Evaluating Tsunami Preparedness Education and Outreach: Public Workshops

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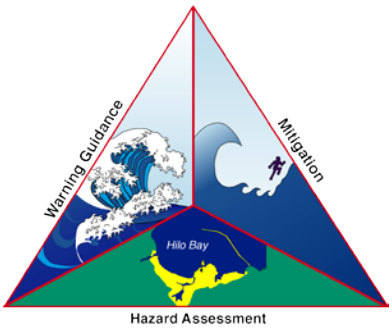

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Introduction

The purpose of this manual is to provide National Tsunami Hazard Mitigation Program (NTHMP) partners with tools that they can use and adapt to evaluate tsunami preparedness public workshops. It was developed at the request of the NTHMP Mitigation and Education Subcommittee to help NTHMP partners demonstrate the effectiveness of their activities in working toward the program vision of "minimal loss of life and property should a tsunami strike any U.S. state or possession, and resilient coastal communities that are prepared for tsunami hazards" (NTHMP 2013). In addition, the manual supports response to a recommendation from the National Research Council of the National Academies that the NTHMP "Develop and implement a program to evaluate the effectiveness of education efforts and use conclusions from evaluations to make education programs even more effective" (NRC 2010). The manual is intended as an aid, not as a prescriptive device.

The emphasis of this manual and the associated instruments is on "outcome evaluation" for in-person tsunami preparedness public workshops,[1] but many of the ideas presented here are also applicable to other types of outreach activities as well as comprehensive programs. The manual includes two prototype instruments: an in-person questionnaire to evaluate learning outcomes at the conclusion of a workshop and a follow-up mail-in questionnaire to evaluate behavior outcomes. Based on evaluation theory and practice, the manual and instruments were designed with the tsunami program manager in mind, recognizing common needs and resource constraints, but are relevant to other hazards as well.

If you are interested in more information about how evaluation can be used to improve your larger outreach program, some useful resources are provided in Appendix A.

Background

NTHMP public workshops are designed to increase preparedness. We know from social science research that information, especially actionable information, is a key factor in motivating preparedness (Wood et al. 2011). What we don't know without evaluation is how the information provided in public workshops is being received and applied. In their article about NOAA's TsunamiReady program, Horan et al. concluded that "coupling these activities [hazard

[1] There is no one evaluation design that can be applied to all activities. In order to provide a generic tool, we had to focus on one activity. We singled out public workshops since they represent a commonly used activity across programs. In addition, research shows that interactive activities, like workshops that allow for adults to learn from technical experts and their peers, are more effective at engaging participants than outreach activities that do not allow for interaction (see Toman, Shindler, and Brunson 2004).

education programs] with sound evaluation efforts has potential to improve disaster and emergency preparedness, response, and recovery" (2010).

Evaluation enables you to identify what works and where improvements are needed and is a critical part of any outreach effort. Evaluation can provide valuable information to help improve future activities, develop new ones, and support decision making regarding resource sharing among your education and outreach activities.

It is particularly important to understand the effectiveness of tsunami preparedness public workshops given the high levels of risk associated with the hazard. Specifically, you may be interested in knowing if there were changes in knowledge and attitudes among your participants and possibly if they changed or adopted new behaviors. You may also be interested in knowing their thoughts on the usefulness and quality of the workshop.

This manual and the associated instruments are based largely on Kirkpatrick's model of training evaluation, first introduced by Donald Kirkpatrick in the 1950s, which guides the collection of information at four levels (Kirkpatrick Partners n.d.):

Level 1: **Reaction** (evaluates the process) – Measures degree to which participants react favorably to the workshop, are engaged with the workshop, and find the workshop personally relevant.

Level 2: **Learning** (evaluates outcomes) – Measures degree to which participants acquire the intended knowledge, attitudes, confidence, and intentions based on their participation in the workshop.

Level 3: **Behavior** (evaluates outcomes) – Measures degree to which participants apply what they learned during the workshop and afterward.

Level 4: **Results** (evaluates impacts) – Measures degree to which targeted outcomes occur (i.e., goals are met) as a result of the workshop.

With each level, the complexity of the evaluation increases, as does the evidence of outcomes. Reactions tell you how your public workshop is received. Typical workshop evaluations are reaction-only evaluations that use Likert scales to rank participants' opinions about various characteristics of a workshop (e.g., the presenter, the materials used, the room, etc.). While it may address questions about content, this type of evaluation doesn't typically get at the *effectiveness* of the content, doesn't tell you if the participants achieved your desired outcomes and actually learned anything or adopted new behaviors. Ultimately, it doesn't allow you to justify how effective your workshop is at protecting lives.

According to Kirkpatrick and Kirkpatrick (2006), "Reaction evaluations have gotten a bad reputation of late. Critics dismiss them as mere 'bingo cards' or 'smiley sheets.' They rightly point out research showing no correlation between level 1 [reaction] evaluations and actual learning. Just because someone liked training, they remind us, is no guarantee that they learned anything."

So, if participants are unhappy with, or not engaged in, the workshop, it could negatively affect the next three levels. If reactions are positive, interest and attitude will likely be high, and chances of learning and behavior adoption increase (Kirkpatrick and Kirkpatrick 2007). Therefore, it is still important to capture reactions, because they may help explain why learning and behavior adoption is or isn't taking place. This information, used with the results from learning and behavior evaluations, can help you refine your public workshops for future participants.

