EPA & CDC Symposium on Air Pollution Exposure and Health

Dates: September 19– 20, 2006

Location: RTP, NC (Auditorium C111B & C)

Goal: This symposium is planned to provide for interdisciplinary dialogue as a means to advance understanding and facilitate applications of exposure research in air pollution health effects analyses. The principal goal of this meeting is to determine priority actions to overcome limitations, barriers, and challenges and move forward with air pollution exposure and associated health effects data for EPA accountability, air pollution health effects research, Environmental Public Health Tracking (EPHT), and community level public health actions.

Objectives:

1. Determine the state of the science for air pollution measurement data and exposure modeling methods, associated health effects surveillance, and epidemiological methods to inform health research studies, Accountability, EPHT, and community actions.
2. Identify emerging issues within air pollution epidemiology and surveillance.
3. Identify the limitations, barriers, and challenges of existing data & methods
4. Prioritize actions to overcome identified limitations, barriers, and challenges (desirable vs. realistic goals and short-term vs. long-term needs)

Outcome: Priority actions to improve air quality data, health data, and linkage and analysis methods for informing health effects research, Accountability, EPHT, and community actions.

- Findings to be reported in a series of articles to appear in the *Journal of Exposure Science and Environmental Epidemiology*

Audience: Experts from academia, EPA, CDC, ATSDR, state health departments, state environmental agencies, EPHT grantees, non-profit organizations.

Organizing Committee:

Chair: H. Özkaynak (EPA)
Co-Chairs: B.Glenn (EPA), M. McGeehin (CDC), H. Zenick (EPA)
Steering Committee: V. Boothe (CDC), G. Foley (EPA), P. Meyer (CDC), J. Qualters (CDC), L. Reiter (EPA), H. Strosnider (CDC), L. Neas (EPA)

Facilitator: Nancy Tosta (Ross Associates)

Logistical Support: SCG, Inc.

Agenda

DAY 1

8:00 - 8:15 **Welcome and Logistics**
Halûk Özkaynak,EPA/ORD

8:15 – 9:00 **Introduction & Charge for Workshop**
Hal Zenick, EPA – ORD Air Accountability & Research Agenda
Mike McGeehin, CDC – Environmental Public Health Tracking
Rich Scheffe – OAQPS Air Accountability & Monitoring Programs

9:00 – 10:45 **Session 1: Air Quality Monitoring & Exposure Modeling Information**
Moderator: P. Barry Ryan (Emory)

Presentations:
Presentation 1: NAAQS pollution monitoring/NEI

- Speaker: Phil Lorang/Tim Hanley/Kevin Cavender (EPA/OAR)
- Focus: Overview, strengths and limitations of PM and Ozone monitoring data
- Questions/issues to be addressed:
  1. What are the strengths and limitations of current PM and O3 monitoring data used in air pollution health effects research and public health surveillance?
     a) Reliability/validity
     b) Geographical and temporal coverage
     c) Representativeness
     d) Accessibility
  2. What are the key programmatic and research needs for the existing ambient monitoring programs for PM and ozone?
  3. What new monitoring activities are being planned or anticipated that could support future air pollution health effects, accountability or public health tracking programs?

Presentation 2: Air Toxics monitoring data bases and modeling

- Speaker: Mike Jones (EPA/OAQPS), Tyler Fox (EPA/OAQPS)
- Focus: Overview, strengths and limitations of air toxics monitoring data and air quality modeling
- Questions/issues to be addressed:
  1. What are the strengths and limitations of current air toxics monitoring used in air pollution health effects research and public health surveillance?
     e) Reliability/validity
     f) Geographical and temporal coverage
     g) Representativeness
     h) Accessibility

2. What are the key programmatic and research needs for the existing ambient monitoring programs for urban air toxics?

3 What new air toxics monitoring activities are being planned or anticipated that could support future air pollution health effects, accountability or public health tracking programs?

