Kentucky Department for Public Health

Kentucky Foodborne and Waterborne Outbreak Investigation Manual

Our mission is to improve the health and safety of people in Kentucky through prevention, promotion and protection.

Kentucky Public Health

Prevent. Promote. Protect.

Revised: February 2025

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Acknowledgements

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Record of Change

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Manual Review and Maintenance

The Kentucky Foodborne and Waterborne Outbreak Investigation Manual will be reviewed on a bi-annual basis. Updates will be made based upon the review of current Centers for Disease Control and Prevention (CDC) guidance, Council to Improve Foodborne Outbreak Response (CIFOR) guidance, other pertinent guidance, as well as improvement plans or corrective action plans developed from exercises and real-world events.

Chapter 1: Outbreak Definition and Quick Reference Guides

1) What is an Outbreak?

2) Purpose of the Outbreak Investigation

3) Steps in Investigating an Outbreak

4) Flowchart of an Outbreak Investigation

5) Health Care Provider Guidelines for Reporting Suspected Foodborne Outbreak Related Illnesses

6) Health Care Provider Guidelines for Reporting Suspected Waterborne Outbreak Related Illnesses

7) Triggers for Activation of Plan

Overview of Outbreak Definition and Quick Reference Guides

Introduction

Foodborne and waterborne disease outbreaks are of extreme public health importance and are required to be reported to the local health department or the Kentucky Department for Public Health (KDPH) according to Kentucky Administrative Regulation 902 2:020 Section 5 (See Appendix N). An effective outbreak response requires **teamwork** from various programs within the KDPH as well as local health departments (LHDs) and outside agencies. This manual has been designed to provide guidance in the coordination of a foodborne or waterborne disease outbreak response.

The Kentucky manual provides this guidance by including information useful in an outbreak investigation, such as the definition of an outbreak, the roles and responsibilities of each involved job title and agency during the response, and a detailed description of the steps in investigating an outbreak. The need for **open communication** by all members of the outbreak team is emphasized throughout the manual. The last chapter provides instructions on how to prepare a final report, a very important final step in any outbreak investigation.

Chapter 1 includes the definition of an outbreak and the purpose of an outbreak investigation. An overview of the steps in an outbreak investigation is also presented. These steps will be discussed in more detail in Chapter 3. Following the steps, a flowchart of an outbreak investigation is included. Additional flowcharts and detailed responsibilities for specific programs and job titles are included in Chapter 2. Chapter 1 lists guidelines that health care professionals should follow in reporting a suspected foodborne or waterborne outbreak-related illness.

1.1 What is an Outbreak?

An outbreak of foodborne illness is defined as **two or more** persons experiencing a similar illness after ingestion of a common food OR different food in a common place. An outbreak of a waterborne illness is defined as **two or more** persons experiencing a similar illness after having contact with the same source of drinking or recreational water. An outbreak may also be defined as a situation when the observed number of cases exceeds the expected number. However, with certain foodborne illnesses such as botulism or chemical poisoning, a single case justifies an in-depth epidemiological and environmental investigation.

To determine if there is an outbreak, the current number of new cases (incidence) can be compared with past levels of the same disease over a similar time period (base line level). If the number is unusually large or unexpected for the given place and time, an outbreak may be occurring.

When trying to confirm an outbreak, it is important to rule out other causes for increases in numbers of cases. For example, an increase in cases of a certain disease may relate to changes in reporting

requirements. Also, media attention to other outbreaks of the same disease tends to heighten public awareness and can lead to an increased number of cases being reported.

The outbreak team, including regional epidemiologists, nurses, and environmentalists, at each LHD should work together to determine if reported foodborne or waterborne related illnesses should be investigated as an outbreak. Health Department Directors and/or Public Information Officers should be updated and informed about the outbreak and investigation as soon as possible. KDPH staff members are also available to provide advice in determining the occurrence of an outbreak. KDPH staff members should be notified of an outbreak or suspected outbreak so that they are prepared to provide technical assistance to local health departments and partner organizations. See Appendix A for a listing of public health and other agency contacts that may be of assistance during an outbreak investigation. The public health importance of determining the existence of an outbreak and conducting an outbreak investigation is described in Section 1.2.

1.2 Purpose of the Outbreak Investigation

Control and prevention
The primary reason to investigate an outbreak is to control the occurrence of disease and prevent further disease. Therefore, it is necessary to first determine whether the outbreak is ongoing or is over. If the outbreak is ongoing, the first goal should be to prevent new cases. If the outbreak has already occurred, the goal should be to determine the factors or sources that contributed to the outbreak and prevent them from occurring in the future. An infectious disease outbreak is generally considered "over" when at least two incubation periods have elapsed with no additional cases identified.

Surveillance
Outbreak investigations can add valuable information to ongoing public health surveillance activities. The goal of surveillance is not to compile numbers of cases of illness for administrative purposes, but to provide data that are important to guide public health policy and action. Continual surveillance adds to existing knowledge regarding the potential for and occurrence of a disease in a population.

Training opportunities
Outbreak investigations may offer the LHD an opportunity to work closely with more experienced epidemiologists, become familiar with investigative techniques or practices, develop thought processes used in designing questionnaires and interviewing, and gain valuable on-the-job training and experience for future outbreaks.

Evaluation
Identifying the cause of outbreaks may be used to evaluate and improve current health programs in the community, identify high-risk groups or etiologic agents previously overlooked and guide future strategies and future allocations in these areas.

Political or legal concerns
There may be overwhelming pressures placed on the LHD by families of **affected** individuals, the media, local politicians, and others to determine the source of an outbreak and whether it may pose a continued or future threat to the community.

Publications and reports
An important objective of an outbreak investigation is to gain additional knowledge regarding the natural history of the disease. Carefully conducted investigations may reveal trends, new or overlooked disease agents, novel vehicles or transmission modes, groups at risk or specific risk factors. New knowledge may also be gained by assessing the impact and effectiveness of control measures.

