Introduction to Enteric (Gastrointestinal Illness) Disease Case Investigations

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Learning Objectives

Following this presentation, participants should understand:

• Goals of enteric case investigations
• How to prepare for and conduct an enteric disease case interview
• How to complete MAVEN question packages for enteric disease events
• When and how to create a MAVEN Foodborne Illness (FBI) Complaint
• When to restrict a case who is a food handler
• How data from case investigations are used to detect and investigate outbreaks
Resources

• Foodborne illness information for healthcare and public health professionals
  • Guide to Surveillance, Reporting, and Control *Disease-specific case investigation guidance*
  • Summary of Reportable Diseases, Surveillance, and Isolation and Quarantine Requirements (105 CMR 300) *Regulations related to reporting requirements and exclusion of food handlers*
  • Foodborne Illness Investigation and Control Manual *Guidance on food handler exclusion*
  • Infection Prevention in Long Term Care: Gastrointestinal Disease *Long term care-specific guidance*

• Foodborne Illness (FBI) Complaint Tip Sheet *When and how to create an FBI complaint*
• CDC’s Foodborne Home Page *Additional disease-specific information*
• CDC’s How to Prevent Food Poisoning *Food safety guidance*
• CDC’s Foods That Can Cause Food Poisoning
• Video: Foodborne Interview Techniques
Enteric Disease Overview

- Enteric infections are caused by bacteria, viruses, parasites, and toxins that usually enter the body through the mouth and cause gastrointestinal illness.

- They can be acquired through:
  - Contaminated food or water
  - Contact with animals, their food, or their environments
  - Contact with the feces of an infected person

- Reportable enteric diseases that may require routine or immediate LBOH follow up:

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Viral</th>
<th>Parasitic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botulism</td>
<td>Hepatitis A</td>
<td>Amebiasis</td>
</tr>
<tr>
<td>Campylobacteriosis</td>
<td>Shigellois</td>
<td>Cryptosporidiosis</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>Typhoid Fever</td>
<td>Cyclosporiasis</td>
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<tr>
<td>Shiga toxin-producing \textit{E.coli} (STEC)</td>
<td>Norovirus</td>
<td>Giardiasis</td>
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</tbody>
</table>
Enteric Disease in Massachusetts

Five-year Average of Probable and Confirmed Reportable Enteric Disease Cases, 2017-2021

- Campylobacteriosis: 1442
- Salmonellosis: 1045
- Giardiasis: 459
- Norovirus: 428
- Shigellosis: 187
- Cryptosporidiosis: 177
- Hepatitis A: 134
- STEC: 119
- Vibrios: 82
- Cyclosporiasis: 66

*All reportable enteric diseases with <50 cases were not included. Typhoid fever cases were included in the salmonellosis case count. Massachusetts Department of Public Health, Bureau of Infectious Disease and Laboratory Sciences. Data are current as of 5/18/2022 and may be subject to change.
Goals of Enteric Disease Case Interviews

- To collect clinical information to understand illness severity trends
- To collect exposure information to support the identification of clusters
- To identify case-patients and their household contacts who work in high-risk settings (e.g., food handlers, childcare workers, healthcare workers)
- To provide prevention information to case-patients to protect themselves and others from future infections
Prior to Contacting Case-Patient

- Familiarize yourself with the disease
  - Incubation period, symptoms, high risk foods, prevention
    - Resource: Guide to Surveillance
  - Food handler exclusion requirements (for case & household contacts)
    - Resource: Summary of 105 CMR 300

- Review demographic and laboratory information
  - Age, race, address
  - Specimen source, pathogen identified
Prior to Contacting Case-Patient

• Review the Question Packages
• Note: Document as much as possible in the MAVEN question packages (QP). The notes section of MAVEN is for tracking interview progress and for any information that does not fit in the question packages
Contacting the Ordering Provider

• Ordering provider information is in the “Labs” tab
  • Double click on a lab result to open it, scroll down to “Ordering Provider”
  • If provider’s address is a hospital then call the hospital’s Infection Preventionist
    • Resource: Infection Preventionist Contact List in Maven Help under “Infection Preventionist Resources”
Contacting the Ordering Provider

