HEI's Program to Assess Health Effects of Long-Term Exposure to Low Levels of Ambient Air Pollution

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RFA Process

- Advisory Committee developed the RFA; expert workshop held
- The response was strong: 39 preliminary applications received from research groups all over the world
- We requested and subsequently received full applications from 8 teams
- Three teams were recommended for funding after a two-stage review process: an external review followed by an internal review*
- HEI Board of Directors approved funding in late 2015

*Members with conflicts were recused from discussion and decisions, per HEI policy

OVERALL OBJECTIVES OF RFA

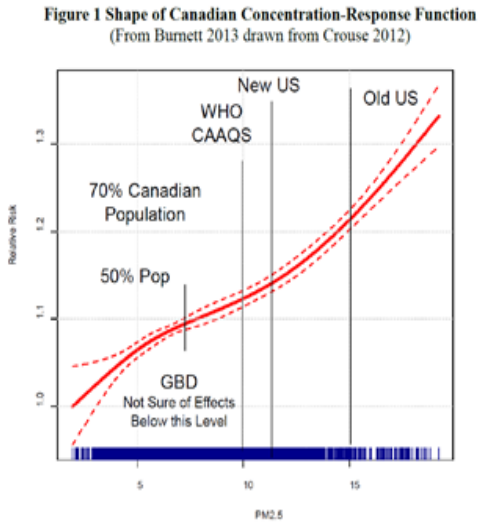
Fund studies to assess health effects of long-term exposure to low levels of ambient air pollution, including all-cause and cause-specific mortality and morbidity endpoints. Studies should analyze and evaluate **exposure-response function(s) for $PM_{2.5}$** and other pollutants at levels currently prevalent in North America, Western Europe, and other high-income regions and may also address related questions about health effects at low levels of ambient air pollution.

Develop statistical and other methodology required for, and specifically suited to, conducting such research including, but not limited to, evaluation and correction of exposure measurement error.

Estimating the Effects of Exposure to Low Levels of Air Pollution

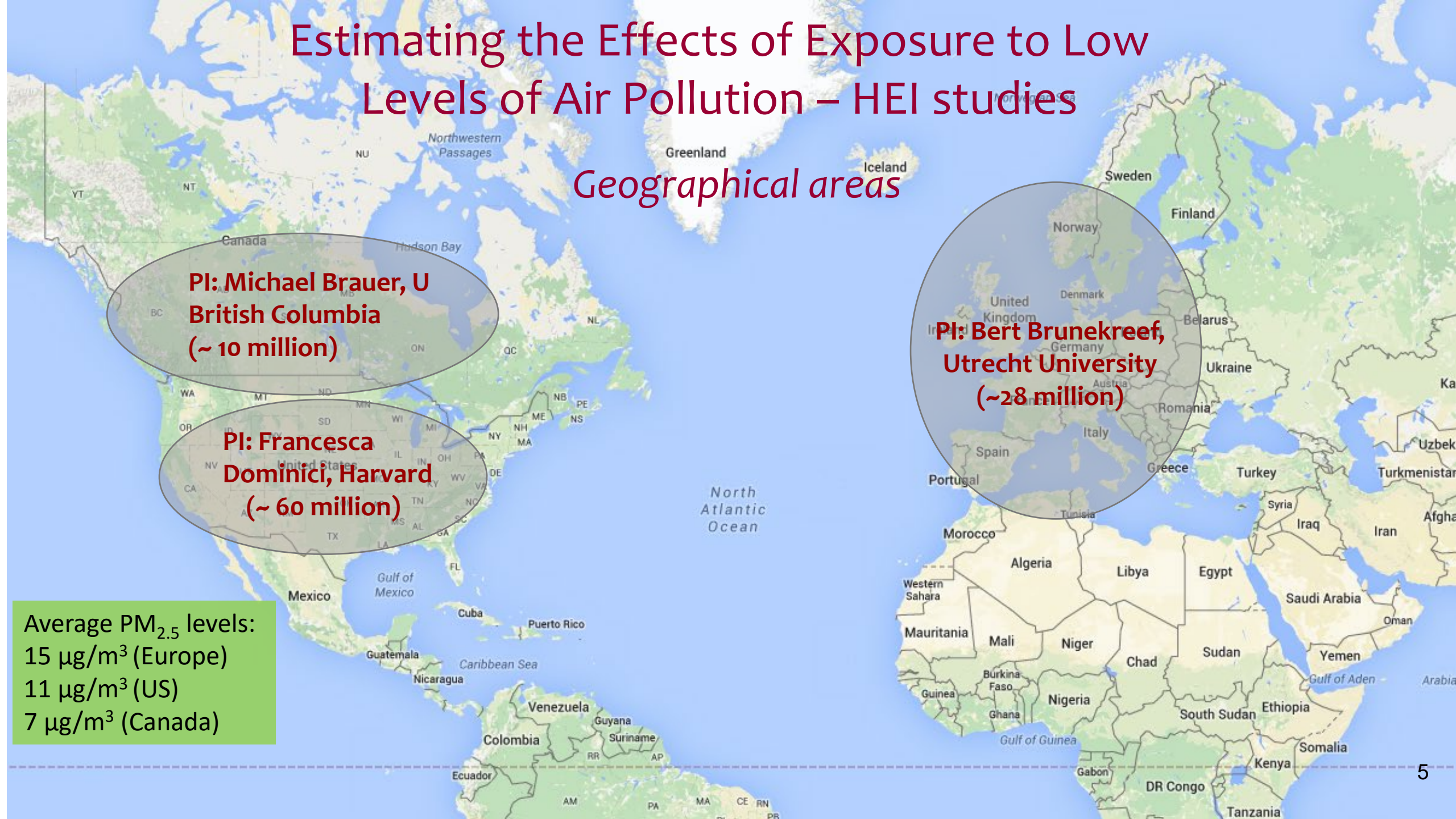
Three studies, with key features:

