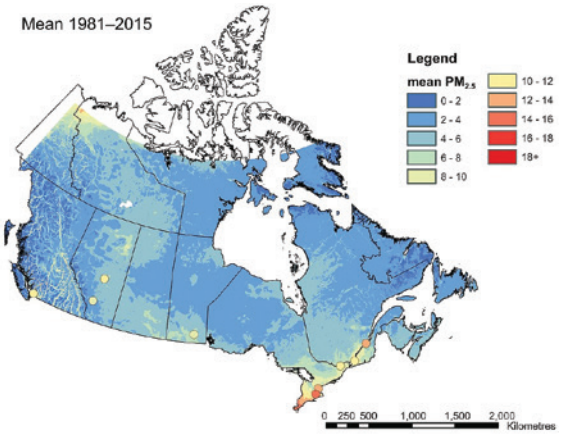


Figure from Research Report 212 shows estimates of fine particulate matter ($PM_{2.5}$) annual means averaged over the entire study period (1981–2015). City-level estimates for the largest cities are shown in the circles.

Air pollution has long been viewed as a significant contributor to the global burden of disease, including to risks of heart disease, diabetes, asthma, and respiratory disease. According to HEI's recent *Global Burden of Disease – Major Air Pollution Sources* report, a major source of $PM_{2.5}$ comes from the burning of fossil fuels, accounting for more than 1 million deaths globally. In Canada, major sources of $PM_{2.5}$ include wildfires, transportation emissions, and wood fuel combustion for home heating. Although air pollution concentrations have been declining over the past few decades in many higher-income countries, several studies published in the past decade have reported associations between risk of mortality and long-term exposures to relatively low concentrations of $PM_{2.5}$.

The new report by Brauer and colleagues presents the final in a set of three research studies funded by HEI to explore health effects from air pollution exposure at levels below government recommended standards. The other two were conducted in Europe, released in September 2021, and in the United States, released in January 2022. All three studies were funded through HEI's program to investigate the health effects of long-term exposures to low levels of air pollution in very large populations.

Research Report 212 is available for downloading at *www.healtheffects.org/publications*. For more information, contact Eva Tanner.