Hour 1: Laying the Foundation for Effective Epi Teams (8:30 AM - 9:30 AM)

- **8:30 AM - 8:40 AM: Welcome, Introductions, and Training Objectives**
  - Brief overview of the training's purpose based on survey feedback.

Welcome & Training Overview

Learning Objectives

DESCRIBE PUBLIC HEALTH IMPORTANCE OF OUTBREAK INVESTIGATIONS

DEFINE AN OUTBREAK AND BASIC PROCESS OF OUTBREAK INVESTIGATION

DEFINE PURPOSE OF AN EPI TEAM

DESCRIBE SIGNIFICANCE OF COLLABORATION WITH PARTNERS

Ground Rules & Engagement

Laying the Foundation for Effective Epi Teams

- **8:40 AM - 9:05 AM: Roles and Responsibilities of Epi Team Members**
  - Interactive discussion on defining and understanding the distinct roles within an Epi Team (e.g., team leader, epidemiologist, environmental health, public information, preparedness, laboratorian).
  - Emphasis on collaboration and clear lines of communication.

Who are your Epi Team members?

- **Choose staff who are familiar with the day-to-day activities of your LHD**

- **LHD Staff with expertise in:**
  - **Leadership**
  - **Epidemiology**
  - **Nursing**
  - **Environmental Health**
  - **Preparedness / Planning**
  - **Public information / Health education**
  - **Laboratory**
  - **Administrative Support / Information Technology**

- **For large response / event you also need community partners**

Who are your Epi Team members?

Role	Expertise
Health Director	• **Leadership expertise**
Management	• **Leadership expertise**
Epi / CD Nurse	• **Epidemiology and Nursing Expertise**
Environmental Health Specialist	• **Environmental Health Expertise**
Preparedness Coordinator	• **Preparedness and Planning Expertise**

Who are your Epi Team members?

Public Information Officer
- Public Information and Communication Expertise

Health Educator
- Health Education and Communication Expertise

Laboratorian
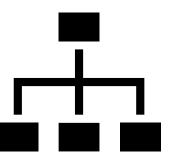- Laboratory Expertise

Administrative Staff
- Administrative Support Expertise

Ancillary Staff
- Subject Matter Area Expertise

Team Member Roles / Functions

Epi Team Leader

- Serves as leadership for the team
- Responsible for :
    - Leading routine meetings and setting meeting agenda
    - Prioritizing and assigning team responsibilities
- During a response:
    - Serving as incident manager
    - Updating and notifying county leadership and state partners
- Role can be filled by:
    - Health Director
    - Deputy Health Director
    - Other Manager position

Team Member Roles / Functions

Epidemiologist
- Serves as epidemiology expert for the team
- Responsible for:
  - Sharing surveillance and baseline disease data
  - Providing updates for ongoing investigations
  - Discussing anticipated threats
- During a response:
  - Maintaining line lists of cases and contacts
  - Providing situation reports on cases and contacts, public health actions taken, and follow-up needed
  - Ensures completeness of data collection
- Role can be filled by:
  - Epidemiologist
  - Communicable Disease Nurse

Team Member Roles / Functions

Nurse
- Serves as nursing expert for the team
- Responsible for:
  - Providing updates for nursing capacity for response
  - Considering standing order needs in preparation for response
  - Discussing management of cases and contacts
- During a response:
  - Interviewing and educating cases and contacts
  - Monitoring for control measure compliance
  - Providing vaccine or medication for PEP
- Role can be filled by:
  - Communicable Disease Nurse
  - Other Public Health Nurse

Team Member Roles / Functions

Environmental Health Specialist
- Serves as expert for environmental and food safety
- Responsible for:
  - Providing updates on environmental complaints (food, private water)
  - Reporting on food recalls, inspection findings
  - Serving as expert on control measures
- During a response:
  - Conducting field investigation, environmental sampling
  - Implementing facility control measures
  - Providing guidance on food safety and engineering regulations
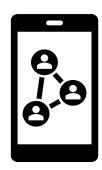- Role can be filled by:
  - Environmental Health Specialist

Team Member Roles / Functions

Preparedness / Planning
- Serves as expert for all-hazard planning and response
- Responsible for:
    - Providing updates on existing all-hazard plans
    - Planning ICS
    - Conducting training for Epi Team response
- During a response:
    - Implementing ICS structure
    - Coordinating with local and state partners for response
    - Providing guidance to team on response plan actions
- Role can be filled by:
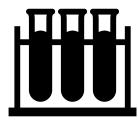   - Preparedness Coordinator

Team Member Roles / Functions

Public Information / Health Education

- Serves as expert for public communications
- Responsible for:
  - Providing updates on LHD public health messaging
  - Developing templates for press releases and educational materials
  - Reviewing and reporting on public alerts or media coverage
- During a response:
  - Prepares and delivers relevant educational materials to providers, partners, and the public
  - Coordinating communications with local and state partners
  - Responds to media inquiries
- Role can be filled by:
  - PIO
  - Health Educator

Team Member Roles / Functions

Laboratory

- Serves as expert for laboratory functions
- Responsible for:
    - Providing updates on LHD lab capacity
    - Reviewing state laboratory guidance
- During a response:
    - Providing guidance on proper specimen collection, packaging, and shipping
    - Coordinating specimen submission
    - Managing specimen supply inventory during response
- Role can be filled by:
    - Laboratorian / Lab Manager
    - Clinical staff with laboratory experience

Team Member Roles / Functions

Administrative
- Serves as expert for agency functions and support
- Responsible for:
  - Creating and distributing meeting schedules and agendas
  - Recording minutes
  - Reporting on LHD response capacity (financial, staffing, building and equipment access)
- During a response:
  - Tracking response expenses (staff overtime, travel, equipment)
  - Ensuring after-hours access to building and equipment
  - Recording response meeting minutes, distributing sit reps
- Role can be filled by:
  - Administrative support specialist
  - Clerical staff

Team Member Roles / Functions

Ancillary support
- Serves as expert for specific subject matter areas
- Responsible for:
  - Offering training to team members
  - Contributing to team planning efforts
- During a response:
  - Offering guidance in area of expertise
  - Supporting team efforts and serving as SME for response
- Role can be filled by:
  - Pharmacist
  - Information Technology
  - School Nurse

Local and State Partners

- Consider who may need to work with your Epi Team during a response:
  - Medical providers and hospital administration
  - School administration and school nurses
  - Local law enforcement and emergency responders
  - Emergency management
  - Corrections facilities
  - Local colleges and universities
  - Housing (shelters, hotels)
  - Public Transportation
  - Others, depending on situation

- **9:05 AM - 9:30 AM: Running Effective Epi Team Meetings**
  - Key components of productive meetings: agenda setting, clear objectives, actionable outcomes, documentation.
  - Introduction to simple tools/templates for meeting management (e.g., a shared meeting agenda template, action item tracker).

