

HHS Public Access

J Public Health Manag Pract. Author manuscript; available in PMC 2017 September 05.

Published in final edited form as:

Author manuscript

J Public Health Manag Pract. 2017 ; 23(Suppl 5 ENVIRONMENTAL PUBLIC HEALTH TRACKING): S4–S8. doi:10.1097/PHH.00000000000626.

Environmental Public Health Tracking Program Advances and Successes: Highlights From the First 15 Years

Holly R. Wilson, MHSE, CHES and Alex E. Charleston, MPH

Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Centers for Disease Control and Prevention, Atlanta, Georgia.

Abstract

Over the past 15 years, the National Environmental Public Health Tracking Program (Tracking Program) has advanced technologically and programmatically, evolving from an abstract concept to a mature program. The Tracking Program, in collaboration with national, state, and local partners, uses data and expertise to identify and address environmental public health needs and improve public health capacity across the United States. Examples of the successful application of environmental public health tracking include informing health impact assessments and filling data gaps. The Tracking Program plans to continue working to direct innovative programs and solutions that protect and improve community health in years to come. With support from the Tracking Program, health departments can enhance their abilities to plan and conduct environmental public health activities.

Keywords

environmental public health tracking network; Environmental Public Health Tracking Program; Tracking Network; Tracking Program

In September 2000, the Pew Environmental Health Commission issued a report stating that public health agencies lacked capacity to evaluate and conduct key investigations into the status of the health of their environment.¹ The commission reported that the environmental public health system in the United States was fragmented and ineffective. It recommended that agencies with roles in environmental public health improve their capacity to evaluate community exposures and conduct investigations.¹

Without environmental health tracking, public health agencies lack critical information to establish environmental health priorities to prevent and reduce disease, thereby improving public health.¹ The report called for the establishment of an environmental public health tracking network (Tracking Network) that would monitor the level of burden from environmentally related disease.

Correspondence: Holly R. Wilson, MHSE, CHES, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Centers for Disease Control and Prevention, 4770 Buford Hwy NE, Mailstop F57, Atlanta, GA 30341 (hdw8@cdc.gov).

The authors declare no conflicts of interest.

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In 2002, Congress appropriated funds to the Centers for Disease Control and Prevention (CDC) to develop this network, and under the direction of the National Center for Environmental Health (NCEH), the National Environmental Public Health Tracking Program (Tracking Program) was created. Environmental public health tracking is the "ongoing collection, integration, analysis, and dissemination of data from environmental hazards monitoring, human exposure tracking, and health effect surveillance."²(p¹⁴¹⁰) These data sources are vital components to a tracking system that allow the linkage of environmental hazard and potential adverse health effects and improve our understanding of the impact of environmental factors on our health.³

In 1988, the Institute of Medicine issued a report stating that public health surveillance is an essential part of public health. Without good surveillance information, programs lack the ability to conduct assessments and make informed decisions.⁴ Former Surgeon General David Satcher stated, "In public health, we can't do anything without surveillance. That's where public health begins." Public health surveillance is the ongoing, systematic collection, analysis, and interpretation of health data for the planning, implementation, and evaluation of public health practice.^{5(p838)}

The Tracking Program established a national environmental public health surveillance system that is vital to improving the health of communities. The program had to break down existing data silos and work with numerous partners to develop a standardized methodology in order to establish an environmental health surveillance system. The Tracking Program accomplished this and established the Tracking Network, a dynamic, online system that brings together health and environment data from a variety of sources and provides supporting information and tools to make the data easier to understand. The Tracking Network currently provides surveillance data on 19 different content areas (Figure 1). These content areas have produced 419 environmental health measures and established more than 59 GB of data that public health departments can utilize to conduct assessments and make informed decisions to improve the health of their communities.

2017 marks the 15th anniversary of the Tracking Program. Over the years, the program has expanded and evolved from an abstract concept to a mature program, addressing environmental public health needs across the United States.

Foundation and Capacity Building: 2002–2005

During the formative years of the Tracking Program, CDC and partners focused on determining the best methods for developing a nationwide Tracking Network that would address the concerns outlined in the Pew report. Examples of partners included state and local health departments, national organizations, academic institutions, and other federal government agencies. A conceptual model proposed by Thacker et al³ in 1996 that describes the hazard-exposure-health effect causal pathway formed the basis for the network's design. Those 3 categories (hazards, exposures, and health effects) informed decisions about the types of data considered for inclusion on the Tracking Network.

Working to transform the idea of a network into reality, CDC initiated several projects with state and local health departments and academic institutions to begin planning, enhancing, and implementing tracking programs and to conduct data linkage demonstrations. At the same time, CDC and partners began to establish the foundation of the Tracking Program. These foundational elements included increasing capacity of public health departments through financial and technical assistance to address environmental health issues; strengthening relationships among public health and environmental agencies; investigating potential sources for data to be included in the Tracking Network; establishing standards and requirements to direct data collection and reporting (known as nationally consistent data and measures, or NCDM); and assessing technological needs and solutions.^{6,7}

Implementation: 2006–2010

Building on the foundation formed during the early years, the Tracking Program entered the implementation phase in 2006. At this time, CDC funded 17 health departments through a competitive cooperative agreement process to begin gathering and submitting NCDM to CDC for inclusion on a National Tracking Network hosted by CDC. CDC's Tracking Network was designed to include data submitted by grantees as well as health and environment data from other national sources such as US Census and other CDC programs. In addition, grantees created custom, local-level tracking network systems to house NCDM and other data important to their communities.

