Module 2: Outbreak Determination and Investigation

Epidemiology Division

Surveillance Branch

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Bureau of Clinical Laboratories
Bureau of Environmental Services

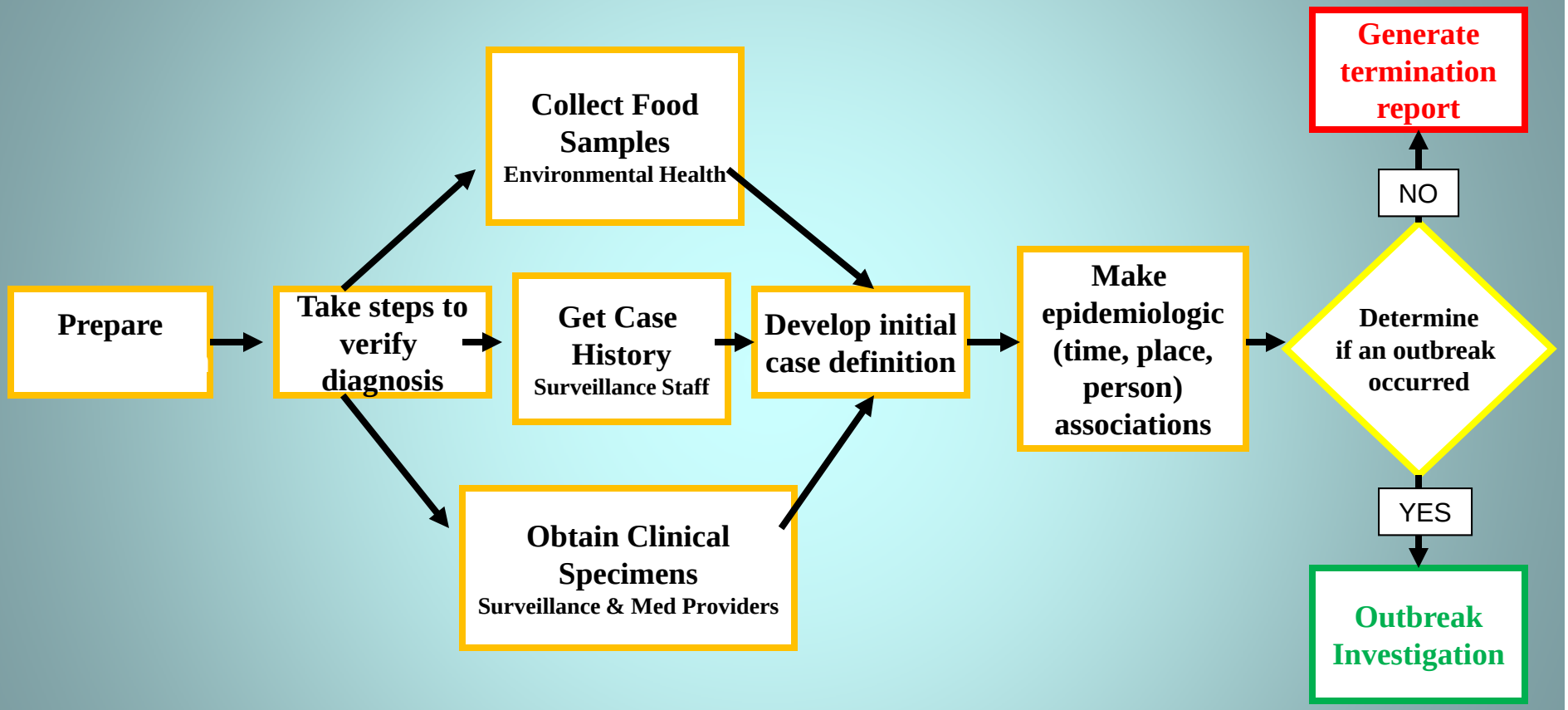
Module Learning Objectives

- List steps needed to prepare for an investigation
- Define foodborne outbreak (FBO)
- Gather information to determine the source
- Identify means for searching for additional cases

Module Learning Objectives (cont.)

- List three phases of interviewing
- Describe methods to ensure consistency of interview data
- List steps for obtaining a case history
- Describe methods for overcoming barriers to interviewing
- Perform group exercise

Outbreak Determination Flow Diagram



Remember the Three-Legged Stool: Epidemiology, Environmental Health, & Laboratory

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Steps to Prepare for Investigation

- Follow Foodborne Outbreak (FBO) Protocol (see Intro Module)
- Complete Preliminary Outbreak Investigation Report
- Notify DETECT Team
  - Minimally Field Surveillance Staff (FSS) and 2 Environmentalists (Env)

Additional Investigation Preparation

- Grab your DETECT Kits
  - Human & environmental sample collection kit
- Plan and Train:
  - Team members understand their role according to protocol
  - Cannot address every situation
  - Reduces confusion during the crisis

Is it a foodborne outbreak?

