

**HEI Annual Conference
April 5–7, 2020
Boston, Massachusetts**

**Scientific Program
(updated 2/19/20)**

Sunday, April 5

10 am Registration Opens

11:30 am Lunch

1:00 pm Welcome and Conference Opening
Dan Greenbaum, President, Health Effects Institute

1:10 pm The Big Deal About Big Data, Causal Inference, and Accountability Research
Chairs: *Jennifer Peel*, Colorado State University and HEI Review Committee; and *Kiros Berhane*, Columbia University and HEI Review Committee

Accountability research, or evaluating the effectiveness of interventions to improve air quality and public health, remains a topic of high interest. Although there have been some successes, showing effectiveness particularly at increasingly lower air pollution levels is challenging. This session will take stock of recent progress across the globe, including novel statistical approaches and big data; discuss the importance of accountability evidence for the causality debate; and explore what approaches are needed for future research.

1:10 Accountability Studies: Lessons Learned and Recommendations for Future Opportunities
Douglas Dockery, Harvard University, USA

1:40 Perspectives in Household Air Pollution Intervention Research in Middle- and Low-Income Countries
Jill Baumgartner, McGill University, Canada

2:10 Break

2:40 Opportunities for Artificial Intelligence and Machine Learning in Environmental Health
Roger Peng, Johns Hopkins University, USA

3:10 The Big Deal About Big Data, Causal Inference, and Accountability Research: What's Next?
Neil Pearce, London School of Hygiene and Tropical Medicine, UK

3:40 Panel Discussion

4:10 pm Break

4:30 pm Poster Session I

6:00 pm Opening Reception and Dinner

Monday, April 6

7:00 am Breakfast

8:30 am **Brain Health and Air Pollution**

Chairs: *Barbara Hoffmann*, University of Düsseldorf, Germany, and HEI Research Committee; and *David Savitz*, Brown University and HEI Research Committee

Globally, neurological disorders represent the second leading cause of death. While increasing evidence has emerged reporting an association between air pollution exposure and brain health throughout the life course, important research gaps remain. This session provides an overview of the relationship between air pollution and neurological effects in childhood and adolescence, and neurodegenerative disease in adulthood, as well as the physiological impacts on the brain that have been observed using recent neuroimaging techniques.

8:30 Air Pollution and the Brain: Where Are We and Where Are We Going?

Marc Weisskopf, Harvard University, USA

8:50 Developmental Exposures to Ambient Ultrafine Particulate Matter Produce Pathological and Behavioral Features Shared by Multiple Neurodevelopmental Disorders

Deborah Cory-Slechta, University of Rochester, USA

9:10 A Multimodal MRI Approach to Studying Air Pollution Exposure and Adolescent Neurodevelopment

Megan Herting, University of Southern California, USA

9:30 Are We Ready to Call Air Pollution Exposure a Risk Factor for Dementia? An Update on the Evidence

Jennifer Weuve, Boston University, USA

9:50 General Discussion

10:30 am Break

11:00 am **History and Future of HEI**

Chairs: *David Savitz*, Brown University and HEI Research Committee; and *James Merchant*, University of Iowa and HEI Review Committee

This session will look back at 40 years of HEI history and look ahead at the next steps in implementing the new Strategic Plan for 2020–2025. We will present new research on accountability, exposure assessment, global health, and energy, and present other new research initiatives.

11:00 Introduction and Presentation of HEI's Scientific Committees

David Savitz and *James Merchant*

11:10 40 Years of Impartial Science: Landmarks in HEI's History

Rashid Shaikh, Director of Science

11:30 New Research Underway at HEI

Annemoon van Erp, Managing Scientist

11:50 HEI Future: Strategic Plan for 2020–2025

Dan Greenbaum, President

12:10 Update on HEI-Energy

Donna Vorhees, CEO of HEI-Energy and Director of Energy Research

12:15 History Quiz!

