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The Use of Public Health Informatics to Improve Environmental Health Practice

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Reliable, accurate public health information technology is essential for monitoring health and for evaluating and improving the delivery of public health practice (AbouZahr & Boerma, 2005). As the complexity and interdependencies of environmental health issues have grown, environmental health programs have begun to identify the emerging need for the integration of data from diverse sources. Environmental health agencies find it beneficial to share data not only between programs and divisions within their own departments, but also with other agencies within the state, region, and nation (Ohio Department of Health, 2011).

Fragmentation of environmental health data directly affects the ability of environmental health programs to protect the communities they serve. Currently, the enormity of available data and the paucity of usable information from the data are a paradox that often frustrates federal, state, and local environmental health officials. The barriers to accessing and using environmental health data restrict the ability of public health officials to address emerging health problems, educate decision makers and the public on the full impact of specific environmental hazards, and evaluate the effectiveness of interventions (Public Health Foundation, 1997). In order for environmental health programs to be effective and grow, the programs need reliable, timely information to make information-driven decisions, improve communication, and improve tools to analyze and present new data (Friede, Blum, & McDonald, 1995).

Using information technology to capture, manage, analyze, and share information is a core capacity of public health informatics. Public health informatics is the application of information science and technology into public health practice and research (Yasnoff, O'Carroll, Koo, Linkins, & Kilbourne, 2000). Specifically, public health informatics supports the mission of disease prevention and health promotion by leveraging information technology solutions, therefore enabling environmental health programs to achieve public health goals more effectively, efficiently, and inexpensively.

In 2001, the Centers for Disease Control and Prevention's National Center for Environmental Health integrated public health informatics approaches into environmental health practice by developing the Environmental Health Specialists Network Information System (EHSNIS), a web-based application accessible anywhere Internet connectivity is

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available, including mobile devices (e.g., smartphones, tablets). EHSNIS coordinates and supports data collection activities in the area of foodborne and waterborne illness outbreak prevention, specifically in the following activities:

- National Voluntary Environmental Assessment Information System, a standardized reporting tool for foodborne illness outbreak environmental assessments;
- *Listeria* Retail Deli Study, a risk assessment to better understand how *L. monocytogenes* is transmitted in the retail environment; and
- Private Well Initiative Inventory, a standardized reporting tool for datasets with information on domestic private wells.

EHSNIS is also available to other government agencies and nonprofit organizations, such as the following, to support their data collection needs relating to environmental health:

- Minnesota Department of Health—Raw Fish/Sushi Study, an assessment of risk factors for foodborne illness present in restaurants preparing and serving raw fish items;
- Georgia State University—Environmental Health Specialists Survey, a survey characterizing environmental health specialists food safety and work related duties; and
- NEHA—Insect and Rodent Control Needs Assessment, a survey to collect data on training offered during NEHA's Annual Educational Conference & Exhibition.

EHSNIS primarily supports two methods of data collection: surveillance or evaluation and web-based survey. The surveillance or evaluation data collection generally includes data collected in the field by registered users of EHSNIS using a structured data collection tool. Conversely, web-based surveys send electronic survey invitations to targeted audiences who do not have to be registered users of EHSNIS to provide survey responses. Web-based surveys support both anonymous and identified-participant survey designs. The data collected within EHSNIS can be electronically downloaded into comma-separated value files for data analysis using analytic software packages (e.g., SAS, Microsoft Excel). This benefits public health practice by providing easy, rapid access to a data collection system and the environmental health data collected (Friede et al., 1995).

EHSNIS is a platform that assists in mitigating and ultimately eliminating some gaps in environmental health data; however, it will not solve all existing data issues. Improving the quality of environmental health data collected, data collection protocols, and data analysis and dissemination depends on long-term planning, standardizing environmental health data, documenting contributions of public health informatics to improving environmental health, and garnering and properly allocating new resources.

Updating existing approaches to data collection and management and developing new analytical techniques to take advantage of evolving environmental health data sources may help improve the environmental health functions of notifiable disease reporting, outbreak detection, emergency response, and program evaluation (Centers for Disease Control and Prevention, 2012). If your food or water safety program is interested in using EHSNIS for

your data collection activities or if you have additional questions or comments please contact EHSNIScdc.gov.

Biographies

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Centers for Disease Control and Prevention Environmental Health Informatics Resources

- **Environmental Health Specialists Network Information System**: Fre e environmental health data collection tool at www.cdc.gov/nceh/ehs/EHSNet/resources/ehsnis
- **e-Learning on Environmental Assessment of Foodborne Illness Outbreaks**: Free virtual reality-style training on how to conduct environmental assessments at www.cdc.gov/nceh/ehs/eLearn/EA_FIO
- **National Voluntary Environmental Assessment Information System**: Free standardized reporting tool for foodborne illness outbreak environmental assessments at www.cdc.gov/nceh/ehs/NVEAIS