



Published in final edited form as:

J Environ Health. 2025 April 01; 87(8): 36–39. doi:10.70387/001c.133854.

Building Capacity Nationwide for Environmental Health and Protecting Communities from Harmful Chemical Exposures

Zheng Li, PhD, MPH^{1,*}, Alan Yarbrough, MS², Angela Ragin-Wilson, PhD², Christopher Reh, PhD²

¹Office of Capacity Development and Applied Prevention Science, Agency for Toxic Substances and Disease Registry, Atlanta, GA

²Office of Associate Director, Agency for Toxic Substances and Disease Registry, Atlanta, GA

Background

The Agency for Toxic Substances and Disease Registry (ATSDR) was established to serve as a science-based public health agency. ATSDR protects communities from harmful health effects related to exposure to natural and man-made hazardous substances. ATSDR helps to determine, prevent, and mitigate health effects in communities. To accomplish this, ATSDR responds to environmental health emergencies, investigates emerging environmental health threats, conducts research on the health impacts of hazardous waste sites, and builds capabilities of and provides actionable guidance to state and local health partners.

With evolving challenges in environmental health and emerging toxic substances, it is critical to build capabilities, strengthen collaborations, improve environmental health expertise, and strengthen the public health workforce nationwide. ATSDR works with communities, internal and external partners, and professional organizations to build their capacity to address issues related to environmental contamination. ATSDR's activities include

- Translating science into educational materials, tools, and actions that can be used to prevent or reduce exposure to hazardous materials and protect health
- Collaborating with partners to investigate hazardous environmental exposures in communities across the nation
- Providing environmental health and medical education and training to health professionals, healthcare providers, partners, and community members

This article provides an overview of ATSDR's key capacity development activities. The activities are organized into four major categories, each targeting a different group of stakeholders (Figure 1).

*Corresponding Author: Zheng Li, 4770 Buford Highway, MS 106-5S, Atlanta, GA, 30341, ZJLi@cdc.gov.

Disclaimer:

The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Agency for Toxic Substances and Disease Registry.

Training and Tools for Environmental Health Professionals

ATSDR and state partners conduct public health assessments (PHAs) to investigate exposure to environmental contaminants, evaluate potential health effects, and develop public health action plans to prevent and reduce these exposures in communities (ATSDR, 2022; Ulirsch and Li, 2022). To train environmental health professionals on the PHA process, ATSDR developed a comprehensive, accredited, online training curriculum on the PHA process (ATSDR, 2024c). The training covers learning about the site and the community, conducting scientific evaluations, and developing a public health action plan. The online training curriculum provides a series of eight accredited modules based on a realistic environmental health case study. The training includes problem-solving exercises, comprehensive resources, and references to conduct PHAs (Figure 2). In addition, ATSDR modernized the complex scientific evaluation processes and empowered health professionals to conduct health assessments in a consistent and transparent manner, by developing innovative tools. One of the tools is the Shower and Household Water-use Exposure (SHOWER) Model. The model evaluates inhalation and dermal exposure from bathing and showering in contaminated water in residential and communal settings (Burk et al., 2022).

The Environmental Health and Land Reuse (EHLR) program is another broadly recognized program aimed at promoting health, community involvement, partnerships, communication, and education related to land reuse (Berman et al., 2024). Land reuse sites are sites that are slated for redevelopment but might have chemical or radiological contamination. Through a collaboration with the National Environmental Health Association (NEHA), ATSDR developed an EHLR Basic Training in two modalities: virtual/live (maintained by ATSDR) and online/asynchronous (maintained by NEHA). ATSDR provided training to federal, state, local, and tribal partners; to commercial businesses; and to domestic and international academic institutions.

Education and Training to Healthcare Professionals

Healthcare professionals carry out a pivotal role in community health. However, their knowledge of environmental medicine and toxic substance is often limited, which makes it difficult for them to recognize environmental exposures in patients and to provide counseling, care, and treatment related to exposure.

