Chapter 1:
Introduction

Chapter Contents

Partnerships for Environmental Public Health Evaluation Metrics Manual

Purpose of the Manual

The Partnerships for Environmental Public Health (PEPH) Evaluation Metrics Manual (Manual) provides examples of tangible metrics that PEPH grantees and program staff can use for program planning, implementation, and evaluation. The Manual is designed to show grantees how to use a systematic, strategic analysis of program activities, outputs, and impacts to identify meaningful metrics that can be used to document program achievements. The Manual also serves to establish a common language around evaluation activities. In creating this Manual, we hope to make evaluation more accessible to PEPH grantees and others working to address environmental public health issues.

The strategies and metrics described in the Manual are that grantees might use to evaluate their programs, but they should not be considered a prescriptive set of actions, rules, or measures that must be followed. The Manual is intended to generate discussion and build capacity among grantees to document and demonstrate their achievements in environmental public health.

This brief introductory chapter:

- Describes the target audience and why we created the Manual.
- Provides an overview of the PEPH program.
- Defines program evaluation and metrics.
- Explains how to use this Manual.

Legend


Lightbulb: Ideas for using this information


Warning: Proceed with caution


Link: Links to an external website


Text Link: References to other information in this manual


Checkbox: Key points

Intended Users

The primary intended audiences for this Manual are PEPH grantees and program staff. However, we hope that other groups and organizations will also find it useful, particularly those interested in measuring environmental public health activities.

Why Was This Manual Created?

In July 2008, NIEHS met with grantees so they could provide input on the development of the PEPH program. During this workshop, grantees reported challenges in evaluating and documenting achievements related to building community partnerships and to other translation and outreach components of their programs. Because researchers do not usually report on these types of projects in journal articles, the PEPH Evaluation Metrics Manual provides ideas about how grantees can measure their success, other than through analysis of peer-reviewed literature.

Subsequent chapters provide possible metrics for common program areas addressed by PEPH grantees, including:

- Partnerships
- Leveraging
- Products and Dissemination
- Education and Training
- Capacity Building

A final chapter on Principles of Evaluation provides more details on program evaluation, for those interested in a more in-depth discussion of key evaluation concepts.

PEPH Program Description

Environmental public health is defined as the science of conducting research and translating it into action to address environmental exposures and health risks of concern to the public.

In 2008, the National Institute of Environmental Health Sciences (NIEHS) created PEPH as a network to promote greater interaction among grantees with a common focus on environmental public health. For the purposes of this program, environmental public health is defined as the science of conducting research and translating it into action to address environmental exposures and health risks of concern to the public. NIEHS uses different funding mechanisms to advance projects responsive to community needs and environmental health concerns; however, over the past 15 years, these programs and projects have not always interacted with one another to share their common approaches, methods, and materials. The PEPH program provides a coordinating framework to break down programmatic silos. It also brings together scientists, community members, educators, health care providers, public health officials, and policymakers in the shared goal of enhancing the impact of environmental public health research at local, state, regional, tribal, national, and global levels. By fostering these multi-level partnerships, vital information about the linkages between environmental exposures and disease can be discovered and used to promote health and reduce the risk of disease across the populations at highest risk.

Goals of the program include:[1]

- Strategically coordinating and integrating new and existing initiatives that involve communities and scientists working together on contemporary issues in environmental public health research.
- Actively engaging communities in research, community engagement and education activities.
- Developing evaluation tools for grantees and program staff to measure the effectiveness of partnerships and the impact of research on public health at local, regional, and national levels.
- Creating and providing materials to increase awareness and literacy about environmental health risks.
- Evaluating program contributions to the advancement of environmental public health.

[1] National Institute of Environmental Health Sciences (NIEHS). 2010. About: Partnerships for Environmental Public Health (PEPH). Available: *https://www.niehs.nih.gov/research/supported/programs/peph/about/index.cfm* [accessed 19 January 2021].