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Foodborne Illness Outbreak Definition

CDC and IAFP Definition

An outbreak is an incident in which two or more persons have the same disease, have similar clinical features, or have the same pathogen – thus meeting the case definition - and there is a time, place or person association among these persons.

A foodborne outbreak is one that is traceable to ingestion of a contaminated food.

Foodborne Illness Outbreak Definition (cont.)

CDC and IAFP Definition

A single case of suspected botulism, mushroom poisoning, ciguatera or paralytic shellfish poisoning or other rare disease, or a case of a disease that can be definitely related to ingestion of a food, can be considered an incident of foodborne illness and warrants further investigation.

Foodborne Outbreak Definition

Alabama Definition

An incident in which two or more persons from different households experience a similar illness resulting from the ingestion of a common food.

Exceptions: botulism and chemical poisoning (1 case = outbreak).

Next Steps

- Gather information to determine source
- Search for additional cases
- Begin Interviews

Information to Determine Source

- Preliminary Outbreak Investigation Report
- Outbreak-specific Questionnaires
- Environmental Inspection Report
- Clinical and food specimen test results
- Healthcare provider medical records

Search for Additional Cases

- Communicate with Community
  - Health Care Facilities
  - Schools
  - Private Providers
  - Exposure Location

Interviewing Objectives

- To determine source of illness and means of transmission
- Minimize repeat interviews

Begin Interviews

- Central Office Epi Provides
  - Outbreak-specific Questionnaire
  - Case Definition
  - Who to Interview
  - Outbreak Name
  - Type of Specimen
  - Additional Consultation

Two Ways to Obtain Information

- Interviewer Led
  - In-person
  - Telephone
- Self Administered
  - Web-based
  - Forms distributed

Self-Administered Questionnaires

- Alternative to in-person or telephone interviews
- Limitations
  - Poor response rates
  - Respondent can misinterpret or fail to understand questions
- Advantage
  - Reduce resources devoted to gathering information, esp. with large outbreaks

Three Phases of Interviewing

1. **Before**
2. During
3. After

Before Interviewing

- Review working case definition
- Obtain outbreak-specific questionnaire from Epi
- Assess workload
- Identify and train interviewers

Develop the Working Case Definition

- Person, Place and Time
- Laboratory Data
- Environmental Data

Outbreak Questionnaire Format

- Demographic information
  - Age, gender, address, other identifying data
- Exposure history
  - Food consumption
- Disease information
  - Symptoms/signs

Open-Ended Questions

- Rarely used
- Data gathering
- Hypothesis generating
- Drawback - difficult to analyze statistically
- Time consuming

Customized Forms

- Gather specific info after have basic initial information
- Read all questions in the order as they appear on questionnaire

Closed-Ended Questions

- Preferred
- Gather specific information
- Can be restrictive and leading
- Can target specific topics

Yes_____	No_____	Unknown_____

Before Interviewing…Remember

- Be consistent in interviews
- Become familiar with questionnaire before conducting interviews
- Practice with someone on team before interviews begin

A Good Interview is a Must

- Accurate and complete data required
- Obtain answers for all questions, even if “unknown”
- Interview 3 “not ill” for every 1 “ill”

Assessing Workload

- Identify and prepare interviewers
  - Assign interviewers; training for all
  - Arrange work schedules (24/7 work)
- Assess workload
  - Number of interviews needed
  - Types of individuals to interview

Outbreak Investigation Interviewing Skills

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Three Phases of Interviewing

1. Before
2. **During**
3. After

During Interviews

- Establish rapport
- Identify self and organization
- Reason for investigation
  - Need to indentify source and prevent others from getting sick
  - Express empathy
  - May be contacted multiple times
- Start with easy questions
  - “Your name/ address/ occupation?”

Assess Communication Styles

- Identify communication style of interviewee and adjust your style to match
  - Action - bottom line / “Just the facts”
  - Feeling – empathetic
  - Creative - need to see the big picture
  - Thinking - want all the details

Consider Human Dynamics

- Anticipate communication barriers
  - Demographic or cultural factors
  - Defensiveness
- Identify appropriate sites and times for interviews
  - Privacy
  - Free from distractions

Strategies for Food Recall

- Ask about food preferences
- Rule in/out some foods
- Show calendar to identify key days and jog memory
- Review receipts and/or checkbook
- If buffet, clearly describe each food
- Show the menu if available

Restaurants

- Be as specific as possible
- How many "combination chicken platters" can there be?