In order to determine if participants have learned anything, changed their attitude, or adopted new behaviors (applied their new knowledge) as a result of your workshop, you will need to conduct learning and behavior evaluations. This manual and the associated instruments emphasize these two levels of "outcome" evaluation to help you assess participants' change in knowledge, attitudes, confidence, intentions, and behavior.

If an objective of your workshop includes the adoption of new behaviors, it is important to conduct evaluations at both learning and behavior levels. While learning is required for behavior adoption to occur, an absence of behavior adoption doesn't mean that there was no learning. If there is no behavior adoption, it may be important to understand why. Is it because learning didn't occur, or are there other barriers that need to be addressed? Measuring behavior is more challenging than measuring learning and is a longer-term activity that should take place weeks or months after the public workshop.

The final level, results, aims to measure impact and is particularly difficult to measure. Evaluations at this level are often costly, require an extended commitment over time, and may not always be practical or even useful. In most cases, your end goal (results) will be related to the survivability of a tsunami. Since tsunamis are so infrequent, evaluating at this level may not even be possible. In addition, it is difficult to link distinct activities to end results as there are often multiple factors involved (Kirkpatrick and Kirkpatrick 2007). Kirkpatrick and Kirkpatrick argue that it may be okay if you can't measure results, suggesting that if you can instill the knowledge and get your participants to adopt the behaviors taught, you will achieve your desired results (2007).

While this manual was designed to help you evaluate existing workshops, we encourage you to use this framework to consider evaluation upfront in the design of future workshops and other outreach activities in order to ease evaluation. This would entail "starting with the end in mind" and working backwards from the results level. Ask yourself:

- What are your desired results?
- What behaviors are needed to achieve desired results?
- What knowledge, attitudes, or confidence are needed to encourage behavior adoption?
- How can you present knowledge in a way that facilitates learning and behavior adoption?

Approach

This manual isn't intended to provide general information about how to conduct an evaluation (see Appendix A if this interests you). It provides background information about evaluation, explains why we chose the approach that we did, and describes the prototypes in Appendices B and C.

Evaluation can be complicated, time consuming, and expensive, but without it, you won't know if your public workshops are effective or not. When it comes to public safety, this is particularly important to know. Based on our understanding of NTHMP partner programs and public workshops, we have designed an approach that should be executable with existing resources (staff and funds) and result in a valid evaluation. Ideally you will be able to demonstrate that participants engaged in your public workshop and found it relevant (reaction), which led to an increase in knowledge and, possibly, a change in attitude, confidence, and intentions (learning), which led to the adoption of new behaviors (behavior).

Goals and Objectives

In order to design an effective evaluation, you will need to have goals and objectives for the workshop. Your goal is likely to be a program goal (e.g., to reduce the risk to individuals in your jurisdiction from tsunamis). Multiple program activities and objectives will contribute to this goal. For an existing workshop, objectives should already be identified.

Since goals are likely program goals and align with Kirkpatrick's results level, which was noted above as being difficult to measure, this manual focuses on objectives. In order to evaluate your success at meeting your public workshop's objectives, they should be measureable, and ideally SMART: **S**pecific, **M**easurable, **A**ction-Oriented, **R**easonable, and **T**ime-Bound (I-TECH 2010).[2] You may need to recast your objectives in order to conduct a meaningful evaluation.

Goal – what the workshop is designed to accomplish overall

Objectives – the outcomes necessary to achieve a goal (not the steps to get there)

SMART Objectives (Adapted from I-TECH 2010)

- **S**pecific: precisely states what the participants will be able to do
- **M**easurable: can be counted during or after the workshop
- **A**ction-Oriented: uses an active, measurable verb (examples of appropriate active verbs: apply, demonstrate, define, describe, explain, identify, list, locate, say, show, use)
- **R**easonable: is appropriate to the time and scope
- **T**ime-Bound: can be achieved by the end of the workshop or within a specified period of time

[2] This is one of a number of definitions for SMART objectives.

Examples of poorly written objectives:

- Participants will have adequate knowledge of tsunami preparedness.
- Improve tsunami preparedness.
- Participants appreciate their tsunami threat.
- Educate participants about tsunami warnings.

These objectives aren't specific enough to measure, aren't time-bound, and don't have strong action verbs that are easy to measure. If your objective isn't specific enough, it will be difficult to measure. And, if it isn't time-bound, it may be difficult to determine if it's reasonable.

SMART objective: After the public workshop (time-bound), participants will say (action-oriented, measurable) that they are more prepared for a tsunami (specific, reasonable).

While most tsunami preparedness public workshops may be similar, they aren't identical, and each workshop likely has its own objectives and desired outcomes. As such, the instruments in Appendices B and C were designed to serve as prototypes. To illustrate how our proposed approach would work, we developed six hypothetical objectives upon which the instruments are based. To see how these objectives can be measured, refer to the section on "Indicators and Targets" on page 11.

Objective 1: After the public workshop, participants will say that they are more prepared for a tsunami.

Objective 2: After the public workshop, participants will be able to demonstrate that they understand the tsunami hazard.

Objective 3: After the public workshop, participants will be able to demonstrate that they understand how to respond to a tsunami warning.

Objective 4: After the public workshop, participants will say that they intend to take steps to increase their preparedness.

Objective 5: After the public workshop, participants will say that the workshop met their needs.