Effective Epi Team Meetings

Set a schedule for Epi Team meetings

E.g. the third Thursday of January, April, July, and October

Send meeting invites well in advance to block the time on staff calendars.

Minimum of quarterly meetings is suggested

Have a standard agenda

Include date, time, and location of meeting

List objectives or agenda items and who will be providing the updates

Make room for open discussion or ad hoc agenda items

Use your agenda template to also take meeting minutes. This ensures consistent documentation.

Effective Epi Team Meetings

- **Essential agenda items:**

Epi / CD Updates
- Surveillance data
- Alerts and emerging diseases
- Ongoing CD cases

EH Updates
- Food recalls
- Inspection findings

Lab Updates
- Capacity status
- Local or state processes

Preparedness Updates
- Response plans
- Training topics
- Exercises (tabletop or full-scale)

Effective Epi Team Meetings

- **Essential agenda items:**

Team priorities
- Resource review

Threat Assessment
- Prioritize actions
- Develop plans

Training
- Team education activities
- Practical exercises

Community Partner
- Partner introductions
- Collaboration planning

Other Meeting Elements

Guest speakers

- Hospital based Public Health Epidemiologists
- State consultants
- Community Partners

Regional meetings

- Collaborate with other LHDs
- Training exercises
- Sharing best practices

Health Department Name
Epi Team Meeting Agenda
Date, Time
Location of meeting

Agenda Items	**Responsible Team Member**
Welcome	Team Leader
Section Updates	
• Epi	Epidemiologist / CD Nurse
• Environmental Health	EH Specialist
• Preparedness	Planner / Preparedness Coordinator
• Laboratory	Lab Manager
• Health Ed / Public Information	PIO or Health Educator
• Nursing	Public Health Nurse
• Administrative	Administrative Officer
• Ancillary	IT / Pharmacy, etc.
Epi Team Priorities	Team Leader
Training Plans	Planner / Preparedness Coordinator
Community Partner Updates	Team Leader
Action Items	Team Leader
Other Business	All Team Members
Adjourn	

Ground Rules for Meetings

- Begin and adjourn on time
- Listen attentively
- One speaker at a time
- Stick to task and topic
- Share the floor
- Disagree respectfully

Group Problem Solving Process

Step **1:** Share perceptions

Step 2: Identify issues and interests

Step 3: Set goals

Step 4: Create options

Step **5:** Clarify and evaluate options

Step **6:** Decide together

Project tracker

Percent over/under to highlighted numbers **25%**

SETUP

Project	Assigned to	Estimated start	Estimated finish	Estimated work (in hours)	Estimated duration (in days)	Actual start	Actual finish	Actual work (in hours)	Actual duration (in days)	Notes
Project 1	Employee 1	5/6/2025	7/5/2025	210	59	5/6/2025	7/10/2025	**300**	64	
Project 2	Employee 4	5/30/2025	6/30/2025	400	30	5/30/2025	7/3/2025	390	33	
Project 3	Employee 2	4/1/2025	5/31/2025	500	60	4/1/2025	6/13/2025	500	72	
Project 4	Employee 3	4/11/2025	4/21/2025	250	10	4/11/2025	4/30/2025	276	**19**	
Project 5	Employee 2	4/11/2025	5/21/2025	300	40	4/11/2025	5/27/2025	310	46	
Project 6	Employee 4	5/11/2025	5/21/2025	500	10	5/11/2025	5/26/2025	510	**15**	
Project 7	Employee 1	5/27/2025	6/20/2025	750	23	5/27/2025	6/25/2025	790	28	
Project 8	Employee 1	6/1/2025	7/10/2025	450	39	5/26/2025	7/5/2025	430	39	
Project 9	Employee 1	4/6/2025	4/26/2025	250	20	4/11/2025	4/21/2025	200	**10**	

Project Planner

Select a period to highlight at right. A legend describing the charting follows.

Period Highlight:	1

Legend:
- Plan Duration
- % Complete
- % Complete (beyond plan)
- Actual Start
- Actual (beyond plan)

ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE	PERIODS
						1 2 3 4 5 6 7 8 9 10 11 12 13 16 17
Activity 01	1	5	1	4	25%	
Activity 02	1	6		6	100%	
Activity 03	2	4	2	5	35%	
Activity 04	4	8	4	6	10%	
Activity 05	4	2	4	8	85%	
Activity 06	4	3	4	6	85%	
Activity 07	5	4	5	3	50%	
Activity 08	5	2	5	5	60%	
Activity 09	5	2	5	6	75%	
Activity 10	6	5	6	7	100%	

- **Break: 9:30 AM - 9:45 AM**

Hour 2: Essential Skills & Collaboration (9:45 AM - 10:45 AM)

- **9:45 AM - 10:15 AM: Data Collection and Analysis Tools & Best Practices**
  - Overview of essential data sources and collection methods in outbreak investigations, including considerations for various data types (qualitative, quantitative).
  - Introduction to basic data analysis concepts relevant for Epi Teams (e.g., descriptive epidemiology, visualizing trends, calculating basic rates).
  - Discussion of common software/tools used for data management and preliminary analysis.

Why good data collection matters to you

Garbage in, garbage out.

Data helps support key response decisions such as:

Case definitions, exposure sources, control measures

Data needs to be timely, complete, accurate, consistent and secure.

Line List Essentials

A line list is a table where each case or person of interest is one row. And each row contains important information on that person.

Used to systematically record information

Simple to review, update and summarize

Can be paper or electronic

NC DPH has template examples on the NC CD Manual Outbreak section

Tips!

One row per case!

Number each case with a new number. You can just start from 1.

