



Building the Environmental Public Health Tracking Data Network

Introduction

In response to the Pew Environmental Health Commission's 2000 report, *America's Environmental Health Gap: Why the Country Needs a Nationwide Tracking Network*,¹ the Centers for Disease Control and Prevention (CDC) and several state and local health and environmental agencies began to create a national environmental public health tracking (EPHT) program. As defined by CDC, "environmental public health tracking is the ongoing collection, integration, analysis, and interpretation of data about environmental hazards, exposure to environmental hazards, and human health effects potentially related to exposure to environmental hazards."² The vision of the EPHT network is to allow for direct electronic data reporting as well as the linkage of data within and across states.

During the summers of 2002 and 2003, CDC awarded cooperative agreements to state and local health agencies to develop a blueprint for EPHT and enhance exposure and health effects surveillance systems. To this end, the health and environmental agencies are working together to inventory and assess data availability and utility. The grantees are specifically charged with conducting at least one project to do one of the following:

- Demonstrate feasibility of linking health effect data with exposure and/or environmental hazards data.
- Develop surveillance methods.
- Assess the utility of linking data to guide appropriate public health action.

This case study highlights the efforts of three states? New York, Washington, and Missouri? to collect, integrate, and analyze

health effects, exposure, and environmental hazards data. The efforts of these states illustrate the potential benefits that accrue when health and environmental agencies work together to build an EPHT network. The case study also demonstrates how data from the EPHT network can be used to implement and evaluate public health prevention and promotion activities.

New York: Creating an Automated Data Exchange System

The New York state EPHT program is working to: increase their understanding of the environment's impact on health; support *Healthy People 2010* objectives by collecting baseline measurements and tracking progress towards improved health outcomes, and; provide reliable and timely data to support public health and environmental regulatory programs. Prior to receiving an EPHT grant, New York had identified pediatric asthma as a priority environmental health concern. However, an enhanced surveillance system is needed to track patterns and trends of disease across both time and space.

New York's first EPHT demonstration project aims to link data from the state's hospital discharge database with air monitoring data. A new data exchange system will allow for real-time data flow between the Department of Health (DOH) and Department of Environmental Conservation (DEC). Information technology (IT) staff from DOH and DEC are working with CDC's Public Health Information Network Messaging System (PHIN MS) software to securely transmit public health information over the internet to

DEC and local health agencies. Data from DEC will be shared with DOH through the Environmental Protection Agency's National Environmental Information Exchange Network (Exchange Network). IT staff are also developing technical specifications and a system architecture for the data exchange systems based on the standards, technical infrastructures, and business requirements of both PHIN and the Exchange Network.

In the pilot phase of the data exchange system, air monitoring data will automatically flow from DEC to DOH. The air monitoring data will be linked with pediatric asthma data and analyzed for trends across both space and time. Staff plan to explore and evaluate the interoperability of the Exchange Network and PHIN, and ultimately extend the data flows between DOH and DEC. New York has made it a priority to share the successes and lessons learned based on their implementation of the automated data exchange system once the network has been evaluated.

Washington: Turning a Vision for Environmental Public Health Tracking into Reality

The Washington state EPHT program is enhancing current (and developing new) data systems that will provide public health and environmental professionals the ability to simultaneously analyze three types of data? health, exposure, and hazard. Program staff are also developing a set of methods and tools to analyze, interpret, and disseminate these data. Washington envisions an EPHT network that will:

- Enhance the way environmental public health data are collected, analyzed, and disseminated.
- Provide data that can be used to institute and evaluate public health prevention and promotion activities.

- Use information technology systems as the building blocks for an automated, real-time, national public health surveillance program.

A priority of the Washington EPHT program is to build capacity to collect and analyze exposure data.

