

FOCUS AREA 7

WORKSHEET:

Epidemiology Investigation

Complete this worksheet if “epidemiology investigation” is a high-priority Focus Area for efforts to improve foodborne disease outbreak-related activities in your agency or jurisdiction. (NOTE: The term “agency/ jurisdiction” refers to the entity for which your workgroup is making decisions. See your completed “Preliminaries” worksheet for a definition.)

List the individuals participating in the discussion of this Focus Area (and their affiliations).

To help you understand what is included in this Focus Area, review the following goals and keys to success.

GOALS FOR THE EPIDEMIOLOGY INVESTIGATION:

During an outbreak investigation, agency/jurisdiction staff collect, analyze, and interpret exposure (and other) information from cases (and comparison groups, where appropriate) to determine the etiologic agent, persons at risk, mode of transmission, and vehicle of the outbreak.

1. PRIORITIZE THE KEYS TO SUCCESS FOR THE EPIDEMIOLOGY INVESTIGATION

“Keys to success” are activities, relationships, and resources that are critical to achieving success in a Focus Area. Determining whether an agency/jurisdiction has a particular key to success in place is somewhat subjective. Metrics, such as measures of time (e.g., rapidly, timely, and quickly), have not been defined. Your workgroup should provide its own definitions for these terms, as is appropriate for your agency/jurisdiction, and use its best judgment in deciding whether a particular key to success is fully or partially in place. Rate the priority for implementing each key to success based on its likely impact on foodborne outbreak response at your agency/jurisdiction and available resources. Use a scale of 1 to 5 to rate each key to success (1=low priority for implementation, and 5=high priority for implementation). If a key to success is already in place in your agency/jurisdiction, check the appropriate box. If a key to success is not relevant to your agency/jurisdiction, select N/A.

Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH
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Staff skills and expertise

- Staff have good interviewing skills and can collect complete and accurate exposure information from cases and controls, where appropriate, or have access to staff in other agencies with this expertise.

Notes (activities, procedures, or comments):

1 2 3 4 5 N/A

Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
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- Staff have expertise in epidemiologic study design or have access to staff in other agencies with this expertise.

Notes (activities, procedures, or comments):

	1	2	3	4	5	N/A
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Outbreak investigation

- Agency/jurisdiction has a written protocol outlining the steps in the epidemiologic investigation of a foodborne disease outbreak. Staff have easy access to the protocol and have been trained in its implementation.

Notes (activities, procedures, or comments):

	1	2	3	4	5	N/A
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- Staff interview cases about exposures as soon as possible after the case is reported.

Notes (activities, procedures, or comments):

	1	2	3	4	5	N/A
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- Staff have access to standard epidemiologic questionnaires used by other investigators in similar outbreaks.

Notes (activities, procedures, or comments):

	1	2	3	4	5	N/A
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Communication

- Staff communicate in a timely fashion and coordinate activities with environmental health and laboratory staff during the investigation.

Notes (activities, procedures, or comments):

	1	2	3	4	5	N/A
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Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
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Making changes

- Agency/jurisdiction involves investigation and response team members in a debriefing or after-action review following outbreak responses to improve future investigation practices and to prevent future outbreaks based on lessons learned.

Notes (activities, procedures, or comments):

1 2 3 4 5 N/A

- Agency/jurisdiction has performance indicators related to the epidemiologic investigation and routinely evaluates its performance in this Focus Area and tracks progress as part of its continuous process improvement program(s).