Line List Essentials

- Identifying information
  - Name, address, phone number, unique identifier

- Demographic information
  - DOB, gender, race, occupation

- Clinical information
  - Date(s) of report and onset of illness, symptoms
  - Laboratory specimen submitted, results

- Exposure / risk factor information
  - Food, water, activities

Identifying Information

First-Name	Last-Name	Street1	City	State	Zip-Code	County	Home-Phone
Ally	Alligator	100 Swamp Lane	Cedar Park	NC	27514	Escambia	111-111-1111
Benjamin	Bear	506 Forest Road	Cedar Park	NC	27514	Escambia	222-222-2222
Carie	Cat	52 House Circle	Cedar Park	NC	27514	Escambia	333-333-3333
Donald	Duck	200 Disney Way	Cedar Park	NC	27514	Escambia	444-444-4444
Emily	Elephant	64 Safari Ave	Cedar Park	NC	27514	Escambia	555-555-5555
Farrah	Fox	182 Tree Farm Road	Cedar Park	NC	27514	Escamb	
Gary	Gorrilla	70 Jungle Drive	Cedar Park	NC	27514	Escamb	
Henry	Horse	300 Farm Court	Cedar Park	NC	27514	Escamb	

Demographic Information

Gender 0=F, 1=M	DOB	Age at Onset	Foodhandler	HCW	Childcare Worker
0	1/2/1986	26	1	0	0
1	12/1/1988	23	0	0	1
0	5/7/1992	19	0	0	1
1	4/4/1973	38	1	0	0
0	6/18/1979	32	0	0	0
0	8/24/1982	30	0	1	0
1	11/25/1981	30	0	0	1
1	9/11/2001	10	0	0	1

Exposure Information

Travel to Escambia County	Ate at Restaurant A	Swam in River B	Attends Day Camp C	Other Exposures
1	0	1	0	lifeguard at River B
1	1	1	0	works at Day Camp C
1	1	0	1	
1	unknown	0	1	works at Restaurant A
1	0	1	0	
1	1	1	0	ate at McDonalds
1	0	unknown	1	shops at Wal-Mart
1	0	unknown	1	

Clinical Information

Date of Report	Date of Onset	Died	Hospitalized	ER Visit	Provider Visit	Vomiting	Diarrhea	Bloody Stools	Fever	Abdominal Cramps
4/14/2012	4/9/2012	0	0	1	0	1	1	1	1	1
4/17/2012	4/11/2012	0	0	1	0	1	1	1	unknown	1
4/23/2012	4/14/2012	0	0	1	0	1	1	1	1	1
4/18/2012	4/7/2012	0	0	0	1	1	1	unknown	1	1
4/27/2012	4/10/2012	0	0	0	1	0	1	0	1	1
4/23/2012	4/14/2012	0	0	0	1	unknown	1	unknown	1	1
4/20/2012	4/13/2012	0	0	0	1	0	1	1	1	1
4/24/2012	4/19/2012	0	1	1	0	1	1	0	unknown	1

Last Few Tips for Line Lists
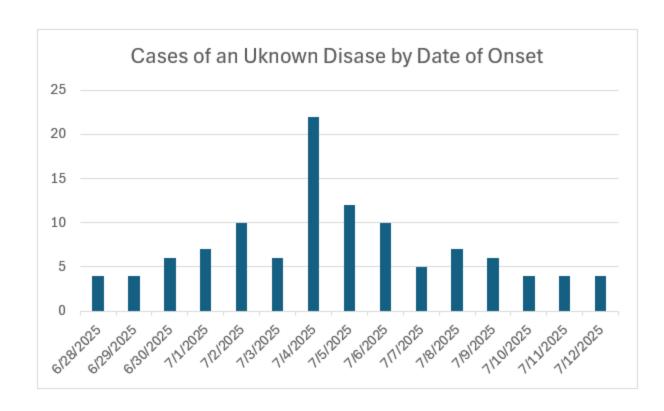
- Designate just a few people to maintain list
- Update case counts regularly

- State may ask you to attach to NC EDSS event (secure); not email (not secure)
- NC EDSS import roster can be used for large outbreaks
  - State staff will do this if needed

Creating an epi curve from a line list

- An epi curve is a bar chart showing how many people first got sick, by day or week, during an outbreak.

Date	Number
6/28/2025	4
6/29/2025	4
6/30/2025	6
7/1/2025	7
7/2/2025	10
7/3/2025	6
7/4/2025	22
7/5/2025	12
7/6/2025	10
7/7/2025	5
7/8/2025	7
7/9/2025	6
7/10/2025	4
7/11/2025	4
7/12/2025	4

Cases of an Uknown Disase by Date of Onset
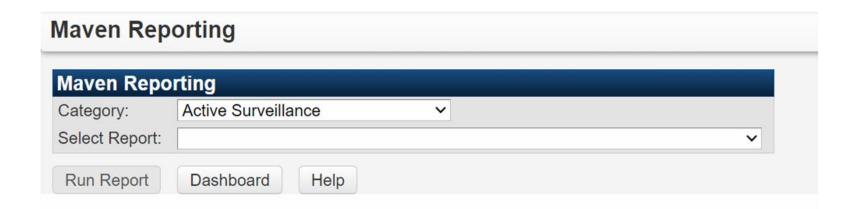
Exporting Data from NC EDSS
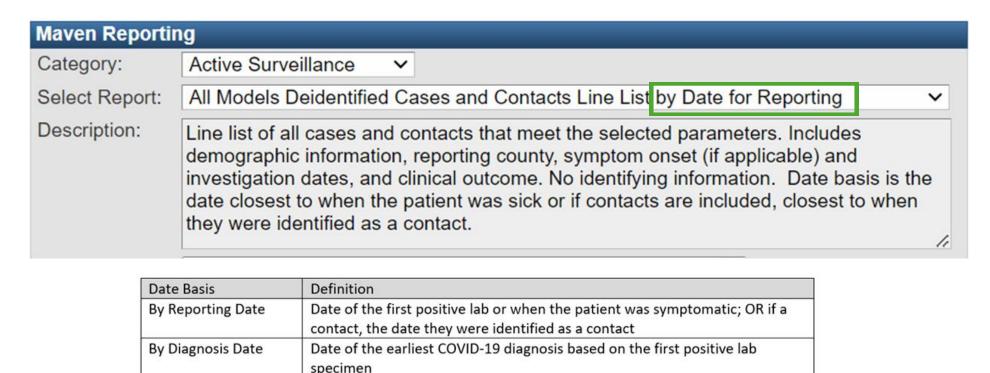
- The Reports icon is located on the toolbar on the homepage

North Carolina Electronic Disease Surveillance System

- The Reports icon takes you to the Maven Reporting screen which allows you to select the 'Category' and 'Report'

Maven Reporting

Maven Reporting

Category: Active Surveillance

Select Report:

Run Report   Dashboard   Help

- The "by" in the report name indicates the criteria by which the report is pulled. Example below is "by Date for Reporting".