1.3 Steps in Investigating an Outbreak

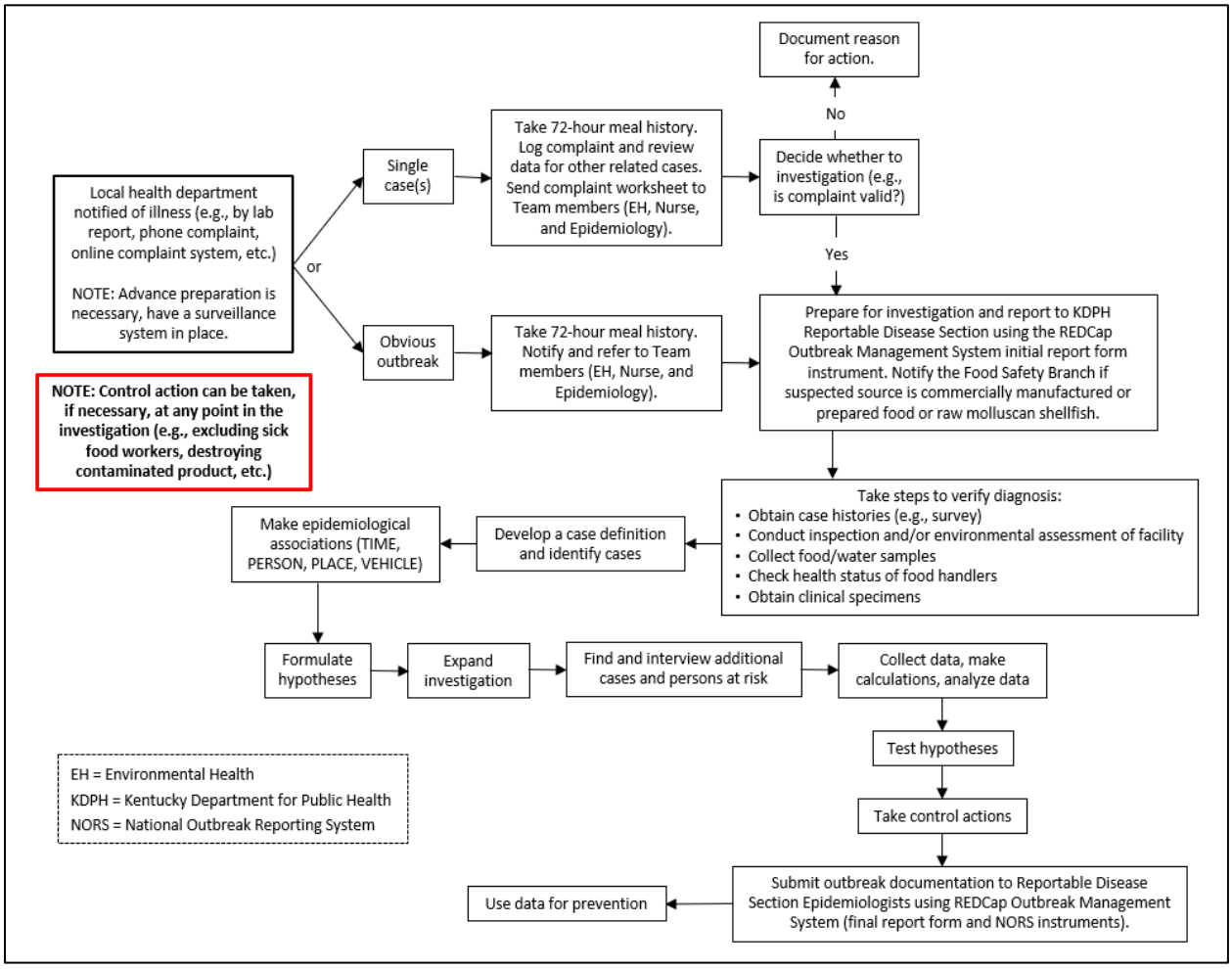
Once a foodborne or waterborne related disease has been reported, the outbreak team should respond quickly and appropriately. A listing of the steps in an outbreak investigation is included in this section. While not all steps may follow in the order listed, all should be considered in a proper investigation. Additional detail on the steps in investigating an outbreak can be found in Chapter 3.

1. Prepare for an outbreak investigation and field work
2. Confirm the existence of an epidemic or outbreak
3. Verify the diagnosis
4. Define a case and identify and count cases
5. Describe the data in terms of person, place and time
6. Develop hypotheses
7. Evaluate hypotheses (Analyze and interpret the data)
8. Refine hypotheses and carry out additional studies
9. Implement control and prevention measures
10. Communicate findings and enter final outbreak data into the REDCap Outbreak Management System (i.e., final report form and National Outbreak Reporting System (NORS) instruments). This includes line list, epi curve, and other supporting documentation.

1.4 Flowchart of an Outbreak Investigation

Please see Figure 1 for the flowchart of events in the investigation of foodborne or waterborne illness complaints and outbreaks. Additional flowcharts and detailed responsibilities for specified agencies and job titles are included in Chapter 2.

Figure 1: Steps in the Investigation of Foodborne/Waterborne Illness Complaints and Outbreaks



1.5 Health Care Provider Guidelines for Reporting Suspected Foodborne Outbreak-Related Illnesses

Health Care Provider Guidelines for Reporting Suspected Foodborne Outbreak-related Illnesses

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If two or more persons are suspected of having a foodborne illness, the health care provider should:

1. **Inquire whether there are other ill persons.**
2. **Immediately contact the Kentucky Department for Public Health (KDPH) Infectious Disease Branch (502-564-3261) and/or your Local Health Department (LHD).***
3. **Collect clinical samples for laboratory analysis.**
4. The KDPH Division of Laboratory Services will accept three to five clinical specimens for norovirus testing. Specimen testing for other enteric pathogens should be sent to a private lab.
5. If suspected food items are available, instruct the individual not to ingest or discard food, but to keep under refrigeration/freezing based on sample condition when collected. Pending further investigation, arrangements should be made to collect and analyze the food samples. Arrangements must be made by the LHD to collect and hold the food items in the refrigerator/freezer. Questions regarding sample collecting/testing of food samples should be directed to the KDPH Division of Laboratory Services (502-782-7708 or call 502-564-4446 and ask for the Food Lab). If the outbreak source is suspected to be a food item, the KDPH Food Safety Branch should be notified at 502-564-7181 and food sample collection and submission should be coordinated through this Branch.

Please provide the following information:

- Brief description of situation
- Names of ill persons
- Address, telephone number
- Age, sex
- Onset of symptoms (date, time)
- Description of symptoms
- Hospitalization status
- Other available information (other ill persons, possible food sources, etc.)
- Name of physician (if different than reporter), address, telephone number

General Definition of a Foodborne Outbreak:
Two or more persons experience a similar illness after ingestion of a common food or different food in a common place.

* 24-hour Division of Epidemiology and Health Planning Emergency HOTLINE: 1-888-9-REPORT, 1-888-973-7678.

1.6 Health Care Provider Guidelines for Reporting Suspected Waterborne Outbreak Related Illnesses

Health Care Provider Guidelines for Reporting Suspected Waterborne Outbreak-related Illnesses

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If two or more persons are suspected of having a waterborne illness, the health care provider should:

1. **Inquire whether there are other ill persons.**
2. **Immediately contact the Kentucky Department for Public Health Infectious Disease Branch (502-564-3261) and/or your Local Health Department (LHD).***
3. **Collect clinical samples for laboratory analysis.**
4. The KDPH Division of Laboratory Services will accept three to five clinical specimens for norovirus testing. Specimen testing for other enteric pathogens should be sent to a private lab.
5. Arrangements will be made by the local health department to collect and analyze the water samples from suspect sources pending further investigation. Samples must arrive in the lab within **30 hours** of collection for normal biological water samples. *Legionella* water samples need to be submitted as soon as possible. Samples requiring chain of custody precautions are to be iced and taken to the nearest certified lab within **6 hours** of collection. DLS must be provided advanced notice before sample collection occurs. Questions regarding sample collecting/testing of water samples should be directed to the Division of Laboratory Services (502-564-4446).

Please provide the following information:

- Brief description of situation
- Names of ill persons
- Address, telephone number
- Age, sex
- Onset of symptoms (date, time)
- Description of symptoms
- Hospitalization status
- Other available information (other ill persons, possible exposure sources, etc.)
- Name of physician (if different than reporter), address, telephone number

General Definition of a Waterborne Outbreak:
Two or more persons experience a similar illness after having contact with the same source of drinking or recreational water

* 24-hour Division of Epidemiology and Health Planning Emergency HOTLINE: 1-888-9-REPORT, 1-888-973-7678.

1.7 Triggers for Activation of Plan:

The steps and procedures described in this Foodborne and Waterborne Outbreak Investigation Manual should be used any time there is an outbreak or suspected outbreak where the source is suspected to be food or water.

- **General Definition of a Foodborne Outbreak**: Two or more persons experience a similar illness after ingestion of a common food or different food in a common place.
- **General Definition of a Waterborne Outbreak**: Two or more persons experience a similar illness after having contact with the same source of drinking or recreational water.

Additionally, if any of the following triggers exist, LHD or KDPH leadership should be alerted to consider activation of the LHD All-Hazards Response Plan or KDPH All-Hazards Response Plan (ESF-8 Annex of the Kentucky Emergency Operations Plan).

SITUATIONS AND ASSUMPTIONS:

The situations below define specific triggers which may prompt LHD or KDPH leadership to consider activation of the LHD All-Hazards Response Plan or KDPH All-Hazards Response Plan (ESF-8 Annex of the Kentucky Emergency Operations Plan) in response to a foodborne or waterborne outbreak. At the most basic level, events that may lead to activation of these plans include those which:

1) require more resources than available during normal operations;
2) require careful coordination of activities of multiple partners;
3) include the involvement of Category A bioterrorism agents; and/or
4) require increased communication between private and public partners, the media and the public.

