Overview of the National Environmental Public Health Tracking Program

Nicholas F. Jones, MBChB, MPH
Judy Qualters, PhD

Environmental Health Tracking Branch
National Center for Environmental Health
Centers for Disease Control and Prevention (CDC)
Presentation Overview

• How did the tracking program come about?
• What has been done so far?
• Implementing birth defects environmental health tracking
“The removal of environmental health authority from public health agencies has led to fragmented responsibility, lack of coordination, and inadequate attention to the health dimensions of environmental problems.”
Typical Environmental Exposures: TODAY

- **Industrial Chemicals**
  - PCBs, Dioxin, Toxaphene, VOCs, Phthalates, Adipates, PBDEs and many others

- **Chlorination Byproducts**
  - Chloroform, Bromoform, etc.

- **Vehicular Emissions**
  - CO, Ozone, Particulates, Benzene, etc.

- **Pesticides**
  - DDT, Mirex, 2,4-D, Atrazine, Malathion, etc.

- **Infectious Agents**

- **Fire Byproducts**
  - Particulates, PAHs, CO

- **Heavy Metals**
  - Lead, Mercury, Palladium, Cadmium
America’s Environmental Health Gap

• Pew Commission Study
  - Survey of local and state health departments
  - Review of existing data sources
  - Review of federal tracking systems

• No national strategy
• National leadership void
• No linkages between hazard, exposure and outcome tracking
• Limited co-ordination of efforts across country eg no data standards
• Less than 50% pop covered by BD registries
• Public expectation – balance knowledge vs privacy
Recommendations

1. Establish baseline network for diseases and exposures (incl. birth defects, asthma, cancer)
2. Early warning system – EH emergencies
3. State pilot tracking programs
4. Federal investigative response capability
5. Linkage to community and academia
Congress Responds

- CDC’s National Environmental Public Health Tracking Program initiated in 2002
  - Congressional funding for "development and implementation of a nationwide environmental health tracking network and capacity development in environmental health at State and local health Departments"
National Environmental Public Health Tracking Program

MISSION:
To provide information from a nationwide network of integrated health and environmental data that drives actions to improve the health of communities
2002 - 2006
Building Capacity and Pilot Testing
Developing the Tracking Program: Grantees - 2002 to 2006
## Pilot Projects

<table>
<thead>
<tr>
<th>Measured</th>
<th># Grantees</th>
<th># Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>Asthma</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Water</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Cancer</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Lead</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Birth defects</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Pesticides</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Reproductive health</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CO</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Fish/shellfish</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Birth Defects Pilot Projects

• Strengthen existing registries (eg geocoding)
• Test environmental linkage
  - FL – spatial analysis methods (RIF, WinBUGS, SatScan)
  - MA – drinking water – distribution system boundaries
  - NJ – Clefts, Cardiac, Downs, Hypospadias, Craniosynostosis, Gastroschisis – drinking water
  - OK – linkage methods
  - UT – tract level analysis – proximity to TRI sites
  - Development disability – PCB (NYS) pesticides (CA)
Overall Results from Funded Projects

- Increased capacity
- Increased availability and enhancement of existing data
- Built new data systems
- Created analytic tools
- Linked data
- Took action
Piloting to Implementation

Environmental Public Health Tracking Network
VISION

Version 1.0
10/20/2004

The document has been developed by Science Applications International Corporation (SAIC) under a contract with the U.S. Centers for Disease Control and Prevention – Department of Health and Human Services.

Environmental Public Health Tracking Network

Welcome to the Environmental Public Health Tracking (EPHT) Network. To begin, select a state by clicking on the map located below, or search for data sources by entering keywords in the space provided and click “Search.” You may also view in-pop map data selection wizard for additional assistance.

Select Data Sources:

- Search:
  - Enter search terms or keyword searches, or submit a state by clicking on the map below.

- Data Sources:
  - Data Search Wizard
  - Feedback
  - Tutorial
  - Frequently Viewed Items

EPHT Toolbox:
- Analysis
- Visualization
- Resources

Conferences & Events:
- 2006 National Environmental Public Health Tracking Conference
- 2006 National Environmental Public Health Tracking Conference

CDC Forum:
- CDC National Environmental Public Health Tracking Program

FirstGov
- Department of Health and Human Services
- FirstGov
New Tracking Funds in 2006  
*(CDC RFA-EH06-601)*

- To provide state health departments the resources to implement statewide EPHT networks that will be part of the National EPHT Network
- 17 awards
- Project Period: 5 Years
National Tracking Network

Key Functions:

• Provide Nationally Consistent Data and Measures
• Describe and Discover Data
• Exchange Data
• Provide Data Management and Analysis Tools
• Inform and Interact with the Public
Tracking Objectives

• Ecologic linkage and population level tracking
  – Unknown effects
    • Generate hypotheses
  – Known associations
    • Identify and quantify at risk populations
    • Monitor intervention impacts

• Facilitate individual level and multilevel studies
  – Facilitate data exchange and development of tools
  – Measure associations
National Approach

- Identification and adoption of standards (NCDMs)
- Tools development (PAVR)
- Training
- Partnership and Collaboration
Ensuring Stakeholder Input

CDC

Standards & Network Development Workgroup
- Network Architecture
- Security
- Geography & Locational Referencing
- Metadata

Program Marketing & Outreach Workgroup
- Health Disparities
- Data Stewards
- Outreach
- Content Messaging