Maven Reporting

Category:	Active Surveillance ∨
Select Report:	All Models Deidentified Cases and Contacts Line List by Date for Reporting ∨
Description:	Line list of all cases and contacts that meet the selected parameters. Includes demographic information, reporting county, symptom onset (if applicable) and investigation dates, and clinical outcome. No identifying information. Date basis is the date closest to when the patient was sick or if contacts are included, closest to when they were identified as a contact.

Date Basis	Definition
By Reporting Date	Date of the first positive lab or when the patient was symptomatic; OR if a contact, the date they were identified as a contact
By Diagnosis Date	Date of the earliest COVID-19 diagnosis based on the first positive lab specimen
By Event Create Date	Date the event was first created in NC COVID

- Some Reports contain 'Identified' or 'Deidentified' in the name. Identified denotes that the output DOES contain PII/PHI and Deidentified denotes the output DOES NOT contain PII/PHI
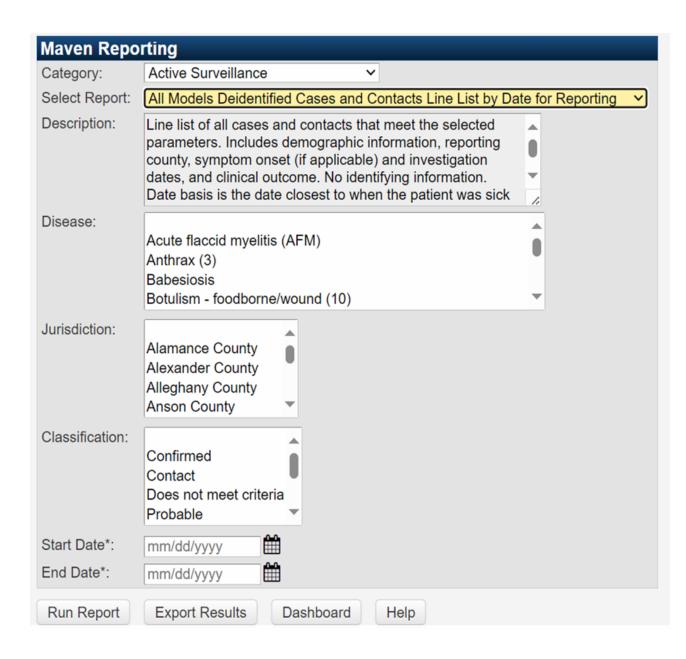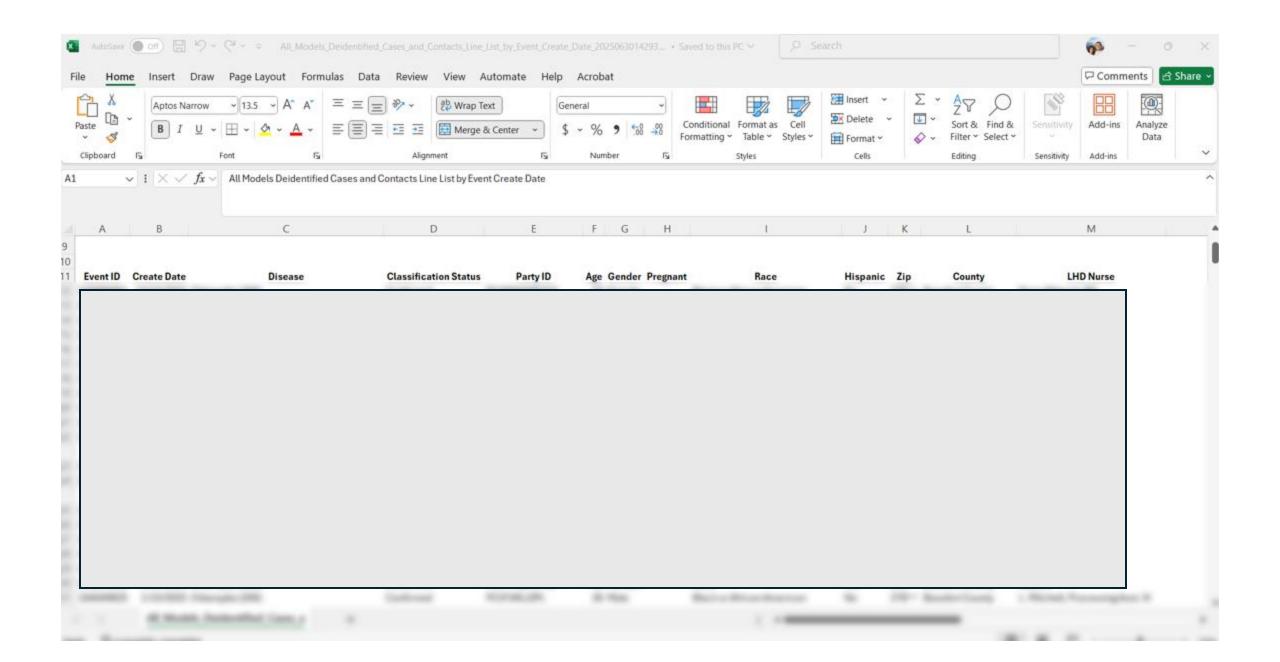
Choosing Report Options

- Choose the disease you would like to show. Hold Ctrl (Control) button to select multiple diseases.

- Choose your county.

- Choose your classification. Usually, to get everybody we select all the options except "does not meet criteria". You can then filter the list more yourself in Excel

- Select your start and end date.

- Select run report to show a webpage. Select Export Results to download an Excel

Notes:
- Run smaller batches at first, so you don't overwhelm the system. Usually, each run should not be more than a few hundred cases

Event ID	Create Date	Disease	Classification Status	Party ID	Age	Gender	Pregnant	Race	Hispanic	Zip	County	LHD Nurse

Strategies for Effective Communication and Collaboration in Public Health

- **10:15 AM - 10:45 AM: Coordination with Internal and External Partners**
  - Strategies for effective communication and collaboration with LHD departments (e.g., Environmental Health, Clinical Services), state public health agencies, healthcare providers, and community organizations.
  - Review of best practices for establishing clear communication channels and information-sharing agreements (e.g., MOUs).
  - Activity: Group discussion on overcoming common coordination challenges.

Strategies for Effective Communication and Collaboration in Public Health: Partnering for Impact

The Importance of Collaboration

Why Collaborate? Enhancing Public Health Outcomes

- Complex health issues require multi-sectoral approaches.
- Leverage diverse expertise and resources.
- Improve reach and impact of health initiatives.
- Build trust and strengthen community relationships.
- Reduce duplication of efforts and optimize resource allocation.

