

Lesson Overview

After exercise play is complete, the job of evaluators is far from over. They are now responsible for analyzing the data collected throughout the exercise, with an eye to improving the jurisdiction's capabilities and capturing lessons learned.

This lesson explains the role of data analysis in a successful evaluation.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the goal of data analysis.
- Describe the components of the post-exercise Controller/Evaluator Debriefing.
- Identify the four steps of data analysis.
- List methods for identifying problematic issues in the exercise.
- Describe at least one technique for conducting root-cause analysis.
- Explain how to develop effective recommendations for improvement.

This lesson should take approximately 45 minutes to complete.

Data Analysis in the Exercise Evaluation and Improvement Process

Data analysis is the third step of the Homeland Security Exercise and Evaluation Program (HSEEP) exercise evaluation and improvement planning process.

The Goal of Data Analysis

The goal of data analysis is to evaluate the ability of exercised functions to perform target capabilities. For this reason, data analysis may be the most important part of the evaluation.

Reviewing Exercise Objectives

Data analysis is the time when evaluators assess player performance against exercise objectives.

For this reason, evaluators should start by re-reading exercise objectives. These objectives provide the foundation for all data analysis.

If the exercise was complex, evaluators may only need to re-read the objectives related to their assignments.

When reviewing the exercise objectives, consider the following points:

- What was the intent of the objective?
- What would demonstrate the successful performance of the objective?
- If the objective was not met, was it the result of poor exercise design or the decisions of players?

Controller/Evaluator Debriefing

As you learned in Lesson 4, evaluators and controllers meet in the Controller/Evaluator Debriefing after the exercise. This meeting includes controllers because they are frequently teamed with evaluators, and because they can provide insights and observations based on the Master Scenario Event List (MSEL).

The Controller/Evaluator Debriefing allows evaluators to review results of the hotwash and participant feedback forms. It also enables evaluators to:

- **Compare Notes with Other Evaluators and Controllers.** The Controller/Evaluator Debriefing enables evaluators to compare notes with other evaluators and controllers. This helps all evaluators fill in information gaps. It also enhances continuity. Consider an evaluator who has notes about a situation that involved follow-up in another situation. If the second situation related to the assigned objectives of another evaluator, the two evaluators must compare notes.

Comparing notes may also help evaluators resolve discrepancies within their own notes.

- **Refine the Evaluation Documents.** The Controller/Evaluator Debriefing enables evaluators to refine their own documentation, if necessary.
- **Develop an Overall Capability Summary.** The Controller/Evaluator Debriefing enables evaluators assigned to the same area to develop an overall capability summary. This summary includes associated activity summaries within it.

Please note that the Controller/Evaluator Debriefing may precede a longer evaluator meeting in which in-depth data analysis occurs. Alternatively, all data analysis may be conducted in one Controller/Evaluator Debriefing. This lesson explains the content of both meetings, although evaluators may choose to combine them.

The Four Steps of Data Analysis

As you just learned, the Controller/Evaluator Debriefing occurs shortly after the exercise. Evaluators typically convene in a more formal meeting later the same week. The purpose of the second meeting, which can last six to eight hours, is to fully analyze exercise data and lay a foundation for the After Action Report/Improvement Plan (AAR/IP).

In this meeting, evaluators complete four steps of data analysis: identifying issues, determining root causes, developing recommendations for improvement, and identifying lessons learned.

The content of each step depends on whether the exercise is discussion-based or operations-based.

Data Analysis Step 1: Identifying Issues

In both discussion-based and operations-based exercises, evaluators identify issues by comparing exercise objectives to actual performance.

Through this comparison, evaluators identify which capabilities (and their associated activities, performance measures, and tasks) were successfully demonstrated in the exercise. They also identify which capabilities need improvement.

