Applications and Communication of Satellite Data for Public Health

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Overview

- Introduction to HEI
- Opportunities for collaboration
  - Research programs
  - Communications Platform: State of Global Air
The Health Effects Institute (HEI) is an independent, nonprofit corporation chartered in 1980 to provide high-quality, impartial, and relevant science on the health effects of pollutants from motor vehicles and from other sources in the environment.

*HEI’s goal is “simply to gain acceptance by all parties of the data that may be necessary for future regulation.”*

*William Ruckelshaus, Former EPA Administrator*
HEI: What we do

- Research targeted at key questions relevant to policy decisions
- Methods development (exposure, epi, biostat)
- Reanalyses of key scientific studies
- Systematic reviews and evaluations
- Global Health research and communication
HEI: Upcoming Research Opportunities

- RFA 19-1: APPLYING NOVEL APPROACHES TO IMPROVE LONG-TERM EXPOSURE ASSESSMENT OF OUTDOOR AIR POLLUTION FOR HEALTH STUDIES

  - RFA 19-1 solicits applications for studies designed to quantitatively evaluate exposure measurement error to determine the potential impact of using novel approaches to assess exposures to air pollution on health estimates.

- Will fund up to 5 studies, 2-4 years, up to $700K each

- Will be published this month, preliminary applications due in March TBD

- [https://www.healtheffects.org/research/funding](https://www.healtheffects.org/research/funding)
HEI: Current projects involving satellite data

- Effects of low level exposures: 3 large studies
  - U.S. - Dominici et al.
  - Canada - Brauer et al./ SPARTAN
  - Europe - Brunekreef et al.

- GBD – Major Air Pollution Sources
  - China, India complete
  - Global assessment underway

- General support for SPARTAN network

- Vermeulen et al. Long-term outdoor air pollution and cause-specific mortality in a pooled analysis of 23 Asian cohorts.
  - Using GBD exposure estimates
Vermeulen et al. *Long-term outdoor air pollution and cause-specific mortality in a pooled analysis of 23 Asian cohorts.*
- satellite derived estimates of ambient PM$_{2.5}$ and NO$_x$
- supplemented with fine scale land use data to the residential information of study participants of
- pooled prospective studies within the Asia Cohort Consortium

Guxans et al. *Air Pollution, Autism spectrum disorders, and brain imaging amongst CHildren in Europe – the APACHE project*
- combine land use variables and satellite data remote sensing of aerosol optical depth to estimate different time windows of exposure of PM$_{2.5}$ and PM$_{10}$. 
HEI: Posted Research Opportunities

- **RFA 18-1 Assessing Improved Air Quality and Health From National, Regional, and Local Air Quality Actions**...HEI is seeking to fund studies to assess the health effects of air quality actions, also known as accountability research. Accountability research refers to empirical studies assessing the effects of regulatory actions, other interventions, or “natural” experiments on air pollution and health (sometimes also referred to as intervention studies).

- up to four larger 3- to 4-year studies with a funding cap of $1,200,000 each and

- one or two smaller, 2- to 3-year methods development studies with a funding cap of $700,000 each.

- **Preliminary Application Due Date:** February 15, 2019

- **Full Application Due Date:** May 20, 2019
HEI: Upcoming Research Opportunities

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HEI: Future Research Opportunities

- *New* HEI Energy Research Program
  - Another public-private partnership

- **Goals:** Fill knowledge gaps left by past and ongoing research about potential population exposures and health effects from unconventional oil and natural gas development (UOGD) across the United States

- **Research planning** underway for future RFAs
  - Population-Level Exposure Research in Multiple U.S. Regions
Goals:

- Communication of levels and trends in air quality and health impact around the world, based on IHME GBD
- Data access – only site where GBD exposure data currently available.
- Simple tools for presenting and comparing data

Audiences:

- general public, journalists, policy makers, NGOs
Year 2: Using the data around the world

A new Health Effects Institute (HEI) report finds that 95% of the world—causing 6.1M deaths a year—has air pollution levels that exceed safe limits. A study in India shows that air pollution is the leading killer of heart disease, stroke, and other non-communicable diseases. The infographic shows the number of deaths from air pollution, etc. The general trend is countries that get hit harder and don't afford clean energy also get hit harder. And the deaths aren't just from pollution, they're also from the health effects of the industries that are driving the pollution. The HEI is calling for a global commitment to clean energy and healthy lives.
## What’s next? : Evolution of a global platform

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<th>2017</th>
<th>2018</th>
<th>2019 (in progress)</th>
<th>2020</th>
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<tbody>
<tr>
<td><strong>Geographic Scale</strong></td>
<td>Global, country</td>
<td>Global, country</td>
<td>Global, country</td>
<td>Global, country, Subnational, urban?</td>
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<td><strong>Long-term Exposure (Population-Weighted)</strong></td>
<td>PM$_{2.5}$ (Ann. Avg.) Ozone (seasonal)</td>
<td>PM$_{2.5}$ Ozone Household AP 'Total' Air Pollution (health only)</td>
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<td><strong>Health Metrics (Numbers, rates)</strong></td>
<td>Deaths DALYs</td>
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<td>Deaths DALYs Life Expectancy</td>
<td>NO$_2$? Source-related? Other?</td>
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Collaboration and Support for State of Global Air

HEI Staff

- **Katherine Walker**, Principal Scientist
- **Pallavi Pant**, Staff Scientist
- **Kathryn Liziewski**, Research Assistant
- **Kethu Manokaran**, Research Assistant
- **Annemoon van Erp**, Managing Scientist
- **Hilary Selby Polk**, Managing Editor
- **Aaron Cohen**, Consulting Scientist

Collaborations

Foundation Sponsors

- Oak Foundation

- Bloomberg Philanthropies

- William & Flora Hewlett Foundation