Presentation 3: PHASE Modeling for EPHT

- Speaker: Tim Watkins/Fred Dimmick/Alice Gilliland (EPA/ORD)
- Focus: Modeling ambient PM, O_3 concentrations using air quality models (e.g., CMAQ) with monitoring and satellite data
- Questions/issues to be addressed:
  1. What are the strengths and weaknesses of models used for estimating individual or population level air pollution exposures in health effects research or for public health tracking?
     a) Availability, coverage and reliability of information required by these models (e.g., emissions inventories, traffic/roadway information, ambient monitoring measurements, etc.)
     b) Cross-sectional vs. longitudinal modeling issues
     c) Differences between models or methods used for predicting exposures in air pollution health effects research and public health tracking studies, and their potential implications to interpretation of results
     d) Uncertainties in modeled estimates
     e) Evaluation of model results by comparison with ambient concentration measurements
  2. What are the key programmatic and research needs of the existing ambient pollution modeling approaches?
  3. What new modeling activities are being planned or anticipated that could support future air pollution health effects, accountability or public health tracking programs?

Presentation 4: Land-Use Regression/Near-Roadways and SHEDS Exposure Modeling

- Speaker: Lucas Neas / Halûk Özkaynak (EPA/ORD)
- Focus: Fine scale urban ambient concentrations and personal exposure modeling using semi-empirical or probabilistic modeling methods
- Questions/issues to be addressed:
  1. What are the strengths and weaknesses of models used for estimating individual or population level air pollution exposures in health effects research or for public health tracking?
     a) Availability, coverage and reliability of information required by these models (e.g., traffic/roadway information, ambient monitoring measurements, time activity diaries, housing factors, etc.)
     b) Cross-sectional vs. longitudinal modeling issues
     c) Differences between models or methods used for predicting exposures in air pollution health effects research and public

health tracking studies, and their potential implications to interpretation of results
   d) Uncertainties in modeled estimates
   e) Evaluation of model results by comparison with exposure measurements
2 What are the key programmatic and research needs for the existing fine-scale urban ambient pollution concentrations and personal exposure modeling approaches?
3 What new ambient/exposure modeling activities are being planned or anticipated that could support future air pollution health effects, accountability or public health tracking programs?

10:45 – 11:00 **Break**

11:00 – 12:30 **Session 2: Health Effects Data for Air Pollution Research, Surveillance, & Accountability**

Moderator: Mark Utell (University of Rochester)

Presentations:
Presentation 1: Overview of health data
- Speaker: Tom Sinks (CDC)
- Focus: Sources, strengths, and limitations of health data
- Questions/issues to be addressed:
  1. What are the classic sources of data for air pollution related health effects? What are their strengths, limitations, consistency across states?
  2. What are emerging sources for health data? What are their strengths and limitations?
  3. How do privacy rules and FERPA limit data access? How do researchers work with/around these limitations?

Presentation 2: “State of the science” for acute health effects research
- Speakers: George Thurston and Kaz Ito (NYU)
- Focus: Relationship between respiratory health/CVD and air pollution
- Questions/issues to be addressed:
  1. What do we know about the relationship between these health effects and air pollution?
  2. What are the data and methodological limitations, issues and needs?
  3. What is the future direction of research related to these health effects and air pollution?

Presentation 3: "State of the science" for air pollution related chronic health effects research

- Speaker: Arden Pope (BYU)
- Focus: Relationship between chronic health effects and air pollution
- Questions/issues to be addressed:
    1. What do we know about the relationship between these health effects and air pollution?
    2. What are the data and methodological limitations, issues and needs?
    3. What is the future direction of research related to these health effects and air pollution?

Presentation 4: Emerging issues in health effects and air pollution

- Speaker: Marni Bekkedal (Wisconsin DPH)
- Focus: Relationship between emerging issues (autoimmune diseases, ALS, MS, autism) and air pollution
- Questions/issues to be addressed:
    1. What are emerging issues (health effects) related to air pollution?
    2. What do we know about the relationship between these health effects and air pollution?
    3. What are the data and methodological limitations, issues and needs?
    4. What is the future direction of research related to these health effects and air pollution?