Data Analysis Step 1: Using the Analysis Component of Exercise Evaluation Guides (EEGs) To Identify Issues

Following the Controller/Evaluator Debriefing, evaluators should use the Exercise Evaluation Guide (EEG) Analysis sheets to develop narratives for each capability and associated activity under evaluation. EEG Analysis sheets have two components:

- **Observations Summary Sheet.** The Observations Summary Sheet allows evaluators to record a general chronological narrative of exercise player actions. This narrative is based on the evaluator's observations. On the sheet, evaluators should record exercise events, specific actions deserving special recognition, particular challenges or concerns, and areas needing improvement. The content recorded on this form will then be used to develop the After Action Report/Improvement Plan (AAR/IP).
- **Evaluator Observations Section.** The Evaluator Observations Section asks evaluators to record and analyze at least three observed strengths and three observed areas for improvement demonstrated by the jurisdiction. For each strength and area for improvement, evaluators should record specific observations on what occurred; a root cause analysis examining why events occurred; and, if necessary, specific recommendations for corrective action. The recommendations and observations which evaluators record will be used to develop the jurisdiction's AAR/IP. They will also be the source of proposed corrective actions generated at a post-exercise After Action Conference.

To complete the Analysis Sheets, evaluators draw data from their Exercise Evaluation Guides (EEGs), as well as from notes, exercise logs, messages, rosters, and other documentation created during the exercise.

Data Analysis Step 1: Identifying Issues in Operations-Based Exercises

During operations-based exercises, evaluators seek to answer the following questions:

- What happened? What did evaluators see?
- What was supposed to happen based on plans and procedures?
- Was there a difference? Why or why not?
- What was the impact? Were the consequences of the action (or inaction or decision) positive, negative, or neutral?

- What should be learned? What are the recommendations for improvements or corrective actions to remedy deficiencies?

Data Analysis Step 1: Reconstructing an Exercise Timeline For Operations-Based Exercises

In operations-based exercises, evaluators reconstruct a timeline of events that occurred during the exercise. (This approach is similar to what most agencies do following an accident or incident.) Evaluators create this timeline using logs, records, and chronological narratives in their own notes.

The reconstructed timeline has three purposes. It helps evaluators:

1. Assess whether actions occurred within the timeframes defined in exercise objectives.
2. Identify discrepancies between what happened and what was supposed to happen in the exercise.
3. Clarify why players made decisions.

The session in which the timeline is reconstructed should be led by an experienced facilitator. To keep the session on track, the facilitator should prioritize areas for discussion.

Suggested Prioritization: To keep the meeting constructive and focused, the facilitator should prioritize the areas for discussion as follows:

- Create a timeline that reconstructs the events that occurred at each location.
- Review the site-specific objectives to be accomplished at each location.
- Determine which activities went well and which need improvement.
- Rank the corrective actions in order of importance.
- Identify the strengths and weaknesses in carrying out these activities.

Typically, evaluators stationed in a particular location/function will conduct the analysis for that location/function.

Data Analysis Step 1: Identifying Issues in Discussion-Based Exercises

In discussion-based exercises, evaluators seek to identify the following issues:

- In an incident, how would response personnel perform the activities and associated tasks?
- What decisions would need to be made, and who would make them?
- Are personnel trained to perform the activities and associated tasks?
- Are other resources needed? If so, how will they be obtained?
- Do plans, policies, and procedures support the performance of the activities and associated tasks? Are players familiar with these documents?

- Do personnel from multiple agencies or jurisdictions need to work together to perform the activities? If so, are agreements or relationships in place to support this?
- What should be learned from this exercise?
- What corrective actions are recommended?

Evaluators gather answers to these questions from their notes and the player hotwash.

Data Analysis Step 2: Determining Root Causes

In both discussion-based and operations-based exercises, evaluators identify discrepancies between what happened and what was supposed to happen. Next, they explore the source of these discrepancies. This second step is called root-cause analysis.

When conducting root-cause analysis, evaluators ask why each event happened or did not happen.

A number of analysis tools are available for root-cause analysis. One common tool is the “why staircase.” To use the why staircase, evaluators keep asking why an event happened or did not happen until they are satisfied that they have identified the root cause.

The “Why Staircase:”

1. Why did it happen?
 2. Why did that happen?
 3. Why was that?
 4. And why was that?
 5. And why was that?
- ROOT CAUSE.

Identifying the Root Cause (an example):

During an exercise, evaluators observed that field teams could not find certain environmental monitoring locations because their maps were different from the one used by the Field Team Coordinator. The evaluators recommended that “all maps used by the Coordinator and the field teams should be the same.”