PEPH Programs

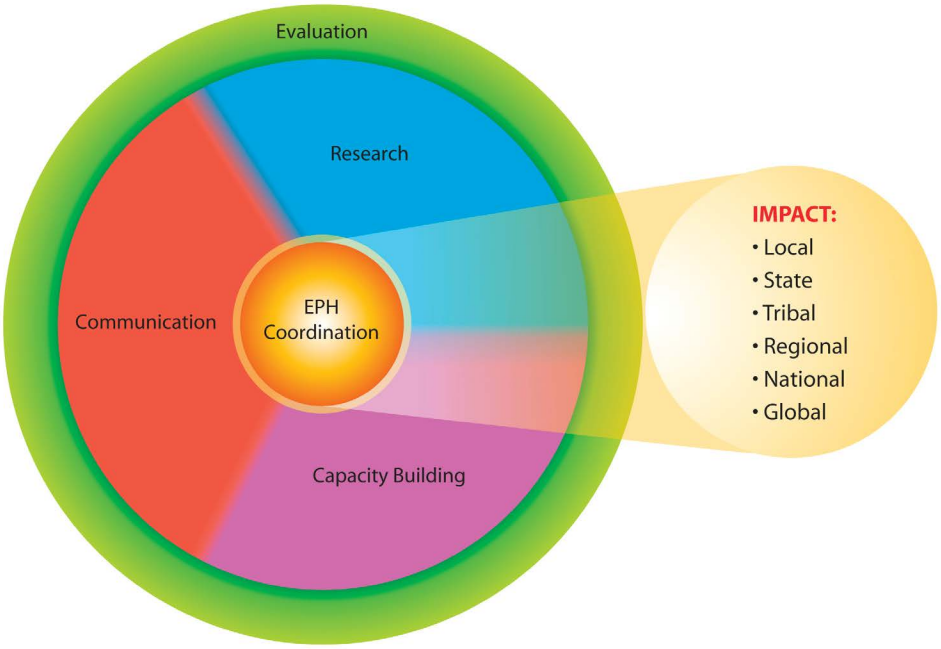
- Breast Cancer and the Environment Research Program
- Centers for Children's Environmental Health and Disease Prevention Research
- Centers for Population Health and Health Disparities
- Environmental Health Sciences Core Centers: Community Outreach and Engagement Program
- Environmental Justice: Partnerships for Communication Program
- Obesity and the Built Environment
- Research to Action
- Superfund Research Program
- Worker Education and Training Program
- American Reinvestment and Recovery Act (ARRA): Science, Technology, Engineering, and Mathematics (STEM) Education
- ARRA: Capacity Building
- ARRA: Building Sustainable Community-Linked Infrastructure to Enable Health Science Research
- Ethical, Legal, and Social Implications of Genomic Research
- NIH Partners in Research Program
- Community Participation Research Targeting the Medically Underserved
- Community Participation in Research
- Understanding and Promoting Health Literacy

Based on feedback provided through the participatory process of developing the PEPH Program,[2] NIEHS program staff developed a model of PEPH (Figure 1.1) that categorizes activities into five primary areas: research, communication, capacity building, evaluation, and coordination.[3] Through its coordinated efforts, PEPH seeks to have a greater impact at the local, state, regional, tribal, national, and global levels. These primary areas are seen as blending into one another – that is, they are not mutually exclusive. Ideally, projects that are a part of the PEPH program will address two or more of these areas.

[2] NIEHS. 2007. PEPH Request for Information. Available: *https://www.niehs.nih.gov/research/supported/programs/peph/about/rfi.cfm* [accessed 19 January 2021]; NIEHS. 2008. PEPH Workshop. Available: *https://www.niehs.nih.gov/research/supported/translational/peph/about* [accessed 19 January 2021]

[3] For more detail on these five primary areas of PEPH, visit NIEHS. 2010. About: Partnerships for Environmental Public Health. Available: *https://www.niehs.nih.gov/research/supported/programs/peph/about/ index.cfm* [accessed 19 January 2021].

Figure 1.1 PEPH Program Model



Evaluation Concepts

Below we highlight a few key evaluation concepts that will help you think about how you can take the examples provided in this Manual and adapt them to meet the needs and context of your project.

For a more detailed discussion of evaluation concepts, check out **Chapter 7: Principles of Evaluation**.

