HEI HEALTH EFFECTS INSTITUTE

update

FALL 2017

New Look at Literature on Traffic-Related Air Pollution Under Way Soon

HEI will initiate an intensive literature review to update its Special Report 17, *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects*, in early 2018. The new literature review, anticipated for release in late 2020, will systematically summarize the evidence relating traffic-related air pollution to short-term and long-term health outcomes. Outcomes of interest will include cause-specific mortality and diseases of the respiratory, cardiovascular, neurological, and reproductive systems. The updated review — the earlier report was published in 2010 — will also provide background on how changes in regulations and vehicle fleets have affected emissions, air quality, and exposure to traffic-related air pollution.

HEI is seeking nominations (including self-nominations) of experts in epidemiology and exposure assessment of traffic-related air pollution for the Traffic Literature Review Panel. Please send your nominations to Rashid Shaikh at *rshaikh@healtheffects.org.*

HEI Advancing Data Sharing and Access

The open and free exchange of data is a critical aspect of the scientific process, ensuring that other investigators can explore the robustness of the findings of a study. For HEI, providing access to data underlying scientific studies is also an important element for ensuring their credibility, especially when the studies are used in public policy settings. Recently, interest in ownership, access, and control of data underpinning research has risen in the scientific as well as stakeholder and legislative communities, and HEI is responding to increased requests for information.

It is HEI's longstanding policy to provide access expeditiously to data for studies that it has funded — in a manner that not only facilitates review and verification of the work but also protects the confidentiality of any volunteer participants whose health information has been gathered, and respects the original investigator's intellectual interests. In cases where confidential data are obtained from third parties — public or private — and used in HEI-sponsored research, HEI makes available information on how others can access data from the third party and, wherever possible, facilitates this process.

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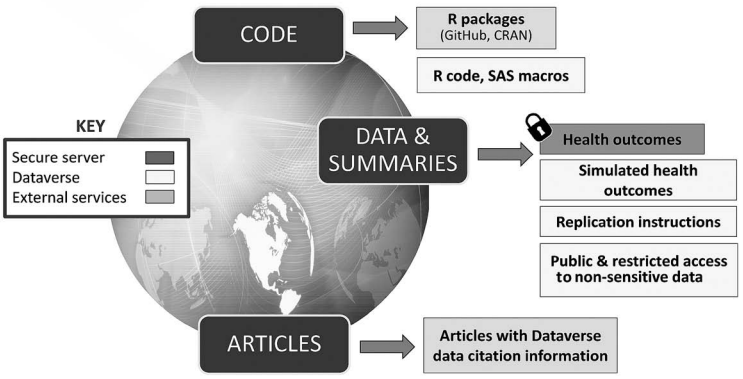
TOOLS FOR DATA ACCESS AND REPRODUCIBILITY



An ongoing HEI study by Francesca Dominici et al. on the effects of exposure to low levels of air pollution will employ these tools for access to study data, including statistical software to implement methods developed in the study and specific instructions on how to reproduce the investigators' health data sets and analyses. (Chart from poster presented at HEI Annual Conference 2017.)

Also in This Issue

Two current HEI efforts in this area are noteworthy. First, the institute has recently published a large, systematic study of human volunteers exposed to ozone. The *Multicenter Ozone Study in oldEr Subjects (MOSES)* measured a very large number of cardiovascular and respiratory health endpoints in 87 healthy, older participants who were exposed to 0, 70, or 120 parts per billion ozone. The study was performed at three clinical centers, and data were collected and analyzed centrally at a data management center. While the MOSES investigators are completing additional analyses, HEI is working with them and a contractor to prepare the data for wider sharing. All data collected during the study, with the exception of the subjects' personal information, will be available through a data repository starting next spring.

Second, HEI funded three studies in 2016 to investigate the health effects of exposure to low levels of ambient air pollution in millions of people in the United States, Canada, and Europe. (See "Ongoing studies funded under this RFA" at RFA 14-3, available at *www.healtheffects.org/research/funding/rfa-archive*.) Their results will likely inform important scientific and regulatory questions. Each of these studies is relying on information from very large populations and administrative databases.