- Populations with millions in the United States, 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



Estimating the Effects of Exposure to Low Levels of Air Pollution – HEI studies

Geographical areas



Average $PM_{2.5}$ levels:
15 µg/m³ (Europe)
11 µg/m³ (US)
7 µg/m³ (Canada)

Teams

Michael Brauer

Jeff Brook (University of Toronto)

Rick Burnett (Health Canada)

Dan Crouse (University of New Brunswick)

Anders Erickson (University of British Columbia)

Perry Hystad (Oregon State University)

Randall Martin, Aaron van Donkelaar (Dalhousie University)

Mike Tjepkema (Statistics Canada)

Scott Weichenthall (McGill University)

Bert Brunekreef

Richard Atkinson (University of London, UK)

Marie-Christine Boutron-Ruault (French Institute of Health and Medical Research (INSERM))

Kees de Hoogh, Danielle Vienneau (Swiss Tropical and Public Health Institute (TPH))

Francesco Forastiere (King's College London)

John Gulliver (Imperial College, UK)

Ole Hertel (University of Aarhus, Denmark)

Gerard Hoek, Maciej Strak (Utrecht University, Netherlands)

Barbara Hoffmann (University of Düsseldorf, Germany)

Nicole Janssen (National Institute of Public Health and the Environment (RIVM)

Klea Katsouyanni (University of Athens, Greece)

Goran Pershagen (Karolinska Institute, Sweden)

Annette Peters (Helmholtz Zentrum, Germany)

Ole Raaschou-Nielsen (Danish Cancer Society)

Per Schwarze (Norwegian Institute of Public Health (NIPH))

Gudrun Weinmayr (University of Ulm, Germany)

Francesca Dominici

Joey Antonelli

Danielle Braun

Christine Choirat

Brent Coull

Qian Di

Marianthi Kioumourtzglou

Petros Koutrakis

Rachel Nethery

Ben Sabbath

Joel Schwartz

Richard Yun Wang

Thomas Ander Wilson

Xiao Wu

Antonella Zanobetti

HEI

Ensuring the highest quality from the studies

- US and Canadian studies are 60-70% complete; European study is nearly 80% complete
- Detailed and continuing HEI oversight

  - Oversight Committee, chaired by Jon Samet (Colorado School of Public Health)

    Progress reports every 5 months

    Annual, detailed renewal requests

    Webinars, meetings and workshops

  - QA/QC audits

- Final reports – after review, to be published with commentaries during 2021-2022

Phase 1 Reports and Review

- EPA – Expedited National Ambient Air Quality Standards (NAAQS) revisions in progress for $PM_{2.5}$ and O_3
- Dominici and Brauer – Early results published in journals while additional work is on-going
- HEI requested Phase 1 Reports, summarizing results to date
- HEI formed special Review Panel, with Sverre Vedal (chair, University of Washington) plus six additional experts in epidemiology, exposure assessment and biostatistics
- Reviews in progress
- Reports and Panel commentary to be published during summer 2019 with aim to inform NAAQS process

Today's session

- All three teams presenting results of work completed to-date (Six poster presentations in yesterday's session)
- Also comments by Special Review Panel (Phase 1 reports)
- Many additional analyses and systematic side-by-side comparisons – still to come

  - Causal and other statistical models
  - Cause-specific mortality and morbidity outcomes
  - Application of similar methods for exposure assessment in different geographical areas
  - And many more…

THANK YOU!