• Ask to speak to a nurse or doctor who can provide additional clinical information regarding the positive lab result that was reported to you
  • Resource: HIPAA memo for LBOHs in Maven Help under “HIPAA Documents”
• Ask doctor or nurse all missing demographic (i.e., occupation, race, etc.) questions, as well as and clinical questions
• Ask if the case-patient recently traveled or there were any exposures of note
• Ask if the case-patient has been informed of their diagnosis
• Confirm the case-patient’s contact information. Update MAVEN event with additional phone numbers or corrections to existing information.
• Make sure information collected is appropriately documented in the Demographic, Clinical and Risk/Exposure/Control & Prevention Question Packages
Interviewing Case-Patient: Demographic Question Package

• Introduce yourself and explain why you are calling, what you will use info for, and who has access to the info
• Try to conduct interview during first contact, but if necessary, schedule a time and date for interview
• Complete missing demographic fields including occupation, employer information, and race/ethnicity
• Enter all information into the appropriate fields in the Demographic Question Package
Interviewing Case-Patient: Clinical Question Package

- Confirm the **onset date** and symptoms with the case-patient
- Ideally, do not leave clinical variables blank
  - If the case-patient does not recall a symptom select “Unknown”
- If the case-patient experienced other symptoms (e.g., those who only had UTI symptoms), document the symptoms in the “Other symptoms (specify)” field
Interviewing Case-Patient: Risk/Exposure/Control & Prevention Question Package

• Determine time period of interest
  • If not outlined in the MAVEN Risk question package, use the pathogen’s incubation period
  • Resource: Guide to Surveillance

• Recommend they look at a calendar and check online bank and credit card statements for grocery store purchase dates/restaurant outings

• If unable to recall food history, ask them to answer the questions based on what they typically eat
Interviewing Case-Patient: Risk/Exposure/Control & Prevention Question Package

• Traveled outside of the United States for the entirety of time period of interest
  • Collect information regarding food handler status, food handler status of close contacts, association with a supervised care setting, and where they went and where they stayed (e.g. name of the Caribbean resort). No additional information needs to be collected
  • If they spent part of the time in another country, then ask about their exposures for the time period of interest spent in the United States

• Infants that are not eating solid food
  • Often exposed through environmental contamination in the household, or secondary transmission from a household member or caregiver
Interviewing Case-Patient:
Risk/Exposure/Control & Prevention Question Package

- Complete questions regarding animal contact and exposure to pet food and treats
  - Backyard poultry, hedgehogs, bearded dragons, turtles, tree frogs, and more have caused enteric outbreaks
  - Pet food, treats, and chews have also been implicated, including frozen mice fed to snakes, chicken feed, and dehydrated dog treats

![Image of interview questions]

Any animal contact?
Yes

Please specify:
- Backyard chickens, two pot dogs

Handle pet food, pet treats, or chews (e.g. pig ears, rawhide chews)?
Yes

Specify type of pet food:
- Blue Buffalo, pig ears, pup-aroni treats
Interviewing Case-Patient: Risk/Exposure/Control & Prevention Question Package

• Document information in the text fields appropriately:

![Food History Questions]

Please respond to the following questions about where food was purchased that you ate during the 7-day recall period:

- List locations, dates, and items consumed for foods eaten away from home (i.e., restaurants, catered events):
  - Restaurant A, Town Name Where Restaurant is Located, Date, Food Items Consumed
  - Restaurant B, Town Name Where Restaurant is Located, Date, Food Items Consumed

- List purchase locations for all foods eaten at home (i.e., grocery stores, warehouse stores, farmers markets):
  - Store A, Town Name Where Store is Located

Enter exposure information in a clear format such as this to ensure it can be used for cluster detection.
Special Situations: Food Handler Exclusion

- Individuals meeting the 105 CMR 300 definition of a “food handler” must be restricted from food handling duties until outlined criteria are met
  - Ex. Producing one or more negative stool specimens >48 hours after completing antimicrobial therapy)
- Very generally, a food handler is someone who, in a paid or unpaid position, handles anything* that goes into someone else’s mouth, or puts their actual hands in someone’s mouth.
  - *This can include food, clean dishes and utensils, medication, medical equipment, etc.