Defining Program Evaluation

Many of us use evaluation in our daily lives, reviewing our children's grades or deciding which appliance or car to purchase, for example. Evaluation at its most basic level is the use of information to make decisions.[4] Program evaluation is therefore simply the use of information to make decisions about a program – such as whether to continue it, adjust it, or expand it to different communities. Typically, program evaluations are used to answer questions about whether a program is working as intended, and to explain why or why not.[5]

Remember to involve your partners in designing your program evaluation. Partners can include community members, decision-makers, policymakers, clinical professionals, and academic researchers.

[4] Patton MQ. 1982. Practical Evaluation. Beverly Hills, CA: Sage Publications, Inc. 15.

[5] Grembowski D. 2001. The Practice of Health Program Evaluation. Thousand Oaks, CA: Sage Publications, Inc.

Benefits of Evaluation

Many PEPH grantees see their job as building relationships and implementing programs that address environmental public health issues. Conducting evaluations might be seen as taking valuable time and resources that could be used to deliver more services. So why evaluate? Because evaluations can help you:[6]

- Identify highlights and program successes.
- Determine if a project worked and why (or why not).
- Identify areas for program improvement and increased efficiency.
- Describe expenditures and justify a need for additional funding.
- Recognize and respond to public needs and wants.
- Identify new audiences and applications for projects.
- Prioritize research and plan for the future.
- Find allies in other agencies, services, or sectors.

Connecting Program Activities and Goals

In order to evaluate a program, it is helpful to understand the expected goals and the activities that will move us toward those goals. Developing program logic models is one way to illustrate systematically how the parts of a program interact to achieve program goals or impacts.[7, 8, 9, 10] While there is no standard format for a logic model, there are some common components that tend to be included. The sample logic model (Figure 1.2) includes many of the components that programs could consider in developing their own logic models.

Inputs are resources that support a program, such as staff time, materials, money, equipment, facilities, and volunteer time. Note that we do not include resources in the logic models provided in the Manual because the resources available to a project tend to be standard across projects. However, each program should assess and identify the specific resources available to its individual projects.

Activities are actions that use available inputs to create and maintain partnerships.

Outputs are the direct products of partnership activities.

[6] Drew CD, van Duivenboden J, Bonnefoy X. 2000. Environmental health services in Europe 5: Guidelines for evaluation of environmental health services. European Series, No. 90. Copenhagen, DM: World Health Organization Regional Publications. Available: *https://www.euro.who.int/__data/assets/pdf_file/0003/98292/E71502.pdf* [accessed 19 January 2021].

[7] W.K. Kellogg Foundation. 2004. Logic Model Development Guide.

[8] Engel-Cox JA, Van Houten B, Phelps J, Rose SW. 2008. Conceptual model of comprehensive research metrics for improved human health and environment. *Environ Health Perspect* 116(5). Available: *https://www.ehponline.org/ambra-doi-resolver/10.1289/ehp.10925* [accessed 19 January 2021].

[9] Liebow E, Phelps J, Van Houten B, Rose S, Orians C, Cohen J, et al. 2009. Toward the assessment of scientific and public health impacts of the National Institute of Environmental Health Sciences Extramural Asthma Research Program using available data. *Environ Health Perspect* 117(7).

[10] Orians CE, Abed J, Drew CH, Rose SW, Cohen JH, Phelps J. 2009. Scientific and public health impacts of the NIEHS Extramural Asthma Research Program: insights from primary data. Res Evaluat 18(5): 375-385.

Impacts (sometimes called outcomes) are benefits or changes resulting from the activities and outputs. Impacts or outcomes may be intended and/or unintended, positive and negative, and can occur in the short-term, intermediate, and long-term time frames.

Context is how the program functions within the economic, social, and political environment of its community. Each program should consider the context in which it plans, conducts, and evaluates its programs. This context-driven approach will help grantees identify evaluation questions that are appropriate to their programs, experience, and communities. Contextual factors that programs might consider include:

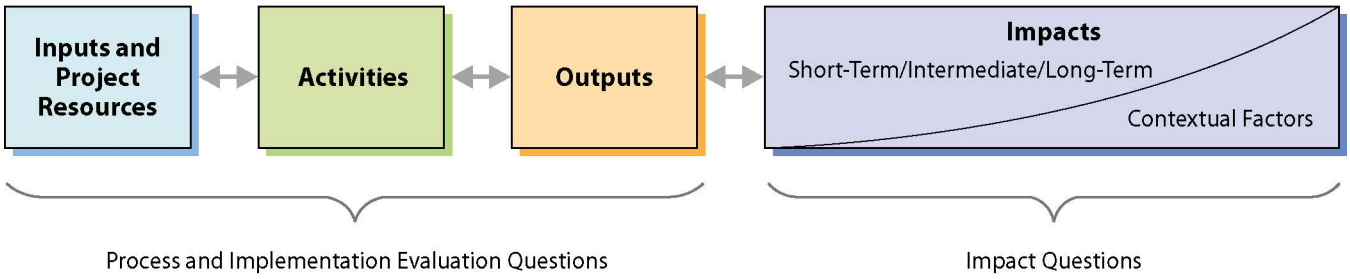
- The target audience and other stakeholders.
- Experience of the grantee organization.
- The political climate.
- The funding environment.

Two-Way Arrows indicate that relationships among the various elements are bidirectional. In theory, relationships can exist between any boxes in the diagram because any action can lead to any output and result in any impact. These arrows also help remind program staff that logic models are iterative and that findings from evaluations should help inform future activities, outputs, and impacts.

Process and Outcome Questions

Process and implementation evaluations tend to ask questions related to the activities and outputs of a program. The questions concern what things were done and how they were done. Outcome or impact evaluations ask questions related to broader changes that occurred as a result of the program. Process and implementation evaluation questions tend to be easier to answer because they are under the control of the program and they can be measured within a short time frame. The role and influence of contextual factors increase as you get further away from inputs (Figure 1.2). Because contextual factors are typically outside the control of the grantee or organization, and because impacts can take longer to achieve than outputs, outcome, and impact evaluation questions may be more challenging to answer.

Figure 1.2 Sample Logic Model



Adapted from TBS, Guide for the Development of Results-based Management and Accountability Frameworks, 2001.

Selecting Metrics

Once the relationship between goals and activities has been clarified, metrics can be identified to help document progress. Metrics are the measures (such as size, capacity, quantity, duration, or frequency) of a characteristic or aspect of the program. Metrics provide a reportable and more systematic means for describing how a program has performed and the extent to which it has achieved its stated goals.

It may be helpful to apply the SMART principle in creating metrics. SMART stands for specific, measurable, attainable, relevant, and timely. Using SMART metrics will ensure that appropriate data are collected and analyzed in order to make decisions about programs. Below is a description of each characteristic.

Metrics are the measures (such as size, capacity, description, quality, quantity, duration, or frequency) of a characteristic or aspect of the program.

Specific – detail the milestones to be achieved, who will achieve them, and how. If the program is addressing exposure to pesticides, a specific measure provides details about what types of pesticides, who the target is, what level of reduction in exposure is expected, and how that level of reduction will be reached.

Measurable – define exactly what level of change is expected. For example, rather than say that relationships among partners will improve, a measurable statement might propose that partners will participate in four discussions per year, during which they will identify two areas of conflict or potential conflict and map out at least one strategy for dealing with the conflict.

Attainable – create a metric that the group or organization can actually achieve. Rather than working toward a goal of eliminating all environmental health risks in a community, an attainable goal might be working with partners and community members to identify one environmental health risk and to make the community aware of steps it can take to reduce risk.

Relevant – ensure that the metric is connected to the goal. If the goal is to improve air quality around schools' bus areas, then a relevant metric might measure partnership activities with schools and school-bus companies, school-bus idling times, or air quality. A metric related to the number of school-bus drivers with CPR training is not relevant because it does not relate to air quality.

Timely – limit metrics to those measures that can reasonably be collected within the time frame of the project. If the project deals with reducing blood lead levels in young children, measures might include data collection at six months, one year, and two years post intervention. Although measures of blood lead levels 10 years from the intervention might be interesting, it is not likely that a project would be able to follow participants that long.

Readers may notice that the example metrics we provide throughout the Manual do not use the SMART principle. This is because they represent general ideas about what programs might want to measure. We encourage you to apply the SMART principles in adapting the metrics for specific programs.

Evaluation Data

Collecting evaluation data from the program outset is important. The earlier a program team decides on its metrics, the earlier it can begin developing processes and protocols to collect the information needed to answer evaluation questions.

