Update on HEI’s Core Scientific Program

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Director of Science, HEI

HEI Annual Conference  
May 1, 2018
HEI’s Strategic Plan 2015-2020

• Guides HEI’s scientific research and review activities;
• Responds to the needs of HEI industry & government sponsors, and other interested parties;
• Anticipates future policy and technology events; and,
• Evolves over time to adapt to changing knowledge and events.
• Thank you for your ongoing feedback as we implement the Plan.
Implementation of the Strategic Plan 2015 – 2020

The HEI Strategic Plan 2015–2020

**Selected Upcoming Ambient Air Quality, Emissions, and GHG Regulatory Events**
- FY 2015: Next PM ISA kickoff, Review of current NO2 ISA
- FY 2016: O3 final rule, New U.S. HD GHG
- FY 2017: PM ISA, NAAQS near-road monitoring, NO2 NAAQS, U.S. LD GHG tech review, Revised WHO air quality guidelines?
- FY 2018: PM ISA, New O3 kickoff, U.S. Tier 3 phase-in, E.U. "real-world" vehicle test
- FY 2019: PM NAAQS, New NO2 kickoff
- FY 2020: PM NAAQS, E.U. air quality progress report, India standards, BS V

**Beyond 2020**
- O3, NOx, SO2, and PM reviews
- New GHG fuel economy standards beyond 2020/2025
- New E.U. emissions tailpipe targets

**Multipollutant Science**
- Complete MOSES: Review, publish, and disseminate
- Effects at low-levels: Select studies, Conduct research, Publish and disseminate
- Complete traffic exposure studies: Publish and disseminate
- Plan for and issue RFA: Select and conduct traffic health studies, Publish and disseminate
- Plan for and convene Committee, and conduct update of Traffic Review
- Workshop on research potential in NPACT and ESCAPE
- Communicate Diesel Epidemiology Review results

**Accountability and Transparency**
- Complete Second-Wave Health Outcomes studies
- Accountability Workshop
- Synthesis of past decade of accountability research: lessons for future actions
- Continue efforts to enhance data access and reproducibility of results

**Emerging Fuels and Technologies**
- Communicate ACES results
- Special Committee on Emerging Technologies: Monitor key fuel and technology development
- Experts review and identify best techniques for comparative toxicity screening, Initiate proof-of-concept testing, Disseminate
- Workshop/review Aromatics and PM
- Workshop/review PM 2.5 and UFPs
- Workshop/review Fuels/Technology

**Global Health Science**
- Update and apply Global Burden of Disease to inform developing world source decisions
- Potential global cohort studies of full range of pollution exposure and/or port exposures and effects

**Cross-Cutting Issues**
- Identification and integration of at-risk populations into HEI studies
- Testing and validation of statistical models; enhanced exposure assessment; climate change; new biologic techniques; new health endpoints and modifying factors

**MID-PLAN REVIEW: VISION 2020**
Addressing the Challenges of Multi-pollutant Science

Estimating the Effects of Exposure to Low Levels of Air Pollution

• Three HEI studies, with key features:
  ○ Populations with millions in the US, Canada and Europe; administrative and traditional cohorts
  ○ Satellite data and ground level exposure measurements; high quality exposure assessment models at high spatial resolutions
  ○ Development and application of novel statistical methods
  ○ Investigator teams with prior experience of productive collaborations
New HEI studies assessing health effects of low levels of air pollution

Geographical areas

PI: Michael Brauer, U British Columbia (~ 6 million)

PI: Francesca Dominici, Harvard (~ 60 million)

PI: Bert Brunekreef, Utrecht (~25 million)
Ensuring the Highest Quality from the Low Exposure Studies

• Detailed and continuing HEI Oversight
  • Oversight Committee (webinars and annual meeting)
    • Progress reports every 5 months
    • Annual renewal requests
    • Substantive review at each stage
  • QA/QC audits
• Nine poster presentations at the Annual Conference: Monday, April 30, 2018
• Program Outputs
  - Investigators have begun to publish results of initial analyses from their studies; HEI has prepared Desk Statements as needed
  - Many additional analyses -- still to come
  - Oversight Committee reviewing initial results and providing feedback in annual contract renewals
  - ALL results will be subjected to HEI Review Committee scrutiny in time to inform key future National Ambient Air Quality Standard (NAAQS) decisions
**Effect of Ozone on the Cardiovascular System:**

**The MOSES Study**

- HEI’s Multicenter Ozone Study in Older Subjects
- HEI’s detailed report, along with Commentary, published in June 2017
- Peer-reviewed papers:
  - Cardiovascular endpoints (submitted)
- Phase 2 analyses underway, report to be submitted this summer and to be published early in 2019
- MOSES data and materials
**MOSES: Data Access Plans**

- The data and associated files may be accessed by anyone, without restrictions, starting on May 15.
- Access to the database: a log-in step, a brief questionnaire, and terms and conditions for publications resulting from the research.
- The MOSES 1 database will reside on a public repository, the Harvard Dataverse.
Share, archive, and get credit for your data. Find and cite data across all research fields.

Dataverse

Datasets (76,688)

Aikens Research Group Dataverse (University of New Hampshire)

April 20, 2018

Data repository for the Aikens Research Group at UNH.

Replication Data for: Predicting Community Evolution in Social Networks


Replication Data for: Predicting Community Evolution in Social Networks. There are 25 data sets obtained from 3 real-world sources: DBLP, Facebook, Salon24. Data sets correspond to different evolution chain lengths, from 2 to 10. For the Salon24 source the limited amount of data.