Objective 6: Three months after the public workshop, participants will say that they have taken steps to increase their preparedness.

Evaluation Design

In order to evaluate your public workshops to determine if they are meeting their objectives, we propose a performance measurement design versus an experimental or quasi-experimental research design, which involve comparison groups. The use of comparison groups increases complexity and resource requirements (time, expertise, funds) significantly.[3] For the type of

[3] "To track outcomes, most government and nonprofit programs rely on performance measurement strategies rather than more expensive and complicated quasi-experimental and experimental designs. Essentially,

public workshop we are seeking to evaluate, a research design that uses comparison groups would likely be difficult, impossible, or even inappropriate.[4]

To show that change has occurred, it is necessary to measure these things at two points in time. Without an established baseline, this is typically done with a pre-test post-test design, which involves administering a test at the beginning of the workshop and then again at the end of the workshop. This design can be burdensome, taking valuable time away from the objectives of the workshop, which may be just a few hours long. And, some learners don't like to be "tested" (especially twice), so an attempt to establish a baseline at the beginning of the workshop may make some participants uncomfortable and create an attitude that may hinder the desired outcomes.

The pre-test post-test design may also result in response-shift bias. This means that a participant may understand a term, concept, or question differently before a workshop than after a workshop and applies specifically to the measurement of self-reported changes. For example, a participant may respond to a question about tsunami preparedness in the affirmative before the workshop, but soon learns that they didn't understand what was meant by tsunami preparedness. Their response in the post-test will also be affirmative, but won't demonstrate any learning. Thus, the pre-test post-test approach can underestimate outcomes (see Pratt, McGuigan, and Katzev 2000).

Based on these drawbacks and our understanding of NTHMP partner public workshops, we have chosen an alternative design. The primary instrument presented here uses the retrospective post-then-pre design for the basis of a questionnaire to be administered at the conclusion of a workshop.[5] The use of questionnaires is the most common data collection method for evaluation. They can be completed anonymously, are inexpensive and easy to administer, can be administered to a large number of people, and are easy to analyze (McNamara n.d., Taylor-Powell and Renner 2009).[6]

The post-then-pre design "is a popular and valid questionnaire design" (Taylor-Powell and Renner 2009). It emphasizes measuring participants' perceptions of their knowledge at the end of the program only, asking at the same time about their knowledge both after and before the workshop. Research has proven the validity of the post-then-pre design, even suggesting it a

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performance measurement strategies seek to answer the question: Did the program accomplish what it set out to accomplish?" (Pratt, McGuigan, and Katzev 2000).

[4] There is a moral hazard involved in intentionally not educating a comparison group of at-risk individuals about tsunami preparedness. Alternatively, there may not be much value in using a comparison group that isn't at risk.

[5] There is no one data collection method that is better than others. An effective evaluation requires an evaluation design that is adapted to the activity and its needs. Other data collection methods include interviews, focus groups, observations, and case studies. You may want to consider incorporating some of these other methods into your evaluation. For more information, see Appendix A.

[6] There are also some limitations to questionnaires: They are impersonal and inappropriate for populations with low literacy; participants may be tired and in a hurry to leave at the conclusion of an outreach activity, so you may not get careful feedback; and the wording of questions may bias responses (McNamara n.d., Taylor-Powell and Renner 2009).

better approach to documenting changes in knowledge and attitudes than the traditional pre-test post-test design (see Pratt, McGuigan, and Katzev 2000).

Advantages to post-then-pre questionnaires over the pre-test post-test design include the following:

- They are easier to develop, use, and analyze.
- They are less intrusive and more economical. A single administration saves time and money.
- They reduce the underestimation of outcomes of self-reported measures resulting from response-shift bias by using a single frame of reference for both sets of questions.

Despite these advantages, there are also limitations to consider. This design is based on self-reporting, which is a valuable way to collect many kinds of outcome data (Hatry et al. 1996), but there are certain types of bias inherent in all self-reporting. In addition, it measures participants' *perceptions* of their knowledge. While this is important information, the design doesn't allow for the measurement of actual knowledge change. To try to account for this, our instrument includes a few questions that require application of knowledge. However, it may not be possible to know if this knowledge is newly acquired as a result of the public workshop. For the purposes of life safety, it may be enough to know that participants have the knowledge.[7]

If you need to demonstrate that your public workshop is solely responsible for knowledge gain, you may want to revisit the pre-test post-test design. Other data collection methods, such as interviews or structured feedback sessions, could be combined with the questionnaire to provide additional insight and provide more in-depth information.

Data Collection Instruments

The post-then-pre questionnaire in Appendix B was designed to capture data about participants' learning and reactions. A second instrument, a mail-in questionnaire, is also provided in Appendix C to help evaluate behavior outcomes that cannot be evaluated at the immediate conclusion of a public workshop.

Both instruments feature questions based on the hypothetical objectives previously introduced. Since you may have other objectives, or you may be interested in capturing different or more information, we have also provided information (below) and resources (Appendix A) to help you craft your own questionnaires.

[7] Most people who attend a public workshop are likely doing so because they think they have something to learn. If their self-reporting indicates that they haven't learned anything new, and their answers suggest they have the knowledge, you may want to consider this in your analysis. They may have had the knowledge prior to your workshop.