TRIGGERS:

Very large outbreak- defined as when the outbreak size exceeds the jurisdiction(s) capacity to respond.

- A large number of cases occurring over a short time period.
- A large number of cases occurring over an extended time period (i.e. cases continue to be above baseline for an extended period of time)
- A large number of cases occurring in a geographic region or jurisdiction (i.e. cases are above baseline for jurisdiction for a specific time period)
- Multiple lab confirmed cases with matching WGS patterns over a short period of time
- Multiple states reporting lab confirmed cases with matching WGS patterns over a short period of time.

Very severe pathogen

- An increase in hospitalizations caused by a specific pathogen or with a similar syndrome
- An increased death rate from a pathogen or syndrome that is above the expected death rate for that pathogen or syndrome

Novel pathogen or contamination of food or water source

- Initial cases of an emerging infectious disease with the potential for significant illness or death (i.e. Hepatitis E, *C. difficile*, cronobacter, free living ameba, etc.)
- Unusual symptoms or treatment response for a known pathogen

Intentional outbreak

- Suspected or known intentional contamination of water or food with a pathogen, toxin, chemical or other hazard

High profile situation/outbreak

- Outbreak involving a large restaurant chain
- Outbreak involving a recreational venue (lake, water park, amusement park, etc.)
- Outbreak involving a large gathering of people (conference, tournament, concert, festival, etc.)
- Other characteristics, such as a high-profile illness, national impact, high media attention, etc., which might justify activation

Laboratory Triggers

- Unusually high pathogen, toxin, or chemical concentrations in sample
- Unusual pathogen serotype or species
- Unexpected pathogen for food vehicle or sample
- Combination of pathogens or chemicals
- Novel pathogen or variant
- WGS-indistinguishable isolates from apparently unrelated foods
- WGS-indistinguishable isolates from human specimens which match cases occurring in other geographic regions, jurisdictions, or states

Environmental Triggers

- Unusual food source or pathogen vehicle
- Contamination without clear natural pathway
    - Evident contamination at an unexpected step in production or preparation
- Evidence of tampering
- Persistent contamination after disinfection
- Unusual pathogen distribution pattern
- Notification from a Federal, State, or local agency of an issue – a local food recall, illness in a production facility, etc.
- Food recall with a specific distribution pattern and associated human cases (i.e., WGS match of human specimens and food samples)
- Water contamination advisory with associated human cases

Criminal Intelligence Triggers

- A confirmed terrorist attack upon a food or water source
- Similar unusual incidents occurring locally and elsewhere within the country
- Claims of responsibility
- Economically motivated adulteration incidents
- Sabotage incidents by disgruntled workers
- Involvement of Category A bioterrorism agents

NOTIFICATION:

Upon the activation of a foodborne or waterborne outbreak response, the following must be notified as appropriate:

Local Jurisdiction:

When a local healthcare jurisdiction is threatened or impacted by an emergency or disaster that may affect a neighboring jurisdiction, local public health agencies shall promptly share incident related information regardless of county or state borders. At minimum, affected local health agencies will notify the following, as applicable, by the quickest means possible:

- Local Health Jurisdictions
    - Health Department Directors
    - Environmental Health Directors
    - Regional Epidemiologists
    - ERRT Members (as appropriate)
    - Public Information Officer
    - Public Health Preparedness Personnel
    - Regional Preparedness Coordinators
    - Hospital Preparedness Program Coordinators
    - County Emergency Management Officials
- Respective State Department of Health
    - State Epidemiologist/Deputy State Epidemiologist
    - Preparedness Program Manager
    - Reportable Diseases Section Supervisor and/or Epidemiologist
    - Division of Public Health Protection and Safety
        - Food Safety Branch
        - Environmental Health Branch
    - Division of Laboratory Services

Department for Public Health:

Upon receiving notification from affected areas, the Kentucky Department for Public Health shall gather incident-related information from the affected local jurisdiction and promptly disseminate information to the following, as applicable:

- State Health Officer
- State Epidemiologist/Deputy State Epidemiologist
- Preparedness Program Manager
- Reportable Diseases Section Supervisor
- Division of Public Health Protection and Safety
    - Food Safety Branch
    - Milk Safety Branch
    - Environmental Health Branch
- Division of Laboratory Services
- Regional Preparedness Coordinators
- State Emergency Management Agency
    - Emergency Management Duty Officer
- Bordering State Department of Health (if applicable)
    - State Health Officer
    - State Epidemiologist/Deputy State Epidemiologist

        - Preparedness Program Manager
- Respective Local Healthcare Jurisdictions (that may be affected by the incident)
    - Heath Department Directors
    - Environmental Health Directors
    - Regional and/or Local Epidemiologists
    - Public Health Preparedness Personnel
- Department of Health and Human Services' (HHS) Office of the Assistant Secretary for Preparedness & Response (ASPR)
    - HHS's Region IV ASPR Office
    - HHS Region IV Regional Emergency Coordinator
    - HHS Region IV Hospital Preparedness Program Coordinator
- Other state and local agencies, as applicable

Incident-Specific Information Dissemination:
The following incident-related information shall be disseminated using established information sharing processes via communication systems or incident management software systems:

- Type of incident
- Name of incident location
- Area of impact
- Number peopled displaced or injured
- Identify triggering incident as suspect or confirmed
- Health and medical response capacity impact
- Laboratory confirmation and case definition, as available
- Request for public health and medical assistance; if required
- Resources for tracking situation (links to applicable websites, etc.)
- Anticipated public information/health guidance release to include recommendations for the public and copies of news releases

Triggers for Media Communication:
The factors the communications office considers when contacting the media about an outbreak are as follows:

- Impact on the Public:
    - Are people at risk?
    - How many have been affected?
- Size of the Outbreak:
    - Is this a local, state, or national issue?
- Seriousness of the Illness:
    - Is the illness deadly?
    - What is the health status of those affected?
    - How is the illness spread?
- Investigation Status:
    - What is the status of the investigation?
- Has the source of the outbreak been identified?

Chapter 2: Roles and Responsibilities

Overview of Roles and Responsibilities

Introduction

Successful investigation and resolution of an outbreak depends on the communication and collaboration of a multi-disciplinary team. The identification of key stakeholders is the initial step to take before an outbreak occurs. Members of an investigation team should be identified, trained, and familiar with investigation protocols to ensure that various tasks are fulfilled. Choosing team members who are familiar with the day-to-day activities of the local health department will facilitate a rapid, efficient response. Depending on the disease, some or all of these individuals will be crucial in executing the Local Health Department's (LHD's) response. All government agencies will utilize an Incident Command System (ICS) structure when investigations and response exceed the capacity of the office(s) that would usually handle this sort of investigation, or if multiple agencies are involved in an investigation or response.

All investigation team members should be informed of the epidemiology of the causative agent or suspected agents and should be instructed on how to complete investigation forms and collect and submit specimens for laboratory testing. Suggested investigation team members include persons who can provide clinical and diagnostic advice, epidemiological support, nursing services, public information, environmental health consultation and inspections, and information technology support. One of the team members should be designated as the TEAM LEADER, who will coordinate all the response activities of the team, and who will be the primary point-of-contact (POC) for the Kentucky Department for Public Health (KDPH) and the Local Health Department (LHD). This individual should have knowledge of communicable diseases and experience in investigating an outbreak.

This chapter lists the roles and responsibilities of those job positions and agencies that could be involved in an outbreak investigation. For some positions and agencies, flowcharts are presented at the end of the chapter for a different type of visual representation of roles and responsibilities.