12:30 pm Lunch

1:30 pm **Poster Session 2**

3:00 pm **Inequalities of Air Pollution Exposures and Associated Health Effects in the U.S.**
Chairs: *Jana Milford*, University of Colorado and HEI Review Committee; and *Michael Jerrett*,
University of California, Los Angeles and HEI Review Committee

A growing body of research has examined inequitable distribution of air pollution exposure across racial and socioeconomic groups in the United States. Questions remain about which population groups are inequitably exposed and likely to benefit from air quality improvements. This session will provide an overview of social determinants of health and exposure in the United States, air pollution inequality research to date, and applications in epidemiological research and policy decisions.

- 3:00 Introduction
Michael Jerrett
- 3:05 Social Determinants of Health: Concepts and Methods Relevant to Air Pollution
Sam Harper, McGill University
- 3:30 Quantifying Air Pollution Exposure Inequality: Methods and Challenges
Jonathan Levy, Boston University, USA
- 3:55 The Role of Socioeconomic Status (SES) in Studies of Air Pollution and Health
Jane Clougherty, Drexel University, USA
- 4:20 Assembly Bill 617 and the Quest for Democracy in Air Quality Management
Veronica Eady, California Air Resources Board, USA
- 4:45 General Discussion
Moderator: *Jana Milford*

5:00 pm **Free Evening**

(Program continues on next page)

Tuesday, April 7

7:00 am Breakfast

8:30 am Particle Components and Associated Health Effects: Then and Now
Chairs: *Frank Kelly*, King's College London and HEI Review Committee; and *Jeffrey Brook*, University of Toronto and HEI Research Committee

Evidence on the health effects of particulate matter has led regulatory agencies to establish mass-based ambient air quality standards for PM_{2.5}. However, interest remains high in whether some chemical components or physical characteristics of the PM mixture are of greater public health concern. This session will present the state of the science related to PM_{2.5} components and other attributes, and discuss whether regulations based on any of these would be more protective of public health than the current PM-mass based approach.

- 8:30 Beyond PM_{2.5}: Enduring Questions About Particle Composition and Physical Characteristics
Frank Kelly
- 8:55 Particle (In)equalities
Bert Brunekreef, Utrecht University, the Netherlands
- 9:20 Integration of Global and Local Datasets for Particle Composition Exposure
Randall Martin, Washington University in St. Louis, USA
- 9:45 Advances in Contributions of Toxicology to the Understanding of Particle Component Toxicity
Flemming Cassee, RIVM, the Netherlands
- 10:10 Break
- 10:30 Advances in Epidemiology of Multiple PM_{2.5} Components
Helen Suh, Tufts University, USA
- 10:55 Discussion
Moderator: *Jeffrey Brook*
Discussants: *Speakers and:*
Jason Sacks, U.S. Environmental Protection Agency, USA
Bruce Copley, Independent Consultant, USA

11:30 am Boxed Lunch

12:00 pm Understanding Ultrafine Particles and Health: How Can We Make Progress?
Chairs: *Allen Robinson*, Carnegie Mellon University and HEI Research Committee; and *David Foster*, University of Wisconsin–Madison and HEI Research Committee

The contribution of ultrafine particle (UFP) exposure to health effects of the air pollutant mixture is an unresolved issue in air pollution research. Recent reviews of the UFP literature continue to identify many of the same challenges in measurement, exposure assessment, and epidemiological studies that were previously identified by HEI's 2013 review. This session will summarize those challenges, discuss areas of progress, and identify issues that need to be resolved by targeted research.

- 12:00 Introduction
Allen Robinson
- 12:05 Ultrafine Particles: What Progress Have We Made and What Questions Remain?
Lidia Morawska, Queensland University of Technology, Australia
- 12:25 Ultrafine Particles and Nervous System Effects: What Can Toxicological Evidence Tell Us?
Barbara Buckley, U.S. Environmental Protection Agency, USA

- 12:45 Trends in Inter- and Intraurban Ultrafine Particle Levels in the U.S.
Albert Presto, Carnegie Mellon University, USA
- 1:05 International Approaches to Vehicular Emissions Regulation: Expectations and Realities
Tim Dallman, International Council on Clean Transportation (ICCT), USA
- 1:25 Ultrafine Particles in a Changing Landscape of Engines and Emissions Control
Matti Maricq, Ford Motor Company, USA
- 1:45 Moderated Discussion

2:20 pm **Closing**
Dan Greenbaum

2:30 pm **Conference Adjourns**