

▶ DIRECT FROM ATSDR



Gregory V. Ulirsch, MS, PhD



Zheng Li, MPH, PhD

New Web-Based Public Health Assessment Guidance Manual: A Foundational Tool for Evaluating Exposure and Public Health Impacts in Communities

Editor's Note: As part of our continued effort to highlight innovative approaches to improve the health and environment of communities, the *Journal* is pleased to publish regular columns from the Agency for Toxic Substances and Disease Registry (ATSDR) at the Centers for Disease Control and Prevention (CDC). ATSDR serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. The purpose of this column is to inform readers of ATSDR's activities and initiatives to better understand the relationship between exposure to hazardous substances in the environment, its impact on human health, and how to protect public health.

The findings and conclusions in this column are those of the author(s) and do not necessarily represent the official position of CDC, ATSDR, and the National Center for Environmental Health.

Dr. Gregory Ulirsch is an environmental health scientist in the Associate Director for Science Office within the Office of Community Health and Hazard Assessment at ATSDR. Dr. Zheng Li is the associate director for science at the Office of Community Health and Hazard Assessment at ATSDR.

Background

The Agency for Toxic Substances and Disease Registry (ATSDR), in close collaboration with state partners and other stakeholders, conducts public health assessments (PHAs) to investigate exposures to environmental contaminants, evaluate potential health effects, and develop public health actions to prevent and reduce these exposures in communities. There are several ways ATSDR can become involved in initiating the PHA process, including petitions (e.g., from the public or other agencies), sites proposed

or listed on the National Priorities List, and requests by other agencies. During the PHA process, ATSDR and/or state partners review various types of data and information and perform a series of scientific evaluations, which can result in several types of products and different follow-up public health recommendations and actions (Figure 1).

The complex PHA process involves the evaluation of multiple data sets, as available. This information includes environmental-, exposure-, and health-related data (e.g., toxicologic, epidemiologic, medical,

health outcome data) to examine the potential for harmful health effects among communities living at or near hazardous sites. Performing PHAs has become increasingly challenging because of complex sites, multiple exposure routes, multiple chemical exposures, emerging contaminants, and rapidly evolving knowledge of chemicals and their toxicities.

Meanwhile, the workforces at both ATSDR and its state partners are changing. The need for and access to current guidance, tools, communication and engagement strategies, and training is essential. Having updated and clear guidance ensures that these evolving workforces understand the complexity of interdisciplinary fields and the highly specialized scientific guidance associated with the PHA process. Using the agency's available resources, ATSDR and its developing workforce can provide services and create products that meet the highest scientific standards.

The Public Health Assessment Guidance Manual (PHAGM) is the primary resource for training public health professionals at ATSDR and its state partners about the entire PHA process (ATSDR, 2022). The PHAGM also serves as a key resource for the public and other stakeholders to understand the PHA process and related products from ATSDR.

Updating the Public Health Assessment Guidance Manual

In recent years, ATSDR has developed new computational tools and updated the PHA process. So, in 2018, ATSDR began to update the 2005 version of PHAGM. To seek recommendations on changes and updates from

FIGURE 1

Basic Components of the Public Health Assessment Process



those involved in the PHA process, ATSDR conducted a wide-reaching survey and conducted focus groups among federal and state health assessors, managers, reviewers, and other scientific staff. The survey and focus group results led staff to update PHAGM with the following features:

- ATSDR’s current guidance and scientific approaches;
- visual appeal with colorful graphics; and
- an online format that is dynamic, user-friendly, easy to update, and accessible on mobile devices.

Between 2019 and early 2022, the new contents and web-based structure of PHAGM were developed, reviewed, and finalized, section by section. After updating the e-manual based on the survey and focus group findings, ATSDR conducted extensive reviews by subject matter experts to ensure high quality and current science.

On April 14, 2022, ATSDR launched the updated PHAGM to provide the most up-to-date scientific methods and resources that ATSDR staff, partners, and other stakeholders can use to evaluate exposures to environmental contaminants and potentially related health effects (ATSDR, 2022). Also, the updated PHAGM was built into a dynamic web-based format, which offers easy-to-use navigation, a toolbox, a comprehensive resource center, an extensive search feature, a glossary, and enhanced readability.