Key Partners in Public Health: Who Are Our Essential Partners?

Key Partners:

Local Health Department (LHD) Departments:

- Environmental Health
- Clinical Services
- Epidemiology

State Public Health Agencies:

- Policy & Guidance
- Resource Allocation
- Surveillance

Healthcare Providers:

- Direct Patient Care
- Health Education
- Early Detection

Community Organizations:

- Trusted Messengers
- Community Needs Assessment
- Program Implementation

Strategies for Effective Communication:
Building Bridges: Communication Strategies

Strategies:

- **Identify Key Messages:** What does your audience *absolutely* need to know? (Playbook, p. 6)

- **Write Clearly:** Use active voice, simple terms, and avoid jargon. (Playbook, p. 9)

- **Tailor to Audience:** Adapt messages to the specific needs and literacy levels of each group. (Playbook, p. 7)

- **Use Multiple Channels:** Employ various methods (e.g., emails, presentations, social media) to reach diverse partners. (Playbook, p. 82)

- **Be Transparent:** Openly share information, even when you don't have all the answers. (Playbook, p. 29)

Best Practices for Information Sharing:
Facilitating Flow: Information-Sharing Best Practices

Best Practices:

- **Establish Clear Communication Channels:** Define preferred methods and frequency of communication.

- **Formal Agreements (e.g., MOUs):** Outline roles, responsibilities, data sharing protocols, and confidentiality.

- **Regular Meetings/Check-ins:** Foster ongoing dialogue and problem-solving.

- **Shared Platforms/Tools:** Utilize common systems for document sharing and project management.

- **Feedback Mechanisms:** Create avenues for partners to provide input and suggest improvements.

Activity: Overcoming Coordination Challenges: Group Discussion: Navigating Coordination Challenges

What are some common challenges you've faced in inter-agency or inter-organizational coordination?

How have you successfully overcome these challenges in the past?

What strategies from today's presentation could help address these challenges?

What new ideas or approaches can we brainstorm together?

Key Takeaways:
Building Stronger Public Health Partnerships

Key Takeaways

Collaboration is essential for addressing complex public health issues.

Tailored, clear communication is the foundation of effective partnerships.

Formal agreements and consistent engagement strengthen information sharing.

Proactive problem-solving and open dialogue are crucial for success.

- **Break: 10:45 AM - 11:00 AM**

Hour 3: Communication & Application (11:00 AM - 12:00 PM)

- **11:00 AM - 11:20 AM: Introduction to Risk Communication Strategies**
  - Principles of effective risk communication during public health emergencies (e.g., transparency, empathy, timeliness, accuracy, tailoring messages to different audiences).
  - Brief examples of effective and less effective risk communication from past events.
  - Practical tips for crafting clear and concise messages for the public and stakeholders.
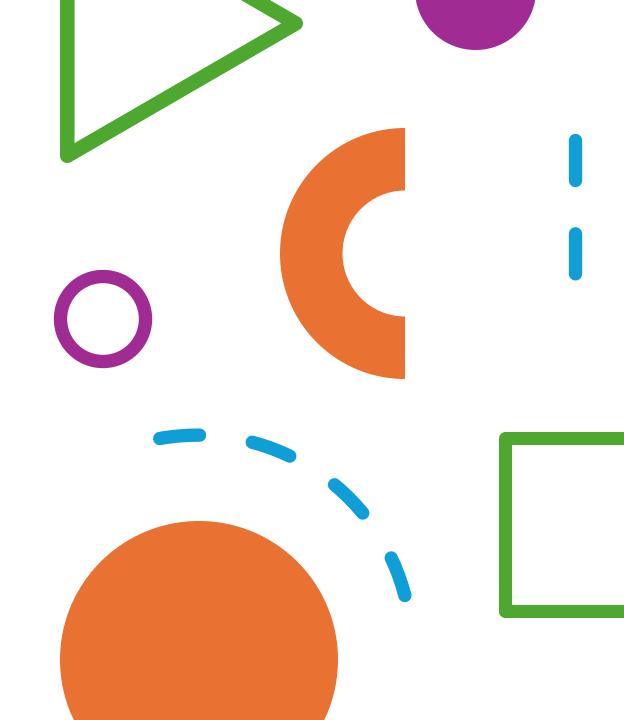
- **Building Bridges: A Strategic Guide to Media Relations for Health Departments**
  - *Your Partner in Public Health Communication*

Why Media Relations Matters

- Raise awareness and educate the public

- Promote healthy behaviors and new initiatives

- Influence public health outcomes

- Build trust and establish your department as the go-to source for health information

- Counter misinformation and disinformation

Building Your Foundation: The Essentials

Media Contact List: A curated list of journalists, editors, and producers (local and relevant beats).

Press Release Templates: Standardized formats for consistency and speed.

Media Pitch Guidelines: Best practices for crafting compelling story ideas.

Spokesperson Roster: A list of trained experts ready to speak on various topics.

Crisis Communication Plan: A clear protocol for managing emergencies.

The Art of the Pitch: Getting Their Attention

Know Your Audience: Research the reporter's beat and recent work.

Craft a Compelling Angle: What makes your story unique, timely, or newsworthy?

Keep it Concise: Be brief and get to the point quickly.
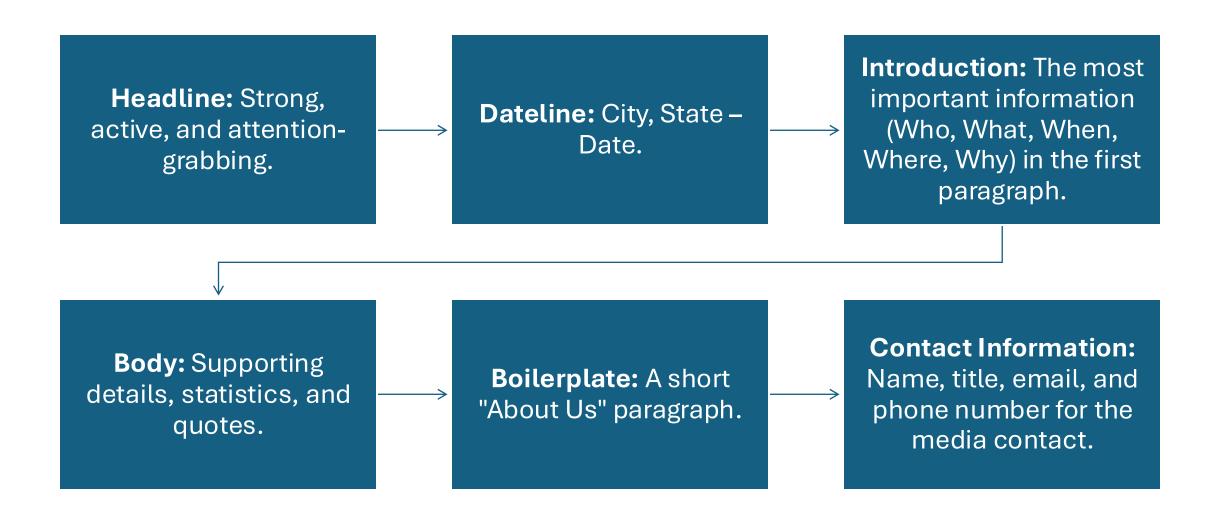
Personalize Your Pitch: Address the reporter by name and reference their work.