Types of Data

Data can be categorized as either qualitative or quantitative. Qualitative data are descriptions of the characteristics of that which is being analyzed. Grantees often collect qualitative data through open-ended questions, feedback surveys, field or program notes, or summary reports. Qualitative data provide valuable and insightful data, but can be difficult to compare, reproduce, and generalize. Quantitative data are numerical or statistical values used to express the quantities of a variable. This type of data is relatively easy to store and manage and can be generalized and reproduced, but it usually fails to provide a complete picture of a program. A mixed-methods approach that combines quantitative and qualitative data provides a robust combination of statistical and descriptive data.

Several factors may dictate whether qualitative or quantitative data, or a mix of the two, should be collected. Available resources, the type of question asked, and access to respondents all influence the type of data collected. Throughout the Manual, we provide examples of both quantitative and qualitative metrics that can be used to document specific activities, outputs, or impacts.

Sources of Data

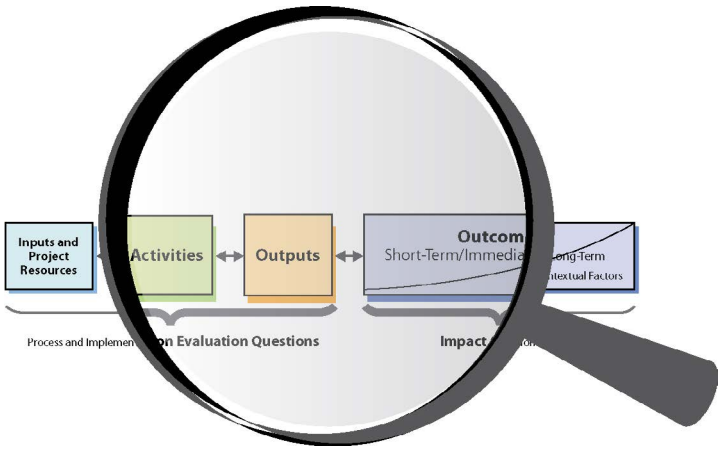
Grantees may find the following sources of data to be helpful in tracking achievements:

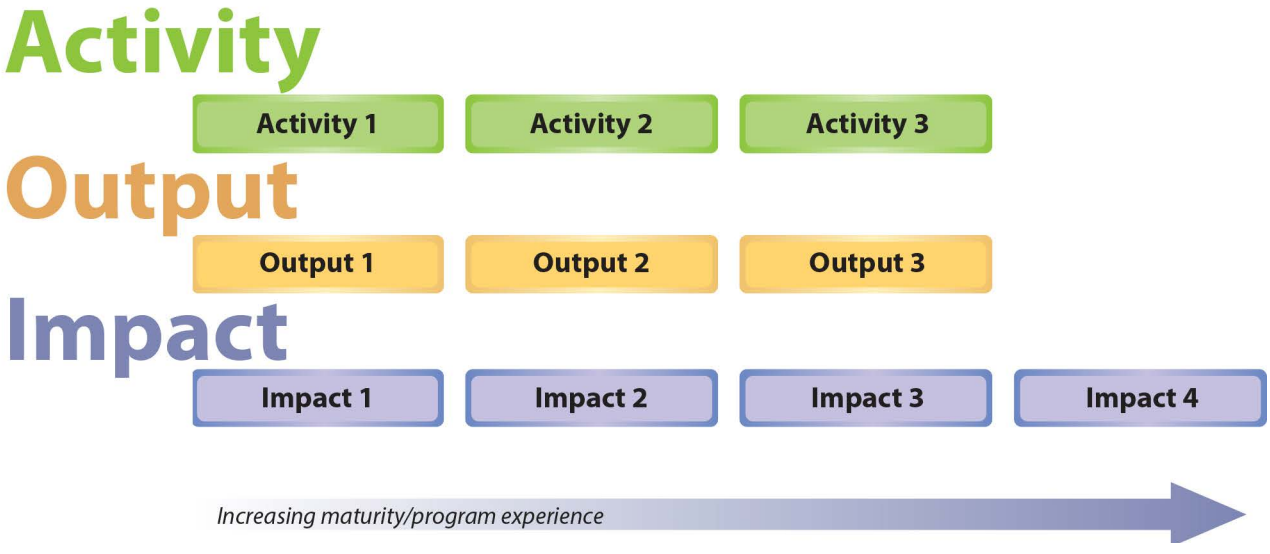
- Activity logs
- Contact logs
- Participant lists
- Feedback forms
- Publication and material development lists
- Meeting agendas
- Telephone logs
- Communication strategies and plans
- Budgets
- Group discussions
- Surveys
- Interviews
- Meeting notes
- Email exchanges
- Internet web logs