"Data access is very important for science. At HEI, we are fully committed to working with our investigators and outside parties to facilitate such access and sharing."
— Rashid Shaikh, HEI Director of Science

In funding these projects — and being aware of their potential use for scientific analyses and policy making — HEI ensured that the data used will be available for sharing upon completion of the studies. One of its funded teams, in particular, is setting what may well be a new standard for data sharing in environmental epidemiology.

Led by Francesca Dominici, the Harvard University team is marrying data from about a dozen sources for their study. Once the study is complete, they plan to put all of their software codes and analytical data sets in a digital data repository. While some of the critical data being used — for example, health outcomes information for 61 million Medicare enrollees — cannot be passed from investigator to investigator under specific data user agreements, the data *are* publicly available from the United States Centers for Medicare and Medicaid Services, and the Dominici team will provide detailed information on how others may obtain and analyze the data from the Centers.

"Data access is very important for science," said HEI Director of Science Rashid Shaikh. "At HEI, we are fully committed to working with our investigators and outside parties to facilitate such access and sharing." HEI

Communicating the Science

Inroads to Understanding Traffic Exposure

On October 16, HEI Principal Scientist Maria Costantini and Consulting Senior Scientist Hanna Boogaard chaired a symposium as part of the 27th annual meeting of the International Society of Exposure Science in Research Triangle Park, North Carolina. Each year the meeting brings together experts from various scientific communities, including academia, government, industry, and nongovernmental organizations.

ISES2017 Research Triangle Park, NC October 15-19, 2017

Titled "Road Work Ahead: Progress in Assessing and Mitigating Exposure to Traffic-Related Air Pollution," the symposium focused on evaluating approaches to improve the understanding of traffic pollution exposure models and metrics, and of action that can be taken to reduce exposure. Participants included HEI investigators Veronica Berrocal of the University of Michigan, who is on the research team of a study led by Stuart Batterman, and Donghai Liang of Emory University, who is working on a study led by Jeremy Sarnat. Rich Baldauf of the U.S. Environmental Protection Agency was the third speaker. HEI

More information about the meeting, including abstracts, is available at *www.intlexposurescience.org/ISES2017*.

Mark Your Calendar! HEI Annual Conference
April 29—May 1, 2018 • Chicago, Illinois

HEI Down Under for Epidemiology Conference

HEI was well represented at the annual conference of the International Society for Environmental Epidemiology, held in Sydney, Australia, in late September. During the conference, Consulting Principal Scientist Aaron Cohen received the prestigious John Goldsmith Award for Outstanding Contributions to Environmental Epidemiology. His acceptance lecture, attended by more than 700 people, highlighted his work on the Global Burden of Disease project and other air pollution research, and proposed directions for studying air pollution's health effects to support future burden of disease estimates.

Aaron Cohen, HEI Consulting Principal Scientist. PHOTO BY JAY MALLIN

HEI Consulting Senior Scientist Hanna Boogaard served on the scientific program committee for the conference and cochaired a symposium, "Is Bigger Always Better? Promises and Pitfalls of Studying Air Pollution Effects in Very Large Populations," with Lianne Sheppard of the University of Washington–Seattle and HEI Review Committee. The symposium built on HEI's ongoing studies to examine potential health effects at low levels of air pollution.

Air pollution research in Asia, with particular focus on high levels of air pollution and disease burden in China and India, was given prominence at this conference. A new regional research consortium, Asian Initiative for Research on Climate and Air Pollution, was launched. HEI will continue to seek opportunities to enhance air pollution research in Asia through activities under its global health programs. HEI

HEI Review Committee Welcomes Two New Members

Two prominent scientists, a biostatistician and a toxicologist, were recently appointed to the HEI Review Committee by the institute's Board of Directors. This committee intensively peer reviews the results of HEI studies and publishes its evaluation in the form of a commentary accompanying each report. Members can serve for up to two four-year terms, per HEI bylaws.

Kiros Berhane is a professor of biostatistics and director of graduate programs in biostatistics and epidemiology in the Department of Preventive Medicine at the University of Southern California's Keck School of Medicine in Los Angeles. He is a leading expert on statistical methods for environmental research and their application to examine the effects of air pollution on children's respiratory and cardiovascular health. His extensive research portfolio includes projects based on the landmark Southern California Children's Health Study, federally funded work concerning childhood obesity, and the Global Environmental and Occupational Health Hub for Eastern Africa.