Provide Value: Offer an exclusive, an expert interview, or high-quality data.

Crafting the Perfect Press Release

Headline: Strong, active, and attention-grabbing.

Dateline: City, State – Date.

Introduction: The most important information (Who, What, When, Where, Why) in the first paragraph.

Body: Supporting details, statistics, and quotes.

Boilerplate: A short "About Us" paragraph.

Contact Information: Name, title, email, and phone number for the media contact.

Becoming a Trusted Source

Be Responsive: Answer calls and emails promptly.

Be Reliable: Provide accurate, timely information.

Be a Resource: If you don't have the answer, connect them with someone who does.

Respect Deadlines: Understand the pressures of the news cycle.

Say Thank You: Acknowledge their work and show appreciation for fair coverage.

Preparing Your Spokesperson

Identify the Right Person: Choose someone with deep knowledge and good communication skills.

Provide Media Training: Teach them how to stay on message, bridge to key points, and avoid jargon.

Develop Key Talking Points: Prepare 3-4 clear, concise messages for them to deliver.

Conduct Mock Interviews: Practice helps build confidence and refine delivery.
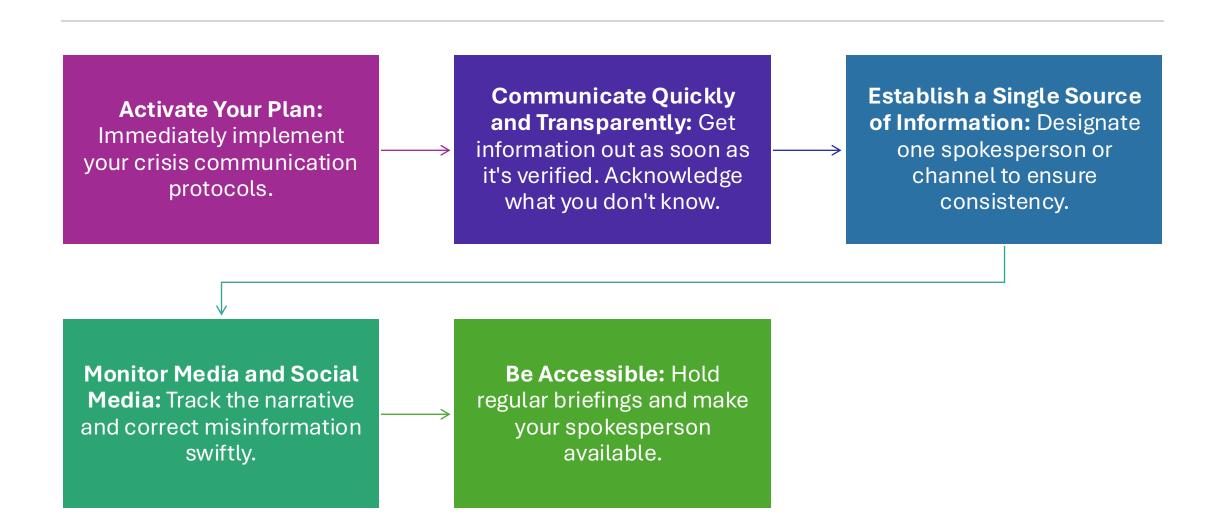
Provide Background: Ensure they know the reporter's name, outlet, and the topic of the interview.

Navigating a Crisis

Activate Your Plan: Immediately implement your crisis communication protocols.

Communicate Quickly and Transparently: Get information out as soon as it's verified. Acknowledge what you don't know.

Establish a Single Source of Information: Designate one spokesperson or channel to ensure consistency.

Monitor Media and Social Media: Track the narrative and correct misinformation swiftly.

Be Accessible: Hold regular briefings and make your spokesperson available.

Leveraging Social & Digital Media

Integrate Your Efforts: Your social media and traditional media strategies should complement each other.

Share Your Coverage: Promote positive media stories on your own channels.

Engage with Journalists Online: Build relationships by following and interacting with reporters on platforms like X (formerly Twitter).

Create Sharable Content: Develop infographics, short videos, and fact sheets that are easy for media and the public to use and share.

Conducting Outbreak Investigations - Key Steps and Team Integration
11:20 AM - 12:00 PM

- A deeper dive into the critical steps in an outbreak investigation (detection, confirmation, case finding, hypothesis generation, analytical studies, control measures, communication, evaluation).

- Highlighting how various Epi Team roles contribute to each stage of the investigation.

- Readiness Exercise

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES
Division of Public Health

Steps of an Outbreak Investigation: Back to Basics

Communicable Disease Branch
North Carolina Division of Public Health

July 2025

Justin Albertson & Megan Davies

Reasons to Investigate an Outbreak

- **END THE OUTBREAK**
- Identify, describe the source
- Identify populations at risk
- Develop strategies to prevent future outbreaks
- Evaluate existing prevention strategies
- Describe new diseases, learn more about known diseases
- Opportunity to educate public about disease prevention
- Address public concern

https://epi.dph.ncdhhs.gov/cd/figures.html#outbreaks

Principles of Outbreak Investigations

- Be systematic
  - Follow the same steps for every type of outbreak
  - Write down case definitions
  - Ask the same questions of everybody

- Stop often to re-assess what you know
  - Line list and epidemic curve provide valuable information; many investigations never go past this point
  - Consider control measures to be applied

- Coordinate with partners (e.g., environmental)

10 Steps
of an
Outbreak Investigation

1. Identify investigation team and resources

2. Establish existence of an outbreak

3. Verify the diagnosis

4. Construct case definition

5. Find cases systematically/ develop line list

6. Perform descriptive epi/ develop hypotheses

7. Evaluate hypotheses/ perform additional studies (if needed)

8. Implement control measures

9. Communicate findings

10. Maintain surveillance

Implement Control Measures

Start at any time during the outbreak

Adapt as needed throughout

Examples – isolating, cohorting, product recall

Should be guided by epidemiologic results in conjunction with environmental investigation

Balance between preventing further disease and protecting reputation of institutions

Identify Investigation Team and Resources

- Local Epi Team
  - Important to plan, train, and exercise
  - After-action reviews
- Early "heads up" and maintain situational awareness
- Resources include internal and external partners, including DPH

What is an outbreak?