Logic Models in the PEPH Evaluation Metrics Manual

To identify potential metrics for PEPH programs, we use a logic model approach to clarify program activities, outputs, and impacts. Because this Manual is not intended to be a primer on logic model development, we encourage readers to explore the logic model resources provided in Chapter 7 and Appendix 4. For the sake of simplicity, this Manual will focus on three logic model components: activities, outputs, and impacts. Although traditional logic models typically show activities, outputs, and impacts as columns and include arrows to show interactions, we present them as rows to emphasize our focus on the specific components of the models, rather than the construction of the models. Figure 1.3 illustrates the basic framework of the logic model used in this Manual.

Figure 1.3 Sample Logic Model





Every component identified in a logic model can be measured. Using this Manual, grantees can get ideas about potential metrics they can use to measure activities, outputs, and impacts common to PEPH programs.

Logic models are presented in this Manual as linear frameworks, but in practice, PEPH programs are far from linear. Programs often cycle through a variety of activities, outputs, and impacts as resources and partners are available, and as windows of opportunity present themselves. Products developed as part of one activity may be used to conduct another activity. And once a program achieves a specific impact, it may change its approach for conducting future activities and outputs.

We developed the logic models in this Manual recognizing that grantees reflect a wide range of experience and capacity. Some PEPH program grantees have been working in this area for more than 20 years, while others are just getting started. In general, the logic models show an increasing level of maturity from left to right and from top to bottom. For example, a new program might be able to implement and measure only a few of the activities or outputs to the left of the model. Another more mature program might be able to conduct a wider range of activities to the right of the model and may be able to show how activities have produced several outputs and have led to measurable impacts.

Our use of logic models and specific metrics in this Manual are not intended to be prescriptive. We do not believe that there is a single logic model that could be applied to all partnerships, education and training programs, leveraging, etc. Our intent is to provide an example of a logic model in each chapter that contains elements that are recognizable to the NIEHS PEPH grantee community. The purpose of this Manual is to provide realistic examples of approaches and metrics that could be used to evaluate the programs as a starting point for discussion, not as a comprehensive prescription. Thus, many reasonable and laudable program elements might not appear in the logic model components. We welcome comments from readers about other metrics that grantees and evaluators use to acknowledge and measure program activities, outputs, and impacts.

Project specific examples provided in this Manual are not meant to be prescriptive, but rather to illustrate activities, outputs, and impacts that might take place. By presenting a range of possibilities, we hope that partners will use logic models to create metrics that are meaningful for their projects.

Organization of the Manual

We gathered information for this manual by reviewing grantee materials and websites together with PEPH program documents and published literature. We also conducted interviews with grantees and consulted program staff and other experts in the field of evaluation and environmental public health. Through these activities we identified five cross-cutting program areas and dedicated one chapter to each area:

- Partnerships (Chapter 2)
- Leveraging (Chapter 3)
- Products and Dissemination (Chapter 4)
- Education and Training (Chapter 5)
- Capacity Building (Chapter 6)

Each chapter also includes examples of Metrics in Action that illustrate real-world PEPH programs. These examples include sample metrics that grantees could use to demonstrate program success. In cases where grantees had evaluation data available, we used specific data. However, where the metrics are hypothetical, we have included an X to indicate where grantees would specify the quantity.

You may notice that some metrics are repeated throughout the Manual. Metrics can be used to demonstrate progress in more than one area. For example, the number of partners participating may be a metric for partnering, leveraging, dissemination, or capacity-building activities. For those who want to know more about evaluation, we provide **Chapter 7: Principles of Evaluation**.

Many PEPH grantees use bibliometric analyses to evaluate their publication activities. Because there are many existing resources that describe methods and strategies for analyzing peer-reviewed literature, we do not discuss these strategies in this Manual. We have provided some bibliometric resources in **Appendix 4**.