2.1 Physicians and Health Care Providers

1. Collect specimens and order lab testing on suspect cases of foodborne or waterborne illness (as well as any other reportable disease).
2. Report to LHD by telephone immediately upon recognition of a suspected outbreak. Although not required by law, the physician should consider contacting the LHD regarding any person with a communicable enteric disease that they know works as a food worker.
    a. If calling outside of traditional business hours call (888) 973-7678.
3. Cooperate with LHD in the investigation and control of an outbreak, including collecting specimens if requested.
4. Encourage patients to adhere to the prevention and control recommendations of the LHD.
5. Contact your facility infection prevention team for awareness and increased response time.

2.2 Local Health Department Director

1. Assure a competent workforce. Mobilize Epi Rapid Response Team (ERRT) when necessary, allowing staff to leave clinic to work on a field investigation as needed.
2. Serve as the spokesperson for the LHD with the support, cooperation, and notification of the KDPH in regard to the mutual approval of messages relating to foodborne/waterborne transmission and food/water safety measures.
3. Determine if preventive treatment is needed for those exposed to a foodborne or waterborne illness.

2.3 Epidemiology Rapid Response Team (ERRT)/ESF-8 Epidemiology Response Team

1. Initiate investigation and collect case and exposure verification as quickly as possible.
2. Work toward rapid specimen collection of known cases and retention of suspect food and water sources.
3. Inform local hospital infection control staff, emergency room staff, primary care physicians, and other potentially affected entities of a possible outbreak so they can test and report similar cases to a designated member of the ERRT.
4. Develop a hypothesis based on the questionnaire information, the case definition, the environmentalist's inspection, and the laboratory results as how the illness was transmitted, through what food(s), and by what organism or agent.
5. Describe and implement control measures to prevent further illness.

2.4 Regional Epidemiologist

Note: During each outbreak investigation the Regional Epidemiologist should coordinate the following steps with the Regional or LHD Nurse, the LHD Sanitarian or Environmentalist, and/or Epi Rapid Response Team.

1. Receive initial report that includes the needed demographics (name, address, phone number, etc.) and report illness complaint to other team members including the LHD nurse and local environmentalist.
2. Determine suspected organism(s) to be tested based upon diagnostic tests, symptoms, and the onset and duration of illness.
3. Confirm diagnosis with the medical provider.
4. Contact the case(s) after conferring with the medical provider to obtain additional related information.
5. **Alert KDPH Division of Epidemiology and Health Planning - Reportable Disease Section (502-564-3261 or 888 973-7678 if calling after business hours) of investigation.**
6. Notify appropriate LHD administration/Public Health Director.
7. Enter case(s) into the Kentucky electronic surveillance system used for reporting disease.
8. Contact and encourage private labs to send laboratory isolates to the Division of Laboratory Services for serotyping and Whole Genome Sequencing (WGS).
9. Look for additional associated cases by informing the local medical community of a possible outbreak and encouraging ill persons to seek medical attention. This would include coordinating the **collection of clinical samples**.

10. Collaborate with ERRT on developing a working case definition and a line listing.
11. Administer questionnaire/investigation form. (See Appendix I for the KDPH Enteric Disease-Specific Investigation Forms).
12. Conduct meal history (72 hours).
13. Create line list in Excel or other database for tracking cases.
14. Analyze data collected from questionnaires, surveys, etc.
15. Describe data: epi curve, attack rate, etc.
16. Create map as required and available (GIS).
17. Formulate a tentative hypothesis and share hypothesis with ERRT.
18. Determine study design if necessary.
19. Coordinate/implement control measures; this may occur early in the investigation. (Refer to Red Book or Control of Communicable Disease Manual (CCDM).)
20. Communicate findings and enter final outbreak data into the REDCap Outbreak Management System (i.e., final report form and National Outbreak Reporting System (NORS) instruments). This includes line list, epi curve, and other supporting documentation.

2.5 Regional or LHD Nurse

Note: During each outbreak investigation the Regional or LHD Nurse should coordinate the following steps with the Regional Epidemiologist, LHD Sanitarian or Environmentalist, and/or Epi Rapid Response Team.

1. Receive initial report that includes the needed demographics (name, address, phone number, etc.) and report illness complaint to other team members including the regional epidemiologist and local environmentalist.
2. Determine suspected organism(s) to be tested based upon diagnostic tests, symptoms, and the onset and duration of illness.
3. Confirm/verify the diagnosis via medical records/notes, labs, or with the medical provider.
4. Contact the case(s) after conferring with the medical provider to obtain additional related information.
5. **Alert KDPH Division of Epidemiology and Health Planning – Reportable Disease Section (502) 564-3261 or (888) 973-7678 (if calling after business hours) of investigation and the Division of Public Health Protection and Safety – Food Safety Branch (502) 564-7181.**
6. Notify appropriate LHD administration/Public Health Director as necessary. The Public Health Director will notify the appropriate federal agencies and Divisions within the KDPH and the Kentucky State Police.
7. Enter case(s) into the Kentucky electronic surveillance system used for reporting disease.
8. Encourage private labs to send laboratory isolates to the Division of Laboratory Services for serotyping and Whole Genome Sequencing (WGS).
9. Look for additional associated cases by informing the local medical community of a possible outbreak and encouraging ill persons to seek medical attention. This would include **coordinating the collection of clinical samples**.
10. Collect and ship clinical laboratory specimens as instructed by laboratory/or state personnel to the Division of Laboratory Services or local hospital/reference lab as needed.
11. Collaborate with ERRT on developing a working case definition and a line listing.

12. Administer questionnaire/investigation form. (See Appendix I for the KDPH Enteric Disease-Specific Investigation Forms.)
13. Conduct meal history (72 hours).
14. Discuss ill person and non-ill person case findings with the epidemiologist and/or other team members.
15. Coordinate/implement control measures; this may occur early in the investigation. (Refer to Red Book or Control of Communicable Disease Manual (CCDM).)

2.6 Regional or LHD Sanitarian or Environmentalist

Note: During each outbreak investigation the Regional or LHD Sanitarian or Environmentalist should coordinate the following steps with the Regional Epidemiologist, the Regional or LHD Nurse, and/or Epi Rapid Response Team.

1. Receive initial illness report that includes the needed demographics (name, address, phone number, etc.).
2. Refer report to public health nurse and epidemiologist to confirm diagnosis and determine the need for further investigation.
3. Investigate two or more isolated foodborne/waterborne illness complaints without a confirmed case as a complaint inspection of the food establishment. During the inspection, food managers should be made aware of the complaint and asked about any complaints they may have received.
4. Conduct a targeted inspection of the suspect food establishment if the definition of a foodborne/waterborne outbreak is met, and where warranted conduct an environmental assessment as directed by the Food Safety Branch (see Environmental Assessment Form, Appendix X).
5. Interview all food preparation employees regarding the detailed preparation of the suspect food.
    a. If the employee does not speak English, ensure interpretation services are available.
6. Interview the food manager regarding ill employees and any consumer complaints.
7. Share and coordinate interviews with other team members.
8. If authorized by the Food Safety Branch, and in consultation with the Division of Epidemiology and Health Planning and the Division of Laboratory Services, collect and submit sample(s) of suspect food/water in accordance with the laboratory protocol (See collection sheet, Appendix E and Appendix F). Contact the Division of Public Health Protection and Safety - Food Safety Branch at 502-564-7181 before collection or submission of food/environmental samples. Food/environmental samples are generally submitted to determine the presence of a specific agent in the food that matches the agent found in the confirmed patient(s). **Food/environmental samples are not submitted to the lab for the purpose of diagnosis of the suspect case.**
9. Utilize tools as warranted by the ERRT to prevent the further spread of illness/injury from the food establishment. Examples:
    - Quarantine suspect foods,
    - Voluntary closure of the food establishment,
    - Removal/exclusion of ill food handlers from the food establishment based on the Kentucky Retail Food Establishment Code and The Kentucky Food, Drug, and Cosmetic Act
    - Elimination of improper food handling practices.