New Web-Based Public Health Assessment Guidance Manual

The e-manual is organized into six main sections (Table 1). These sections provide the information necessary to guide health assessors step-by-step through the PHA process (Figure 2). The initial two sections (Understanding the PHA Process and

Who’s Involved) provide general information about ATSDR, the PHA process, and various stakeholders involved in PHA process activities.

The next main section is Getting Familiar With the Site, which teaches health assessors about the types of information they will need to collect about the site and community. This section is followed by the Engaging the Community section, which was informed by several guidance documents, including the Community Engagement Playbook (ATSDR, 2021). The Playbook provides specifics on the phases of community engagement activities needed throughout the entire PHA process at a site.

The PHA process is primarily driven by data that are used to understand exposures. The fifth main section—Selecting Sampling Data—guides health assessors on how to evaluate the usability and quality of envi-

TABLE 1

Public Health Assessment Guidance Manual Section Description

Section	Description of Content
Understanding the Public Health Assessment (PHA) Process	Describes the Agency for Toxic Substances and Disease Registry's (ATSDR) mission, goals, mandate, purpose of guidance, general factors to consider, and PHA process steps.
Who's Involved	Explains ATSDR's role in the PHA process and describes the various entities involved in PHA process activities.
Getting Familiar With the Site	Describes the steps for gathering pertinent site information during the PHA process, types of information to collect, and available resources for gathering this information.
Engaging the Community	Introduces the goals and phases of the community engagement process. Describes valuable strategies, actions, tools, and activities.
Selecting Sampling Data	Describes how to evaluate the usability and quality of environmental and biological sampling data (and modeling data in some cases) to examine environmental contamination at a site.
Conducting Scientific Evaluations	Describes ATSDR's scientific process for evaluating exposure pathways, screening contaminants, estimating exposure point concentrations (EPCs), performing exposure calculations (e.g., exposure doses, EPC-adjusted air concentrations, hazard quotients, cancer risks), and conducting the in-depth toxicological effects analysis.
Putting It All Together (under development)	Describes how to formulate conclusions and recommendations from the evaluations conducted during the PHA process. Also provides information about how to structure written documents to ensure they use clear and effective communication.
Health Equity Module (under development)	Describes how to integrate and evaluate social vulnerability and environmental justice factors into the PHA process. At present, ATSDR is formulating strategies, approaches, and content ideas.

ronmental sampling data, and in some cases, biological or modeled data. The sixth section, Conducting Scientific Evaluations, is the largest section in PHAGM. It includes four subsections, each with multiple scenarios and examples that focus on ATSDR's rigorous approach for determining if harmful exposures were possible from a site or released in the past, present, or future. This approach involves the following steps:

- evaluating exposure pathways;
- determining contaminants that are of concern by comparing all of those found at a site against health-protective, media-specific screening levels;
- estimating exposure point concentrations (EPCs);
- calculating exposure doses, EPC-adjusted air concentrations, hazard quotients, and cancer risks; and
- determining if harmful noncancer or cancer effects are possible by performing an in-depth toxicological effects analysis.

In addition, two new sections are currently under development (Table 1). The Putting It All Together section will guide health assessors in formulating their conclusions, recommendations, and public health actions, and using clear and effective communication strategies to convey this information to the public. Finally, ATSDR is developing a future Health Equity Module. The goals are to determine the best strategies and approaches for engaging socially and environmentally burdened communities around our sites and to provide guidance for health assessors on how to integrate and evaluate these factors into the PHA process.

To supplement the materials in the main sections, the PHAGM website includes several key tools:

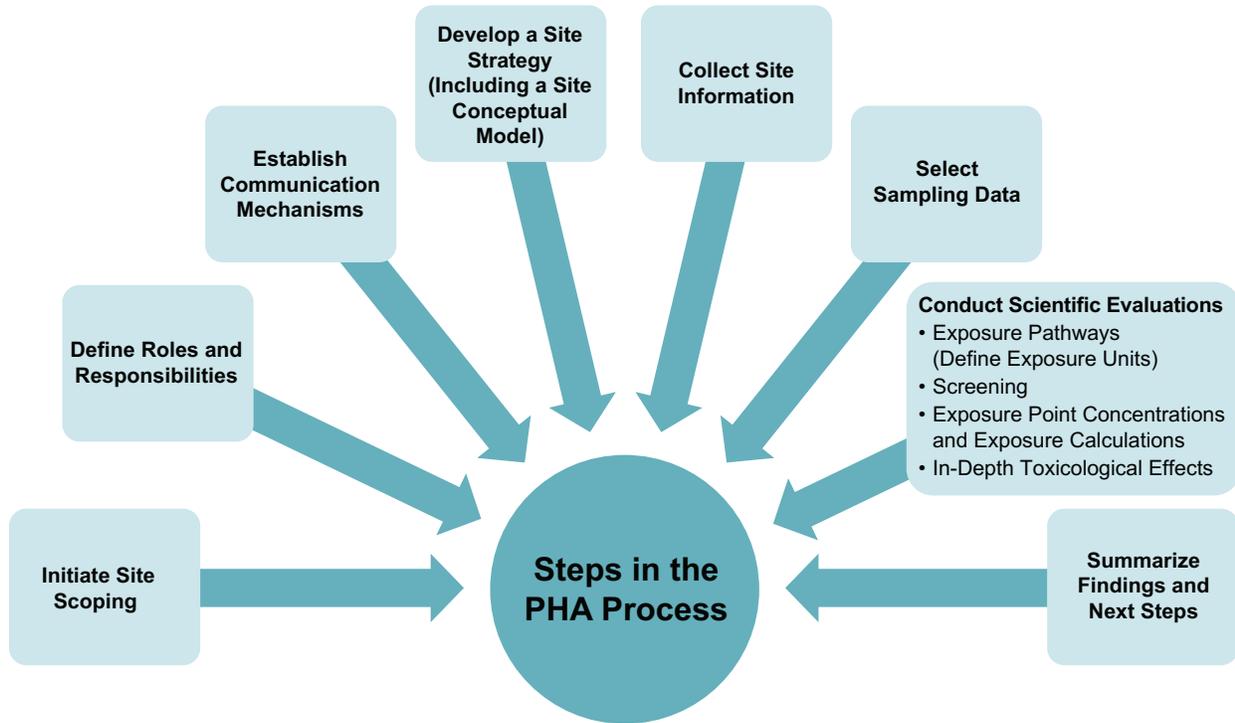
- A resources webpage stores various types of information that one might need when performing the different phases of the PHA process, such as ATSDR guidance documents and available data sources.

- A toolbox contains items, such as checklists and templates, that are linked with the individual PHAGM sections.
- A glossary provides definitions for terms used in PHAGM and words used by ATSDR in communications with the public.
- A search function allows users to easily find materials on a topic presented in any part of PHAGM.

The new web-based PHAGM reflects the most current scientific methods, tools, and up-to-date resources. It will provide public health professionals at ATSDR, its state partners, and even colleagues around the world a method for evaluating complex environmental exposures and potential health effects in communities near contaminated sites. The new PHAGM will lead to broad and long-lasting positive public health impacts by providing timely and accurate assessment of environmental hazards and protecting communities from harmful exposure. 🌱

FIGURE 2

Steps in the Public Health Assessment (PHA) Process



Acknowledgements: The authors thank Liz Bertelsen of Eastern Research Group, Inc. for her tireless work in assisting ATSDR in updating the 2005 PHAGM and transforming it into the new “living” e-manual. In addition, the authors thank all of the reviewers at ATSDR, especially Dr. David Mellard and Jamie Rayman. All of these reviews made the content of this e-manual better.

Corresponding Author: Zheng Li, Associate Director for Science, Office of Community Health and Hazard Assessment, Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention, 4770 Buford Highway NE, Atlanta, GA 30341. Email: ZJLi@cdc.gov.

References

Agency for Toxic Substances and Disease Registry. (2021). *Community Engagement Playbook*. <https://www.atsdr.cdc.gov/ceplaybook/index.html>

Agency for Toxic Substances and Disease Registry. (2022). *Public Health Assessment Guidance Manual (PHAGM)*. <https://www.atsdr.cdc.gov/pha-guidance/>

Did You Know?

Explore how land reuse can transform your community’s health with the Environmental Health and Land Reuse Certificate Program. In this free, online course from NEHA and the Agency for Toxic Substances and Disease Registry, you can learn to redevelop land reuse sites like brownfields. With self-paced and group learning options, you can learn—and earn continuing education contact hours—on your own schedule. Find more information about the program at www.neha.org/ehlr.