Content Workgroup
- Air
- Water
- Cancer
- Lead
- Birth Defects
- CO Poisoning
- Vital Statistics – Births
- Hospitalizations – Asthma/CVD

Portal Analysis and Visualization Team
Birth Defects Implementation

- Content Work Group
- 10 of 17 grantees commence 2008
- Collaboration between registries and EPHTN programs
<table>
<thead>
<tr>
<th>State</th>
<th>CDC codes</th>
<th>Age</th>
<th>Type</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>Yes</td>
<td>Up to age 1</td>
<td>P</td>
<td>FD, T†</td>
</tr>
<tr>
<td>CT</td>
<td>No</td>
<td>Up to age 1</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>FL</td>
<td>Yes</td>
<td>Up to age 1</td>
<td>A &amp; P</td>
<td>FD</td>
</tr>
<tr>
<td>ME</td>
<td>No</td>
<td>Up to age 1</td>
<td>A &amp; P</td>
<td>FD, T</td>
</tr>
<tr>
<td>MD</td>
<td>No</td>
<td>Newborn</td>
<td>P</td>
<td>FD, T</td>
</tr>
<tr>
<td>MA</td>
<td>Yes</td>
<td>Up to age 1</td>
<td>A</td>
<td>FD</td>
</tr>
<tr>
<td>MO</td>
<td>No</td>
<td>Up to age 1</td>
<td>P</td>
<td>FD</td>
</tr>
<tr>
<td>NH</td>
<td>Yes</td>
<td>Up to age 1</td>
<td>A</td>
<td>FD, T</td>
</tr>
<tr>
<td>NJ</td>
<td>No</td>
<td>Up to age 2*</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>NM</td>
<td>No</td>
<td>Up to age 4</td>
<td>A &amp; P</td>
<td>FD, T</td>
</tr>
<tr>
<td>NY</td>
<td>Yes</td>
<td>Up to age 2</td>
<td>A &amp; P</td>
<td></td>
</tr>
<tr>
<td>NYC</td>
<td>Yes</td>
<td>Up to age 2</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>PA</td>
<td>No</td>
<td>Up to age 2</td>
<td>P</td>
<td>FD</td>
</tr>
<tr>
<td>UT</td>
<td>Yes</td>
<td>Up to age 2</td>
<td>A</td>
<td>FD, T</td>
</tr>
<tr>
<td>WA</td>
<td>No</td>
<td>Up to age 1**</td>
<td>P</td>
<td>FD</td>
</tr>
<tr>
<td>WI</td>
<td>No</td>
<td>Up to age 2</td>
<td>P</td>
<td>FD</td>
</tr>
</tbody>
</table>

† all systems capture live births; FD = fetal deaths; T=terminations * voluntary to 22 ** to 10 FAS
Implementation Issues

- Privacy and small numbers
- Legislative mandates
- Data quality
- Geocoding
- Non live birth cases
- Registry establishment and support
- Organizational
Positive Impact of Tracking

- Geocoding
- Support for code change eg fetal diagnosis
- Record linkage with hospital discharge
- Support for web based reporting
- Registry provision of EPHTN data
- Secure access to data
- Enhanced data collection for tracking defects
- Supplement reporting with birth certificates
- Data linkage projects eg pesticides and hypospadias
Data to Action

Key Issues for Tracking

- Reaching local levels
- Measuring exposure
- Linking health, exposure, & hazard data
  - Measuring impact
- Utility to stakeholders
Linking data by place

Social demographic
eg census, BRFSS

Health events
eg hospitalisations
births

Physical environment
eg water supply, air
toxic substances

home
work
school

areas (eg county, tract, zip)
points (eg street address)
lines (eg roads, rivers)
Environmental-Spatial Model

Hazard Identification
- Hazardous agent
- Present in environment
- Route of exposure exists

Exposure Evaluation
- Host exposed to agent
- Agent reaches target tissue
- Agent produces adverse effect

Health Effect Evaluation
- Effect clinically apparent

Map sources of hazardous agents and model fate and transport
- Identify individuals exposed to agents in time and space
- Map and analyze spatial patterns of health events

Adapted from “GIS and Public Health,” Cromley and McLafferty 2002
## DRAFT EPHTN HEALTH DATA MODEL

### STATE SECURE PORTAL(S)

1. Source or Individual Data* *(Raw)*

### IDENTIFIED

PARTIALLY DE-IDENTIFIED

State Firewall

### NOT PUBLIC

*(some form of “registration”)*

*Conceivably linkable data*

### NATIONAL and/or STATE SECURE PORTAL

2. “Individual” Level Data* *(Key descriptors e.g., race, sex, age)*

### NATIONAL (and/or State) PUBLIC PORTAL

3. Counts & Interpreted Data* *(High resolution minimal aggregation)*

4. Counts *(Low resolution – more masking & aggregation)*

5. Rates or other metrics *(Measures/indicators)*

### DE-IDENTIFIED

Nationally Consistent Data and Measures

### PUBLIC

*Conceivably linkable data
Summary

• Tracking data are essential to successful public health
• Success depends on cooperation among many organizations
• Excellent progress to date
• Next step - staged implementation at local, state and national level
• Vision: Healthy Informed Communities
For more information:  www.cdc.gov/nceh/tracking

Contact us:  EPHT@cdc.gov