

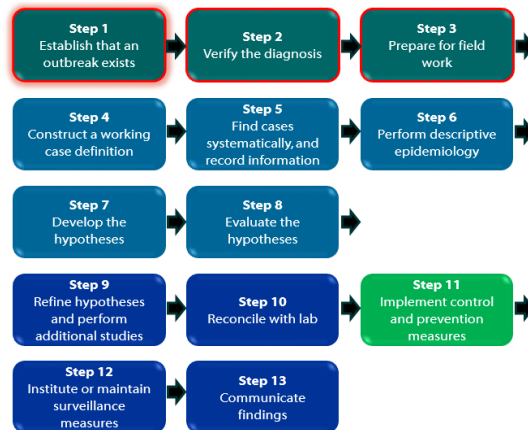
Toxicological Outbreak Investigation

Module 5: Steps of a Toxicological Outbreak Investigation, Part 1



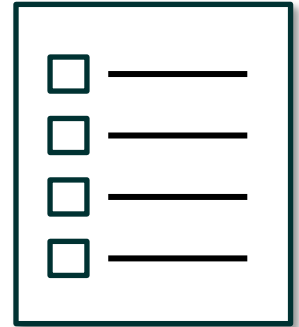
Welcome

- Welcome to Module 5, Part 1 of Toxicological Outbreak Investigation. This training follows the general steps outlined in CDC's Principles of Epidemiology in Public Health Practice: An Introduction to Applied Epidemiology and Biostatistics, 3rd edition.
- In this module, we will discuss the first three steps in an outbreak investigation.
- This module should take about 20 minutes to complete.



Objectives

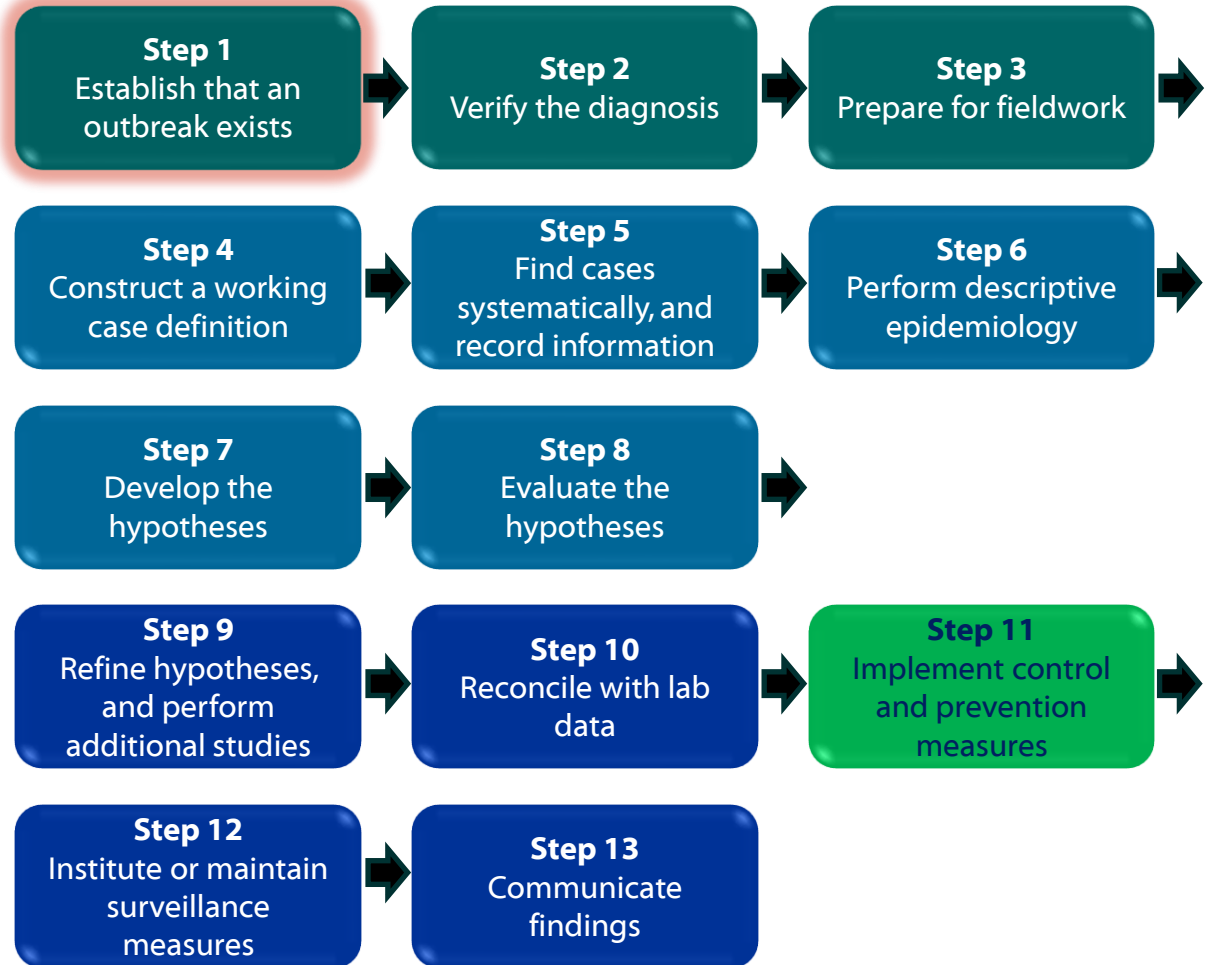
- After completing this module, you will be able to
 - Recognize indications that an outbreak might be occurring
 - Identify reasons to consider investigation of an outbreak
 - Recognize factors indicating that an outbreak is potentially caused by a toxic agent
 - Identify steps to prepare for fieldwork