Instrument 1: Post-then-Pre Questionnaire

The primary purpose of the post-then-pre questionnaire in Appendix B is to determine if any learning has occurred as a result of the public workshop. Referring back to Kirkpatrick's definition, this includes knowledge and intentions (but could also include and attitudes and confidence). However, as previously noted, there is some value in collecting information about reactions to the content and the experience. As such, our prototype was designed around two categories (levels) of questions: learning and reactions, with an emphasis on the former.

You may also want to use your questionnaire to collect demographic information. In the interest of maximizing space to provide examples of tsunami preparedness-related questions, we did not include any demographic questions on the prototypes. You may need to reduce the number of learning and reaction questions if you want to collect demographic information in order to keep the questionnaire from becoming too long.

The post-then-pre questionnaire is to be administered to participants at the end of the public workshop. Include time in your workshop's agenda for completion of the questionnaire. Your participants shouldn't be expected to stay past ending time.

Instrument 2: Mail-In Questionnaire

Unlike measuring changes in reaction and learning, measurements associated with behavior require follow-up with participants at a later date to determine whether or not any of the behaviors recommended in the public workshop have been adopted. You may not need to evaluate at this level (behavior) if all of your objectives are focused on the learning level. The purpose of the mail-in questionnaire in Appendix C is to determine if any new behaviors have been adopted as a result of the public workshop. Note: while this approach also relies on self-reporting, the alternative would involve observation, which is difficult and likely impractical to do for a typical public workshop.

The mail-in questionnaire is to be sent to participants approximately three months[8] after the public workshop (assuming you won't have access to the group a second time). Depending on your participants, you may be able to do this via email or the Web. Alternatively, this could also be done through interviews or phone surveys. On the day of the public workshop, have your participants sign in and ask them to provide the contact information you will need (mailing address, email address, phone number). At the same time, you may want to tell them to expect the follow-up questionnaire. Explain to them the purpose and the importance of their response.

[8] This is subjective. You will have to decide what timing works best for your program and participants (e.g., you may be planning a tsunami walk and want to see if any of your participants took part, you may not want to send out a questionnaire during the holidays).

"With mail and e-mail surveys, the greater number of follow-up contacts, the higher the response rate" (Taylor-Powell and Hermann 2000). Following are a few practical notes to consider when planning to use a mail-in questionnaire:

- Include a personalized, hand-signed cover letter that explains the purpose of the questionnaire. Emphasize the relationship of the questionnaire to the public workshop, the importance of participants' input, the confidentiality of responses, and that you are evaluating the workshop and not the participants.
- Include a postage-paid envelope for return of the completed questionnaire (you may also want to provide an online option).
- Use first-class mail so that undeliverable surveys are returned to you (helps with tracking).
- Include tracking numbers on the questionnaires so you know who has and who hasn't responded (this will save you money, and possibly time, on follow-up).
- After one week, follow-up with a personalized reminder postcard/phone call/email to all participants.
- After two weeks, resend the cover letter, questionnaire, and postage-paid envelope to non-respondents.
- After two more weeks, as a final attempt, send another reminder postcard (or call/email) or resend the cover letter, questionnaire, and postage-paid envelope to non-respondents.

Adapting the Prototypes

Since you will likely be drafting your own questionnaire(s), here are some things to consider:

- Start your questionnaire with questions that are easy to answer (i.e., close-ended).
- Close-ended questions are less burdensome than open-ended questions and are likely to result in greater response and less missing data. In addition, less educated individuals are less likely to complete open-ended questions (Kiernan 2001). However, open-ended questions can provide you more insight into what the participants think and know (less guessing) about the subject and their experience. A mixture of close-ended and open-ended questions is recommended.
- It doesn't matter if your response options start with a positive or negative response. Just be consistent throughout (Taylor-Powell 1998, Kirkpatrick and Kirkpatrick 2007).
- An odd number of responses allows for a neutral response, while an even number of responses is more appropriate when you want the participants to "take sides" (Taylor-Powell 1998).
- In a multiple choice question, when appropriate, offer an option that allows participants to respond that they don't have an answer (e.g., none, do not know, no opinion).
- Place demographic questions at the end of the questionnaire, emphasize that they are voluntary, and only ask them if necessary, especially those that may be sensitive (e.g., age, race, gender, income, access and functional needs).
- The shorter the questionnaire, the better. Kirkpatrick and Kirkpatrick suggest 8-15 items (2007).

Appendix A includes a number of resources that can help you adapt or design your own questionnaires.

Pilot Testing

We recommend that you pilot test your questionnaires before administering them after a workshop. The purpose of a pilot is to improve clarity, where it may be lacking, prior to use. If possible, test the questionnaire with a small group of people representative of your target audience. If this isn't possible, pilot it with coworkers. Have your testers read and complete the questionnaire. Invite them to ask you questions as they arise and provide general feedback about the length and format. Testers' responses, questions, and feedback may highlight areas where clarification or other adjustments are needed to make a more effective instrument.

Data Analysis

Data analysis follows data collection. This goes beyond the scope of this manual, but in this section we briefly provide you with some thoughts on how to analyze data. For more assistance with this, some resources are provided in Appendix A. In addition, you may want to consult a professional evaluator or statistician.

Indicators and Targets

In order to analyze the data to determine whether or not you have met your objectives, you will need to have set indicators. "Indicators are the measurements that answer your evaluation questions" (Taylor-Powell, Steele, and Douglah 1996). Indicators provide evidence of learning or behavior adoption and express what you want to know in order to be able to say whether or not you met your objectives. There are two parts to an indicator, the measurable characteristic or change that contributes to achievement of the objective and the statistics (e.g., percent of respondents) used to summarize the results (Hatry et al. 1996).