Washington has begun two demonstration projects to link health, exposure, and environmental hazards data. The first project, the *Environmental Integration and Exposure Impact Observation* system, will give the DOH real-time access to fish tissue contamination data from the Department of Ecology's (DOE) environmental data warehouse through DOE's Exchange Network node. To obtain exposure data for the project, DOH is developing questions about individual fish consumption habits to be included in the state Behavioral Risk Factor Surveillance System survey. Additionally, the state is also in the process of developing a state-based health and nutrition examination survey (state-HANES) to determine the body burden of heavy metals and other pollutants in Washington residents. Finally, DOH will link the fish tissue data to aggregated birth defects surveillance data. DOH officials will use results of this data linkage project to identify populations at risk and to develop fish consumption advisories.

Washington is also building a pesticide exposure and response data system. DOH is partnering with the state Department of Labor and Industries, as well as the independent Washington Poison Center, to develop a data system to electronically gather pesticide poisoning data from poison control centers, hospitals, and laboratories. The Cholinesterase Monitoring Data System (CMDS) will also automatically match incoming cholinesterase blood tests against an existing database to determine if the result is new or whether it is a follow-up test. Cholinesterase is a biomarker for exposure to certain classes of especially toxic pesticides. The system will send an

alert, if the result exceeds a threshold for cholinesterase depression, to program staff for potential follow-up or enforcement action. DOH staff will assess the utility of the electronic data collection software for other data linkage projects such as birth defects, cancer, and lead poisonings.

Missouri: Revitalizing a Database to Allow for the Integration of Environmental Public Health Data

Missouri's EPHT demonstration project is integrating health, exposure, and environmental hazards data from a demolition site in St. Louis that is home to a former lead smelter. Prior to their EPHT grant, Missouri used CDC's Systematic Tracking of Elevated Lead Levels and Remediation (STELLAR) application to document lead-screening activities. Now they are developing a new database that will allow direct electronic reporting of blood lead laboratory results to the Department of Health and Senior Services. Additionally, the new database will support the development of an electronic notification system as well as the electronic documentation of environmental assessments and lead abatement activities.

The new lead database is compatible with the Missouri Health Strategic Architecture and Information Cooperative (MOHSAIC), a statewide integrated data warehouse that can be accessed by state and local public health officials. The lessons learned from the conversion of the STELLAR database into MOHSAIC will be used to guide the conversion of 15-19 environmental databases, including heavy metals, carbon monoxide, arsenic, pesticides, asthma, and others. With all of these databases in

MOHSAIC, staff will be able to link different pieces of information and create new databases.

Finally, through a partnership with the Missouri Department of Natural Resources, the EPHT program is making electronic linkages between MOHSAIC databases and lead smelters/lead mining databases. Geographic information systems have been used to map the location of children living in St. Louis with high lead levels and their proximity to the lead smelters. Spatial analyses have identified hot spots in the city that appear to have increased numbers of lead poisonings cases. These analyses should help to focus public health intervention activities.

Conclusions

Since 2002, New York, Washington, and Missouri have been working diligently to build the EPHT network. To date, their efforts demonstrate that health, exposure, and environmental hazards data from state health and environmental agencies can be integrated and analyzed. Furthermore, Washington has shown that non-traditional public health agencies, such as the state Department of Labor and Industries, can be valuable partners in the development of an EPHT network. Data from all of the demonstration projects will be used to design and evaluate public health prevention and promotion programs. It is envisioned that these projects and others will also provide CDC and other state and local health agencies with valuable lessons learned and success stories that can be used to guide the development of a national EPHT program.

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¹ Pew Environmental Health Commission, America's Environmental Health Gap: Why the Country Needs a Nationwide Health Tracking Network. 2000. Available at <http://healthyamericans.org/reports/files/healthgap.pdf>.

² Centers for Disease Control and Prevention, Environmental Public Health Tracking Program: Closing America's Environmental Public Health Gap. 2004. Available at www.cdc.gov/nceh/tracking/aag.04.htm.

Additional Resources

www.cdc.gov/tracking/.

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