10. Contact the Food Safety Branch at 502-564-7181 if the suspect food is commercially manufactured or raw molluscan shellfish (Appendix X). Complete the survey on the Kentucky Food Safety Reporting System, or the DFS-216 Record of Complaint and Investigation (See Appendix H). This will initiate a product trace back, trace forward and/or recall if warranted. The Food Safety Branch will also share and coordinate this information with the appropriate team members within the state.
11. Once the cause of the foodborne illness is determined, educate the food establishment manager on proper controls to prevent future illness, verify that the controls have been communicated to food handlers, and verify that the controls have been implemented.
12. Food/environmental samples must have official seal and remain in the possession of the collector and be accounted for at all times until they are either directly released to a public health laboratory employee or packaged and shipped by a traceable courier. A chain of custody form is required and can be found in Appendix G. If a sample cannot be shipped or transported to the Division of Laboratory Services immediately after collection, the Division of Laboratory Services must be contacted, and the item(s) must be kept refrigerated in a dedicated, secure location at a local health department facility.

2.7 Regional Childcare Consultant

1. Alert the Regional Epidemiologist or the public health nurse of potential foodborne/waterborne disease outbreak in a childcare center.
2. Alert the Early Childhood Mental Health Program Administrator at the KDPH of potential foodborne/waterborne disease outbreak in a childcare center.
3. Collaborate with regional epidemiologist, nurse, and environmentalist to prepare and distribute information to local childcare centers.
4. Assist regional epidemiologist and public health nurse with active surveillance measures such as screening for ill children at drop-off and assisting with phone calls to centers to determine how many children and staff are out sick with the illness of concern.
5. Accompany and assist the environmentalist during the inspection of the childcare center.
    a. If infant formula is suspected as the vehicle, assist in collecting formula brand, lot numbers, use-by dates, unopened and open containers for possible laboratory testing. The Food Safety Branch will determine when testing is warranted.
    b. The Food Safety Branch will notify the FDA Cincinnati District Emergency Response Coordinator and HFPComplaints@fda.hhs.gov of infant formula related complaints/concerns for appropriate follow-up.
6. Educate childcare center staff on proper hand washing, diapering, and cleaning procedures. Distribute flyers to centers regarding these procedures. Collaborate with the STARS Quality Coordinator on education and observation of hand washing, diapering, and cleaning procedures. (STARS is a childcare facility rating program.)

2.8 KDPH State Epidemiologist/Deputy State Epidemiologist/Division of Epidemiology and Health Planning

1. Alert Division of Public Health Protection and Safety - Food Safety Branch and/or Environmental Management Branch of investigation, and Division of Public Health Preparedness and Safety- Preparedness Branch, when necessary.

2. Notify Commissioner, Deputy Commissioner of KDPH, and Cabinet for Health and Family Services (CHFS) Communications Office about situation when appropriate.
3. Consult with LHD/ERRT on investigation, media issues, and control measures.
4. Coordinate use of resources and personnel at KDPH.
5. Involve appropriate epidemiologic personnel at state level.
6. Consult with Preparedness Branch leadership about need to activate the State Health Operations Center.
7. Determine need for federal notification/assistance/Epi-Aid.
8. Initiate and coordinate contact with Centers for Disease Control and Prevention (CDC) to assist with investigation or as an information resource.
9. Coordinate collection and transportation of lab samples between local health departments and Division of Laboratory Services.

2.9 KDPH Division of Epidemiology and Health Planning – Infectious Disease Branch – Reportable Disease Section

1. Provide consultation and technical assistance to LHD staff in the epidemiologic investigation of disease outbreaks.
2. Provide guidelines for the epidemiologic investigation and control of a specific outbreak consistent with state and national objectives, current policy, and current medical and scientific literature.
3. Determine whether a particular outbreak warrants further epidemiologic investigation and the nature and extent of additional epidemiologic, or laboratory data required.
4. Alert State Epidemiologist/Deputy State Epidemiologist, Division of Laboratory Services, and Division of Public Health Protection and Safety – Food Safety Branch and Environmental Management Branch, when appropriate.
5. Keep LHDs informed of the progress of any outbreak investigation.
6. Identify and arrange for additional staff and material resources from the KDPH if an outbreak exceeds the resource capacity of the LHD and the regional office.
7. Provide advice on collection of food, water, or other specimens in coordination with Division of Laboratory Services as well as the Food Safety Branch and Environmental Management Branch of the Division of Public Health Protection and Safety.
8. Recommend and request implementation of control measures.
9. Distribute outbreak surveillance information and summary reports to LHDs, regional offices, physicians, and other agencies.
10. Provide training materials instructive in the methods of outbreak investigations.
11. Will be notified by the KDPH Reportable Disease Section when a gastrointestinal illness is reported to the LHD by a correctional facility in the LHD district.
12. Finalize outbreak report data and upload to NORS.

2.10 Kentucky Department for Public Health (KDPH) - Emergency Preparedness and Response Branch

1. Serves as the Primary Coordinating Agency for ESF #8 Public Health and Medical Services in collaboration with the Emergency Preparedness and Response Branch
2. Collaborates with local, state, and federal agencies to develop and evaluate emergency operations plans through an active planning, training, and exercise cycle;

3. Maintains spaces, equipment, supplies, incident management software systems, and interoperable communication systems to ensure ESF #8 can support and coordinate public health and medical operations;
4. Registers key incident management personnel into incident management software systems to allow for notification and sharing of information;
5. Provides leadership in coordinating and integrating public health and medical preparedness, response, and recovery efforts for local health departments, hospitals, and other healthcare agencies;
6. Assigns personnel to coordinate public health and medical services through KDPH'S SHOC and the state's EOC;
7. Activates and deploys public health and medical teams to provide support and technical assistance to affected jurisdictions;
8. Coordinates requests for health and medical assistance through Mutual Aid, Emergency Management Assistance Compact (EMAC), and/or federal assistance**.**

2.11 KDPH Division of Public Health Protection and Safety – Food Safety Branch

1. Alert the Kentucky Division of Epidemiology and Health Planning that an investigation has been initiated.
2. Provide technical support and assistance as needed to LHD and/or Division of Epidemiology and Health Planning, Infectious Disease Branch, Reportable Disease Section.
3. The Food Safety Branch will review the epidemiological data for outbreaks reported to the Food Safety Branch.
4. Contact the Division of Laboratory Services for submission of food/environmental samples (see Appendix J).
5. Contact the United States Department of Agriculture (USDA) if the food product under their regulatory authority is suspected.
6. Contact the United States Food and Drug Administration (FDA) if the food product under their regulatory authority is suspected.
7. Contact appropriate regulatory authorities in sister (surrounding) states, as warranted.
8. Where warranted, conduct/coordinate recall effectiveness checks with FDA.
9. For suspected acts of terrorism or other suspected or threated intentional acts of food contamination, contact the Kentucky State Police.
10. The Food Safety Branch may be designated by the KDPH Commissioner as the responsible Branch for coordinating the investigation into acts of terrorism or other suspected or threatened intentional acts of food contamination.
11. Develop a final report of illness or injury implicating food and distribute to relevant agencies.
12. Maintain copies of the final report of illness or injury implicating foods at KDPH following suggested records retention schedules.
13. If the food is manufactured within the Commonwealth of Kentucky or a Kentucky firm is suspected of being responsible for causing the violation, the Food Safety Branch will initiate an inspection of the suspect facility.
14. All questions regarding public media releases are to be referred to the CHFS Office of Communications and Public Health Content.
15. All issues and questions regarding animal feeds are to be referred to the University of Kentucky Division of Regulatory Services.

16. All issues and questions regarding shell eggs and produce grown in Kentucky are to be referred to the Kentucky Department of Agriculture.
17. See Appendix J for the Foodborne Illness Outbreak Food Specimen Sampling Criteria and Protocol.

