HARVARD
SCHOOL OF PUBLIC HEALTH

LAMPS
Linking Assessment and Measurement to
Performance in PHEP Systems

Public Health Emergency Preparedness Exercise Evaluation Toolkit

September 2013

This page is intentionally left blank.

About the Toolkit

ACKNOWLEDGEMENTS

The concepts presented in this toolkit build upon the guidance of the Homeland Security Evaluation and Exercise Program as well as work previously completed by the Harvard School of Public Health - Center for Public Health Preparedness (HSPH-CPHP)[1]. The toolkit and all related documents have been developed through a contract with the United States Centers for Disease Control and Prevention (CDC). The views and opinions expressed as part of the toolkit do not necessarily represent the views and opinions of the CDC.

PERMISSIONS

Educational use of this document is permitted without permission. Public health professionals may download, copy, and/or transmit any portion of this document for informational and non-commercial purposes only. Each copy of these materials must retain all copyright and other propriety notices contained therein.

CONTACT

All questions, comments, and feedback regarding this toolkit can be directed to:

> Harvard School of Public Health
> Preparedness and Emergency Response Research Center (HSPH-PERRC)
> 677 Huntington Avenue
> Landmark Center, 3rd Floor East
> Boston, MA 02215
> EPREP@HSPH.HARVARD.EDU
> http://lamps.sph.harvard.edu/
> http://www.hsph.harvard.edu/eprep

---

[1] Created in 2000 with CDC funding, the Harvard School of Public Health - Centers for Public Health Preparedness (CPHP) was one of 27 centers located in graduate, accredited schools of public health that trained front-line workers in state and local health departments, preparing them to protect the public in the event of a public health emergency – inclusive of infectious, environmental, occupational, and terrorist threats.

This page is intentionally left blank.

Contents

This page is intentionally left blank.

Introduction

An effective emergency response depends upon public health agencies working collaboratively with other responders to set and achieve incident objectives often under trying circumstances. Emergency preparedness exercises allow public health agencies to efficiently prepare for emergencies by giving responders the opportunity to examine capabilities, validate plans, and challenge assumptions in a controlled setting. Evaluating the performance of public health agencies during exercises gives responders the opportunity to assess their current capabilities and identify areas for improvement. Harvard School of Public Health - Linking Assessment and Measurement to Performance in Public Health Emergency Preparedness Systems (HSPH-LAMPS) created the Public Health Exercise Evaluation Toolkit as a resource that public health agencies can use to improve the evaluation component of their emergency preparedness exercises.

Exercise evaluation planning should start as soon as long-term goals and specific exercise objectives for an exercise series have been defined. Exercise planners should consider how the exercise will be evaluated from the first step of designing the exercise, through conducting the exercise, and finally to producing the After Action Report and Improvement Plan. Exercising is an investment in preparedness. Constructing a valuable evaluation requires the combination of a well-designed exercise, trained evaluators, and effective evaluation tools for those evaluators to use.

The Public Health Exercise Evaluation Toolkit contains information for exercise planners and evaluators to use when preparing to conduct and evaluate any form of emergency preparedpess exercise. The toolkit is organized into eight sections:

Section	Description
Section 1: Evaluation Methodology	How to approach exercise design to maximize accountability and systems improvements
Section 2: Exercise Basics	Core concepts of exercise programs
Section 3: Facilitator Guidelines	Facilitator responsibilities and details discussing common challenges
Section 4: Evaluator Guidelines	Evaluators' responsibilities before, during, and after exercise play
Section 5: Exercise Evaluation Tools	Methods and tools that evaluators use during exercises to collect data
Section 6: Emergency Preparedness Exercise Evaluation Database	New tool that exercise planners can use to develop emergency preparedness exercise evaluation tools
Section 7: After Action Reports	The products of evaluation
Section 8: References	Material referenced or cited throughout the toolkit

This page is intentionally left blank.

Section 1: Evaluation Methodology

STARTING WITH EVALUATION

Emergency preparedness exercises have been used by different agencies in different fields for years to satisfy a wide variety of requirements. Some agencies may complete exercises in order to satisfy funding or accreditation requirements. Others may conduct exercises to educate responders and demonstrate new equipment. In order to get the most out of an emergency preparedness exercise, agencies need to consider the long-term benefit that emergency preparedness exercises can provide.

The question that starts the exercise planning process is, "what are we trying to evaluate?" Once the topic of the exercise has been identified, more specific, but equally important elements of the exercise then have to be prepared. This includes selecting the type of exercise that will be designed, writing the scenario, identifying exercise staff, and preparing exercise materials. An exercise is complete when the evaluation collected during the exercise has been synthesized into an After Action Report and Improvement Plan that agencies can use to track improvements as they continue their preparedness efforts.

Every exercise component should be focused on creating the best possible environment to collect detailed and valid exercise information. This includes the selection of an appropriate exercise type that matches the capabilities that agencies involved in the exercise are prepared to assess and the resources, both financial and time, that they are prepared to invest. Regardless of the exercise type, the scenario needs to be written with consideration for the exercise objectives. The exercise scenario will dictate the play that occurs and is significantly connected to how the exercise will be evaluated. Depending upon the agencies involved in the exercise and the exercise type, the level of facilitation or control that exercise staff will need to exhibit will vary. Exercises that involve a wide

audience or stakeholders who are not familiar with emergency preparedness exercises will need expert facilitators and controllers to delicately influence exercise play to achieve objectives without providing answers or disrupting the exercise environment so evaluators can take an honest look at agencies, systems, and capabilities.

Exercises are often a flurry of activity which last only a few hours. Ensuring that a throughout evaluation of the exercise will occur will help to foster buy-in from stakeholders and will help agencies maximize the return on their investment in the exercise. A well-planned evaluation includes three components: reliable and valid metrics for measurement, tools to track those metrics, and people who are ideally dedicated to only capturing evaluation information.