Notes (activities, procedures, or comments):

1 2 3 4 5 N/A

2. PRIORITIZE CIFOR GUIDELINES RECOMMENDATIONS TO ADDRESS NEEDED IMPROVEMENTS

Having identified activities and procedures in need of improvement, review the CIFOR Guidelines recommendations related to this Focus Area (listed below). Rate the priority for implementing each recommendation based on its likely impact on foodborne outbreak response at your agency/ jurisdiction and available resources. Use a scale of 1 to 5 to rate each recommendation (1=low priority for implementation, and 5=high priority for implementation). If a recommendation is already in place in your agency/jurisdiction, check the appropriate box. If a recommendation is not relevant to your agency/jurisdiction, select N/A. **Refer to the blue underlined section number following each recommendation to view the recommendation as it appears in the CIFOR Guidelines.**

Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
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Staff skills and expertise

- Ensure that the epidemiologic investigator on the outbreak response team has the necessary training and skills to plan and conduct epidemiologic studies during an outbreak investigation (e.g., expertise in interviews, study design, questionnaire development, and data analysis). ([3.2.2](#))

1 2 3 4 5 N/A

- Ensure that the epidemiologic investigator knows how to collect clinical specimens and store and transport them properly. ([3.2.2](#))

1 2 3 4 5 N/A

- Train staff in the use of the standardized forms to ensure proper completion. ([3.2.2](#)) ([3.4.3](#)) ([7.4.3](#))

1 2 3 4 5 N/A

	Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
<ul style="list-style-type: none"> Ensure that staff are trained to use tools to analyze outbreak data (e.g., Epi Info, SAS). (3.2.2) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Provide continuing education to the epidemiologic investigator to maintain and improve skills in their specialty. (3.2.2) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Train the epidemiologic investigator in the agency's/jurisdiction's outbreak response protocols and the epidemiologic investigator's role in an investigation. (3.2.2) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Assemble a reference library with information about foodborne diseases, enteric illnesses, and control measures. Where possible include electronic resources that can be accessed during field investigations. (3.4.5) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Assemble a list of resource persons who have expertise in specific disease agents and epidemiologic investigation methodologies. (3.5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Exercise outbreak response team members together to ensure that each team member can perform their role according to agency-specific protocols and legal authorities and understands the roles and responsibilities of other team members. (3.2.2) 		1	2	3	4	5	N/A

Additional ideas:

Outbreak investigation

<ul style="list-style-type: none"> Prepare a written protocol outlining the steps in the epidemiologic investigation of a foodborne disease outbreak. (3.2.1) (3.2.2) (3.4) (Chapter 5) (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Have appropriate equipment and supplies ready for use by the epidemiologic investigator when needed. (3.4.1) (3.4.2) (3.4.3) (Box 3.1) 		1	2	3	4	5	N/A

Data collection

<ul style="list-style-type: none"> Use standard forms for collecting exposure information to ensure that pertinent information is collected from all cases. (5.3.3) (7.4.3) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Use standard “core” questions and data elements on data collection forms to enhance data sharing and comparisons across jurisdictions. (7.4.3) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Develop templates for data collection forms before an outbreak occurs. (For examples, see the CIFOR Clearinghouse at https://cifor.us/clearinghouse.) (3.4.3) (5.3) (5.4) (7.4.3) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Obtain tools to analyze outbreak data (e.g., Epi Info, SAS) before an outbreak occurs. (3.2.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Determine how confidential information will be stored, whether and how it can be shared with others in the outbreak response team, and if agreement must be in place to facilitate the sharing of the information. (2.1.1) (2.3) (Box 2.4) (3.5.2) 		1	2	3	4	5	N/A

	Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Be familiar with and follow state and federal laws and practices that protect confidential information from disclosure. (2.3) (3.5.2) 		1	2	3	4	5	N/A

Additional ideas:

Identify etiologic agent (if unknown)

<ul style="list-style-type: none"> Contact health care providers of cases who have sought medical attention to determine if a diagnosis has been confirmed. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Interview cases to characterize symptoms, incubation period, and duration of illness to provide clues to a possible etiology. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Obtain stool samples from cases and establish an etiology through laboratory testing. (Table 5.1) 		1	2	3	4	5	N/A

Additional ideas:

Identify persons at risk

<ul style="list-style-type: none"> Ensure epidemiology staff have access to surveillance systems to identify illnesses that meet the case definition (5.2.2) and to conduct supplemental case-finding activities. (5.2.3) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> If an outbreak is related to an event or establishment, obtain a list of persons attending the event or patronizing the establishment during the outbreak period. (Table 5.1) Event planners and queries of social media might help identify persons attending an event. 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> If an outbreak is related to an event or establishment, interview persons who attended the event or patronized the establishment to identify cases and determine attack rates by time. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> If the identified agent is reportable, review recently reported cases to identify possible exposures to the event or establishment. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Review foodborne illness complaints to identify undiagnosed cases that could be linked to an outbreak. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Alert health care providers of a possible outbreak and review laboratory reports to identify additional cases. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Ask cases if they know of others who are ill. (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Depending on the nature of the outbreak, take additional steps to identify cases, such as reviewing medical charts at hospitals or physicians' offices, reviewing employee or school absences, reviewing death certificates, surveying the affected population, or asking the public to contact the health department if they think they might have the illness under investigation. (Table 5.1) 		1	2	3	4	5	N/A

Additional ideas:

Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
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Identify mode of transmission and vehicle

<ul style="list-style-type: none"> Establish a case definition on the basis of the etiologic agent or clinical characteristics of the illness associated with the outbreak, with restrictions by person, place, and time. (Table 5.1) (5.2.1) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Describe cases by person, place, and time, and evaluate this descriptive epidemiology to identify patterns suggestive of particular food items or diets. (Table 5.1) (5.3.1) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Plot cases on an epidemic curve to track illnesses over time. (Table 5.1) (5.2.4) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Collect exposure histories from patients as soon as possible using techniques to improve food history recall. If there are sufficient resources, interview cases with a detailed exposure history questionnaire as they are reported (i.e., before an outbreak has been recognized). (Table 5.1) (5.3.3) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> To improve food history recall, encourage cases to remember what they ate by looking at a calendar for the appropriate period and elaborating on where they ate, with whom, and events associated with the meal. (5.3.3) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> To help cases think about all exposures, provide a structured list of places where cases might get food, including food pantries, farmers markets, conference meetings, and caterers. (5.3.3) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> To improve food history recall, enlist the help of those preparing meals for case(s) during the period of interest. (5.3.3) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> To improve food history recall, obtain cash register or credit card receipts from cases to identify/verify food purchases and places where food was consumed. (5.3.3) (Table 5.1) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> To improve food recall, if the subject uses a grocery store shopper card, ask permission to obtain purchase records. Work with stores where cases purchased food to obtain shopper card purchase records. (5.3.3) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Document brand names, product code information, purchase dates, and locations from patients for prepackaged food items. (Table 5.1) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Explore other sources of information (in addition to product information from cases) such as product distribution data obtained from the food distributor or lists of suppliers from retailers, restaurants, and institutions. (5.4) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Use a dynamic cluster investigation process to develop hypotheses about an outbreak. As new exposures are suggested during interviews with cases, re-interview previously interviewed cases to uniformly assess their exposure to the new exposure. Assess the new exposure for all newly reported cases. (5.3.4) 	1	2	3	4	5	N/A
<ul style="list-style-type: none"> Interview appropriate non-ill persons to obtain exposure information for comparison groups in case-control or cohort studies. (Table 5.1) 	1	2	3	4	5	N/A

	Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
<ul style="list-style-type: none"> Interview non-outbreak-associated ill persons (i.e., cases with microbial agents other than the agent under investigation from the same time period) to obtain exposure information for comparison groups for case-case analytic studies. (5.4.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Compare exposure frequencies among cases against known or estimated background exposure rates, such as those found in the FoodNet Atlas of Exposures at https://www.cdc.gov/foodnet/surveys/population.html to identify suspected food items using a binominal distribution probability model. (5.4.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Investigate establishment subclusters intensively and rapidly by ascertaining additional cases, gathering detailed food consumption data for subcluster cases, and conducting ingredient-specific case-control studies at the subcluster establishment. (5.3.5) (5.4.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Conduct an investigational traceback to determine whether a suspected food vehicle from multiple cases has a distribution or other point in common. Because traceback investigations can be resource-intensive, the decision to conduct one should be based on input from public health and regulatory agencies. (5.4.2 p.105) 		1	2	3	4	5	N/A