2.12 KDPH Division of Public Health Protection and Safety – Milk Safety Branch

1. Responsible for assuring that all permitted facilities are in compliance with the current Grade "A" Pasteurized Milk Ordinance.
2. Assist with and/or coordinate investigation of outbreaks involving milk; products where milk may be a source of infection; or milk production, processing, packaging, or shipping operations.

2.13 KDPH Division of Public Health Protection and Safety - Environmental Management Branch

1. Alert the State Division of Epidemiology and Health Planning – Reportable Disease Section when the need for an investigation is identified.
2. Provide technical support and assistance as needed.
3. Contact the Division of Laboratory Services for submission of water sample for bacteriological examination or contact other laboratory services when required.

2.14 KDPH Division of Laboratory Services

1. Receive initial alert on the case and that food/environmental samples may be authorized to be collected and sent to the State Food Lab for suspected foodborne illness and disease cases.
2. Receive initial alert on the requested foodborne pathogen(s) to be tested on authorized collected food/environmental samples including the number and expected arrival time of the samples to be sent to the State Food Lab for suspected foodborne illness and disease cases.
3. Prepare or order specialized media, reagents, and materials needed to test each suspect food pathogen.
4. Receive preauthorized food/environmental samples collected by authorized food collectors such as registered sanitarians.
5. Analyze or refer food samples for suspect foodborne pathogen(s).
6. Provide a preliminary test report.
7. Contact the Division of Public Health Protection and Safety - Food Safety Branch and Division of Epidemiology and Health Planning Reportable Disease Section with positive laboratory test results.
8. Alert Division of Laboratory Services Management with positive test results if a high alert foodborne illness or outbreak is suspected or confirmed.
9. Provide WGS testing on bacterial isolates in collaboration with the Division of Epidemiology and Health Planning and the CDC.
10. Dispose, retain, or ship and transfer suspect bacterial foodborne pathogen isolates as directed by CDC, FDA, Food Emergency Response Network (FERN), or federal authority managing a biological food terrorism or defense suspect case.
11. Provide a final lab test report to the Food Safety Branch and Reportable Disease Section and contact listed on the 504 form. The Food Safety Branch will distribute to additional necessary recipients.

2.15 KDPH Division of Maternal and Child Health - Early Childhood Development Branch – Early Childhood Promotion Section

1. Alert the regional childcare consultant and the KDPH Division of Epidemiology of potential foodborne/waterborne illness outbreaks.
2. Provide support and assistance to regional childcare consultant as needed.

2.16 Cabinet for Health and Family Services (CHFS) Office of the Inspector General (OIG)

1. Will be notified by the KDPH Reportable Disease Section of all gastrointestinal illnesses in healthcare facilities under OIG jurisdiction.
2. Investigate possible violations of state laws or regulations as needed based on OIG guidelines.

2.17 CHFS Office of Public Affairs

1. Be aware of potential media interest, particularly location/areas affected by outbreak, number of cases, and potential impact on the public at large.
2. Identify potential spokespeople to handle media interviews. In cases of disease outbreaks, physicians or health care providers are excellent spokespeople and often have a reassuring effect on the public.
3. Determine when public communications are necessary. This can vary. If the outbreak appears to be large in scale and other members of the public are at risk, draft and distribute a news release immediately. Similarly, if the outbreak is small but has the potential to produce significant public concern/panic, it is advisable to distribute a statement or possible release explaining the situation.
4. Assist in the creation, print, and distribution of communications materials such as media statement, news releases, talking points, fact sheets, flyers, or information pamphlets.
5. Be prepared to update web sites with new information and outbreak numbers.
6. Identify health or feature reporters (or other reporters in the local area who are familiar with public health and commonly cover the LHD – sometimes that is the government reporter) and compile a media contact sheet.
7. Determine when and how frequently communications will be distributed. If the outbreak is particularly large and there are daily updates, it might be necessary to send out daily communications.
8. Maintain ongoing communication with outbreak points-of-contact. Generally, this will be a representative(s) from epidemiology, food/health public safety, and the laboratory.
9. Gain familiarity with the details of the outbreak, the nature of the disease, and how it is spread.
10. Review media reports to determine accuracy of reporting (and possible need for clarification or correction), how media are using communications, and the effect communications are having on public feedback.

2.18 Kentucky Department of Corrections (KYDOC)

1. Notify KDPH Reportable Disease Section when a gastrointestinal illness is reported to the LHD by the correctional facility in the LHD district.

2. Coordinate with the LHD and KDPH as needed to conduct investigations based on the guidelines of KYDOC, LHD, and KDPH, respectively.
3. Collaborate with all pertinent parties when a local jail food preparation is suspected of causing an outbreak.

2.19 Kentucky Department of Agriculture

1. Cooperate in the process of the control and eradication of foreign animal diseases that impact the food supply.
2. Cooperate and provide communications with other agencies and organizations; federal, state, and local health departments; veterinarians; producers; and animal owners within Kentucky.
3. Exclude, detect, control, or eradicate serious insect pests and plant diseases that may be contributing to morbidity and mortality in an outbreak.
4. Regulate the sale and the use of pesticides that could impact the food supply and human health.
5. Investigate incidents of pesticide misuse relative to a pesticide-based food contamination incident.
6. Review and interpret laboratory results and provide an appropriate response.
7. Embargo pre-harvest food ingredients to protect the food supply.
8. Mobilize expertise in support of the timely and accurate investigation of pesticide, heavy metals and other contamination incidents involving pre-harvest food that carry over to pre- and post-harvest food production.
9. Regulate the production, sale and transportation of shell eggs.
10. Assist with or coordinate proper collection and shipping of specimens to DLS with LHDs.

2.20 Kentucky Department of Fish and Wildlife Resources

1. Provide consultation, support and technical assistance to KDPH and local health departments concerning food and water contamination resulting from wildlife.

2.21 Kentucky Energy and Environment Cabinet

1. Provide consultation, support and technical assistance as needed regarding a contaminated water supply.
2. Advise in the disposal of hazardous waste materials.

2.22 Kentucky Emergency Management

1. Provide a comprehensive and functional communications network between all general and command staff groups.
2. Coordinate with federal, state and local law enforcement.
3. Provide logistical support to the designated lead agency.
4. Coordinate resources.
5. Conduct or coordinate media briefs, if appropriate.
6. Coordinate the Emergency Operations Centers.