ATSDR develops educational products on environmental medicine to help train healthcare professionals on evaluating and treating individuals with environmental exposures and providing counseling on personal risk reduction strategies. A few recently developed resources include Per- and Polyfluoroalkyl Substances (PFAS): Information for Clinicians (ATSDR, 2024b; Wendel et al., 2024) and Clinician Briefs and Overviews on Ethylene Oxide (ATSDR, 2024a). ATSDR hosts a Medical Toxicology Fellowship program and is working on integrating environmental medicine education into formal healthcare professional training. In addition, ATSDR supports Pediatric Environmental Health Specialty Units (PEHSU), a national network of experts on health issues that arise from environmental exposures from preconception through adolescence.

Building Capacity at the State Level

Launched in 1987, ATSDR's Partnership to Promote Local Efforts to Reduce Environmental Exposure (APPLETREE) cooperative agreement is a flagship program dedicated to building capacity to assess and respond to community exposure to hazardous substances (Henry and Cowins, 2023). The current program (2023-2028) supports 30 state health departments by providing funding, training, guidance, and technical assistance. The APPLETREE program helps ATSDR's public health partners identify exposure pathways associated with environmental contamination, review health outcome data when appropriate, and provide information to affected communities and health professionals about possible health effects and ways to reduce or stop exposure to harmful chemicals.

In the United States, over 8 million children are enrolled in daycare centers and other early childcare centers. However, most states don't have formal processes to assess properties for harmful chemicals. In response, ATSDR created the Choose Safe Places for Early Care and Education program. The program helps towns, cities, and states adopt practices that will make sure early childcare and education centers are located away from chemical hazards (Henry and Cowins, 2023). ATSDR also developed online tools and resources to help everyone involved with establishing new early care and education centers choose safe locations. As part of the APPLETREE program, we provide funding, technical support, and guidance to help states start their own safe siting programs.

Community Engagement Science and Intervention

Community engagement (CE) is critical to the success of public health activities and programs. ATSDR has developed numerous resources, trainings, and programs to strengthen CE science and practices. Effectively engaging communities is key to addressing their environmental health concerns and expanding the reach and impact of our programs and activities. For example, ATSDR created a full suite of resources and tools for Soil Screening, Health, Outreach, and Partnership (soilSHOP) events (ATSDR, 2024d). During soilSHOP events, ATSDR and public health partners test and screen for contaminants in soil samples that community members gathered from their gardens and outdoor areas. We also educate community members about lead soil contamination and share tips for reducing potential exposures. Another example of a CE resource is Community Engagement Playbook (ATSDR, 2021). The Playbook was designed for public health professionals and state, territorial, local, and tribal partners to guide them through the phases of effective community engagement. .

Conclusion

Over the past four decades, ATSDR has successfully collaborated with STLT partners and non-government organizations to address environmental concerns and protect communities from environmental hazards. Capacity building at all levels is critical in accomplishing our mission to protect the communities we serve. Strengthening capacities remains essential for detecting, preventing, and reducing harmful environmental exposures. It also remains essential to protect communities across the nation from hazardous substances.

References:

- [ATSDR] Agency for Toxic Substances and Disease Registry. 2021. Community Engagement Playbook [accessed January 21, 2025]. Available from: <https://www.atsdr.cdc.gov/community-engagement-playbook/php/about/index.html>
- [ATSDR] Agency for Toxic Substances and Disease Registry. 2022. Public Health Assessment Guidance Manual. [accessed January 7, 2025]. Available from: <https://www.atsdr.cdc.gov/pha-guidance/index.html>.
- [ATSDR] Agency for Toxic Substances and Disease Registry. 2024a. Clinician Brief: Ethylene Oxide [accessed January 7, 2025]. Available from: <https://www.atsdr.cdc.gov/environmental-medicine/hcp/clinicianbriefeto/index.html>
- [ATSDR] Agency for Toxic Substances and Disease Registry. 2024b. PFAS Information for Clinicians – 2024 [accessed January 29, 2025]. Available from: <https://www.atsdr.cdc.gov/pfas/hcp/clinical-overview/>
- [ATSDR] Agency for Toxic Substances and Disease Registry. 2024c. Public Health Assessment Training [accessed January 7, 2025]. Available from: <https://www.atsdr.cdc.gov/pha-training/php/training/>
- [ATSDR] Agency for Toxic Substances and Disease Registry. 2024d. ATSDR SoilSHOP Toolkit [accessed January 29, 2025]. Available from: <https://www.atsdr.cdc.gov/soilshop/>
- Berman L, Unkart S, Lewin M, Labbo R, Bare G, Wooden A, Erdal S, Bing L, Casteel S, Amar O, Jones T, Begay L. Development, Evaluation, and Long-Term Outcomes of Environmental Health and Land Reuse Training-Part 1: Developing Environmental Health and Land Reuse Trainings for the Environmental Health Workforce and Their Community Partners. *J Environ Health*. 2024;86(10):16–22. [PubMed: 39381359]
- Burk T, Mellard D, Ulirsch GV, Li Z. Public Health Assessment Site Tool and Affiliated Applications: A Key Resource for Evaluating the Health Impact of Community Exposure to Hazardous Chemicals. *J Environ Health*. 2022; 85(4):40–42 [PubMed: 37207109]
- Henry A, Cowins J. APPLE TREE: Building Local Capacity to Respond to Environmental Exposures. *J Environ Health*. 2023; 85(10):26–28
- Ulirsch GV, Li Z. New Web-Based Public Health Assessment Guidance Manual —A Foundational Tool for Evaluating Exposure and Public Health Impacts in Communities. *J Environ Health*, 2022; 85(2): 38–41 [PubMed: 37201133]
- Wendel A, Hansen L, Bernstein A. PFAS Information for Clinicians From ATSDR. *J Environ Health*. 2024;86(10):32–34.

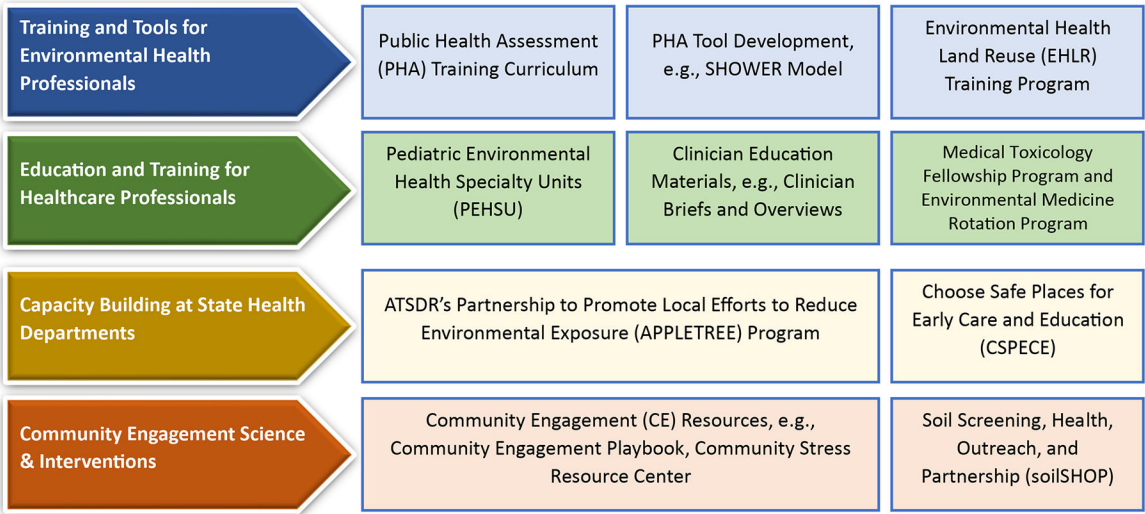


Figure 1:
Overview of ATSDR’s capacity development activities.