Increase in cases above what is expected in that population in that area

Occurrence of 2 or more 'epi-linked' cases

Example:
Outbreak or Not

Single case of acute hepatitis A in food handler?

Seven cases of pertussis in a community in December?
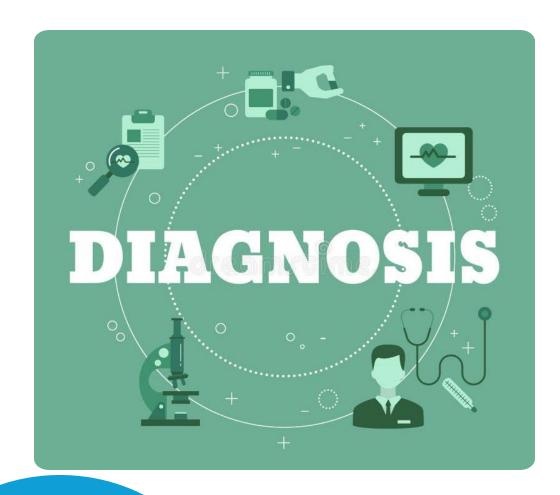
One case of acute GI illness in individual after eating at Diner A?

Thirty cases of acute GI illness after eating at church picnic?

One case of smallpox?

Verify the Diagnosis

Confirm:

- Clinical signs
- Clinical symptoms
- Test results

Reduce diagnostic error

- Confirm symptoms were reported accurately
- Confirm appropriate lab tests were performed
- For rare conditions, educate clinicians

Verify the Diagnosis

Obtain medical records, laboratory reports

Hospital-based Public Health Epidemiologists (PHEs) and hospital Infection Prevention Programs can be very helpful

Interview patients or their proxies

If needed:

Recommend/conduct clinical testing

Collect specimens

Hold specimens

Consult with DPH CDB, SLPH

In conjunction with CDB, request NCSLPH to perform bacteriologic, virologic, other testing

Construct Case Definition

CONSTRUCTING A CASE DEFINITION IS A TEAM SPORT

INVOLVE THE CDB SUBJECT MATTER EXPERT (SME)

"Friends don't let friends construct case definitions alone!"

A case definition allows a simple, uniform way to identify cases

"Standardizes" the investigation

Unique to outbreak but is based on objective criteria (person, place, & time)

Can be broad or narrow, often adjusted as investigation progresses

Broad (Sensitive) early in investigation

Narrow (Specific) as more information is obtained

Case Finding

Cast a broad net

Use your networks

Be creative

Active Case Finding

- Phone calls to clinical partners
- Healthcare facilities
- Practitioners in your community
- Laboratories

- Ask cases if they know of other ill people

Passive Case Finding

- Review surveillance data

- Blast fax, Press release, Epi-X

- Trusted leaders in the community can educate & encourage self-reporting illness

- People might spontaneously self-report illness

- Consider a call center or dedicated call line

Develop Line List

CDB IS HERE TO HELP

WE HAVE TEMPLATES

IF YOU'VE EVER PLANNED A PARTY, YOU KNOW HOW TO DO THIS!

Examples of Line Lists

Perform Descriptive Epidemiology

WHO, WHAT, WHERE, & WHEN
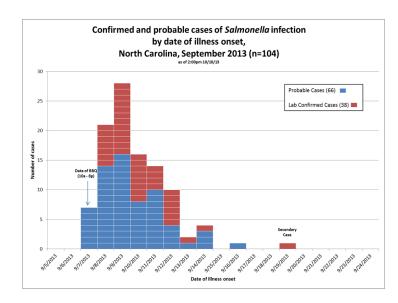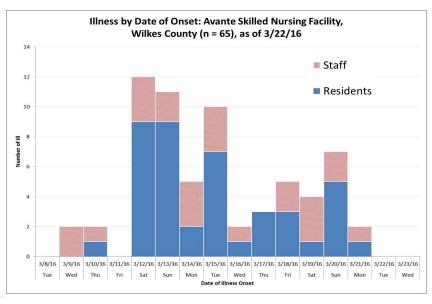
AKA, PERSON, PLACE & TIME

INVOLVE THE CDB SME…please, we love this stuff!

- "What" – Outbreak cases
  - Use the outbreak case definition
  - Everything you need should be in your line list

- "Who" – Person
  - Demographics (age, gender, race, other)
  - Exposures

- "Where" – Place
  - Spot maps

- "When" – Time
  - Epi curves

Epidemic 'Epi' Curve

- Visual representation of
    - Ill persons (cases) over time
    - Magnitude of outbreak
    - Number of cases on the vertical (y) axis
    - Time period (or date of illness onset) on the horizontal (x) axis
    - Type of outbreak
        - Point source
        - Propagated (person-to-person)
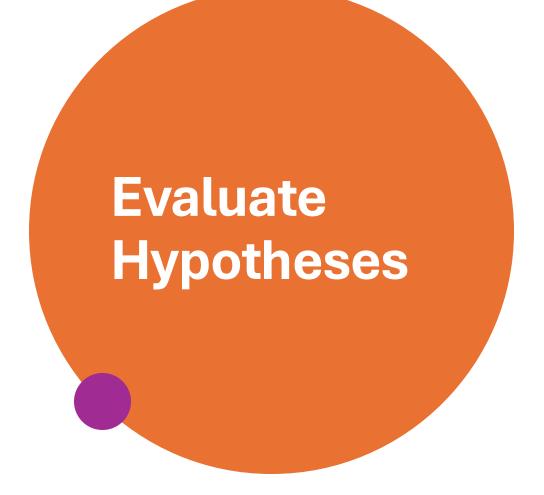- How to make an epi curve
    - Call CDB!