2.23 Centers for Disease Control and Prevention

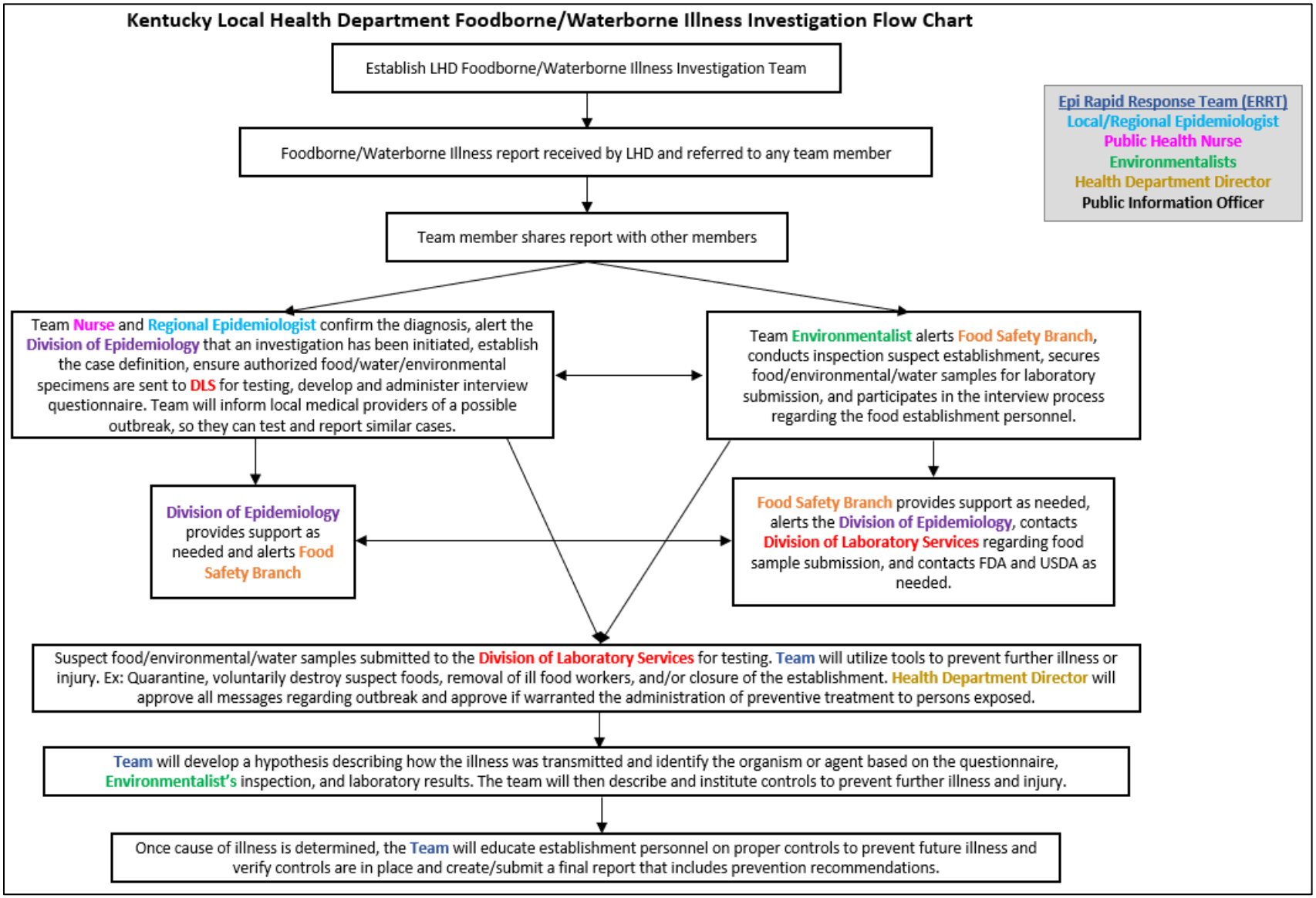
1. Provide epidemiologic consultation to KDPH and local health departments in determination of risk factors for illness and development of prevention and control strategies.
2. Make available on-site field assignees for assistance in epidemiologic investigations, if needed.
3. Detail additional CDC personnel (e.g., EIS Officers, program specific experts) to Kentucky for urgent epidemiological responses and investigations when requested and feasible.
4. Coordinate multi-state epidemiologic investigations needed to implicate foods or other sources of infection.
5. Provide reference diagnostic support to the state public health laboratory testing and confirmatory capability beyond the state.
6. Notify KDPH of any suspected outbreak identified through national surveillance in which Kentucky residents are reported as cases.
7. Work closely with KDPH and local public health epidemiologists and laboratorians to identify illnesses and clusters of illness.

2.24 U.S. Food and Drug Administration

1. Coordinate a voluntary recall of FDA-regulated products that are linked to outbreaks of foodborne disease.
2. Conduct/coordinate recall audit checks with state food protection agencies.
3. Provide coordination, field investigators, laboratory support, technical consultation, regulatory support and media relations to KDPH and local health departments.
4. Provide policy, technical and scientific support to investigations.
5. Provide technical and scientific advice and support to field investigators during an outbreak investigation.
6. Notify the Food Safety Branch when there is a foodborne outbreak involving a Kentucky firm.

2.25 U.S. Department of Agriculture

1. Provide coordination, laboratory support, technical consultation, regulatory support and assistance with media relations.
2. Coordinate voluntary recalls of meat, poultry or egg products linked to outbreaks of foodborne disease


Kentucky Local Health Department Foodborne/Waterborne Illness Investigation Flow Chart
Establish LHD Foodborne/Waterborne Illness Investigation Team
Foodborne/Waterborne Illness report received by LHD and referred to any team member
Team member shares report with other members
Epi Rapid Response Team (ERRT)
Local/Regional Epidemiologist
Public Health Nurse
Environmentalists
Health Department Director
Public Information Officer
Team Nurse and Regional Epidemiologist confirm the diagnosis, alert the Division of Epidemiology that an investigation has been initiated, establish the case definition, ensure authorized food/water/environmental specimens are sent to DLS for testing, develop and administer interview questionnaire. Team will inform local medical providers of a possible outbreak, so they can test and report similar cases.
Team Environmentalist alerts Food Safety Branch, conducts inspection suspect establishment, secures food/environmental/water samples for laboratory submission, and participates in the interview process regarding the food establishment personnel.
Division of Epidemiology provides support as needed and alerts Food Safety Branch
Food Safety Branch provides support as needed, alerts the Division of Epidemiology, contacts Division of Laboratory Services regarding food sample submission, and contacts FDA and USDA as needed.
Suspect food/environmental/water samples submitted to the Division of Laboratory Services for testing. Team will utilize tools to prevent further illness or injury. Ex: Quarantine, voluntarily destroy suspect foods, removal of ill food workers, and/or closure of the establishment. Health Department Director will approve all messages regarding outbreak and approve if warranted the administration of preventive treatment to persons exposed.
Team will develop a hypothesis describing how the illness was transmitted and identify the organism or agent based on the questionnaire, Environmentalist's inspection, and laboratory results. The team will then describe and institute controls to prevent further illness and injury.
Once cause of illness is determined, the Team will educate establishment personnel on proper controls to prevent future illness and verify controls are in place and create/submit a final report that includes prevention recommendations.

Regional Epidemiologist

Receive initial report that includes the needed demographics (name, address, phone number, etc.) and report illness complaint to other team members including the Regional or Local Health Department Nurse and Local Environmentalist.

Determine suspected organism(s) to be tested based upon diagnostic tests, symptoms, and the onset and duration of illness.

Confirm diagnosis with the medical provider. Encourage private labs to send laboratory isolates to the Div. of Laboratory Services for serotyping Whole Genome Sequencing (WGS). Contact the case(s) after conferring with the medical provider.

Alert KDPH Division of Epidemiology and Health Planning - **Reportable Disease Section (502-564-3261 or at (888) 973-7678** if calling after business hours**)** of investigation. Notify appropriate LHD administration/Public Health Director as necessary.

Enter case(s) into the Kentucky electronic surveillance system (e.g., NEDSS) used for reporting disease.

Look for additional associated cases by informing local medical community of a possible outbreak and encouraging ill persons to seek medical attention. This would include coordinating the collection of clinical samples (active surveillance).

Collaborate with ERRT members on developing a working case definition and a line listing. Create line list in Excel or other database for tracking cases. Analyze data collected from questionnaires, surveys, etc. Describe data: epi curve, attack rate, etc. Create map as required and available.