Replication Data for: The Birth of Pork: Local Appropriations in America’s First Century


Replication materials for Gordon, Sanford C., and Simpson, Hannah K. "The Birth of Pork: Local Appropriations in America’s First Century"

ZEF Dataverse (Center for Development Research, University of Bonn, Germany)

April 20, 2018

The Center for Development Research (ZEF) is an institute of the University of Bonn, Germany. It started its research at ZEF's researchers aim to find science-based solutions to development-related issues. ZEF's research departments on
Click on one of the search results

Data on Electricity Generating Units from EPA Air Markets Program Data merged with National Emissions Inventory

Zigler, Conwin, 2017. "Data on Electricity Generating Units from EPA Air Markets Program Data merged with National Emissions Inventory". https://doi.org/10.7910/DVN/EOFLPT, Harvard Dataverse, V1

**Description**


**Subject**

Earth and Environmental Sciences; Mathematical Sciences

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1 File

- AMPD_Unit_with_Sulfur_Content_and_Regulations_with_Facility_Attributes.csv
  - Comma Separated Values - 755.6 MB - Oct 24, 2017 - 8 Downloads
  - MD5: b115b171989e3e6558a98e8eb21627/e6
  - [Download](#)

**Description**
MOSES Study Data

**Subject**
Medicine, Health and Life Sciences

**Dataset Persistent ID**
doi:10.7910/DVN/OLJSSK
MOSES: Material Sharing Plan

- Limited amounts of MOSES material (blood and sputum)
- Any researcher from a not-for-profit US research center, interested in doing specific analyses, can request the samples
- Interested researchers will need to submit a short Material Request Form and sign a Material Transfer Agreement
- The Request Form will include:
  - the rationale and aim of the research project;
  - a description of what the research project will add to scientific knowledge;
  - experimental methods
- Requests for material will start to be reviewed on July 1, 2018
MOSES: Data and Materials

• Announcements at HEI website
• For More Information:
  • Contact Maria Costantini or Annemoon van Erp
  • Also, the MOSES investigators, Phil Bromberg, John Balmes, and Mark Frampton
Accountability Research
Effectiveness of Environmental Regulations

• HEI has a long-term track-record of comprehensive research and reviews

• Under a 2011 RFA, HEI funded four studies on large-scale, multi-year regulatory programs
  • Zigler: Statistical methods for causal inference (published: 5/’16)
  • Gilliland: Evaluating changes in air pollution and children’s health in Southern California (published: 1/’17)
  • Russell: Impacts of Regulations on Air Quality and Emergency Department Visits in Atlanta (Just published: 4/’18)
  • Meng: Goods movement regulations in California and health impact (phase 1 completed; phase 2 in progress)
Accountability Research

Future Plans

• Session at the Annual Conference in May 2017
• Plans underway to publish an RFA late this year
• Your ideas most welcome
Health Effects of Traffic-Related Air Pollution

• A high-priority area for HEI; strong emphasis during strategic planning

• Several studies in review and publications:
  • Exposures of students living in dorms in the vicinity of roads in Atlanta (Sarnat – Just published)
  • Traffic tunnels in Hong Kong and Baltimore (Wang)
  • Enhanced statistical modeling (Batterman)
  • Spatial and temporal variance of near road exposures (Frey)

• Tire and brake wear –
  -- Koutrakis (in progress)
  -- Franklin (new study)

HEI Fort McHenry Tunnel Study
....of a tunnel studied before
The Next Phase of Traffic Research

• 2017 RFA: Assessing Adverse Health Effects of Exposure to Traffic-Related Air Pollution, Noise, and Their Interactions With Socio-Economic Status

• Three new studies funded:
  • Traffic-related air pollution and birth weight (Dadvand and Sunyer, ISGlobal)
  • Non-tailpipe emissions and noise on traffic and children’s health (Franklin, University of Southern California)
  • Air pollution components, noise and socio-economic status (Raaschou-Nielsen, Copenhagen University)
  • Studies funded through other mechanisms (For example Apte)

• More on these studies later in the conference and at the poster sessions
Review of the Traffic Literature

• HEI published a comprehensive review in 2010
• Strong interest in an update of the review from sponsors → 2015-2020 Strategic Plan
• HEI has appointed a new panel to systematically review, new epidemiologic studies: health endpoints, exposures, effects of noise, SES, green space.
• Also, trends in mobile source pollution, as regulations and technologies have advanced, and their potential implications
• Target publication in 2020
• More during the conference
Transparency

- Data Access: Key to scientific credibility and transparency
- Longstanding HEI policy on data sharing
- Recent Examples:
  - RIOPA study – indoor, outdoor and personal exposures in three US cities → 40+ papers
  - Data from MOSES – available mid-May 2018
  - Dominici and other low exposure studies – built in component
- Balancing Act:
  - Complexity, effort and cost
  - Privacy and intellectual issues
  - Legal and regulatory issues – national and international
- Session on reproducibility

From: Francesca Dominici, Harvard Chan School of Public Health
Moving Forward

• HEI continues to be a success model for developing quality and impartial science

• Detailed report in *HEI Annual Update 2018*

• The *HEI Strategic Plan* is moving at a brisk pace
  • With many projects coming to fruition this year
  • And a number of important new ones underway

• We look forward to hearing your ideas on where we can and should focus going forward!
Transition...

Maria Costantini
Leaving after 25+
years of working at HEI

Wish her all the best

Note book for your messages
Thank You!