Partnering To Collect Improved Human Exposure Measurement Data

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Benefits of Collaboration

- Collaborations allow complex environmental challenges to be efficiently addressed by leveraging resources and scientific expertise
- Collaborations are routinely formed with other federal, state, and local government organizations, as well as academia and international groups
- These projects represent highly successful partnerships between various research organizations that address a number of research objectives and improve our understanding of exposures to chemicals of interest to the Agency

Detroit Exposure and Health Effects Studies

Several research studies are being conducted in the Detroit Metropolitan area to better understand the relationship between people's exposure to air pollution and human health. The overall goal of these studies is to use measurement and modeled data to assess the impact of ambient-based PM and air toxic sources on human populations and the neighborhoods in which they live.

- **Detroit Exposure and Aerosol Research Study (DEARS) - NERL**
  - Air pollution exposure study involving indoor, outdoor, and personal exposure monitoring for 120 residents in Wayne County, Michigan over a three-year period
  - Impacts of industrial point and mobile sources on exposures to PM components and select air toxics will be determined
  - Data gathered in this study will be leveraged with other exposure and health effects studies
- **Detroit Children's Health Study (DCHS) – NHEERL/NERL**
  - Data from DEARS, along with school-based monitoring and modeled data, will be used to assess the impact of outdoor air pollutants on asthma of students in the Detroit and Dearborn areas
- **Healthy Heart Study – University of Michigan**
  - Personal exposure data from DEARS will be used to determine cardiovascular impacts, including brachial artery dilation
- **Detroit PM Toxicology Study – NHEERL**
  - Toxicological studies conducted on coarse, fine, and ultrafine PM collected at one of the DEARS monitoring sites
  - Along with source apportionment data from DEARS, this study will provide insight into the toxicological properties of PM attributed to specific ambient sources
- **Canadian Windsor Air Quality Studies – Health Canada**
  - Exposure and health effects studies conducted across the Detroit River in Canada; similar in scope and design to the U.S. studies
  - Contains a human exposure component, similar to DEARS, and health effects studies involving asthmatic children and diabetics

Collaboration involves scientists across ORD, the Michigan Department of Environmental Quality, Community Action Against Asthma – CAAA, the University of Michigan, Health Canada, the Environmental and Occupational Health Sciences Institute (EOHSI), and RTI International.

Outcomes

By collaborating on these projects…

- EPA is able to obtain valuable information that might not have been able to be gathered in any other manner.
- EPA is benefiting from improved measurement and modeling capabilities of exposure and health effects.
- EPA is gaining access to communities.
- EPA is saving significant amounts of public funds, reducing the survey response burden on the public, and reducing the time needed to obtain the required data by the participating Agencies.
- EPA will gain a more comprehensive understanding of the relationship between exposure to air pollution and human health effects.
- EPA will gain a rich database useful for understanding particulate matter and air toxics source impacts on human health.
- EPA will participate in producing the first national residential multi-parameter database.
- EPA will use the AHHS data to develop new distributions of concentration levels and to examine changes in the occurrence and magnitude of these concentration levels and risks over time, where baseline data is available.
- EPA has obtained valuable information on pesticide usage in child care centers, concentrations of pesticides on surfaces in the centers that children may contact, and the distribution of pesticides within child care centers.

Interagency Effort to Characterize Contaminants in Child Care Centers (CCC)

- Collaboration between the US Department of Housing and Urban Development (HUD), the US Consumer Product Safety Commission (CPSC), and the EPA to measure levels of pesticides, lead, and allergens in licensed institutional child care centers randomly selected for participation in this national survey
- Multi-stage sampling design with clustering resulted in 166 child care centers from 30 primary sampling units being selected for participation
- Samples for pesticide, lead, and allergen analysis were collected at multiple locations in each child care center

2001 Community-Based Study in the Greater Jacksonville, FL Area (JAX)

- Collaboration between the Duval County Health Department (DCHD), the Centers for Disease Control and Prevention (CDC), and the EPA on a measurement study to characterize young children's potential exposures to pesticides in residential environments in Jacksonville, FL
- DCHD initiated this community-based study and solicited participation from CDC for measurements of pesticide metabolites in urine and EPA for assistance in characterizing pesticide residues in the homes of study participants
- Project evolved into a three-tiered study that examined the potential exposures of young children (4 to 6 years of age) to a large number of organophosphate and pyrethroid pesticides

The American Healthy Homes Survey (AHHS)

- Collaboration between EPA's ORD and OPPT, and the US Department of Housing and Urban Development's (HUD) Office of Healthy Homes and Lead Hazard Control to perform a national survey of housing related hazards.
- In addition to measuring lead and allergens, AHHS will provide the first ever national estimates of housing-related potential health hazards (e.g., pesticides, mold, arsenic). Specific objectives of the proposed AHHS are to:
  - Estimate the number and percent of homes with lead-based paint hazards and evaluate changes since the 1997-2000 National Survey of Lead and Allergens in Housing (NSLAH)
  - Estimate the levels of specified allergens in dust in homes and evaluate changes in the levels since the NSLAH
  - Produce the first ever national estimates of the levels of additional housing-related hazards, including:
    - Specific molds in house dust in homes and relate these estimates to observed water damage
    - Residential-use pesticides and relate these estimates to homeowner or applicator applied pesticides and household products
    - Arsenic concentrations in house dust and soil, as well as bioavailable arsenic in soil, and relate these data to the presence of chromated copper arsenate (CCA) treated wood or other arsenic contaminated surfaces that children may touch

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