



EMERGING SCIENCE FOR ENVIRONMENTAL HEALTH DECISIONS

AGENDA

Toward Understanding the Interplay of Environmental Stressors, Infectious Disease, and Human Health

JANUARY 15-16, 2019

THE NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE

500 FIFTH STREET NW, ROOM 100, WASHINGTON, DC 20001

THIS WORKSHOP WILL BE WEBCAST

SCIENTISTS HAVE LONG KNOWN that the environment plays a defining role in the spread of infectious disease. For example, flooding could increase the populations of mosquitoes that carry malaria. But, could environmental stressors also play a role in human susceptibility to infection? Emerging findings suggest that environmental pollutants such as heavy metals, pesticides, and airborne particulate matter may weaken the immune system. Emerging evidence also suggests that exposure to some pollutants may reduce vaccine effectiveness. But, environmental health, the study of the effect of the environment on human health, is rarely combined with

the study of infectious diseases. Research on the interplay between these fields could inform new health practices, public health research, and public health policy.

This workshop will bring together infectious disease, global public health, toxicology, environmental epidemiology, and science policy experts to explore the growing body of research on the links between environmental stressors, infectious disease, and human health. The workshop will feature presentations, panel discussions, and breakout sessions to engage scientists and decision makers in this important, cross-disciplinary issue.

TUESDAY, JANUARY 15, 8:30 AM–5:00 PM

8:00 **Registration**

8:30 **Welcome**

- **Keegan Sawyer**, National Academies of Sciences, Engineering, and Medicine
- **Melissa Perry**[†], the George Washington University

8:40 **Interplay: the case for transdisciplinary science in advancing health and development**—Robert Newman[§], The Aspen Institute

8:55 **The Impacts of Environmental Exposures on Infectious Diseases**—Linda Birnbaum, National Institute of Environmental Health Sciences

[§] Member of the Workshop Planning Committee for Toward Understanding the Interplay of Environmental Stressors, Infectious Disease and Human Health.

[†] Member of the Standing Committee on the Use of Emerging Science for Environmental Health Decisions.

SESSION 1 ENVIRONMENTAL EXPOSURE AND INFECTIOUS DISEASE: EMERGING TRENDS

Moderator: Robert Newman[§], The Aspen Institute

9:10 **Environmental Health in the Global Health Arena**—Keith Martin, Consortium of Universities for Global Health

9:40 **A One Health Perspective on Foodborne Illness and Antimicrobial Resistance**—Laura Kahn, Princeton University

10:10 **The Microbiome and Immune System in Environmental Risk of Infectious Disease**—Rodney Dietert, Cornell University

10:40 *Break*

11:00 **Panel Discussion with Session 1 Speakers**

11:40 *Lunch*

(continued)

**TUESDAY, JANUARY 15, 8:30 AM–5:00 PM
(CONTINUED)**

**SESSION 2 EXPLORING EMERGING EVIDENCE: PEOPLE,
POPULATIONS, AND ECOSYSTEMS**

Moderator: Margaret Karagas^{§†}, Dartmouth College

12:45 Introductory Remarks by the Moderator

**TOPIC 1: CHEMICAL TOXICANTS AND INFECTIOUS
DISEASE**

12:50 Environmental chemicals, *Staphylococcus aureus*,
and antimicrobial resistance—Meghan Davis[§],
Johns Hopkins University

1:10 Perfluoroalkyl substances and immunosuppressive
effects—Implication on infectious diseases and
vaccination responses—Berit Granum, Norwegian
Institute of Public Health (by webconference)

TOPIC 2: METAL EXPOSURES AND INFECTIOUS DISEASE

1:30 Mercury and Immune Modulation: Is the
Inflammasome the Key?—Jennifer Nyland,
Salisbury University

1:50 Epidemiological studies of environmental exposure
to arsenic and immune-related outcomes—Molly
Kile, Oregon State University

2:10 Panel Discussion Part 1

Moderator: Margaret Karagas^{§†}, Dartmouth
College

2:40 Break

**TOPIC 3: AIR POLLUTION AND INFECTIOUS
DISEASES**

3:00 The Global Burden of Lower Respiratory Infections
Attributable to Ambient and Household Air
Pollution: estimates from GBD 2017—Aaron Cohen,
Health Effects Institute