Additional ideas:

Determine potential for ongoing transmission

<ul style="list-style-type: none"> Create an epidemic curve, and on the basis of the agent, incubation period, and likelihood of secondary spread, evaluate the course of the epidemic to determine whether cases may still be occurring. (5.2.4) (Table 5.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> If the outbreak appears to be ongoing, continue surveillance and review potential abatement procedures. (Table 5.1) 		1	2	3	4	5	N/A

Additional ideas:

Communication

<ul style="list-style-type: none"> Ensure that the epidemiologic investigator knows the other members of the outbreak response team before an outbreak occurs. (3.2.2) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Establish and use routine procedures for communicating among outbreak response team members and their organizational units before an outbreak occurs. (3.2.2) (7.4.2) 		1	2	3	4	5	N/A

	Already in Place	Priority for Implementation or Improvement in Your Agency/Jurisdiction LOW ----- HIGH					
<ul style="list-style-type: none"> Maintain close communication and coordination with members of the outbreak response team during an investigation. Update all members of the outbreak response team daily. Make sure suspicious new exposures are adequately considered by all team members and that the public information officer is routinely updated to ensure appropriate messaging to the public and media. (5.1.5) (5.3.4) (6.2.1) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Ensure timely and collaborative sharing of epidemiologic information with response partners during multistate investigations to facilitate source identification and institution of control measures. (7.4.2) (7.4.3) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Submit preliminary reports of outbreaks to CDC’s National Outbreak Reporting System (NORS) while the investigation is ongoing to identify potentially related outbreaks occurring in multiple places and facilitate further investigation of the outbreaks. (6.6.5) 		1	2	3	4	5	N/A

Additional ideas:

Making changes

<ul style="list-style-type: none"> Participate in a debriefing or after-action meeting following outbreak investigations with all members of the outbreak response team to identify lessons learned and compare notes on ultimate findings. Identify factors that compromised the investigation and clarify changes to procedures, resources, training, and agency structure to optimize future investigations. (Box 6.6) (6.6.4) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Work with outbreak response team to summarize investigation findings, conclusions, and recommendations in a written report, consistent with the size and complexity of the investigation and including lessons learned and action items for follow-up and quality improvement. (6.6.5) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Work with outbreak response team to submit summary data about the outbreak to CDC’s National Outbreak Reporting System (NORS) database using CDC’s form 52.13. Make every effort to complete both Part 1 and Part 2. (6.6.5) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Track relevant corrective action items as part of agency/jurisdiction continuous quality improvement program(s). (6.6.4) 		1	2	3	4	5	N/A
<ul style="list-style-type: none"> Consider sharing reports with unusual findings more broadly to improve future response or prevention efforts. (6.6.7) 		1	2	3	4	5	N/A

Additional ideas:

3. MAKE PLANS TO IMPLEMENT SELECTED CIFOR GUIDELINES RECOMMENDATIONS

For each CIFOR Guidelines recommendation selected in the previous steps (or idea formulated by the workgroup), identify who will take the lead in implementing the recommendation and the time frame for implementation (e.g., a specific completion date or whether the change is likely to require short-, mid-, or long-term efforts). If certain actions must precede others, make a note of this and adjust the time frame. In addition, consider factors that could positively or negatively influence implementation of the recommendation and ways to incorporate the recommendation into your agency’s/jurisdiction’s standard operating procedures.

CIFOR recommendations or other ideas from previous steps	Lead person	Time frame for implementation	Notes (e.g., necessary antecedents, factors that might influence implementation, ways to incorporate the recommendation into standard operating procedures)

One person should be given responsibility for monitoring progress in implementing the above CIFOR Guidelines recommendations. Follow-up should occur at specified checkpoints (e.g., 3, 6, 9, and 12 months after the start of the Toolkit process), and results should be shared with the entire workgroup.

DATE WORKSHEET COMPLETED: _____

NEXT DATE FOR FOLLOW-UP ON PROGRESS: _____