Kiros Berhane. PHOTO COURTESY OF KECK SCHOOL OF MEDICINE, USC

Berhane directs the study design and statistical methodology research program of the Southern California Environmental Health Sciences Center and has served on science advisory panels, the Committee to Review the Health Effects in Vietnam Veterans of Exposure to Herbicides, committees at the Institute of Medicine of the National Academies, and several HEI review panels. He is an elected fellow of the American Statistical Association. He is also a member of the U.S. Environmental Protection Agency Science Advisory Board and National Institutes of Health Biostatistical Methods and Research Design Study Section. A native of Ethiopia, Berhane earned a Ph.D. in biostatistics from the University of Toronto, Canada.

Frank Kelly is a professor of Environmental Health and director of the Environmental Research Group at King's College London, UK. He is director of the Health Impact of Environmental Hazards Health Protection Research Unit and deputy director of the Medical Research Council–Public Health England Centre for Environment and Health, a partnership between Imperial College and King's College. His research focuses on the mechanisms of lung injury induced by exposure to air pollution. He has conducted studies in healthy volunteers as well as those with pre-existing airways disease, such as asthma. The primary focus of these studies relates to the events occurring within the respiratory tract lining fluid in the lung, which is the first defense against inspired pollutants.

Frank Kelly.

In addition, Kelly has been heavily involved in air pollution issues facing London and other parts of Europe. He led HEI-funded accountability studies on London's Congestion Charging Scheme (HEI Research Report 155) and Low Emission Zone (Research Report 163), published in 2011. He chairs the Committee on the Medical Effects of Air Pollution, established by the UK government. Kelly earned a Ph.D. in physiology from Queen's University, Belfast, Northern Ireland. HEI

HEI in the News

Media outlets that specialize in environmental and energy issues took note of HEI's *Multicenter Ozone Study in oldEr Subjects (MOSES), Part 1,* published in June. MOSES, the largest systematic study ever conducted of human volunteers exposed to ozone air pollution, found no evidence of effects from ozone on the heart in its 87 healthy, 55- to 70-year-old participants, but did find effects on the volunteers' ability to breathe, even at low ambient levels. These results provided confirmation of ozone effects on the lung at concentrations similar to the current National Ambient Air Quality Standard (NAAQS) of 70 parts per billion. Here are samples of the news coverage.

Greenwire

"Study Shows Ozone's Respiratory Effects, Finds No Heart Link" (July 6, 2017)

This item quoted HEI President Dan Greenbaum on the new study's observed lack of cardiovascular effects, while noting that MOSES confirmed earlier research on effects of ozone in the airways.

Clean Air Report

"New Studies May Bolster Environmentalists' Push for Tough NAAQS" (July 25, 2017)

In addition to MOSES, this article discussed preliminary results of an ongoing HEI-funded "low levels" study that were published in the June 29 issue of the *New England Journal of Medicine.* In its initial analysis, the latter study, led by Francesca Dominici of the Harvard T.H. Chan School of Public Health, reported associations of mortality with exposure to $PM_{2.5}$ and ozone even at concentrations below the current NAAQS. HEI

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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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Workshop Summary Published

Effects of Fuel Composition on Particle Emissions

Now available on the HEI website is a succinct Executive Summary of proceedings from an HEI expert workshop that focused on the challenging question of the effects of fuel composition on particulate matter emissions. HEI gathered some 45 researchers and government and industry representatives in Chicago last December to address important questions, including the impact on tailpipe emissions of factors such as ethanol blending, the content of aromatic constituents of gasoline, and the use of gasoline direct injection.

The Executive Summary includes an overview of regulatory and technology issues, results of laboratory tests for emissions from gasoline engines fueled with different ethanol blends, links between tailpipe emissions and real-world measurements, and future challenges. The workshop summary, program, and presentations are available *at www.healtheffects.org/meeting/workshop-effects-fuel-composition-pm.*

Vehicle fuels are tested at the California Air Resources Board's Haagen-Smit Laboratory. PHOTO BY ALLEN ROBINSON