Depending on your needs, you may also want to establish targets. However, unless targets have a sound basis, they can lead to inaccurate interpretation and poor decision making, which could negatively impact your program and, ultimately, life safety. In the absence of appropriate targets, aim for general positive change and, if necessary, set numerical targets after you have had some time to work with the questionnaires and the results. The initial results can serve as a basis for appropriate targets (Hatry et al. 1996).

The following table illustrates possible indicators for the hypothetical objectives previously introduced and aligns them with the questions on the questionnaires.

	Question	Outcome Indicator
In Person Questionnaire		
Objective 1: After the public workshop, participants will say that they are more prepared for a tsunami because of the workshop.	1	% of respondents who say they are prepared (very or somewhat) for a tsunami because of the workshop
	2a	% of respondents who say they understand their tsunami threat because of the workshop
	2b	% of respondents say they know how to prepare for a tsunami because of the workshop
	2c	% of respondents say they understand tsunami warnings because of the workshop
	2d	% of respondents say they know how to respond to a tsunami warning because of the workshop
	2e	% of respondents say they know how to use a map to identify tsunami evacuation zones and safe areas because of the workshop
Objective 2: After the public workshop, participants will be able to demonstrate that they understand the tsunami hazard.	4	% of respondents know that a tsunami isn't a single wave (mark true).
	5	% of respondents know that a tsunami can reach the coast within minutes of an earthquake (mark true)
	6	% of respondents correctly describe the difference between a local and distant tsunami
Objective 3: After the public workshop, participants will be able to demonstrate that they understand how to respond to a tsunami warning.	7	% of respondents correctly list the three natural warning signs of a tsunami
	8	% of respondents correctly rank the order of actions to take if they are at the beach and feel a strong or long earthquake
	9	% of respondents know when it is safe to return to the tsunami evacuation zone (mark b)
Objective 4: After the public workshop, participants will say that they intend to take steps to increase their preparedness.	3a	% of respondents who say they plan to develop an emergency plan that includes tsunamis or add tsunamis to an existing plan because of the workshop
	3b	% of respondents who say they plan to put together a portable emergency supply kit because of the workshop
	3c	% of respondents who say they plan to talk with their family, friends, and neighbors about tsunami preparedness because of the workshop
	3d	% of respondents who say they plan to participate in the tsunami drill on [date] because of the workshop

	Question	Outcome Indicator
Objective 5: After the public workshop, participants will say that the workshop met their needs.	10a	% of respondents who say they are satisfied (very satisfied or satisfied) with the usefulness of the information presented
	10b	% of respondents who say they are satisfied (very satisfied or satisfied) with the overall quality of the workshop
	11	% of respondents who say they would recommend the workshop to others
Mail-In Questionnaire		
Objective 6: Three months after the public workshop, participants will say that they have taken steps to increase their preparedness.	3a	% of respondents who say they developed an emergency plan that includes tsunamis or added tsunamis to an existing plan since the workshop
	3b	% of respondents who say they put together a portable emergency supply kit since the workshop
	3c	% of respondents who say they talked with their family, friends, or neighbors about tsunami preparedness since the workshop
	3d	% of respondents who say they participated in the tsunami drill on [date]

*Question 12 on the in-person questionnaire and questions 1, 2, 4, 5, and 6 on the mail-in questionnaire aren't tied specifically to achievement of objectives in this table. However, responses to these questions can provide useful information and insight into some of the other answers provided.

Analyzing the Data

In order to analyze your data, it will help to have an understanding of basic statistics. Most of the questions on this questionnaire can be analyzed using descriptive statistics. Descriptive statistics include frequencies (counts), percentages, measures of central tendency (mean, median, mode), and measures of variability (range, standard deviation). The indicators proposed for our hypothetical objectives rely on simple percentages to help you determine the effectiveness of your public workshop. Depending on the type of data you are collecting, other statistics may be appropriate.

Not all questions can be analyzed using statistics. For open-ended questions, the responses to which are more descriptive and narrative and can't be counted, communicated as a percentage, or otherwise statistically analyzed, you will need to do content analysis. This entails looking across all of the responses to a question to identify patterns (consistencies and differences) and information that may help explain the degree to which you met (or didn't meet) your objectives.

Conclusion

The purpose of this manual is to present a practical, cost-effective, and valid approach to evaluating public workshops. We recognize that evaluations should be designed based on individual project and program needs and resources, but believe that the approach recommended here is appropriate for evaluating NTHMP tsunami preparedness public workshops. It isn't, however, the only valid approach.

Some programs and projects may require a more robust evaluation (e.g., experimental or quasi-experimental). In these cases, if you don't have an evaluation professional on staff, we recommend that you refer to the resources in Appendix A or investigate the availability of evaluation assistance from your state or territory's Sea Grant or Land Grant extension programs. (See also the Extension Disaster Education Network.)

Once you have concluded your evaluation and analyzed the results, you will want to apply your findings. These findings can be used to:

- Improve your public workshop,
- Justify your efforts and generate support,
- Demonstrate need for additional resources,
- Provide lessons learned for other related activities,
- Generate ideas for new activities, and
- Establish credibility.