In 2009, CDC added 6 more states, bringing the total to 23 grantee tracking programs. By 2010, the Tracking Program had expanded to include 24 health departments.

An important milestone for this phase was the official launch of the National Environmental Public Health Tracking Network (www.cdc.gov/ephtracking). At the time of release in the summer of 2009, the Tracking Network was the first of its kind to bring together standardized health and environment data into a single, dynamic, Web-based system.

Network Growth and Enhancement: 2011–2015

As the Tracking Program matured, it expanded to include 1 city and 25 state programs by 2014. In addition to broadening the geographic scope of the Tracking Program, CDC continued to enhance the functionality of the National Tracking Network. Examples of the technological accomplishments during this phase include added capabilities to the Tracking Network like showing multiple measures at the same time⁸ and making data accessible by machines through an application program interface that allows users to create mobile apps or other tools.⁹ Along with technological advancement, CDC continued to add new content areas to the National Tracking Network. Many of the grantee tracking programs extended their reach beyond NCDM and traditional environmental health topics to include data on infectious diseases such as Lyme disease and Zika virus infection on their local tracking networks.

Increasing Impact: 2016-Present

CDC and partners spent the first decade defining what the Tracking Program would look like and how it would function; they spent the next 5 years growing in size and building programmatic, scientific, and technological capacity. Having reached a level of maturity with respect to National Tracking Network performance and functionality, plus staff expertise, the focus of the Tracking Program has shifted from a developmental mind-set to a more applied approach.

CDC regularly monitors the Tracking Program's efforts to improve public health. Tracking Program grantees report their accomplishments to CDC in the form of public health actions (PHAs), which result from implementation of environmental public health tracking in their jurisdictions. Between 2005 and 2016, more than 400 PHAs have been reported to the Tracking Program. The PHAs include activities such as identifying populations at risk, responding to environmental health threats, developing interventions, and informing policies.¹⁰

For example, staff from the Louisiana Tracking Program used their data management and mapping capabilities to create emergency maps following 2 disaster events in early spring 2016. The maps showed locations of evacuated nursing homes, shelters, impassable roads, and evacuation zones. Regional health agency staff used the maps to inform emergency response efforts.

In another example, the Oregon Tracking Program provided data, data analysis, and maps for a health impact assessment conducted by the Oregon Health Authority and partners to evaluate the potential health and safety effects of adding a stoplight and signaled crosswalk in a rural town. Tracking data showed existing health conditions of the community, including maps of body mass index data, adding to the understanding of the connections between chronic disease prevention and the built environment.

A third example describes how the Missouri Tracking Program identified a gap in information related to occupational health in the state. Before the tracking program began its work, the Missouri Department of Health had access to very little information connecting work-related hazards to health outcomes. Tracking program staff partnered with new and existing partners to collect data, which they then analyzed and displayed on their state tracking network. The state data on occupational health are now compared with national data, providing a clearer picture of worker health in Missouri.¹¹

As the 3 examples show, the National Tracking Program works to improve public health, not only by helping communities directly but also by aiding the public health agencies serving those communities. Supporting health departments is the basis for successful PHAs from CDC. Throughout the Tracking Program's duration, CDC, with help from many partners, has continued working to strengthen environmental public health capacity within state and local health departments, including those that do not receive CDC funding to participate in the program. One of the mechanisms CDC uses to further expand capacity is through a longstanding partnership with the Association of State and Territorial Health Officials (ASTHO).

CDC funds the ASTHO Peer-to-Peer Tracking Fellowship, which provides mentorship opportunities to public health agencies not funded through CDC's Tracking Program. The fellowship aims to help improve a health department's ability to utilize environmental and health effects data and enhance its environmental health surveillance capacity.

Since 2009, CDC has funded 41 ASTHO fellowship projects in 27 unique state, county, city, and territorial health departments (Figure 2). This mechanism has shown significant success in increasing health departments' knowledge, skills, and infrastructure related to environmental public health tracking. For instance, after completing fellowship experiences, 3 state health departments—Louisiana, Michigan, and Kentucky— successfully competed to receive CDC funding to join the Tracking Program.

Kentucky's experience in particular demonstrates the intent of the fellowship program and its potential to effect positive change on a health department's capacity to conduct environmental public health tracking.

Kentucky first participated in the ASTHO Tracking Fellowship in 2010. Its project focused on 2 main activities: linking chronic respiratory illness and air quality and forming a statewide environmental public health tracking workgroup. After the fellowship project period ended, Kentucky continued to build environmental public health tracking capacity within the state. In May 2013, Kentucky became the first nonfunded state to submit data to CDC's National Tracking Network.