Section 2: Exercise Basics

EXERCISE PROGRAM MANAGEMENT

A basic understanding of exercise program management and design is necessary in order to best understand the importance and challenges to effective exercise evaluation. This section contains information that will provide public health exercise planners with a solid background in exercise program management.

Exercises are opportunities for agencies to respond to simulated situations in the same way they would respond to real emergencies. Exercises can serve multiple purposes. First, exercises can familiarize responders with information that they need to know to properly respond to real events. Second, exercises are an opportunity to collect

Exercise Program Constraints and Considerations

- Time available to plan and conduct each exercise
- Resources available to plan and conduct each exercise
  - Funding
  - Staff (Planning, Facilitation/Control, Evaluation)
- Other exercise Logistics
  - Convenient timing of exercise date(s)
  - Exercise Location

1. Strategy/ Plan

2. Exercise Design and Development

3. Conduct and Evaluation

4. Improvement Planning

information on response capabilities and systems.[23] Lastly, exercises promote accountability in planning and response as stakeholders interact and examine assumptions in a safe setting. Observing and recording exercise activity is crucial to fostering progress and improvement among exercise participants. Exercise programs should follow the HSEEP cycle (shown on the previous page) which is structured to foster continuous improvement over time. By conducting an exercise to only practice responding a large investment of time, effort, and funding in emergency preparedness is wasted. Using an exercise to demonstrate measurable capabilities to a predetermined standard can have a significant and lasting impact on an agency's emergency response capabilities as each exercise is used to develop, assess, and then improve upon response capabilities over time.

Exercise plan complexity may range from a fire drill to a comprehensive multiyear training and exercise plan. Exercise planners should consider several factors, including time constraints and available funding, in addition to their capabilities assessment when setting exercise program priorities and developing their exercise plan.

1. STRATEGY / PLAN

Effective exercise programs begin with exercise planners determining objectives and outlining strategies to achieve exercise program goals. Exercises should be conducted and evaluated only after a clear exercise program plan has been developed. Agencies may need to spend a significant amount of time and effort conducting assessments of their strengths and weaknesses in order to set overarching exercise program goals before they are ready to move onto the specifics of exercise design and development.

One method for determining exercise program goals is to identify capabilities that agencies want to demonstrate or evaluate during the exercise. Capabilities based exercise design is a

---

[2] Biddinger PD, Savoia E, Massin-Short SB, Preston J, Stoto MA. Public health emergency preparedness exercises: lessons learned. Public Health Rep. 2010 Nov-Dec; 125 Suppl 5:100-6.
[3] Savoia E, Biddinger PD, Fox P, Levin DE, Stone L, Stoto MA. Impact of tabletop exercises on participants' knowledge of and confidence in legal authorities for infectious disease emergencies. Disaster Med Public Health Prep. 2009 Jun; 3(2):104-10.

practical approach to enhancing capabilities that are useful in response to a variety of real-world hazards and threats. Organizations should rely upon multiple sources for information that will help them form a capabilities assessment that will guide the exercise program.

Information Sources for a Capabilities Assessment

- Hazard Vulnerabilities Analysis
- Past Real-World or Exercise Experience
- After-Action Reports and Improvement Plans
- ASPR Healthcare Preparedness Capabilities
- CDC Public Health Emergency Preparedness Capabilities
- FEMA Target Capabilities List
- Regulations (updates/changes in standards/guidance)

A thorough capabilities assessment may require exercise planners to review multiple sources for public health-related capabilities. Exercise planners may identify too many capabilities than are practical to include in a single emergency preparedness exercise and should consider developing a multi-year training and exercise plan that focuses on demonstrating and evaluating a few core capabilities during each exercise. Organizations should also consider conducting exercises to evaluate the effectiveness of new or updated trainings, plans, and/or resources such as equipment or communication systems. Once a capabilities assessment has been created, exercise planners can set priorities to create a training and exercise plan.

2. EXERCISE DESIGN AND DEVELOPMENT

Exercise planners still have many tasks to attend to after an exercise plan has been created and before the exercise is held and evaluated. In addition to planning exercise logistics, planners need to identify measurable exercise-specific objectives and write a scenario that will lead players to reach those objectives. During this step, exercise planners will also prepare their evaluation plan and exercise evaluation instruments to collect data during the exercise.

3. CONDUCT AND EVALUATION

During the exercise, players will respond to injects from the exercise scenario and evaluators will record exercise data. Injects are messages written by exercise planners and set to be

delivered at specific times to cause exercise participants to react. The Master Scenario Events Lists (MSEL) contains the information for every inject that will be used during an exercise as well as the time it should be delivered and to whom the information is intended. Simply stated, injects form the "script" of the exercise. It is important that evaluators review the MSEL before an exercise so they understand the expected actions they should be looking for during exercise play.

Exercise evaluation is the observation and measurement of selected capabilities with the goal of identifying areas for improvement as well as identifying potential ways an organization can enhance those capabilities. The exercise evaluation provides data for the after action report and improvement plan.

4. IMPROVEMENT PLANNING

During this phase, items from the improvement plan are tracked as recommendations from the after action report are addressed. Enhancements to capabilities should be noted by exercise planners so they can be tested and validated in future exercises. Finally, the exercise program strategy and plan created by exercise planners at the start of the cycle should be reviewed and revised, starting the cycle over again.

EXERCISE TYPES

There are multiple types of exercises that can be categorized as either discussion-based or operations-based depending upon their format. Exercise planners should design their exercise program to progress from less complex discussion-based exercises to more complex operations-based exercises.

Discussion-based exercises include seminars, workshops, and tabletop exercises. Operations-based exercises include drills, functional exercises, and full-scale exercises. Public health agencies should consider the capability or capabilities they are trying to assess, the resources they have available, and past exercise experience when determining which exercise type is best for their agency. Below is a brief summary of the various exercise types. The evaluator's role

remains the same regardless of exercise type; however, the methods evaluators will use to collect information will vary depending upon the type of exercise they are observing.