We hope that this manual and the prototypes will help you do all of the above. Ultimately, we hope they will help you demonstrate that your public workshops are contributing to the reduction of tsunami risk in your community.

Select Bibliography

Hatry, H., T. van Houten, M.C. Plantz, and M. Taylor Greenway. 1996. Measuring Program Outcomes: A Practical Approach. United Way of America.

Horan, J. L.A. Ritchie, S. Meinhold, D.A. Gill, B.F. Houghton, C.E. Gregg, T. Matheson, D. Paton, and D. Johnston. 2010. Evaluating Disaster Education: The National Oceanic and Atmospheric Administration's TsunamiReady Community Program and Risk Awareness Education Efforts in New Hanover County, North Carolina. *New Directions for Evaluation.* 126 (Summer 2010): 79-93.

International Training & Education Center for Health (I-TECH). 2010. Writing Good Learning Objectives. I-TECH. http://www.go2itech.org/resources/technical-implementation-guides

Kiernan, N.E. 2001. Creating Valid Answer Categories. Tipsheet #59. Penn State Cooperative Extension. http://extension.psu.edu/evaluation/tipsheets/design/creating-valid-answer-categories

Kirkpatrick, D.L. and J.D. Kirkpatrick. 2006. Evaluating Training Programs: The Four Levels. 3rd Edition. Berrett-Koehler Publishers.

Kirkpatrick, D.L. and J.D. Kirkpatrick. 2007. Implementing the Four Levels: A Practical Guide for Effective Evaluation of Training Programs. Berrett-Koehler Publishers.

Kirkpatrick Partners. n.d. Kirkpatrick Partners: The New World Kirkpatrick Model. Website. http://www.kirkpatrickpartners.com/OurPhilosophy/TheNewWorldKirkpatrickModel/tabid/303/Default.aspx

McNamara, C. n.d. Basic Guide to Program Evaluation (Including Outcomes Evaluation). Authenticity Consulting. Website. http://managementhelp.org/evaluation/program-evaluation-guide.htm

National Research Council (NRC), Ocean Studies Board. 2010. Tsunami Warning and Preparedness: An Assessment of the U.S. Tsunami Program and the Nation's Preparedness Efforts. National Academies Press. http://dels.nas.edu/Report/Tsunami-Warning-Preparedness-Assessment/12628

National Tsunami Hazard Mitigation Program (NTHMP). 2013. National Tsunami Hazard Mitigation Program 2013–2017 Strategic Plan. NTHMP. http://nws.weather.gov/nthmp/documents/NTHMPStrategicPlan.pdf

Pratt, C.C., W.M. McGuigan, and A.R. Katzev. 2000. Measuring Program Outcomes: Using Retrospective Pretest Methodology. *American Journal of Evaluation*. 21, no. 3 (September 2000): 341-49.

Regan, M.J. and W.H. Desvousges. 1990. Communicating Environmental Risks: A Guide to Practical Evaluations. U.S. Environmental Protection Agency. Available from http://www.epa.gov/nscep/index.html

Taylor-Powell, E. 1998. Questionnaire Design: Asking Questions with a Purpose. University of Wisconsin-Extension. http://learningstore.uwex.edu/Assets/pdfs/G3658-02.pdf

Taylor-Powell, E. and Hermann. 2000. Collecting Evaluation Data: Surveys. University of Wisconsin-Extension. http://learningstore.uwex.edu/Assets/pdfs/G3658-10.pdf

Taylor-Powell, E. and M. Renner. 2009. Collecting Evaluation Data: End-of-Session Questionnaires. University of Wisconsin-Extension. http://learningstore.uwex.edu/Assets/pdfs/G3658-11.pdf

Taylor-Powell, E., S. Steele, and M. Douglah. 1996. Planning a Program Evaluation. University of Wisconsin-Extension. http://learningstore.uwex.edu/Assets/pdfs/G3658-01.pdf

Toman, E., B. Shindler, and M. Brunson. 2004. Fire and Fuel Management Communication Strategies: Citizen Evaluations of Agency Outreach Activities. *Society and Natural Resources*. 19, no. 4 (Apr 2006): 321-36.

Wood, M., D.S. Mileti, M. Kano, M.M. Kelley, R. Regan, and L.B. Bourque. 2012. Communicating Actionable Risk for Terrorism and Other Hazards. *Risk Analysis.* 32, no. 4 (Apr 2012): 601-15.

Appendix A: Key Online Resources

There are a number of good online resources designed to aid evaluation. We found the most useful to be those that came from university extension programs. Some of these resources are noted in this appendix, which isn't intended to be exhaustive.