12:30 – 1:30 **Lunch**

1:30 – 4:15 **Session 3: Linking Air Quality & Health Data for Accountability and Tracking**

Moderator**:** Suzanne Condon (Massachusetts Department of Public Health)

1:30 – 2:00 **Presentations:**

Presentation 1: Methodologies used in analyzing health and air quality data

- Speaker: Carol Gotway Crawford
- Focus: Statistical methodologies for analyzing health and air quality data
- Questions/issues to be addressed:
    1. What are classic methodologies? What are their strengths and limitations?
    2. What are emerging methodologies? What are their strengths and limitations?
    3. Issues to discuss
        - Short-term vs. long-term exposures
        - Spatial and spatial/temporal compatibility
        - Long latency of some health effects?
        - Sample size, rare health events
        - Misclassification issues
        - Small area analysis

2:00 – 2:30 **Case Study Presentation 2:** PHASE

- Speaker: Andy Smith-ME
- Focus: PHASE is an example of EPA Modeled & Monitoring Data combined to examine impacts for asthma and myocardial infarctions due to short term exposures to O3 & PM.

- Objectives:
  - Discuss utility of analysis results for public health practice/action and potential utility in epidemiological research
  - Illustrate data linkage and analysis
  - Discuss methodological shortcomings
  - Discuss steps to overcome or compensate for shortcomings

2:30 – 2:45 **Break**

2:45 – 3:15 Case Study Presentation 3: Traffic data linked with asthma & birth outcome data

- Speaker: Eric Roberts-CA
- Focus: This is a case example of using a surrogate measure for assessing air quality impact on asthma & birth outcomes.
- Objectives:
  - Discuss utility of analysis results for public health practice/action and potential utility in epidemiological research
  - Illustrate data linkage and analysis
  - Discuss data and methodological shortcomings
  - Discuss steps to overcome or compensate for shortcomings

3:15 – 3:45 Case Study Presentation 4: Linking monitored and modeled air toxics data with cancer and other health outcomes

- Speaker: Jerry Fagliano – NJ
- Focus: Case example of linking air toxics monitoring data and modeled air toxics data (USEPA NATA) with cancer incidence and other health outcome data
- Objectives:
  - Illustrate data linkage and analysis
  - Discuss shortcomings of air toxics and health outcome data
  - Discuss utility of analysis results for public health practice/action and priority setting for epidemiologic research
  - Discuss steps to overcome or compensate for shortcomings

3:45-4:15 Presentation 5: Overview of air accountability program objectives and needs

- Speaker(s) Danelle Lobdell/Susan Stone (EPA)
- Focus: Role of accountability programs in air pollution health effects research and environmental public health tracking

- Objectives:
    - Role of accountability studies in public health policy and actions
    - How does accountability differ from epidemiology and tracking?
    - What are some of its key issues and challenges/
    - Discuss steps to overcome these limitation

4:15 – 5:00 **Summary of Main Points from Presentations & Charge for Day 2**

Halûk Özkaynak

5:00 **Adjourn**

DAY 2

8:30 – 9:00 **Instructions for Break-out Discussion Groups**

Halûk Özkaynak

9:00 – 11:30 **Discussion Groups**

11:30 – 12:30 **Lunch**

12:30 – 2:00 **Report Out**
Each break-out group reports on priority short-term and long-term goals

2:00 – 2:15 **Break**

2:15 – 3:30 **Prioritize Actions & Next Steps**
Facilitator: Nancy Tosta
Group prioritizes goals and discusses next steps to be taken by research organizations, institutions, or programs

3:30pm **Adjourn**

Day 2 Discussion Groups

Group 1: Existing O3, PM and Air Toxics Data Sources for Health Research Studies& Surveillance

Chair: Tom McKone (LBL)
Rapporteurs: P. Barry Ryan (Emory)

Members: (Group of 10-12 interdisciplinary exposure and health experts)

Goal: Determine short-term and long-term goals to overcome limitation, barriers, and challenges associated with O3 & PM ambient monitoring and exposure modeling information

Discussion Issue 1: What are the limitations, barriers, and challenges associated with O3 & PM data for accountability, air pollution health effects research, EPHT, or public health surveillance? Such as:

a. Critical limitations of existing O3, PM and air toxics monitoring and exposure information
b. New sources of data (i.e., satellite)
c. Issues related to estimating or modeling exposures from air quality data
d. Technical barriers or communication difficulties in sharing the necessary exposure information between the different research organizations, institutions or programs

Discussion Issue 2: How can we overcome these limitations, barriers, and challenges?