DISCUSSION-BASED EXERCISES

SEMINAR

Seminars are guided discussions led by a facilitator used to teach concepts or ideas to participants. An example of a seminar is a lecture used to explain a newly revised mass vaccination clinic plan to public health staff and volunteers.

WORKSHOP

Workshops are guided discussions led by a facilitator which the goal of developing a final product. An example of a workshop is a meeting with town agencies to outline roles and responsibilities in a comprehensive emergency management plan.

TABLETOP EXERCISE

Tabletop exercises are guided discussions led by a facilitator that walk senior staff or decision-makers through a hypothetical, but plausible, scenario. An example of a tabletop exercise is a meeting where participants are asked to walk through the actions they would take in response to a catastrophic flood.

OPERATIONS-BASED EXERCISES

DRILL

Drills are events that test the ability of a single agency to implement a specific operation or function. An example of a drill is a test of a mass notification system with the objective of determining how long it takes for messages to reach public health staff and volunteers.

FUNCTIONAL EXERCISE

Functional exercises are events designed to evaluate capabilities and multiple functions in response to a simulated incident. During functional exercises, response activities are communicated and verbalized, but not taken. For example, a public health agency would verbalize the steps they would take to implement a dispensing site plan, but they would not actually take those actions.

FULL-SCALE EXERCISE

Full-scale exercises are events designed to evaluate capabilities and multiple functions in response to a simulated incident. During full-scale exercise, real response activities are taken. An example of a full scale exercise is the evacuation of an apartment building in response to a simulated fire and opening of an emergency shelter.

Key Elements of a Successful Exercise Program

Has support from both agency leaders and participants

Exercise program goals and priorities are realistic, specific, and based upon a thorough capabilities assessment

Exercises are planned with respect for organizational constraints

Exercise programs progress from less to more complex exercise types over time

Evaluation is structured to facilatate postive change and is incorporated into the earliest stagest of exercise program development

Has a realistic timetable

This page is intentionally left blank.

Section 3: Facilitator Guidelines

FACILITATOR RESPONSIBILITIES

Facilitators are responsible for ensuring that the exercise objectives are achieved through skillfully guiding and moderating the discussion among participants. To accomplish this, an exercise Facilitator must have both good communication skills and be well informed on the emergency plans and organizational responsibilities of the discipline they represent. It is important to note that each exercise is designed as an educational experience for participants, not as a test.

Facilitator Responsibilities, Part 1

• Review appropriate exercise materials including the objectives, ground rules, and scenario before the exercise date.
• Report to an assigned location at the time designated by the exercise planning team.
• Upon arriving at the exercise location, introduce yourself to the exercise participants and ask all participants to share their name, organization, and job position. It may also be helpful to have participants write their name and agency on a nametag or placard.
• Deliver injects to exercise participants at the appropriate time:
    • Allow participants time to ask questions and clarify key points of the message.
    • Deliver injects verbatim as they are written in the MSEL, but consider that actions taken by players may create the need that the pre-scripted scenario is modified to continue exercise play in a realistic manner.
    • Following each inject, prompt participants to engage in discussion or action if necessary.
    • Notify the Lead Facilitator about any confusion among exercise players regarding the MSEL
• Ensure that your group stays on the same timeframe as the larger group.

Facilitators have important responsibilities and are generally responsible for keeping the exercise on schedule. Facilitators should ensure the pace and tone of the exercise and keep participants excited and engaged. Facilitators should not lead player's discussion or actions to conflict or increase stress or frustration among players.

Facilitator Responsibilities, Part 2

- Recognize unconventional actions and unrealistic plans described by participants, particularly those that are potentially inconsistent with state plans and protocols.
- When appropriate, clarify state plans and expectations of local agencies to keep participants on track. If you are unsure, request the assistance of the Lead Facilitator to answer questions regarding plans and expectations.
- Notify the Lead Facilitator if exercise participants will be unable to reach all the exercise objectives.

Sometimes participants in an exercise may not reach required expected actions or participants may be reluctant or reticent to be the first person to talk or act after they receive an inject. Facilitators may consider using the trigger questions listed below to prompt necessary discussion or action.

Facilitator Trigger Questions/Prompts

- What would you be doing at this point?
- What resources would you need to respond to this situation? Are those resources currently available?
- In order to perform the necessary response activities, what adjustments to normal operations are needed?
- With what other agencies/departments would you be collaborating?
- Do your agency/department plans include provisions for this?

COMMON FACILITATOR CHALLENGES

Facilitators may need to address exercise play that is disruptive or that leads participants away from the objectives of the exercise. Exercises should be a safe forum where all participants can freely discuss or demonstrate the actions they would take in response to a scenario. Examples of participant behavior that exercise participants should be prepared for are listed on the next three pages.

Issue #1: Aggressive Participants

- An aggressive participant who dominates the discussion or does not allow exercise players to act as they would normally will keep the entire exercise from reaching the exercise objectives in a meaningful way

Solution

- Facilitators should recognize the contribution that the disruptive participants is making in a positive light, but afford other participants the opportunity to demonstrate their knowledge, skills, and abilities. It is best to set ground rules before initiating the exercise so that all participants know what to expect. Some participants will be more active during an exercise, but it is important to involve all players to thoroughly evaluate how capable agencies and not individuals are at response.

Issue #2: Reticent or Reluctant Participants

- Participants who are not actively involved or contributing to an exercise are not disruptive, but do detract from the overall quality of the exercise. Participants should expect to participate and contribute to an exercise they are asked to attend. Reticent participants may miss taking expected actions that are crucial for moving the exercise forward.

Solution

- Give extra encouragement to those who are a little reticent. It is important that everyone participates and that no one person or organization dominates the discussion. Use of an internal ICS structure within the group or discipline role may help, but it can also lead to only a few participants "running the show." Active engagement of all may require the Controller asking targeted questions of participants who are less involved in discussion, or gently requesting that the more talkative participants give others a chance to contribute their ideas.

Issue #3: Keeping the Exercise on Track

- Participants who are actively involved in the exercise, but may be overly eager to share irrelevant information can be the most difficult for facilitators to address. Participants may begin discussing a relevant topic or capability, but then go into details that are only relevant for their department or agency.