Steps in an Outbreak Investigation

Depending on the circumstances, some of these steps might be taken in a different order.

Implementing control and prevention measures should be a constant consideration. This should be done as soon as there is information to support such actions.



Definition of an Outbreak

- *What is an outbreak?*
- *How would you define the term?*



Definition of an Outbreak (cont.)

- An outbreak is the occurrence of **more cases** of disease, injury, or other health condition **than expected** in a given geographic area or among a specific group of persons during a specific period.
- In some cases, especially for toxicological outbreaks, the exact disease might not be known, and the outbreak might be detected based only on symptoms or a clinical syndrome.
- Note that this course focuses on investigations of acute outbreaks, involving outcomes with a relatively short latency period between exposure and onset of disease. It does not cover outbreaks of conditions with longer latency periods, such as cancer or other chronic diseases.

Toxicological Outbreaks

- Toxicological outbreaks are typically a result of acute exposure to a toxic agent or acute poisoning.

Severe Illness Potentially Associated with Consuming Diamond Shruumz™ Brand Chocolate Bars, Cones, and Gummies



For Everyone
NOVEMBER 14, 2024

Childhood Lead Exposure Linked to Apple Cinnamon Fruit Puree Pouches — North Carolina, June 2023–January 2024

Weekly / July 18, 2024 / 73(28);622–627

Investigation of Elevated Lead & Chromium Levels: Cinnamon Applesauce Pouches (November 2023)

FDA issues Warning Letter and leverages Import Alerts.

Spice outbreak larger than first thought

*Published: Monday, April 6th 2015, 3:54 pm EDT
Updated: Monday, April 6th 2015, 7:52 pm EDT*

Posted by David Kenney, Reporter CONNECT

Gather Information

- The first step is to learn as much as you can about the situation and about the affected people. This helps you gain a clear understanding of the illnesses. Speak to
 - Physicians
 - Patients
 - Family, friends, and community
- Speak with physicians or others in the community to gain an understanding of how often this type of illness typically occurs in that community.

Review Surveillance Data

- Unlike many infectious disease outbreaks, disease-specific surveillance data are typically not available for toxicological outbreaks.
- In some cases, syndromic surveillance, hospital discharge data, poison center data, or other types of routine surveillance data, if available, can be helpful.

Reasons to Investigate

- If you determine that an outbreak is occurring, there are several reasons why you might choose to investigate it:
 - To find the cause of the outbreak to initiate control measures
 - To learn more about the disease to prevent future outbreaks
 - To understand the extent or scope of the outbreak
 - To address public concerns
 - To address political, legal, or programmatic considerations
 - To train public health staff

Challenge #1

- **What is an outbreak? Select the best response.**
 - A. The occurrence of more cases of a particular health condition than expected in a given area or among a specific group of persons during a specific period
 - B. An expected seasonal increase in the number of people with similar signs or symptoms
 - C. A friend or family member who shows signs or symptoms
 - D. None of the above