Examples of roles that are generally considered to have food handling duties

<table>
<thead>
<tr>
<th>Always</th>
<th>Most of the time</th>
<th>Sometimes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cook/food prep worker</td>
<td>Food establishment manager</td>
<td>Physician</td>
</tr>
<tr>
<td>Bartender</td>
<td>Grocery store worker</td>
<td>Physician assistant</td>
</tr>
<tr>
<td>Waiter/waitress</td>
<td>Food processing plant worker</td>
<td>Nurse</td>
</tr>
<tr>
<td>Childcare worker</td>
<td>Host/hostess</td>
<td>Health aide</td>
</tr>
<tr>
<td>Dentist</td>
<td>Paramedic/EMT</td>
<td></td>
</tr>
<tr>
<td>Dental hygienist</td>
<td>Pharmacist</td>
<td></td>
</tr>
<tr>
<td>Dishwasher</td>
<td></td>
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</tbody>
</table>
Special Situations: Food Handler Exclusion

• If a case-patient meets the definition of a food handler:
  1. Identify if case-patient worked in a food handling capacity while symptomatic
  2. Exclude from work
     • Resource: Summary of 105 CMR 300
  3. Inform case-patient of return-to-work criteria
  4. Notify employer that case-patient can’t return to food handling duties. This generally can be done without disclosing diagnosis
     • Resource: Foodborne Illness Control Manual: Chapter 8, When there are Sick Food Employees
  5. Ensure criteria have been met prior to clearing for return to work
  6. Document in MAVEN

Exclusion: when a case-patient is legally required to be restricted from food handling duties until return-to-work criteria are met

Clearance: when exclusion is lifted after return-to-work criteria is met by the case-patient
Case-patient’s MAVEN event can be shared with LBOH of workplace

- Go to menu on the left of case’s event and select “Share Event”

Document foodhandler exclusion in Risk Question Package
Foodhandler Exclusion Tips

• An individual is still considered a food handler if wearing gloves
• A letter from a case’s medical provider does not replace the need to meet clearance criteria outlined in 105 CMR 300
• Minimally necessary information should be relayed to an employer to protect patient confidentiality
• Clearance stool specimens are still required for food handlers whose initial infection was detected from a non-stool source (e.g., urine, blood)
• Regulations do not specify the type of test that should be performed for clearance testing, only that a stool specimen needs to be negative. Culture independent diagnostic tests (non-culture tests, ex. PCR test) can detect dead genetic material for a prolonged period, even after an individual is no longer infectious
**Special Situations: Daycare/School Attendee**

- If parent/guardian of a case-patient reports that they attend daycare or school:
  - Resource: “Daycare” and “School” sections of the [Guide to Surveillance](#) for exclusion recommendations

**Special Situations: Long Term Care Resident**

- If a case-patient is a long term care resident:
  - Resource: [Infection Prevention in Long Term Care: Gastrointestinal Disease](#)
  - Supplement case-patient interview with a call to the Director of Nursing or administrator for the facility to gather meal information and advise on infection control measures
    - Residents with gastrointestinal symptoms should be placed on standard plus contact precautions for the duration of their illness; those with a bacterial or parasitic infection should remain on precautions until a negative stool specimen is produced.
Foodborne Illness (FBI) Complaints: Overview

- Foodborne Illness (FBI) Complaint events are:
  - Independent from a case-patient’s disease event
  - Created in MAVEN to document the foods and drinks consumed by an individual prior to onset of gastrointestinal illness symptoms associated with a diagnosed or undiagnosed disease
  - Used to communicate food exposures between individuals conducting case interviews and those who permit or license implicated food establishments
  - Used to monitor trends in illness across Massachusetts and for outbreak detection
  - Reviewed by MDPH’s Food Protection Program (FPP) and forwarded to the appropriate jurisdiction (in-state or out-of-state) when warranted.
Foodborne Illness (FBI) Complaints: When to Create One Following Enteric Case Interview