Solution

- Facilitators have to be comfortable with determining when a capability has been demonstrated and when it is acceptable to move exercise participants forward in the exercise. Participants should be reassured that they have done a good job demonstrating the capability and the facilitator should move the discussion to the next item in order to keep the exercise on track.

Issue #4: Disagreements

- Exercises can be stressful for participants and disagreements may occur where agencies, departments, or individual's priorities come into conflict. Participants may see the exercise as an opportunity to reach out to stakeholders who they need to plan or coordinate with and to improve their plans.

Solution

- Each exercise is an opportunity to evaluate plans and capabilities, not to conduct planning. Facilitators should remind exercise participants that conflict and disagreements are normal and expected. Issues will be recorded by exercise evaluators and included in the after action report and improvement plan that will be written after the exercise. Participants should be told that they have done a good job identifying a challenge for both sides and the facilitator should have both parties agree to table the issue until after the exercise is complete if a resolution is not immediately found.

Issue #5: Multiple Conversations

- Evaluators will find it very difficult to keep track of more than one conversation at a time. Important exercise data might be lost or participants might not hear important prompts that will continue exercise play. Side discussions should normally be discouraged, but it is important that facilitators recognize that side discussions potentially represent important issues.

- Side discussions may start up:
  - when participants do not feel engaged in the discussion or exercise
  - when exercise participants recognize important issues,
  - but are unwilling to share the information with the group
  - but are unable to share the information with the group

Solution

- Facilitators should try to identify why the side discussions are occurring and engage or address participants while addressing the root cause. Facilitators should pause all discussion and explain the order that the exercise follow. Facilitators can check in with all participants or with participants who have been involved in side conversations to encourage their participation in the main discussion. Participants should know that if they feel they have something valuable to add to the discussion that this is an open conversation and they should feel free to contribute. Facilitators should thank and encourage participants who engage in thoughtful discussion so they know that their contributions are appreciated.

How to Support Exercise Evaluation with Effective Exercise Facilitation

Ensure that participants are fully engaged. If participants appear disinterested or distracted, attempt to involve all players in the discussion. If this becomes unusually challenging, notify the Lead Facilitator, and he/she can provide additional messages to help draw participants back into exercise play.

Give extra encouragement to those who are a little reticent. It is important that everyone participates and that no one person or organization dominates the discussion. Use of an internal ICS structure within the group or discipline role may help, but it can also lead to only a few students "running the show." Active engagement of students may require the Facilitator asking targeted questions of participants who are less involved in discussion, or gently requesting that the more talkative participants give others a chance to contribute their ideas.

Avoid the temptation to jump in with the 'right' solutions when participants are struggling. Instead, try to ask questions that guide participants in the right direction and let them arrive at solutions themselves (experiential learning).

Maintain a balance between spending too long on a single issue and moving so fast that there is not an opportunity to achieve consensus. There will be issues in the scenario that prompt intense discussion. While a goal of the exercise is to encourage participants to consider challenging problems and explore different solutions, the Facilitator works to ensure that all of the exercise objectives are met. Nonetheless, the group should not be forced to address every issue and respond to every question at the expense of allowing participants adequate time to engage in meaningful discussion about the most important concepts.

Caution the group on having multiple simultaneous conversations. If a subgroup of participants initiates a separate side conversation, gently ask them to share their thoughts with the larger group (at least periodically).

Model and encourage the behaviors you wish to elicit from participants, such as making eye contact and acknowledging comments in a positive manner.

This page is intentionally left blank.

Section 4: Evaluator Guidelines

EVALUATOR RESPONSIBILITIES

Exercises are an opportunity for organizations to observe and measure capabilities through effective play and evaluation. Conducting any exercise represents a significant investment in emergency preparedness by an agency. A combination of time, effort, and funding goes into planning and conducting even the most basic exercise. Involving trained evaluators in an exercise program is an effective way of ensuring that the most accurate and reliable data is collected at every exercise.

The role of the evaluator during an exercise is to observe and record exercise play relative to the exercise objectives without altering exercise play. Evaluators are responsible for recording the key actions and decisions of the participants during the exercise. To accomplish this, an exercise evaluator must have an understanding of

> **Evaluator Responsibilities - Before the Exercise**
>
> - Review the exercise details and logistics (type date, time, location, assignment)
> - Review the exercise evaluation plan
> - Review the exercise objectives
> - Review the exercise scenario and Master Scenario Events List (MSEL)
> - Review the exercise evaluation guide
> - Review any relevant background information/sources/plans/procedures

general evaluation methodology, and be well-informed on the emergency plans and organizational responsibilities of the participating disciplines. While recording performance, evaluators should also, if possible, identify changes that could be made to enhance capabilities. Significant preparation is required in order for an evaluator to be prepared to effectively and efficiently evaluate an exercise. A large portion of the work that an evaluator does for an exercise may occur before and after the actual exercise.

Evaluating exercise play can be challenging if it is not approached in a structured and systematic way. At moments throughout an exercise the pace of exercise play may be overwhelming for even experienced evaluators. As such, evaluators should show up to their assigned location

well before the exercise is scheduled to begin and check-in with the lead facilitator or controller for the exercise. Next, each evaluator should introduce themselves to the participants or players who they have been assigned to evaluate. It is important for evaluators to try to make participants and players feel at ease before and during an exercise so the participants and players actions remain as realistic as possible. It is important to note that an exercise is intended as an educational experience for participants, not as a test. The goal is to analyze community-wide performance throughout the exercise, not to measure or evaluate the performance of any individual, department, or agency.