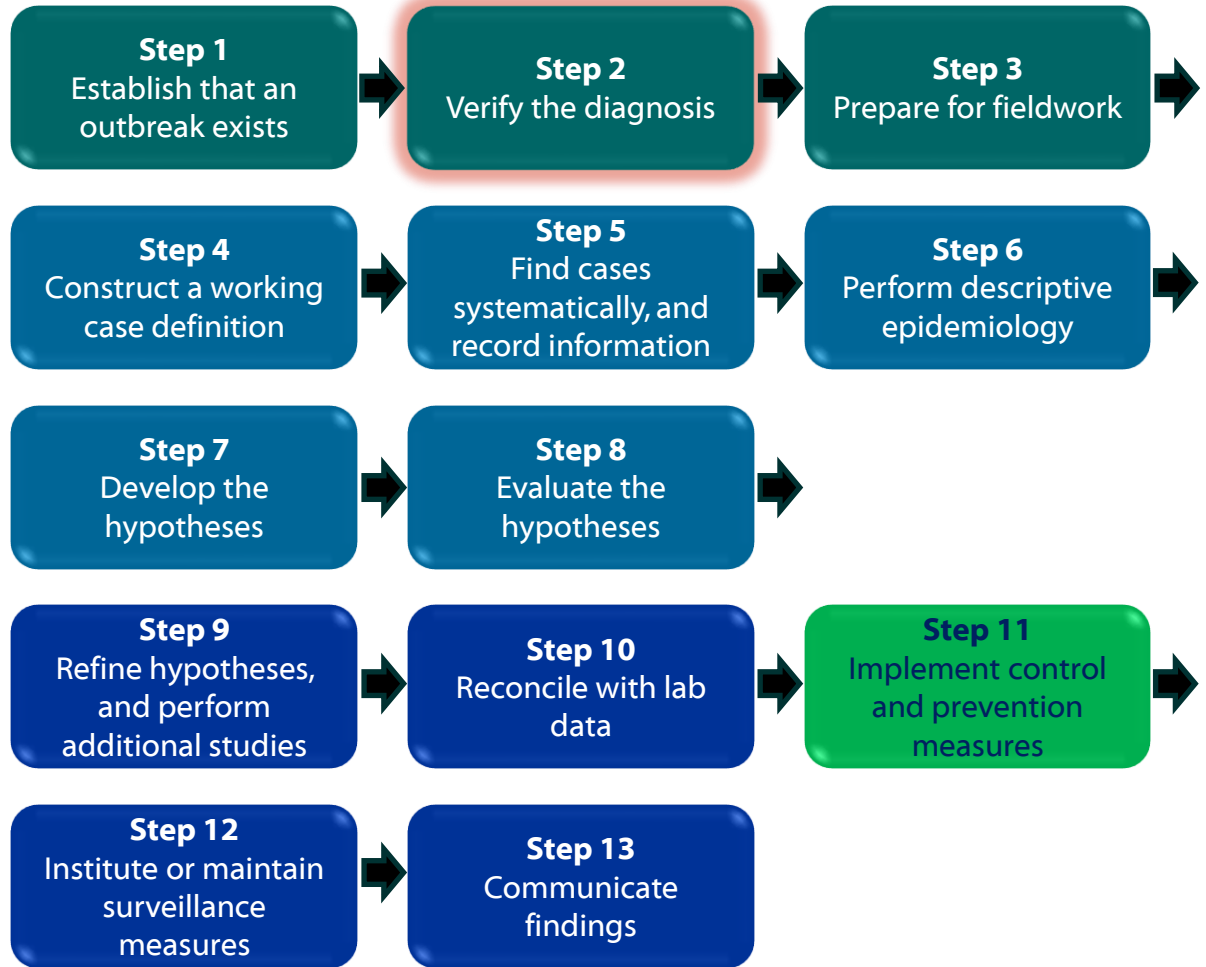
Challenge #1 Answer

- **The correct answer is A.** The occurrence of more cases of a particular health condition than expected in a given area or among a specific group of persons during a specific period.

Steps in an Outbreak Investigation

Depending on the circumstances, some of these steps might be done in a different order.

Implementing control and prevention measures should be a constant consideration. This should be done as soon as there is information to support such actions.



Verify Diagnosis

- If a specific diagnosis is available, review the symptoms and medical records of patients to confirm that diagnosis.
- For many toxicologic outbreaks, the exact diagnosis is not known at the start of an investigation.
 - Review the symptoms and medical records of the identified patients to identify a common set of symptoms, possible diagnoses, and possible causes of the illness.
 - Sometimes the list of possible causes includes both infectious and toxic agents.
- In some cases, it is also important to determine whether all known patients have the same condition.

