Burden of Disease from Major Air Pollution Sources in India

Scope, Approach, Partners

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The Health Effects Institute: 
**Trusted Science ➔ Cleaner Air ➔ Better Health**

- An independent non-profit institute providing trusted science on the health effects of air pollution for 35 years

- Balanced Core Support
  - US EPA and Industry (Worldwide Motor Vehicle)

- Partnerships
  - Also WHO, ADB, Clean Air Asia, TERI, Sri Ramachandra Medical School, EU, US DOE, industries, foundations, others

- Independent Board and Expert Science Committees
  - Oversee and intensively peer review all science
  - International experts from India, China, many others

- Over 350 scientific studies, reviews, re-analyses conducted around the world, including increasingly in Asia
Key Scientific and Policy Questions

Building on the Indian Burden of Disease:

- What are the major sources of air pollution?
- How do they contribute to population exposures?
- What are their relative contributions to the burden of disease?
- What kinds of actions would it take to achieve substantial improvements in the future?
Scientific Approach

- Develop current and future emissions inventories
- Simulate the fraction of ambient PM$_{2.5}$ due to each major source
- Baseline – 2015
- 3 energy/policy scenarios
- Estimate the GBD 2015 population exposure to each source
- Estimate source-specific burden
An international collaboration: GBD MAPS overview

- Begun in 2013
- Focus: China and India
- Scientific expertise: The GBD MAPS Working Group
- High level oversight: The GBD MAPS International Steering Committee
- Quality Control:
  - Independent External Peer Review
  - HEI Management, Review and Publication
An international collaboration: The GBD MAPS Working Group

US/CANADA
- Michael Brauer/UBC (co-chair)
- Aaron Cohen/HEI (co-chair)
- Randall Martin/Dalhousie Univ.
- Aaron van Donkelaar/Dalhousie Univ.
- Richard Burnett/Health Canada
- Mohammad Forouzanfar/IHME
- Joseph Frostad/IHME
- Wang Yuxuan/University of Texas

INDIA
- Chandra Venkataraman/IIT Bombay
- Pankaj Sadavarte/IIT Bombay
- Kushal Tibrewal/IIT Bombay
- Sarath Guttikunda/IIT Bombay, Urban Emissions
- Kalpana Balakrishnan/Sri Ramanachandra MCRI

CHINA
- Wang Shuxiao/Tsinghua University
- Zhang Qiang/Tsinghua University
- Ma Qiao/Tsinghua University
- Zhou Maigeng/China CDC
- Yin Peng/China CDC
- Kan Haidong/Fudan University
High level oversight: GBD MAPS International Steering Cmte

- Dan Greenbaum/ HEI
- Bob O’Keefe/ HEI
- K. Srinath Reddy/ PHFI
- Christopher Murray/ IHME
- Hao Jiming/ Tsinghua University
- Yang Gonghuan/ Peking Medical College
- Majid Ezzati/ Imperial College, London
- Michal Krzyzanowski/ King’s College London
- Greg Carmichael/ World Meteorological Institute, Univ. of Iowa
Quality control: Independent peer review

- Bhargav Krishna / PHFI
- Pallavi Pant / University of Massachusetts
- Noelle Selin / Massachusetts Institute of Technology
- Kunal Sharma / Shakti Foundation
Quality control:
HEI report management, review and publication

- **Katherine Walker**, Principal Scientist
- **Allison Patton**, Staff Scientist
- **Hilary Selby Polk**, Managing Editor
- **Kathryn Liziewski**, Research Assistant
- **Devashri Salvi**, Research Intern
- **Mary Brennan**, Consulting Editor
- **Fred Howe**, Consulting Proofreader
- **Ruth Shaw**, Consulting Compositor
Scientific Approach: Next speakers

Dr. Chandra Venkataraman
IIT - Bombay

- Develop current and future emissions inventories
- Simulate the fraction of ambient PM$_{2.5}$ due to each major source
- Estimate the GBD 2015 population exposure to each source
- Estimate source-specific burden

Dr. Michael Brauer
UBC
Progress is possible!

Los Angeles Then and Now

Source: New York Times