One of the greatest challenges for an evaluator is prioritizing what information is important to record when observing exercise play. Evaluators should always rely upon the exercise objectives to determine what is most important to track during an exercise. Evaluators should focus on recording quantitative and qualitative measures that directly pertain to exercise objectives in favor of exercise play that does not pertain to exercise objectives. Sometimes, exercise play and participants may stray from the objectives set forth in an exercise. It is not the responsibility of evaluators to keep participants and players in an exercise on track. Generally, evaluators should refrain from interacting with players and participants to alter exercise play. Facilitators and controllers will interact with exercise participants during the exercise to address issues that may arise concerning exercise play. The only exception to this principle is in the event that an evaluator witnesses an unsafe or hazardous situation during an exercise. In this case, the evaluator should take immediate action to ensure the safety of all exercise participants following procedures are outlined in the Situation Manual or their Evaluator Guide.

Important Information Evaluators Generally Record

- What plans, policies, and procedures did the participants implement to prevent, protect against, respond to, and/or recover from the incident described in the exercise scenario?
- Who made decisions or took actions and what position or agency did they represent?
- At what time or in what sequence did events occur?
- Were roles and responsibilities of agencies, departments, and organizations clearly defined?
- How were various decisions made? Who had authority to make decisions? Were there triggers in the decision making process?
- How successful were exercise participants in achieving desired results?
- How was information shared with other agencies and with the public? What information was shared?
- What mutual aid agreements were recognized? How were they activated?
- What recommendations for improvements were made by the group?
- Which issues were unresolved or require follow-up?
- What actions do participants plan to take in order to address outstanding issues?
- What additional training is needed to improve performance?
- What addition resources are needed to improve performance?
- What changes are needed to plans, procedures, or organization structures?

Another challenge for evaluators is knowing when and where to look for information during an exercise. Ideally, evaluators should already know what key response measures they are looking for during an exercise and be familiar with the tools at their disposal to record their observations. Evaluators should review the Master Scenario Events List (MSEL) before the exercise date to familiarize themselves with the injects that players will be responding to as well as the expected actions exercise planners anticipate player taking.

Evaluators may be asked to work independently or as part of a large team. The number of evaluators at an exercise can range from one evaluator in a small tabletop exercise run by a local department of public health to multiple evaluators positioned at various locations in different states during a national-level exercise. The exercise evaluation plan should be developed to put each evaluator in the best possible location to observe and record the specific actions that will occur in their area. In a tabletop exercise, evaluators should be seated at the table among participants. In a full-scale exercise, evaluators should be positioned close enough

to observe exercise play without interfering with responders or endangering themselves. When multiple evaluators are present at an exercise, the exercise evaluation team should clearly outline roles and expectations for evaluators in the exercise evaluation plan.

Finally, evaluators should review any additional materials and plans that the exercise evaluation team hands out in advance of the exercise. The best exercise evaluators are those who have extensive subject matter expertise regarding the topic they are evaluating, but who do not assume intent or root causes. Evaluators who have experience with the role, position, or type of agency being evaluated are the best to use because they will not need to spend a significant amount of time educating themselves about an agency's function or plan and instead can focus on the specifics of the agency or plans actions. Evaluators should at least have general knowledge about the roles, agencies, or actions they are asked to evaluate.

Evaluator Responsibilities – During/After the Exercise

• Report to assigned location/unit prepared to record exercise activity
• Wear identification/nametag/vest that denotes s/he is an evaluator
• Carry copies of exercise materials including the:
    • MSEL
    • Evaluation instrument
    • Evaluator guide
    • Other relevant documents (maps, rosters, etc.)
• Record exercise activity without interfering with exercise play
    • Identify strengths and areas for improvement
    • Record specific items listed on the exercise evaluation instrument
• Fully complete evaluation forms and support development of the After Action Report/ Improvement Plan

Tips for Successful Exercise Evaluation	Conduct an evaluator briefing in advance of the exercise.
	Recruit evaluators with exercise experience and subject matter expertise whenever possible
	Evaluators should position themselves close enough to participants to observe exercise activity without interferering with exercise play
	Evaluators should review exercise materials including evaluation tools before the exercise
	Evaluators should prioritize observing and recording activity that pertains to exercise objectives and target capabilities
	Evaluators should balance observing exercise activity with taking comprehensive and detailed notes that they can use to thoroughly complete evaluations tools
	Conduct a hotwash immediately after the exercise is over to get participant feedback

The "Hotwash"

Immediately following the completion of any exercise, all participants should convene for a debriefing, sometimes referred to as a "hotwash". The hotwash gives participants an opportunity to voice their observations and emotions in a group setting. The purpose of this debriefing is to immediately share the key observations from each of the groups, namely the particular successes and challenges observed. These observations will form the basis of the participant hotwash. In order to get the most out of the hotwash, it should be moderated by an experienced evaluator or facilitator. The discussion should be constructive, brief and focused on identifying successes and challenges from the exercise.

This page is intentionally left blank.

Section 5: Exercise Evaluation Tools

EXERCISE EVALUATION TOOLS

In order to provide concrete and constructive feedback, evaluators will be provided standard guidelines and forms. Exercise evaluation tools are documents intended to assist with the exercise evaluation process by providing evaluators with consistent standards and guidelines for observation, data collection, analysis, and report writing. Evaluators should make themselves familiar with the exercise evaluation guide they will be using to record their observations and rate exercise play.

Important Exercise Data
• Time: when an action was verbalized or taken
• Order: the sequence of events
• Participation: who was active or inactive
• Communication: key words, phrases, or connections made between participants
• Conflict: when responsibilities or response actions were not clear
• Reasons: the root cause and why actions were taken or not taken
• Actions: that did occur
• Absences: actions that were expected, but did not occur

Evaluators can and should collect exercise data from multiple sources using a variety of methods to ensure they produce the most thorough evaluation possible. The Harvard School of Public Health has developed an exercise evaluation instrument specifically for hospitals and public health agencies that evaluators can use to record exercise data.

The exercise evaluation instrument breaks capabilities down into measurable response elements that evaluators can rate according to both qualitative and quantitative metrics. Items in the exercise evaluation guide are ordered by response phase beginning with mitigation and preparedness measures and ending with recovery measures so an evaluator can progress chronologically through the instrument along with exercise play.