Review from Module 2

- Outbreaks that are caused by a toxic agent often have characteristics that can aid in distinguishing a toxicological etiology from other etiologies (i.e., infectious).
- **However, none of these characteristics distinguish between toxicological and infectious outbreaks.**

Characteristics Suggesting a Toxicological Outbreak

Absence of fever

Short latency time (for acute outbreaks)

Similar symptoms across cases that are consistent with the effects of a toxic agent

Setting or affected population suggests potential toxic exposures

Apparent dose-response relationship between symptoms and a suspected exposure

Absence of person-to-person transmission

Concurrent animal illnesses

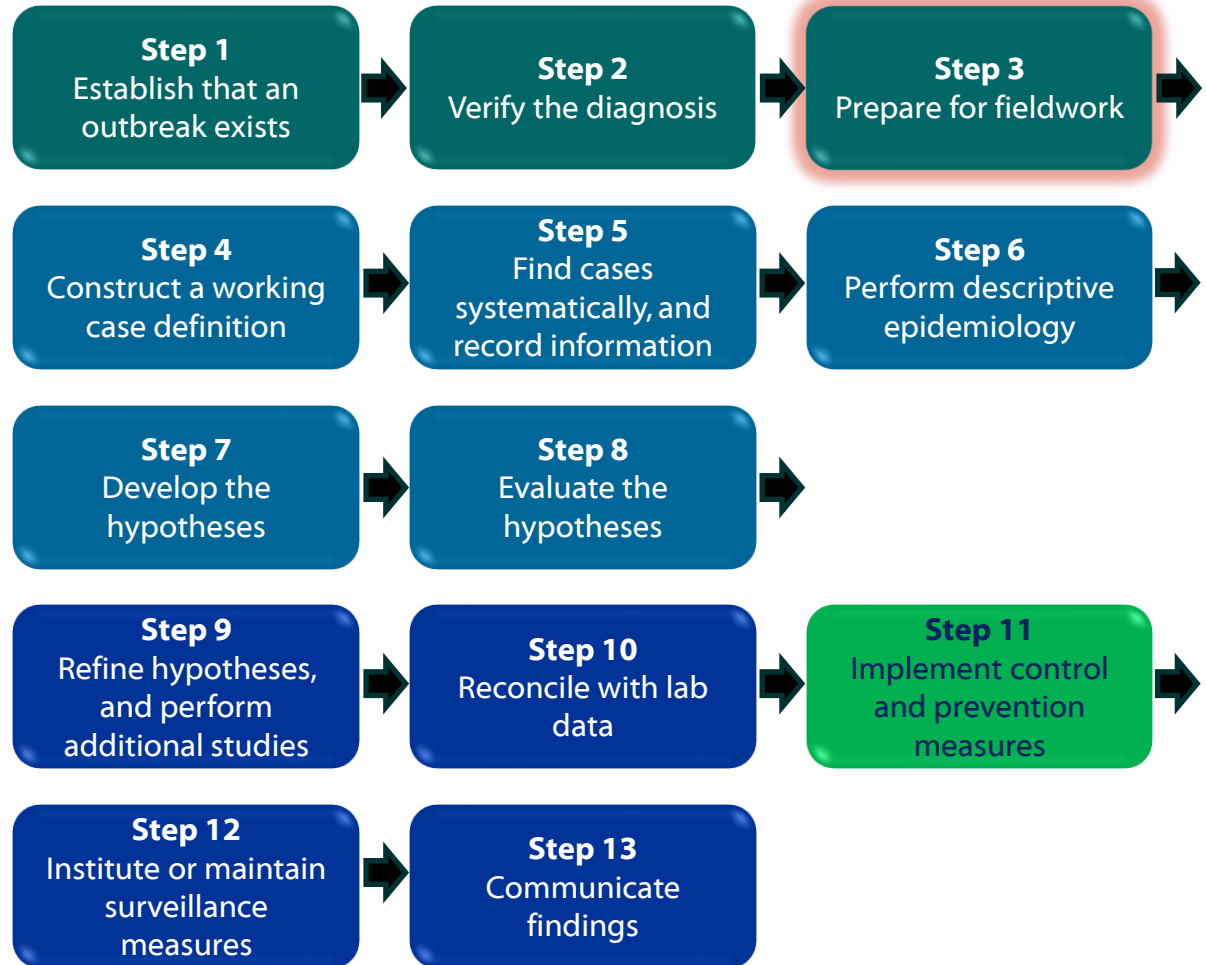
Consider Possible Toxic Agent

- It is important to consider a possible toxic agent exposure as early as possible.
 - Some toxic agents are quickly eliminated from the body.
 - Some toxic agents can quickly break down in the environment.
 - The sooner an environmental or biological sample is collected, the greater the chances the sample will still contain the toxic agent.
- A toxicologist can help identify toxic agents that could cause the signs and symptoms being observed.
 - Some toxic agents cause a unique set of signs and symptoms that allow toxicologists to quickly identify them, called a “toxidrome.”
 - Recognizing the toxidrome can be helpful in identifying the specific toxicological agent.