• When case-patient interview identifies that, during their incubation period, the individual:
  • Ate food away from home (restaurant, event, etc.)
  • Ate a food consistent with the pathogen at home, even if the food was improperly prepared
  • Handled a locally produced pet food or pet treat
• Always create an FBI Complaint when an individual reports consuming unpasteurized milk, unpasteurized and unaged cheese, unpasteurized juice/cider, or raw seafood or shellfish
• For all, sufficient details regarding name of food product or establishment, location, foods consumed, and dates of consumption are needed.
Foodborne Illness (FBI) Complaints: Tips/Resources

- Create FBI Complaints **immediately** after your case-patient interview is complete so appropriate follow up with the establishment can be conducted.
- Create FBI Complaints for suspect in-state AND out-of-state exposures:
  - MDPH will forward out-of-state exposures to the appropriate jurisdiction.
  - FBI Complaints typically do not need to be created for exposures that occurred outside of the country.
- For more information on foods commonly associated with various diseases refer to:
  - Diagnosis and Management of Foodborne Illnesses
  - CDC: Foods That Can Cause Food Poisoning
  - FDA: What You Need to Know about Foodborne Illnesses
Foodborne Illness (FBI) Complaints: How to Create One Following Enteric Case Interview

- How to create an FBI Complaint Tip Sheet:
  - Resource: [FBI Complaint Tip Sheet](#) in Maven Help under ‘Foodborne and Enteric Disease’
- Isn’t this repetitive? The food history is in the case’s event, why do I need to do this?!
  - YES, it is. FBI Complaints identify higher risk exposures reported by cases and are used to share only pertinent case details to regulatory authorities for further follow up (Food Protection Program, local health inspectors in another jurisdiction, other states).
- MDPH is pursuing ways to streamline the creation of FBI Complaints associated with an enteric disease event
- Refer to FBI Complaint Tip Sheet for suggestions on how to speed up process
Cluster Detection Tools

• LBOH notification to MDPH
  • Suspected clusters or outbreaks of enteric illness is immediately reportable by the LBOH to MDPH
  • Definition of cluster: An increase in the usual frequency of illness in a given area or among a specific population over a particular period of time
    • Examples:
      • Multiple undiagnosed individuals reporting GI illness after event of shared dining experience
      • More than one case of campylobacteriosis reporting dining at the same restaurant during their incubation period
  • Notify MDPH at 617-983-6800
  • Resource: MAVEN ePostcard
Cluster Detection Tools

• Whole Genome Sequencing
  • DNA fingerprints of bacteria are compared to one another to identify those that are closely related within MA and nationally, and therefore more likely to have resulted from a common exposure

• Case Review
  • MDPH epidemiologists review all case information collected by LBOHs to identify shared exposures

• FBI Complaints
  • FPP reviews all complaints and identifies establishments reported multiple times

• Routine analysis of MAVEN data
  • Free Text Report: Analyzes all risk and exposure free text data from MAVEN in a certain time period and flags words that were mentioned more frequently than usual
  • Monthly Enteric Report: Analyzes frequency of cases reported by disease type and city/town over time to detect unusual increases warranting further follow up

• SaTScan
  • Software used to identify cases clustered geographically and temporally
Contact Information

• **Epidemiology Program**  
  617-983-6800
  
  Call with questions related to:
  • Reportable disease investigations
  • Definition of a food handler in any setting
  • Infection control recommendations for high-risk settings

  Notify Epi Program about:
  • Potential clusters or outbreaks (any setting), diagnosed or undiagnosed

• **Food Protection Program**  
  617-983-6712
  
  Call with questions related to:
  • Definition of a food handler in food settings
  • Working with a retail food establishment to restrict a food handler
  • Inspections

  Notify FPP about:
  • Food safety complaints
  • Potential clusters or outbreaks (food establishment), diagnosed or undiagnosed
Q&A