HSPH Exercise Evaluation Tool

Research has shown that many after action reports describe the development and execution of an exercise but provide very little information that would allow the reader to judge whether the jurisdiction performed adequately or not[4]. This has been mainly due to the lack of valid and reliable objective measures of performance[5]. In order to help address this challenge, researchers at the Harvard School of Public Health's CDC-sponsored Preparedness and Emergency Response Center called LAMPS (Linking Assessment and Measurement to Performance in PHEP Systems) have developed and tested an exercise evaluation instrument that allows evaluators to best capture data in a way that can objectively measure preparedness.

The HSPH exercise evaluation uses a combination of checklist of actions, subjective scoring system and subjective comments field to capture data observed during an exercise. This framework provides both quantitative and qualitative data that can be used for performance improvement and accountability purposes. From our experience, the combination of checklist and subjective scores provides an objective assessment that allows us to track improved performance over time from previous exercises and to discriminate between facilities and sub-regions in terms of levels of performance[6]. The subjective comment field provides data that could be used to answer why the system performed as it did. The measures in the evaluation instrument are generated through a broad literature review and expert opinion and are based on the objectives of the exercise.

---

[4] Savoia E, AgboolaF, Biddinger PD. Use of After Action Reports (AARs) to Promote Organizational and Systems Learning in Emergency Preparedness. Int. J. Environ. Res. Public Health 2012, 9, 2949-2963.

[5] Savoia E, Biddinger PD, Burstein J, Stoto MA. Inter-agency communication and operations capabilities during a hospital functional exercise: reliability and validity of a measurement tool. Prehosp Disaster Med. 2010 Jan-Feb; 25(1):52-8.

[6] Ibid.

TESTING THE EXERCISE EVALUATION TOOL:

The HSPH evaluation instruments was tested and revised based on structured observations performed by a group of researchers from Harvard School of Public Health who have implemented the evaluation instrument in over 20 preparedness exercises. In addition, feedback on the practicality of the instruments and on the validity of the results was gathered during structured interviews with external evaluators that had the opportunity to use the instruments during these exercises. Finally, statistical analysis was performed to assess the reliability and validity of the instrument.

In order to assess the utility of the evaluation tool, the research team at HSPH conducted another study to compare the tool to an existing tool. Ten trained and ten untrained evaluators with similar demographic characteristics, background, and level of experience in public health emergency preparedness were recruited and asked to view the same one-hour videotaped tabletop exercise and to use both the HSPH and HSEEP evaluation instruments to assess performance. Study participants felt that the HSPH evaluation format was more likely to capture data that could be used for measuring differences between similar entities (67% vs. 30%; P value: 0.02), and for measuring improvement over time (76% vs. 39%; P value: 0.02). [4]

HOW TO COMPLETE THE EXERCISE EVALUATION TOOL:

Figure 1, 2, and 3 below shows the different sections of the HSPH exercise evaluation tool. Evaluators are encouraged to complete every section of the tool in order to create a complete picture of the entity being looked at.

Section 1: Cover Sheet

• Record Exercise Information
• Record Evaluator Information
    • Rate Experience
    • Rate Familiarity with Basic Exercise Information

A) COVER SHEET: (SEE FIGURE 1)

The user should provide information on his/her experience and training. Evaluators should also subjectively rate the expertise of the participants representing the entity they are evaluating on a scale of 1 to 5. This is not an assessment of their performance during the exercise. In other words, an entity may have a score of 5 on the knowledge of existing plan or the representation of senior management perspective but may not respond well in an area of the exercise. This helps gauge whether the right players are "at the table."

Figure 1

HARVARD SCHOOL OF PUBLIC HEALTH   LAMPS
Linking Assessment and Measurement to
Performance in PHEP Systems

Please complete this evaluation form.
This form is designed to assess the emergency response capabilities required to respond to the situation presented during this exercise.

Observed Agency or Entity Name:
Location:

For the evaluator, please answer the following questions about *your* training or experience:
  1. Length of time you have been involved directly or indirectly in emergency preparedness activities?
  2. Number of public health or emergency preparedness trainings you attended in the past year:
  3. Have you been formally trained in the incident command system (ICS)?

Number of emergency response exercises (tabletops, functional or full-scale) attended in past three years

Using a scale ranging from 1 (little or no expertise) to 5 (excellent expertise), do you feel that the *participants* (either directly observed or called during the exercise) from the agency you evaluated were able to adequately represent their facility's expertise in:

	Score
Representation of senior management perspective and decision making	1 2 3 4 5
Knowledge of entity resources and capabilities	1 2 3 4 5
Specialty expertise within the agency (facility engineers, etc.)	1 2 3 4 5
Knowledge of existing emergency plans and procedures	1 2 3 4 5
Contacts and interpersonal relationships to others outside of the agency	1 2 3 4 5
Information management	1 2 3 4 5
Personnel resource management	1 2 3 4 5

B) SPECIFIC MEASURES (SEE FIGURE 2)

Each measure (called general task) has a number of checklists of actions (specific actions) and also a quantitative score (overall performance) attached to it so that evaluators can objectively document the performance of specific actions as well as subjectively rate the quality of such performance. The checklists of actions are observable actions and there should always be a check for each action. Each action should be checked "Yes" if done and "No" if not done. There is no "not applicable" field because the tool is tailored specifically to the exercise. A subjective score is given to each general task. A scale of 1 to 10 is used to rate how well each measure (general task) was performed. A score of 1= unsatisfactory performance, 5= good performance and 10 = excellent performance. The checklist of actions serves as a guide to help score the general task, but one can check off all the actions as completed and still receive a low score. The score is attests to the quality of the performance. Figure 2 (see below) is an example that helps to clarify this point. Two entities may complete all the actions under "re-assessment of agent/cause of incident" and get two different scores because of difference in the quality of their performance.