This observation does not address the root cause of why the maps were different. For this reason, it does not ensure that the problem will not be repeated. For example, was the problem a result of how the maps were distributed?

Further discussion revealed that the field teams had actually been given the same map as the Coordinator, but they chose to use the old map because the new map was less clear. Discovering this, evaluators realized that the recommended solution must also involve improving the new map.

When evaluators have identified the root cause of a problem, they can be sure that corrective actions will actually address the problem, and not just a symptom of it.

Data Analysis Step 3: Developing Recommendations for Improvement

After identifying issues and their root causes, evaluators develop recommendations for enhancing preparedness. These recommendations will be the basis for corrective actions identified in the After Action Conference.

Honesty is key when writing recommendations. If you have a criticism, record it. Exercises will only improve preparedness if they are followed by accurate and useful feedback.

Recommendations for improvement should:

- Identify areas to sustain or improve.
- Address both short- and long-term solutions.
- Be consistent with other recommendations.
- Identify references for implementation.

To the extent possible, evaluators should detail how to implement improvements. They can even recommend who will implement them and provide suggested timeframes for completion.

Note: Each recommendation should link to analysis and specific observations about an activity. Exercise Evaluation Guides (EEGs) were designed to increase this linkage.

Sample recommendations:

- The Planning Chief should attend the EMI course on developing an Incident Action Plan (IAP).
- The county emergency management coordinator should continue to refine Mutual-Aid Agreements (MAAs).
- The city and county should sustain the Unified Command that integrates their response to disaster.

Data Analysis Step 3: Recommendations for Discussion-Based Exercises

When developing recommendations for discussion-based exercises, evaluators should guide their discussion with the following questions:

- What changes need to be made to plans to improve performance?
- What changes need to be made to organizational structures to improve performance?
- What changes need to be made to leadership and management processes to improve performance?
- What training is needed to improve performance?

- What changes to resources are needed to improve performance?
- What practices should be shared with other communities?

Data Analysis Step 3: Recommendations for Operations-Based Exercises

When developing recommendations for operations-based exercises, evaluators should guide their discussion with the following questions:

- What changes need to be made to plans or procedures to improve performance?
- What changes need to be made to organizational structures to improve performance?
- What changes need to be made to leadership and management processes to improve performance?
- What training is needed to improve performance?
- What changes to equipment are needed to improve performance?
- What are lessons learned for approaching a similar problem in the future?

Data Analysis Step 4: Lessons Learned

As the last step in data analysis, evaluators should look for and record “lessons learned.” A “lesson learned” is an innovative practice or a piece of knowledge gained from experience. This piece of knowledge provides guidance for approaching a similar problem in the future. Lessons learned allow communities to build on both past experiences and the experiences of one another. For this reason, they save time, conserve money, and accelerate preparedness improvements.

Any lessons learned applicable to other jurisdictions should be included in the After Action Report/Improvement Plan (AAR/IP).

Note: Lessons learned are centralized on the Department of Homeland Security (DHS) Lessons Learned Information Sharing portal (LLIS.gov). LLIS allows members of the nationwide response community to learn about, read, submit, and comment on lessons learned.

- **Sample lesson learned:** “During a chemical weapons exercise, the jurisdiction found that using buses to transport large numbers of walking wounded to medical facilities improved incident response by reducing strain on Emergency Medical Services (EMS) vehicles and decreasing transport times for victims. This lesson learned involved a number of agencies and disciplines and can be widely applied.”

Lesson Summary

In this lesson you learned:

The primary goal of data analysis is to evaluate the ability of exercised functions to perform target capabilities.

The four steps of data analysis are:

1. Identifying issues.
2. Determining root causes.
3. Developing recommendations for improvement.
4. Capturing lessons learned.

During data analysis, evaluators can identify problematic issues by:

- Comparing exercise objectives to actual events.
- Completing the Analysis sheets of the Exercise Evaluation Guides (EEGs).
- Reconstructing a timeline of exercise events.
- Root-cause analysis examines the source of discrepancies between what happened and what was supposed to happen. The “why staircase” is one technique for conducting a root-cause analysis.

Evaluators should develop recommendations for improvements wherever they identify that plans, training, or equipment need work. These recommendations form the basis of corrective actions.