

▶ DIRECT FROM CDC ENVIRONMENTAL HEALTH SERVICES



Erik W.
Coleman, MPH



Aja-Fatou
Jagne, MPH

Advancing Environmental Health Practice Through Environmental Health Informatics Activities

Editor's Note: NEHA strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, the National Environmental Health Association features this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in every issue of the *Journal*.

In these columns, authors from CDC's Water, Food, and Environmental Health Services Branch, as well as guest authors, will share insights and information about environmental health programs, trends, issues, and resources. The conclusions in these columns are those of the author(s) and do not necessarily represent the official position of CDC.

Aja-Fatou Jagne is an Oak Ridge Institute for Science and Education (ORISE) fellow in CDC's Division of Environmental Health Science and Practice (DEHSP). Jagne provides support to DEHSP by contributing to environmental health informatics resource development and providing technical assistance through research, scientific reasoning, and effective communication. Erik W. Coleman is a health scientist (informatics) in CDC's DEHSP. Coleman assists in building capacity to use data to address environmental hazards and improve services.

Environmental health (EH) programs collect data (e.g., inspection results) that might not be routinely analyzed for trends or used to inform timely public health decision-making. State, tribal, local, and territorial (STLT) health departments and EH programs, however, can lack resources, time, or the experience to collect, analyze, and visualize EH data. Leveraging the use of informatics by standardizing data collection, sharing, and utilization can support innovative approaches to improving EH practice.

The Centers for Disease Control and Prevention (CDC) Water, Food, and Environmental Health Services Branch supports the work of EH informatics through collaborative activities that

- promote timely public data and information sharing to detect and address existing or potential exposures to EH hazards,
- support best practices for the innovative use of existing data and electronic information to design interventions to protect public health, and

- identify environmental and health outcome indicators to assess the need for and impact of EH services.

Designing an Open Data Standard to Improve Health and Safety in Aquatic Facilities

Open data is defined as data that are freely available to everyone to use and republish, without restrictions or mechanisms of control (Auer et al., 2007). Open data in EH provides accessibility to diverse data that, in turn, can improve analysis and evaluation, inform program and policy development, increase capacity for public participation, enable transparency, and improve accountability (Huston, Edge, & Bernier, 2019). Designing a standardized way to report open data will increase consistency in collecting and reporting that will make it more useful.

Illnesses from recreational water are a prominent EH concern. The capacity of EH programs to conduct effective inspections and use the data collected is critical to addressing aquatic facility safety issues. To help build this capacity, CDC partnered with the National Environmental Health Association (NEHA) to improve how STLT health departments and EH programs use aquatic facility inspection data.

To develop the data standard, NEHA started by contracting with Smarter Civic to design and execute an aquatic facility inspection data ecosystem scan. This scan helped to better understand how EH programs manage and publicly share their data. The ecosystem scan identified

- jurisdictions with published aquatic facility inspection data in open data,

- jurisdictions that post aquatic facility inspection information online, and
- trends in how aquatic facility inspection data are presented when available online.

The information gathered from this ecosystem scan assisted in developing NEHA's open data standard for reporting aquatic facility inspection data. Currently, NEHA is supporting several EH programs in health department to implement the open data standard in their jurisdictions. These EH programs play a crucial role in documenting and reporting on the standard development process and best practices because this work might inform future EH data reporting efforts.

Leveraging Informatics to Improve Environmental Health Practice and Innovation

CDC partnered with the Public Health Informatics Institute (PHII) and NEHA to evaluate EH data, processes, and information systems of food service establishment and aquatic facility inspections. This evaluation will lead to recommendations for an informatics solution to improve data use and information technology infrastructure of EH programs. To get there, PHII will conduct a business process analysis and business process redesign, and then determine requirements for a data standard or framework to support STLT health departments and EH programs. These processes are expected to support evidence-based practices and policies and strengthen informatics capabilities of EH programs to use electronic data for informed and timely decision-making.

PHII will work with a diverse and representative sample of STLT health departments and EH programs that vary in governance relationships between the state and local EH programs (e.g., centralized, decentralized, shared, or mixed programs), rural and urban EH programs, and across geographic regions throughout the U.S. Specifically, PHII will

- conduct key informant interviews with STLT health department and EH program professionals;
- develop business process matrices and task flow diagrams of the current state of food service establishment and aquatic facility processes;
- develop functional requirements for future state and local EH restaurant and aquatic facility processes;



Environmental health professionals conduct an aquatic facility inspection. Photo courtesy of the Centers for Disease Control and Prevention, Environmental Health Services.

- conduct an interactive workshop with EH program professionals in STLT health departments to map out and validate key EH processes, identify areas for improvement in informatics capabilities for EH programs, and develop a standardized informatics methodology or framework for EH programs; and
- report findings and recommendations for next steps.

Informatics, a transformational tool in our robust and rapidly evolving technology system, has the potential to improve real-time surveillance systems, communication, and sharing of information among various agencies (Williams, Oke, & Zachary, 2019). EH is no exception to the various public health sectors that have embraced this tool to improve the health of populations across the nation. EH programs and professionals are encouraged to take advantage of the tools and resources produced through CDC's EH informatics activities. Leveraging informatics can help enhance the EH practice to inform policy decisions that impact the air we breathe, water we drink and use, and food we eat. 🍷🍷

Corresponding Author: Erik W. Coleman, Health Scientist (Informatics), National Center for Environmental Health, Centers for Disease Control and Prevention, 4770 Buford Highway NE, MS S106-5, Atlanta, GA 30341-3724. E-mail: ecoleman@cdc.gov.

Quick Links

- Centers for Disease Control and Prevention's Environmental Health Practice Resources: www.cdc.gov/nceh/ehs/activities/eh-practice-resources.html
- Public Health Informatics Institute: <https://www.phii.org>
- National Environmental Health Association's Informatics Resources: www.neha.org/eh-topics/informatics/informatics-resources

References

- Auer, S.R., Bizer, C., Kobilarov, G., Lehmann, J., Cyganiak, R., & Ives, Z. (2007). DBpedia: A nucleus for a web of open data. In K. Aberer, K.-S. Choi, N. Noy, D. Allemang, K.-I. Lee, L. Nixon, . . . P. Cudré-Mauroux (Eds.), *The semantic web: Lecture notes in computer science* (pp. 722–735). Berlin, Germany: Springer-Verlag.
- Huston, P., Edge, V.L., & Bernier, E. (2019). Reaping the benefits of open data in public health. *Canada Communicable Disease Report*, 45(11), 252–256.
- Williams, F., Oke, A., & Zachary, I. (2019). Public health delivery in the information age: The role of informatics and technology. *Perspectives in Public Health*, 139(5), 236–254.