Figure 2

General Task	Specific Action	Detailed Observations	Overall Performance
	(check all boxes and fill in spaces as appropriate)		*for response element* 1= Unsatisfactory 5= Good 10=Excellent
Re-assessment of agent/cause of the incident	☐ Yes ☐ No Assessed certainty of agent/cause of incident	-	1 2 3 4 5 6 7 8 9 10
	☐ Yes ☐ No Identified any changes in symptoms occurring in affected population, if applicable	Participants should identify a list of symptoms	
	☐ Yes ☐ No Reassessed type of or potential agents/causes	Participants should discuss a list of potential agents/cau	
	☐ Yes ☐ No Assessed if subject matter experts were needed	-}	

Section 2: Measures

- Record Completion of Specific Actions (Yes/No)
- Record Detailed Observations and Additional Information
- Rate Overall Performance of General Task

C) OPEN-ENDED MEASURES (SEE FIGURE 3):

This section allows evaluators to provide data in a free text format. Evaluators are encouraged to record successes and challenges observed during the exercise. Suggestions for improvement based on what was observed during the exercise and/or expert opinion of what could/should have been done will provide valuable information to the participants. The data will help generate recommendations and identify areas for improvement that can be used in the after action report.

Figure 3

Please fill out the following section:

Please describe 3 successes and 3 challenges you observed regarding the ability to recover from the incident.

Please describe 3 actions or 3 changes that could have been taken to recover from the incident.
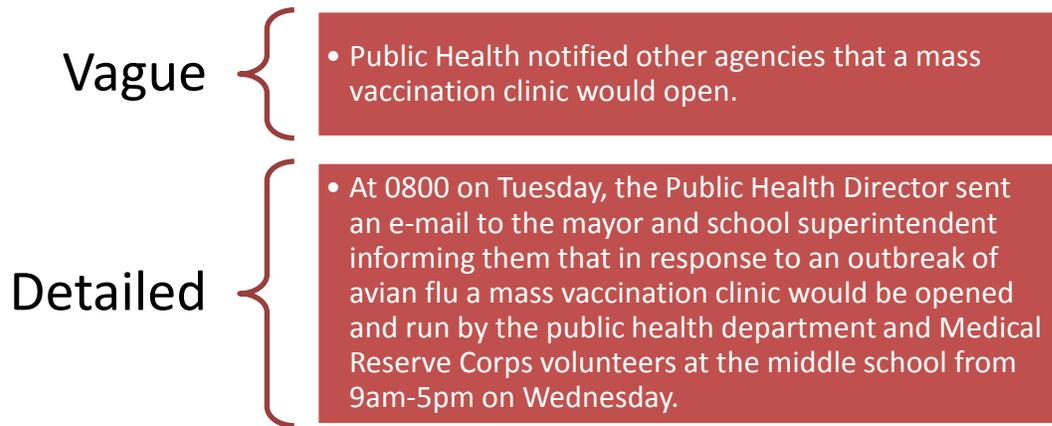

Notes

Additional comments

Section 3: Measures

- Record successes and challenges during response
- Identify potential areas for improvement
- Record additional notes and changes

Evaluators can rely upon the prompts of who, what, where, when, why, and how to guide them in making their observations. An example of a vague observation compared to a detailed observation follows below:

Vague

- Public Health notified other agencies that a mass vaccination clinic would open.

Detailed

- At 0800 on Tuesday, the Public Health Director sent an e-mail to the mayor and school superintendent informing them that in response to an outbreak of avian flu a mass vaccination clinic would be opened and run by the public health department and Medical Reserve Corps volunteers at the middle school from 9am-5pm on Wednesday.

This page is intentionally left blank.

Section 6: Emergency Preparedness Exercise Evaluation Database

Recognizing the difficulties that public health agencies and hospitals have in identifying and creating specific, valid, and reliable measures for their exercises, the Harvard School of Public Health LAMPS project combined two evaluation resources into a searchable database that is available to exercise planners, evaluators, and others involved in health emergency preparedness. The first resource is a database of over 600 measures of performance. The second resource is an evaluation instrument that allows evaluators to capture both quantitative and qualitative data during an exercise.
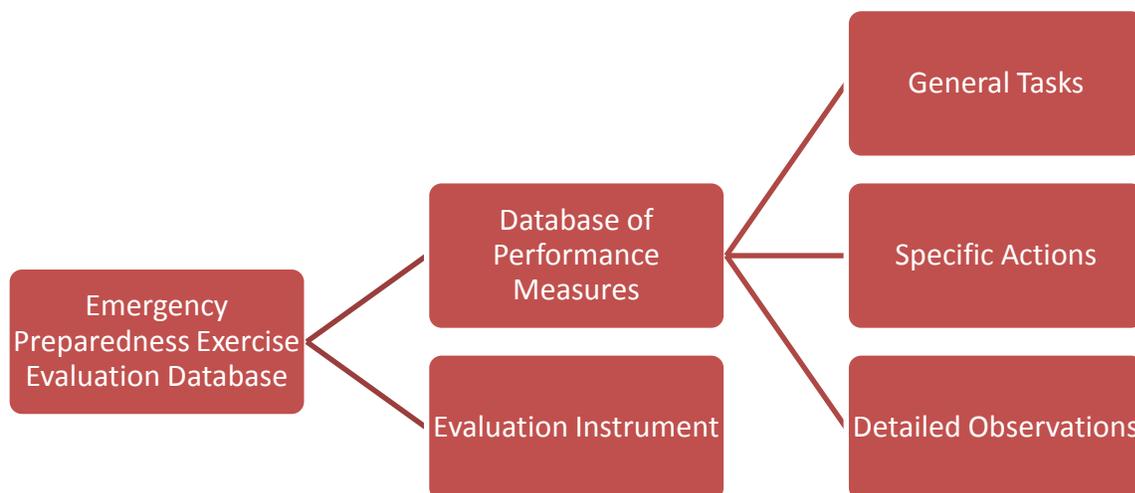
Exercise planners can identify relevant evaluation measures by searching this database by using Centers for Disease Control and Prevention (CDC) public health preparedness capabilities, using the Assistant Secretary for Preparedness and Response (ASPR) healthcare preparedness capabilities, naming the incident response stage (i.e. notification, mobilization, etc.) and/or by keyword. The results from the search(es) can be edited and tailored by the user to combine or delete individual measures to fit the needs of the exercise. After users have identified appropriate measures that they wish to use for their evaluation, we have designed the database to also help users create their own

comprehensive evaluation tool for their evaluators, based on the objectives of the exercise being conducted. The end result is an exercise evaluation tool designed for each specific exercise that includes both quantitative and qualitative measures of performance.