Confirmed and probable cases of *Salmonella* infection by date of illness onset, North Carolina, September 2013 (n=104)

Illness by Date of Onset: Avante Skilled Nursing Facility, Wilkes County (n = 65), as of 3/22/16

Environmental Inspection and Investigation

- Guided by pathogen and setting
- Review prior inspections, routine or otherwise
- Outbreak specific inspection
- Special studies
    - Guided by epidemiology and environmental inspection findings
    - Environmental sampling
        - WHAT WILL WE DO WITH THE RESULTS?
        - DOES IT CHANGE ANYTHING PUBLIC HEALTH DOES TO CONTROL THE OUTBREAK?
        - WHAT WOULD BE THE REMEDIATION?
        - WHAT MIGHT BE THE UNINTENDED CONSEQUENCES?

Evaluate Hypotheses

- Two methods:
  - Compare hypothesis with established facts
    - In most outbreaks, this is sufficient
  - Perform additional studies (e.g., analytic)
    - Cohort or case-control
    - Assess exposures equally among ill and non-ill persons

Implement Control Measures

- Start at any time during the outbreak
- Adapt as needed throughout
- Examples – isolating, cohorting, product recall
- Should be guided by epidemiologic results in conjunction with environmental investigation
- Balance between preventing further disease and protecting reputation of institutions

Communicate Findings

- **Public and Media:**
  - Single member of team should interact with media, communicate progress and findings
  - Media attention desirable if public action is needed
  - Response to media attention important to address public concerns about outbreak
  - Opportunity to educate community
  - Single overriding communication objective (SOCO)
  - Results of investigations are public record...as is everything else to do with the investigation (e.g., emails, meeting notes, communications to partners, recommendations to the public and businesses)

  - Public and press are unaware of most outbreak investigations

Maintain Surveillance

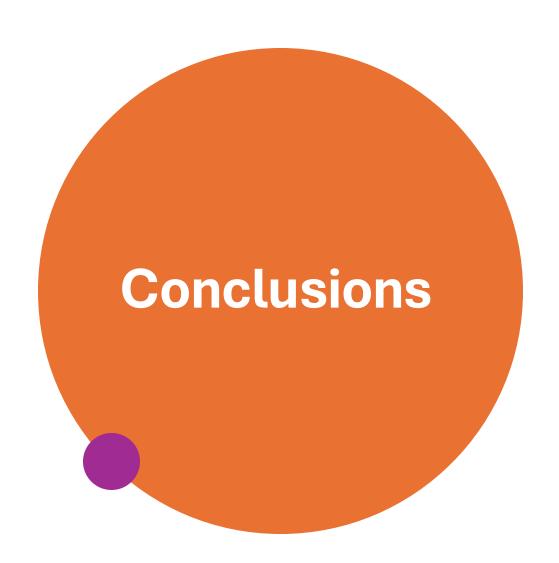To determine that the outbreak really is over

To ensure secondary outbreak is not occurring

Evaluate / document effectiveness of control measures

It is recommended to maintain surveillance for 2 average incubation periods following the last date of illness onset

Conclusions

Epidemiologic investigations are essential to determine the source of outbreaks. Environmental investigations are a vital part of investigations and should be done with (not instead of) epidemiologic investigations

- Be systematic!

- Follow the steps of an outbreak investigation!

- Communicate, communicate, communicate!

Final 30 Minutes: Practical Application & Wrap-Up

- **12:00 PM - 12:20 PM: Group Discussion**
  - Facilitated discussion applying learned strategies related (e.g., measles outbreak) to the roles, data analysis, and communication strategies discussed.
  - Encourage participants to think about challenges and potential solutions in a real-world context.

Discussion Activity: Navigating a Measles Outbreak

Applying Our Strategies in a Real-World Context

Scenario: The Suspected Measles Outbreak

- **Background:**
- A local pediatrician reports 3 unvaccinated children from the same daycare with fever, rash, and cough.
- Initial lab tests are pending but highly suggestive of measles.
- The daycare has ~50 children and 10 staff; vaccination records are incomplete.
- News of a potential measles case is starting to circulate on local social media.
- **Initial Challenges:**
- Rapid contact tracing is needed.
- Public anxiety is rising.
- Need for clear, consistent messaging to parents, healthcare providers, and the wider community.
- Ensuring timely vaccination recommendations and access.

Discussion Point 1: Defining Roles in the Outbreak Response

Key Questions:

Based on the Epi Team roles we discussed (Leader, Epidemiologist, Nurse, Environmental Health, PIO, etc.), which roles are immediately critical in this measles outbreak scenario?

How would you ensure these team members understand their specific responsibilities and avoid duplication of effort (e.g., multiple calls to the same family)?

What pre-outbreak planning (e.g., designated primary contacts, communication trees) could have streamlined role activation?

Discussion Point 3: Crafting and Delivering Effective Messages

Key Questions:

- Who are your primary audiences for communication in this scenario (e.g., daycare parents, general public, healthcare providers, local media)?

- What are the top 2-3 'key messages' you would want to convey to each of these audiences, and how would you tailor them?

- What 'clear communication channels' (e.g., press release, social media, direct parent letters, healthcare provider alerts) would you use, and why?

- How would you address the social media chatter and potential misinformation quickly and transparently?

Discussion Point 4: Overcoming Coordination Challenges

Key Questions:

What are the biggest coordination challenges you anticipate in this measles outbreak scenario (e.g., inter-departmental, state-local, public-private)?

Drawing from our discussion on 'best practices for information sharing' (e.g., MOUs, regular check-ins), what specific solutions would you implement to overcome these challenges?

How would you ensure 'proactive problem-solving and open dialogue' within your team and with external partners as the outbreak evolves?

What role does 'trust' play in successfully navigating these coordination complexities, and how do you build/maintain it during a crisis?

Concluding Thoughts & Next Steps

Key Takeaways:

Effective communication and collaboration are the bedrock of successful outbreak response.

Pre-planning and clear roles are vital.

Real-time, shared data platforms are essential.

Tailored, transparent messaging builds public trust.

Call to Action:

Identify one strategy you will implement or strengthen in your own work/team.

Continue the dialogue: share best practices and challenges with your peers.

- **12:20 PM - 12:30 PM: Q&A, Next Steps, and Feedback**
  - Open forum for final questions and discussion.
  - Discuss possibilities for future trainings, including virtual/hybrid options and deeper dives into specific topics identified in the survey.
  - Gather feedback on the training via evaluation survey to inform future development.

- Thank you!