Discussion Issue 3: In order of priority, what are short-term and long-term goals to improve O3, PM and air toxics exposure data for accountability, air pollution health effects research, EPHT, and public health surveillance studies?

Day 2 Discussion Groups

Group 2: Existing Health Data

Chair: Mark Utell (University of Rochester)

Rapporteur: Eric Roberts (CA)

Members: (Group of 10-12 interdisciplinary exposure and health experts)

Goal: Determine short-term and long-term goals to overcome limitation, barriers, and challenges associated with health effects data

Discussion Issue 1: What are the limitations, barriers, and challenges associated with the quality and access of health effects data for accountability, air pollution health effects research, EPHT, or public health surveillance studies?

Consider:

a. Critical limitations of existing health related information

b. New sources of data (i.e., Medicare, Dept. of Education/schools)

c. Issues related to access & privacy of health data for analysis, display & dissemination of results

b. Technical barriers or communication difficulties in sharing the necessary health information between the different research organizations, institutions or programs

Discussion Issue 2: How can we overcome these limitations, barriers, and challenges?

Discussion Issue 3: In order of priority, what are short-term and long-term goals to improve health effects data and analysis methods for accountability, air pollution health effects research, EPHT, and public health surveillance studies?

Day 2 Discussion Groups

Group 3: Emerging Health & Air Quality Issues (ALS, MS, Autism, Air Toxics)

Chair: Marni Bekkedal (Wisconsin DPH)
Rapporteur: Suzanne Gilboa (CDC)

Members: (Group of 10-12 interdisciplinary experts on exposure, health and statistical data analysis)

Goal: Determine short-term and long-term goals to overcome limitation, barriers, and challenges associated with exposure and health effects data for emerging health & air quality issues

Discussion Issue 1: What are important emerging health effects and air quality issues for accountability, air pollution health effects research, EPHT, or public health surveillance studies?

Discussion Issue 2: What are the limitations, barriers, and challenges associated with existing exposure and health effects data for these emerging issues? Such as:

a. Critical limitations of existing exposure and health related information
b. What are the emerging sources of health surveillance data (i.e., ALS Registry)
c. What are emerging sources of exposure data for air toxics?
d. Technical barriers or communication difficulties in sharing the necessary exposure and health information between the different research organizations, institutions or programs

Discussion Issue 3: How can we overcome these limitations, barriers, and challenges?

Discussion Issue 4: In order of priority, what are short-term and long-term goals to improve exposure and health effects data for these emerging issues for accountability, air pollution health effects research, EPHT, and public health surveillance studies?

Day 2 Discussion Groups

Group 4: Linkage and Analysis of Air Quality and Health Data

Chair: George Thurston (NYU)

Rapporteur: Aaron Cohen (HEI)

Members: (Group of 10-12 interdisciplinary experts on exposure, health and statistical data analysis)

Goal: Determine short term and long-term goals to overcome limitation, barriers, and challenges associated with linkage and analysis of air quality and associated health effects for Accountability, EPHT, and community based actions.

Discussion Issue 1: What are the limitations, barriers, and challenges associated with the application of existing exposure and health effects data for EPHT and accountability activities? Such as:

a. Critical limitations of existing exposure and health related information
b. Limitation of analysis methods
c. Exist gaps (Need for more pilots, Research on personal exposure vs. ambient concentrations, consistency across states or researchers)
d. Needs to inform community level public health actions
e. Technical barriers or communication difficulties in sharing the necessary exposure and health information between the different research organizations, institutions or programs

Discussion Issue 2: How can we overcome these limitations, barriers, and challenges?

Discussion Issue 3: How can models and other surrogate information on environment, exposures or health be used for EPHT and accountability purposes in the community scale setting?

Discussion Issue 4: In order of priority, what are short-term and long-term goals to improve linkage and analysis of existing exposure and health effects data, methods, and resulting public health actions for accountability and EPHT?