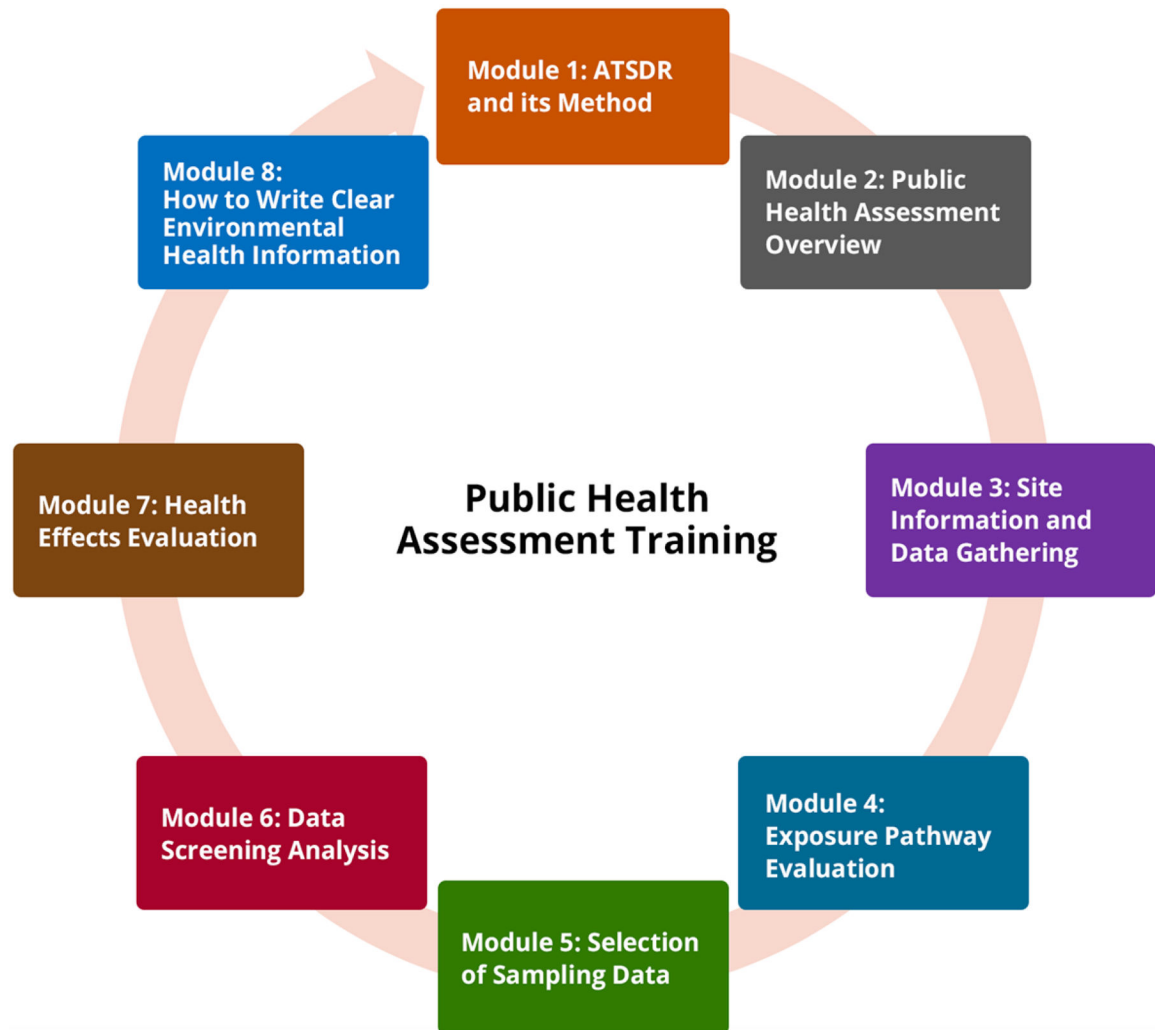


Figure 2:
Online Public Health Assessment Training program and modules.