Steps in an Outbreak Investigation

Depending on the circumstances, some of these steps might be done in a different order.

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Prepare for Fieldwork

- If you decide to investigate, it is time to prepare for fieldwork.
- Preparing for fieldwork includes the following:
 - Developing investigation objectives
 - Assembling an investigation team
 - Clearly defining roles
 - Planning for logistics and supplies

Typical Objectives

- Typical investigation objectives
 - Describe the illness.
 - Determine extent of the outbreak.
 - Identify the etiology (e.g., the infectious or toxic agent that caused the outbreak).
 - Identify the source of exposure (method by which people came into contact with the toxic agent or other cause of the outbreak).

Assembling an Investigation Team

- Most infectious outbreak investigation teams include
 - Physician
 - Epidemiologist
 - Lab technician
 - Representatives from local and state health departments
 - Community member
 - Communications specialist
- Toxicological outbreak investigation teams usually **also** include a **toxicologist**. A toxicologist is a professional who studies the effects of toxic agents on people.
 - Helps determine which toxic agents cause illness similar to what you are seeing
 - Advises on which exposures and clinical symptoms to ask about and which signs to observe
 - Helps interpret laboratory results



Assembling an Investigation Team (cont.)

- The term “toxicologist” can refer to professionals with different training and skills.
 - Many toxicologists are scientists who study the effects of potentially harmful substances on the health of humans, animals, and the environment.
 - They might work in academic institutions such as universities, industry, or government.
 - Their activities include conducting research studies, risk assessment, and other investigations.
- Clinical toxicology is the discipline dedicated to preventing and treating poisoning injuries caused by chemicals, drugs, and toxins.
 - Many clinical toxicologists are pharmacists or other healthcare professionals with specialized training to manage human exposures to harmful substances.
 - Medical toxicologists make up a subset of clinical toxicologists. They are licensed physicians who can diagnose and treat patients who have been poisoned.
 - Veterinary toxicologists are veterinarians who have expertise on poisoning hazards that can harm pets, livestock, and wildlife.

Assembling an Investigation Team (cont.)

- Toxicological outbreak investigations often also include other team members.
 - Veterinarian (Many toxic agents affect humans and animals similarly.)
 - Can collect biologic specimens from animals and perform necropsies
 - Botanist (Some toxic agents are plant-based.)
 - Can help with determining
 - Types of toxic trees, plants, and herbs that grow in the region
 - Types of illness these toxic plants might cause
 - Industrial Hygienist (Some toxicological outbreaks occur at the worksite.)
 - Can assist with
 - Identifying potential exposures at a particular workplace
 - Developing questions or measurement approaches for studying workplace exposures



Clearly Defining Roles

- Clearly define who is leading the investigation and the roles of various team members.
- Ensure the roles are clear for various health agencies, including those operating at local, state, and national levels.
- Ensure there is a plan for communication among the various agencies involved in the investigation.
- In some situations, a formal invitation must be received from an authorized official before a field investigation starts.

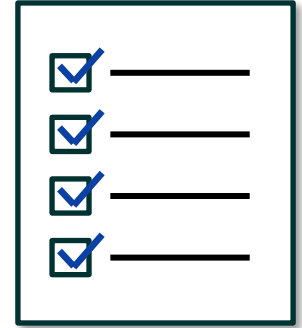
Planning for Logistics and Supplies

- Plan for collection of biological and environmental samples.
 - Consult with laboratory staff.
 - Plan for proper specimen collection, transport, and storage.
 - Obtain needed supplies.
- Plan for any necessary safety supplies.
- Identify and plan for any other necessary supplies and equipment, such as computers, tablets, cell phones, special medical equipment, cameras, etc.
- Make needed travel arrangements.



Module Summary

- This concludes Module 5 Part 1.
- In this module, we discussed the first three steps of a toxicological outbreak investigation. Remember
 - Before deciding to investigate, it is important to determine whether an outbreak exists.
 - If an outbreak exists, it is important to consider if it may be the result of a toxic agent exposure as soon as possible.
 - When preparing for fieldwork, consider who should be part of the team.
 - Before fieldwork begins, clearly define objectives and roles. Plan for logistics and supplies.
- You should now be able to
 - Recognize indications that an outbreak may be occurring
 - Identify reasons to consider investigation of an outbreak
 - Recognize factors indicating that an outbreak is potentially caused by a toxic agent
 - Identify steps to prepare for fieldwork



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