Healthy Food Chinese Kitchen

COMBINATION PLATTERS

Served with roast pork fried rice and egg roll

1. *Broccoli with Garlic Sauce	$5.95	**10.** *General Tso's Chicken	$7.95
2. Vegetable Delight	$6.25	**11.** Chicken Lo Mein	$6.75
3. Pork with Chinese Vegetables	$6.50	**12.** Beef with Broccoli	$6.95
4. *Hunan Pork	$6.95	**13.** Pepper Steak with Onion	$6.95
5. Bar-B-Q Spare Ribs	$7.25	**14.** Beef Lo Mein	$6.95
6. Chicken Chow Mein	$5.95	**15.** Shrimp Chow Mein	$6.75
7. Chicken with Broccoli	$6.95	**16.** Shrimp with Lobster Sauce	$7.25
8. Moo Goo Gai Pan	$6.50	**17.** Shrimp with Cashew Nuts	$6.95
9. Sweet & Sour Chicken	$6.50	**18.** *Shrimp with Garlic Sauce	$7.25

Challenges During Interview

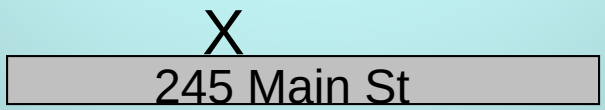
- Information often missed
  - Identify facility locations, extent of exposure, timeline and specific signs and symptoms
  - Check for food or clinical samples
  - Consider non-foodborne transmission
- Commercial food products
  - Obtain specific dates, locations, lot number and product descriptions

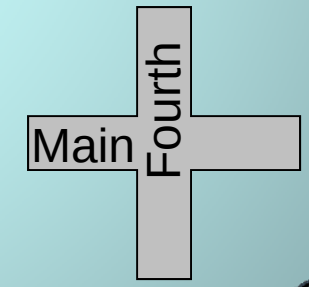
Read Labels
Be Specific

- Hamburger
  - Ground chuck
  - Ground sirloin
  - 23% fat content
  - 30% fat content
- Lettuce
  - Shredded
  - Chopped
  - Type- iceberg v romaine

Information Often Missed

- Location of facility (be specific)
  - Chain X store in Anytown, AL
  - Chain X store on corner of Main and Fourth in Anytown, AL
  - Chain X store located at 245 Main Street in Anytown, AL





Information Often Missed (cont.)

- Extent of exposure
  - Who else ate the food
  - Names and contact information of other persons at event
  - How much did they eat?
- Timeline information
  - Purchase date/time
  - Consumption date/time
  - Symptom onset date/time

Information Often Missed (cont.)

- Specific signs and symptoms
  - Especially important if no laboratory confirmation
- Check if food or clinical samples still available
- Information needed to assess potential for non-foodborne routes of transmission

Communication Barriers (cont.)

- Last meal bias
  - Take multi-day food history
- Irate consumer
  - Be sensitive, adjust communication style
- Cultural Diversity
  - Different cultures have different styles of communicating (age, gender, cultural, ethnic)

The Last Meal Bias

Cause	Average incubation	Range incubation	Fever	Vomiting	Diarrhea
Heavy metals	5 -15 min	1 min – 8 hrs	--	+++	++
Staph enterotoxin	2-4 hrs	30 min - 8 hrs	--	++++	+++
Bacillus cereus emetic syndrome	2 - 4 hrs	30 min - 6 hrs	--	+++	+
Clostridium perfringens	11 hrs	6 - 24 hrs	--	--	++++
E. coli invasive	11 hrs	8 - 24 hrs	++	--	+++
Vibrio parahaemolyticus	12 – 24 hrs	4 - 30 hrs	+	+	+++
Bacillus cereus diarrhea syndrome	12 hrs	6 - 24 hrs	--	+	+++
Salmonella	24 hrs	6 - 72 hrs	++	+	+++
E. coli enterotoxigenic	26 hrs	8 - 48 hrs	--	--	+++
Shigella	36 hrs	1 - 7 days	+++	+	+++
Norovirus	36 hrs	10 - 50 hrs	+	+++	+++
Vibrio cholerae	2 – 3 days	few hrs - 5 days	--	--	++++
Campylobacter jejuni	2-5 days	1 - 10 days	++	--	+++
E. coli O157:H7	3 – 4 days	2 – 10 days	++	--	+++
Yersina enterocolitica	4 days	3 - 7 days	++	+	++
Cryptosporidium parvum	7 days	1 - 12 days	+	+	+++

* *Vibrio vulnificus* has an incubation period of 12 hours to 3 days. However, infection with this organism does not present with vomiting or diarrhea, but with fever, septicemia and severe wound infection.

** *Listeria monocytogenes* has an average incubation period of 3 weeks (ranging from 1-70 days).

Non-Foodborne Routes of Disease Transmission

- Petting Zoos
- Day Care Centers
- Drinking Water
- Swimming Pools

Before Ending Interview

- Ask about “Other Food”
- Ask questions as written
- Review for completeness and accuracy
- Ask if individuals have
  - Unanswered questions
  - Additional information
- Thank them

Three Phases of Interviewing

1. Before
2. During
3. **After**

After the Interview

- Keep track of interviewees and interviewers
- Fax questionnaires to Communicable Disease (CD), 334-206-3734
- Confirm all information was received
- When notified and by whom
- Number of possible attendees/patrons
- Coordinate reports from others involved (Area/Local staff)

“I can give you a six-word formula for success. “Think things through – then follow through”

-Sir Walter Scott

Module Learning Objectives

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Group Exercise

Fraternity/Sorority Student Interview

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