Section 7: After Action Reports

An After Action Report (AARs) provides invaluable feedback to participants and serves as the record of the observations made by evaluators during an exercise. Following an exercise, an after action report is written by with input from members of the exercise planning and evaluation teams. An after action report includes a summary of exercise logistics, the exercise scenario, player activities, and observations that combine to form the basis for recommendations in the improvement plan. Observations should include not only what happened during the exercise, but also the strengths and areas for improvement observed among the exercise participants.

After Action Report Sources
• Notes taken and observations made by evaluators during the exercise • Data from exercise evaluation guides • Participant self-evaluation forms/ Feedback forms • Copies of plans, policies, or procedures from exercise participants • Comments made by exercise participants during the exercise hotwash

In an after action report, the analysis sections should address both actions taken and not taken by participants. In order to be beneficial for improvement planning analysis should go beyond simply recreating the timeline of events in an exercise and thoroughly examine exercise performance.

Characteristics of a Beneficial After Action Report
• Summarize actions taken, or not taken by participants during the exercise • Determine how participants performed with respect to expected outcomes • Determine whether or not exercise objectives were met • Identify strengths observed among participants • Identify areas for improvement among participants and the root causes of any challenges, weaknesses, and deficiencies • Support recommendations that address areas for improvement

The importance of after action reports is their proven ability to promote measurable system improvements. In one research study, HSPH researchers examined a wide variety of AARs from the Department of Homeland Security/Federal Emergency Management Agency Lessons Learned Information Sharing (LLIS.gov) database to analyze how lessons learned from the response to real-incidents may be used to maximize knowledge management and quality improvement practices such as the design of public health emergency preparedness (PHEP) exercises. This research study found that regardless of the incident type or the jurisdiction assessed in the report a set of similar challenges were reported in most after action reports.[7] These common challenges have identified a core pair of public health emergency preparedness capabilities (Emergency Operations Coordination and Information Sharing) that should be included in most emergency preparedness exercises.[8] Exercise program managers should clearly document areas for improvement found during their exercises and relate each gap to a capability in order to identify and prioritize capabilities that should be assessed during future preparedness planning efforts and exercises.

After action reports can vary in length and detail depending upon the specifics of the exercise that was observed. An outline for an effective after action report is shown on the next page.

---

[7] Savoia E, Agboola F, Biddinger PD. Use of After Action Reports (AARs) to Promote Organizational and Systems Learning in Emergency Preparedness. *International Journal of Environmental Research and Public Health*. 2012; 9(8):2949-2963.

[8] The study identified three DHS/FEMA Target Capabilities (Emergency Operations Coordination, Communication, and Emergency Public Information and Warning) which are mapped to two CDC PHEP Capabilities.

Recommended HSEEP AAR Format

Executive summary	
Exercise overview	Background information
	Participating organizations
	Exercise date, time, location
	Exercise type
	Hazard/scenario type
	Evaluation methodology
Exercise goals and objectives	
Exercise events synopsis	
Analysis of mission outcomes	
Analysis of critical task performance	
Conclusion	
Appendix A: Improvement plan matrix	Recommendations
	Due dates
	Responsible organizations

This page is intentionally left blank.

Section 8: References and Resources

HARVARD SCHOOL OF PUBLIC HEALTH

The Harvard School of Public Health has made many of the exercise and evaluation tools presented in this document available online. More information on emergency preparedness and response, including free online courses can be found by following the links below:

http://lamps.sph.harvard.edu/

http://www.hsph.harvard.edu/eprep

http://www.hsph.harvard.edu/hperlc/

FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

The Federal Emergency Management Agency (FEMA) offers both on-line and on-site courses on conducting preparedness exercises as part of its Comprehensive Exercise Curriculum and Master Exercise Practitioner Program. More information about the program, as well as links to free on-line courses, can be found at:

http://training.fema.gov/

Recommended Courses:	
• IS – 120 An Introduction to Exercises	• IS – 700, NIMS, An Introduction
• IS – 139 Exercise Design	• IS – 800, NRP, An Introduction

HOMELAND SECURITY EXERCISE AND EVALUATION PROGRAM (HSEEP)

The Homeland Security Exercise and Evaluation Program (HSEEP) is a capabilities and performance-based exercise program that provides a standardized methodology and terminology for exercise design, development, conduct, evaluation, and improvement planning. HSEEP is currently undergoing revisions that make it a more practical, effective tool for exercise planners and practitioners from across the whole community of preparedness stakeholders. More information about the program can be found at:

http://hseep.dhs.gov

WORKS CITED

Biddinger PD, Savoia E, Massin-Short SB, Preston J, Stoto MA. Public health emergency preparedness exercises: lessons learned. Public Health Rep. 2010 Nov-Dec; 125 Suppl 5:100-6.

Savoia E, Agboola F, Biddinger PD. Use of After Action Reports (AARs) to Promote Organizational and Systems Learning in Emergency Preparedness. *International Journal of Environmental Research and Public Health*. 2012; 9(8):2949-2963.

Savoia E, Biddinger PD, Burstein J, Stoto MA. Inter-agency communication and operations capabilities during a hospital functional exercise: reliability and validity of a measurement tool. Prehosp Disaster Med. 2010 Jan-Feb; 25(1):52-8.

Savoia E, Biddinger PD, Fox P, Levin DE, Stone L, Stoto MA. Impact of tabletop exercises on participants' knowledge of and confidence in legal authorities for infectious disease emergencies. Disaster Med Public Health Prep. 2009 Jun; 3(2):104-10.

End of document.