3:20 Understanding the molecular mechanisms of how
air pollution increases susceptibility to pulmonary
infections—Kymberly Gowdy, East Carolina
University

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**TOPIC 4: ENVIRONMENTAL DISRUPTION AND
INFECTIOUS DISEASE**

3:40 Hot, Urban, and Uncertain: Tackling Environmental
Health in an Era of Rapid Global Change—Justin
Remais, University of California, Berkeley

4:00 Environmental Stressors, Disasters and Infectious
Disease: Implications for Vulnerable Communities
—Maureen Lichtveld, Tulane University

4:20 Panel Discussion Part 2

Moderator: Joshua Rosenthal^{§†}, National
Institutes of Health

4:50 Day 1 Closing Remarks—David Savitz[§], Brown
University

5:00 Adjourn Day 1

WEDNESDAY JANUARY 16, 8:30 AM–12:30 PM

8:30 Welcome—Gary Ginsberg^{§†}, New York State
Department of Health

**SESSION 3 DEVELOPING CROSS-CUTTING RESEARCH
STRATEGIES**

Moderator: Gary Ginsberg^{§†}, New York State
Department of Health

8:35 Reconciling Divergent World Views on Mercury Pollution—
Evolving thoughts on interdisciplinary and translational
research—Niladri Basu, McGill University

9:00 Overview of the Breakout Activity—Gary Ginsberg^{§†},
NY State Department of Health

BREAKOUT GROUPS

**CRITICAL RESEARCH PRIORITIES TO ADVANCE THE
SCIENCE**

- a. Immunotoxicology
- b. Epidemiology
- c. Disease Ecology
- d. Environmental Change

**CRITICAL TRANSLATIONAL PRIORITIES
TO FACILITATE THE USE OF RESEARCH IN
DECISION-MAKING**

- e. Convergence
- f. Community Engagement
- g. Education and Training
- h. Capacity Building

(continued)

- 9:05 **Breakout Group Discussions**
10:20 *Break*
10:35 **Report Backs and Discussion**

**SESSION 4 IMPLICATIONS OF THE EMERGING SCIENCE:
INFORMING RESEARCH AND POLICY DECISIONS
FROM LOCAL TO GLOBAL**

- 11:30 **Panel Discussion: Informing Decisions, Local to Global**
Moderator: John Balbus[§], National Institute of Environmental Health Sciences
- Gary Ginsberg^{§†}, NY State Department of Health
 - Helen Petach, US Agency for International Development
 - Carlos Santos Burgoa, the George Washington University
 - Gina Solomon[†], University of California, San Francisco
- 12:15 **Closing Remarks**—Robert Newman[§], The Aspen Institute
12:30 **Adjourn Workshop***

*Emerging Science for Environmental Health Decisions Committee Business Meeting 1:20pm–4pm. This meeting is open to Committee, Government Liaisons, and workshop participants.

§ Member of the Workshop Planning Committee for Toward Understanding the Interplay of Environmental Stressors, Infectious Disease and Human Health

† Member of the Standing Committee on the Use of Emerging Science for Environmental Health Decisions.

Workshop Planning Committee

This workshop was organized by the following experts: **Robert Newman**, the Aspen Institute; **John Balbus**, National Institute of Environmental Health Sciences; **Meghan Davis**, Johns Hopkins University; **Gary Ginsberg**, New York State Department of Health; **Margaret Karagas**, Dartmouth College; **Melissa Perry**, the George Washington University; **Joshua Rosenthal**, National Institutes of Health; **David Savitz**, Brown University; **John Vandenberg**, Environmental Protection Agency

For more information and to subscribe for updates, please visit
<http://dels.nas.edu/envirohealth>

Emerging Science workshops are free and open to the public.

About Emerging Science for Environmental Health Decisions

The National Academies' Standing Committee on the Use of Emerging Science for Environmental Health Decisions (ESEHD) examines and discusses issues on the use of new science, tools, and research methodologies for environmental health decisions. The ESEHD committee is organized under the auspices of Board on Life Sciences and the Board on Environmental Studies and Toxicology of the National Academies of Sciences, Engineering, and Medicine, and sponsored by the National Institute of Environmental Health Sciences.