General

Adolescent and School Health—Program Evaluation, Centers for Disease Control and Prevention
http://www.cdc.gov/healthyyouth/evaluation/index.htm

American Evaluation Association
http://www.eval.org/

Evaluation Guides from the OERC (Outreach Evaluation Resource Center), National Network of Libraries of Medicine
http://nnlm.gov/evaluation/guides.html

Extension Evaluation, North Carolina Cooperative Extension
http://www.cals.ncsu.edu/agexed/exeval/Home_Page.html

Basic Guide to Program Evaluation (Including Outcomes Evaluation), Authenticity Consulting
http://managementhelp.org/evaluation/program-evaluation-guide.htm

Kirkpatrick Partners: The Official Site of the Kirkpatrick Model
http://www.kirkpatrickpartners.com/

Planning for Meaningful Evaluation, NOAA Coastal Services Center
http://www.csc.noaa.gov/digitalcoast/publications/meaningful-evaluation

Program Development and Evaluation, University of Wisconsin-Extension
http://www.uwex.edu/ces/pdande/evaluation/index.html

Program Evaluation, Penn State Cooperative Extension
http://extension.psu.edu/evaluation

Program Evaluation, U.S. Environmental Protection Agency
http://www.epa.gov/evaluate/

Program Performance and Evaluation Office (PPEO)—Program Evaluation, Centers for Disease Control and Prevention
http://www.cdc.gov/eval/index.htm

Data Collection and Instrument Design

Checklist to Evaluate the Quality of Questions, Centers for Disease Control and Prevention
http://www.cdc.gov/healthyyouth/evaluation/data.htm

Data Collection Methods for Program Evaluation: Questionnaires, Centers for Disease Control and Prevention
http://www.cdc.gov/healthyyouth/evaluation/data.htm

Collecting and Analyzing Evaluation Data, National Network of Libraries of Medicine
http://nnlm.gov/evaluation/booklets PDF/booklet Three PDF.pdf

Collecting Evaluation Data: End-of-Session Questionnaires, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-11.pdf

Collecting Evaluation Data: An Overview of Sources and Methods, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-04.pdf

Collecting Evaluation Data: Surveys, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-10.pdf

Evaluating One-Time Short Training, North Carolina Collaborative Extension
http://www.cals.ncsu.edu/agexed/exeval/Evaluating_One-Time_Short_Training.html

Introduction to Survey Design & Delivery, NOAA Coastal Services Center
http://www.csc.noaa.gov/digitalcoast/publications/survey-design

Questionnaire Design: Asking Questions with a Purpose, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-02.pdf

Questionnaire Design Instrumentation Measurement, Penn State Cooperative Extension
http://extension.psu.edu/evaluation/tipsheets/design

Quick Tips: Designing a Retrospective Post-then-Pre Question, University of Wisconsin-Extension
http://www.uwex.edu/ces/pdande/resources/quicktipsubject.html

Quick Tips: Using the Retrospective Post-then-Pre Design, University of Wisconsin-Extension
http://www.uwex.edu/ces/pdande/resources/quicktipsubject.html

Quick Tips: When to Use the Retrospective Post-then-Pre Design, University of Wisconsin-Extension
http://www.uwex.edu/ces/pdande/resources/quicktipsubject.html

Writing Good Learning Objectives, I-TECH
http://www.go2itech.org/resources/technical-implementation-guides

Data Analysis

Analyzing Qualitative Data, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-12.pdf

Analyzing Qualitative Data for Evaluation, Centers for Disease Control and Prevention
http://www.cdc.gov/healthyyouth/evaluation/data.htm

Analyzing Quantitative Data, University of Wisconsin-Extension
http://learningstore.uwex.edu/Assets/pdfs/G3658-06.pdf

Analyzing Quantitative Data for Evaluation, Centers for Disease Control and Prevention
http://www.cdc.gov/healthyyouth/evaluation/data.htm

Collecting and Analyzing Evaluation Data, National Network of Libraries of Medicine
http://nnlm.gov/evaluation/bookletsPDF/bookletThreePDF.pdf

Quick Tips: Analysis of Retrospective Post-then-Pre Data, University of Wisconsin-Extension
http://www.uwex.edu/ces/pdande/resources/quicktipsubject.html

Appendix B: In-Person Questionnaire

Tsunami Preparedness Public Workshop

End of Workshop Questionnaire

Thank you for joining us today. Your participation and your opinion on the workshop are very important to us. [Coastal Community] is always looking for ways to improve our programs to better serve you. Please do us a favor and take a moment to complete this confidential questionnaire. It will help us understand how we are doing and what we can do to improve the workshop.

Questions 1-3 are designed to compare what you think ***now*** about tsunamis and tsunami preparedness with what you thought ***before*** this workshop. Please circle two answers for each statement or question. In the column labeled "After the Workshop," circle the answer that describes what you think now, after attending the workshop. In the column labeled "Before the Workshop," circle the answer that describes what you thought before the workshop.

1. How prepared do you think you are for a tsunami?

After the Workshop				**Before the Workshop**			
Very	Somewhat	A little	Not at all	Very	Somewhat	A little	Not at all

2. What do you know about tsunamis and tsunami preparedness?

	After the Workshop			**Before the Workshop**		
a. I understand my tsunami threat	Yes	No	Not sure	Yes	No	Not sure
b. I know how to prepare for a tsunami	Yes	No	Not sure	Yes	No	Not sure
c. I understand tsunami warnings	Yes	No	Not sure	Yes	No	Not sure
d. I know how to respond to a tsunami warning	Yes	No	Not sure	Yes	No	Not sure
e. I know how to use a map to identify tsunami evacuation zones and safe areas	Yes	No	Not sure	Yes	No	Not sure

3. What do you plan to do to prepare for a tsunami in the next three months?

	After the Workshop				**Before the Workshop**			
a. I plan to develop an emergency plan that includes tsunamis or add tsunamis to an existing plan	Yes	No	Maybe	Already Done	Yes	No	Maybe	Already Done
b. I plan to put together a portable emergency supply kit	Yes	No	Maybe	Already Done	Yes	No	Maybe	Already Done
c. I plan to talk with my family, friends, and neighbors about tsunami preparedness	Yes	No	Maybe		Yes	No	Maybe	
d. I plan to participate in the tsunami drill on [date]	Yes	No	Maybe		Yes	No	Maybe	

4. A tsunami is not a single wave. It is a series of waves. (Please circle your answer.)

True Probably True Not Sure Probably False False

5. A tsunami can reach the coast within minutes of an earthquake. (Please circle your answer.)

True Probably True Not Sure Probably False False

6. Please describe the difference between a local and a distant tsunami.

_____

_____

_____

7. It is important to know the natural warning signs of a tsunami since there may not always be time for an official tsunami warning. Please list the three natural warning signs.