In 2014, Kentucky added a second ASTHO fellowship. Its project involved submitting additional data on hospitalizations and emergency department visits to CDC's National Tracking Network. Kentucky successfully fulfilled the data submission requirements in part because of the relationships established with data stewards and other partners during the 2010 fellowship.¹² Later in 2014, Kentucky competed for and was awarded funding by CDC to join the National Environmental Public Health Tracking Program.

Kentucky became involved with the fellowship program again in 2017, this time as a CDCfunded mentor to another state health department participating in the fellowship. In the span of several years, Kentucky progressed from fellowship participant to fellowship mentor, demonstrating the efficacy of the program in bolstering environmental health tracking capacity.

Future Directions

While the Tracking Program has had impacts across most of the country, the program's reach falls short of 100%. The Pew report outlined a vision for a nationwide network and that idea remains a goal for the Tracking Program.

Looking ahead to 2020, the Tracking Program will focus activities on improving operational efficiencies and exploring innovative approaches in planning, implementing, and evaluating environmental public health surveillance. For example, CDC is developing a science-to-action agenda to prioritize environmental health and surveillance issues for the Tracking Program to address. The program also will be looking at ways to evaluate current information technology processes to determine how to increase performance and timeliness

References

- 1. Pew Environmental Health Commission. America's Environmental Health Gap: Why the County Needs a Nationwide Health Tracking Network: Technical Report. Baltimore, MD: Johns Hopkins University School of Public Health; 2000.
- 2. McGeehin MA, Qualters JR, Niskar AS. National Environmental Public Health Tracking Program: bridging the information gap. Environ Health Perspect. 2004; 14:1409–1413.
- 3. Thacker SB, Stroup DF, Parrish RG, Anderson HA. Surveillance in environmental public health: issues, systems, and sources. Am J Public Health. 1996; 86(5):633–638. [PubMed: 8629712]
- 4. Institute of Medicine. The Future of Public Health. Washington, DC: National Academies Press; 1988.
- 5. Fairchild A, Bayer R, Colgrove J. Privacy and public health surveillance: the enduring tension. Am Med Assoc J Ethics. 2007; 9(12):838–841.
- 6. Litt J, Tran K, Malecki KC, Neff R, Resnick B, Burke T. Identifying priority health conditions, environmental data, and infrastructure needs: a synopsis of the Pew Environmental Health Tracking project. Environ Health Perspect. 2004; 112(14):1414–1418. [PubMed: 15471735]
- Charleston AE, Wall P, Kassinger C, Edwards PO. Implementing the environmental public health tracking network: accomplishments, challenges, and directions. J Public Health Manag Pract. 2008; 14(6):507–514. [PubMed: 18849770]
- 8. Wall P, Kassinger C. Multiple measures on the National Environmental Public Health Tracking Network. J Public Health Manag Pract. 2015; 21(2):S36–S43.
- 9. Burkel V. Environmental health tracking rides the open data wave. J Environ Health. 2015; 78(7): 36–38.
- Qualters J, Strosnider HM, Bell R. Data to action: using environmental public health tracking to inform decision making. J Public Health Manag Pract. 2015; 21(2):S12–S22. [PubMed: 25621441]
- 11. Missouri Department of Health and Senior Services. [Accessed March 20, 2017] Missouri EPHT fills information gap on worker's health. http://ephtn.dhss.mo.gov/EPHTN_Data_Portal/pdf/ success-stories/Information-Gap-on-Workers-Health.pdf
- Kaelin, C. Environmental Public Health Tracking ASTHO Fellowship Report. Arlington, VA: Association of State and Territorial Health Officials; 2014. http://astho.org/Environmental-Health/ Tracking-Environmental-Health-Hazards/KY-2014-Phase-II-Final-Report [Accessed February 27, 2017]
- Centers for Disease Control and Prevention. [Accessed April 20, 2017] National Environmental Public Health Tracking Program strategic plan, fiscal years 2016–2020. https://www.cdc.gov/nceh/ tracking/pdfs/cdc_eph_tracking_program_2016-2020_strategic_plan_508.pdf

- Many individuals have spent the last 15 years taking the Tracking Program from an intellectual concept to an applied practice with concrete public health impacts. In that time, CDC and partners have planned, developed, expanded, and enhanced activities, methods, and tools related to environmental public health tracking. Along the way, CDC and grantees learned valuable lessons creating the national and local tracking programs and networks that are available in CDC's Guide to Building an Environmental Public Health Tracking Network (https://www.cdc.gov/nceh/tracking/pdfs/ How_To_Guide.pdf).
- The Tracking Program has achieved much since the early days, from technological advances to enhancing public health capacity at the state and local levels. As shown by the Kentucky example, CDC, with support from Tracking Program grantees and partners, can help increase health departments' abilities to plan and conduct environmental public health tracking activities and programs within their jurisdictions.
- Building on the successes of the past, the Tracking Program will continue working to direct innovative programs and solutions that protect and improve health of communities across the country. Plans include promoting the advancement of evidence-based environmental public health practice by increasing efficiency of operations and exploring novel strategies, partnerships, and methodologies.

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FIGURE 1. Tracking Network Content Areas and Data

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FIGURE 2.

Map of National Tracking Network Grantees and Fellows, 2017