_____

_____

_____

8. If you are at the beach and you feel a strong or long earthquake. What would you do? Please rank the following as first (1), second(2), or third(3).

_____ Go to high ground or inland

_____ Drop, cover, and hold on

_____ Try to find out more information

9. After a tsunami, when is it safe to return to the tsunami evacuation zone? (Please circle your answer.)

a) After the first wave
b) When local officials tell you it is safe
c) When the tsunami warning is cancelled
d) Not sure

10. How satisfied are you with the following? (Please circle your answer.)

a. The usefulness of the information to you	Very Satisfied	Satisfied	Neutral	Somewhat Satisfied	Not Satisfied
b. The overall quality of the workshop	Very Satisfied	Satisfied	Neutral	Somewhat Satisfied	Not Satisfied

11. Would you recommend this workshop to others? (Please circle your answer.)

Yes No Not Sure

If not, why not? _____

_____

12. Please share with us any suggestions you have for improving the workshop.

_____

_____

_____

Appendix C: Mail-In Questionnaire

Sample Cover Letter

Post-Workshop Mail-In Questionnaire

Dear [Participant],

Thank you again for participating in our Tsunami Preparedness Public Workshop on [date]. As you now know, the tsunami threat to [Coastal Community] is real. It is because of this threat that we want to ensure that the people of [Coastal Community] have all the information they need about the tsunami threat and are taking steps to prepare themselves and their families.

In order for this to happen, we need to be delivering information that is useful, motivating, and actionable. As we mentioned at the workshop, we take your safety very seriously, and we are always looking for ways to improve our programs to better serve you. With this questionnaire, we are interested in finding out what tsunami preparedness actions you have taken since the workshop and, based on these actions, if you have any additional suggestions for us. We would greatly appreciate it if you would take the time to fill out and return this questionnaire.

As you may have noticed, there is an ID number on the questionnaire, this is for tracking purposes only. Your response is completely confidential.

When you have completed the questionnaire, please return it in the enclosed, postage paid envelope. If you have any questions about this questionnaire, or tsunami preparedness, please contact me at (xxx) xxx-xxxx or xxxx@coastalcommunity.gov.

Thank you in advance for your help.

Sincerely,

[Coastal Community Official]

P.S. Don't forget to visit http://www.coastalcommunitystsunamisite.gov/ for more information about tsunami preparedness.

Tsunami Preparedness Public Workshop

Post-Workshop Mail-In Questionnaire

On [date] you attended a Tsunami Preparedness Public Workshop hosted by [Coastal Community]. We are interested in finding out what tsunami preparedness actions you have taken since the workshop and, based on these actions, if you have any additional suggestions for us. Please do us a favor and take a moment to complete this confidential questionnaire. It will help us understand how we are doing and what we can do to improve the workshop.

1. After the workshop, I was eager to increase my tsunami preparedness? (Please circle one answer.) Strongly Agree Agree No Opinion Disagree Strongly Disagree

2. After the workshop, I felt prepared to increase my tsunami preparedness? (Please circle one answer.) Strongly Agree Agree No Opinion Disagree Strongly Disagree

3. What have you done to prepare for a tsunami since the workshop? (Please circle one answer for each item.)

Since the workshop, I have done the following:

a. Developed an emergency plan that includes tsunamis or added tsunamis to an existing plan	Yes	No	I already had one
b. Put together a portable emergency supply kit	Yes	No	I already had one
c. Talked with my family, friends, or neighbors about tsunami preparedness	Yes	No	
d. Participated in the tsunami drill on [date]	Yes	No	

Got any great photos of you putting together your emergency supply kit, particpating in the tsunami drill, practicing evacuation? Be an example. Share them on social media. We'd love to see them.
#TsunamiPrep

4. Please tell us about the tsunami preparedness actions you have taken since the workshop. Have you done anything not listed above?

_____

_____

_____

5. If you have not taken any preparedness actions since the workshop, why not? Is there more information or assistance that you need from us?

_____

_____

_____

6. Please share with us any new suggestions you have for improving the workshop and encouraging tsunami preparedness.

_____

_____

_____

Sample Reminder Postcard

Post-Workshop Mail-In Questionnaire

Last week, we mailed you a brief questionnaire asking you for more information related to your participation in the Tsunami Preparedness Public Workshop on [date].

If you have already completed and returned your questionnaire, thank you very much. If you have not, please take some time and do so today. Your response is extremely important to us and will help us further our efforts to keep the people of [Coastal Community] safe from tsunamis.

If you did not receive a questionnaire, or need a replacement, please contact me at (xxx) xxx-xxxx or xxxx@coastalcommunity.gov, and I will get another one in the mail to you immediately.

Sincerely,

[Coastal Community Official]