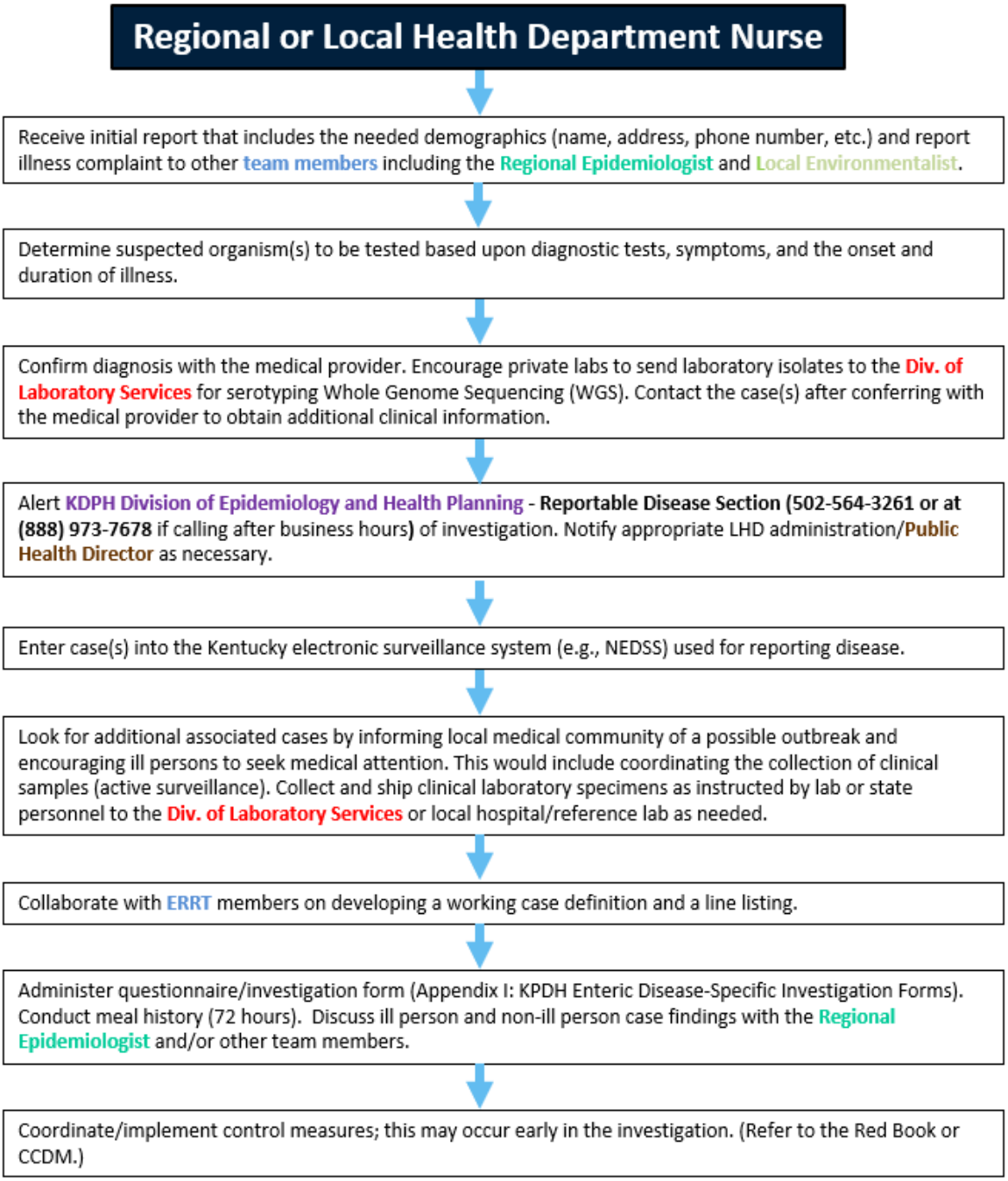
Administer questionnaire/investigation form (Appendix I: KPDH Enteric Disease-Specific Investigation Forms). Conduct meal history (72 hours). Determine study design if necessary.

Formulate a tentative hypothesis and share hypothesis with ERRT.

Coordinate/implement control measures; this may occur early in the investigation. (Refer to the Red Book or CCDM.)

Create, with the joint input of the team members, and submit the final report that includes recommendations to prevent future foodborne and waterborne illnesses from occurring.

Enter outbreak information into the final report form and National Outbreak Reporting System (NORS) instruments in REDCap. See appendix K for a copy of the NORS forms.


Regional or Local Health Department Nurse
Receive initial report that includes the needed demographics (name, address, phone number, etc.) and report illness complaint to other team members including the Regional Epidemiologist and Local Environmentalist.
Determine suspected organism(s) to be tested based upon diagnostic tests, symptoms, and the onset and duration of illness.
Confirm diagnosis with the medical provider. Encourage private labs to send laboratory isolates to the Div. of Laboratory Services for serotyping Whole Genome Sequencing (WGS). Contact the case(s) after conferring with the medical provider to obtain additional clinical information.
Alert KDPH Division of Epidemiology and Health Planning - Reportable Disease Section (502-564-3261 or at (888) 973-7678 if calling after business hours) of investigation. Notify appropriate LHD administration/Public Health Director as necessary.
Enter case(s) into the Kentucky electronic surveillance system (e.g., NEDSS) used for reporting disease.
Look for additional associated cases by informing local medical community of a possible outbreak and encouraging ill persons to seek medical attention. This would include coordinating the collection of clinical samples (active surveillance). Collect and ship clinical laboratory specimens as instructed by lab or state personnel to the Div. of Laboratory Services or local hospital/reference lab as needed.
Collaborate with ERRT members on developing a working case definition and a line listing.
Administer questionnaire/investigation form (Appendix I: KPDH Enteric Disease-Specific Investigation Forms). Conduct meal history (72 hours). Discuss ill person and non-ill person case findings with the Regional Epidemiologist and/or other team members.
Coordinate/implement control measures; this may occur early in the investigation. (Refer to the Red Book or CCDM.)

Regional or Local Health Department Sanitarian or Environmentalist

Receive initial report that includes the needed demographics (name, address, phone number, etc.). Refer report to **Regional or Local Health Department Nurse** or **Regional Epidemiologist** to confirm diagnosis and determine the need for further investigation.

Investigate two or more isolated foodborne/waterborne illness complaints without a confirmed case as a complaint inspection of the food establishment. During the inspection, food managers should be made aware of the complaint and asked about any complaints they may have received.

Conduct a targeted inspection of the suspect food establishment if the definition of a foodborne/waterborne outbreak is met. Where warranted, conducted environmental assessment as directed by the Food Safety Branch.

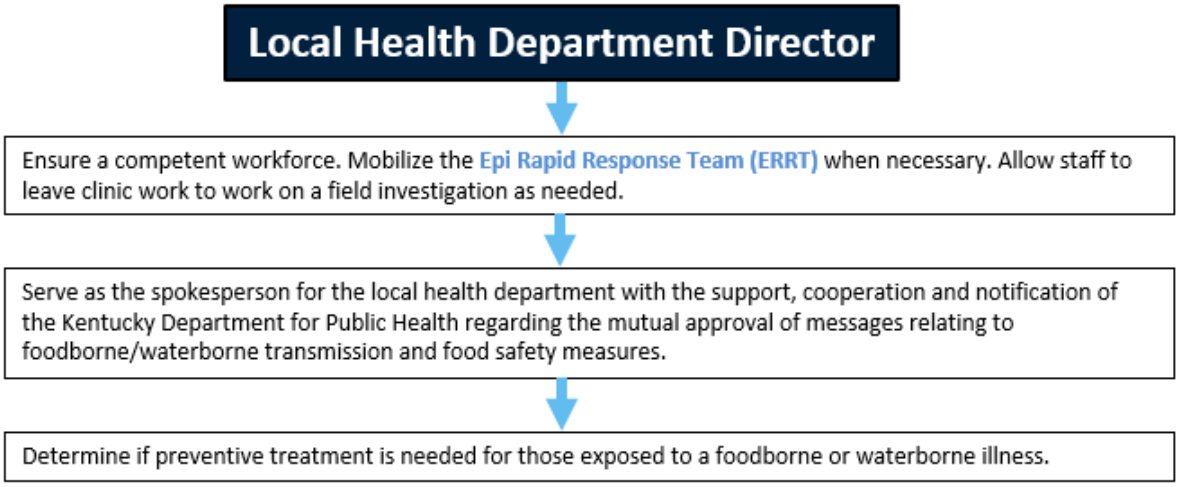
Interview all food preparation employees regarding the detailed preparation of the suspect food. Interview the food manager regarding ill employees and any consumer complaints. Share and coordinate interviews with **team members** .

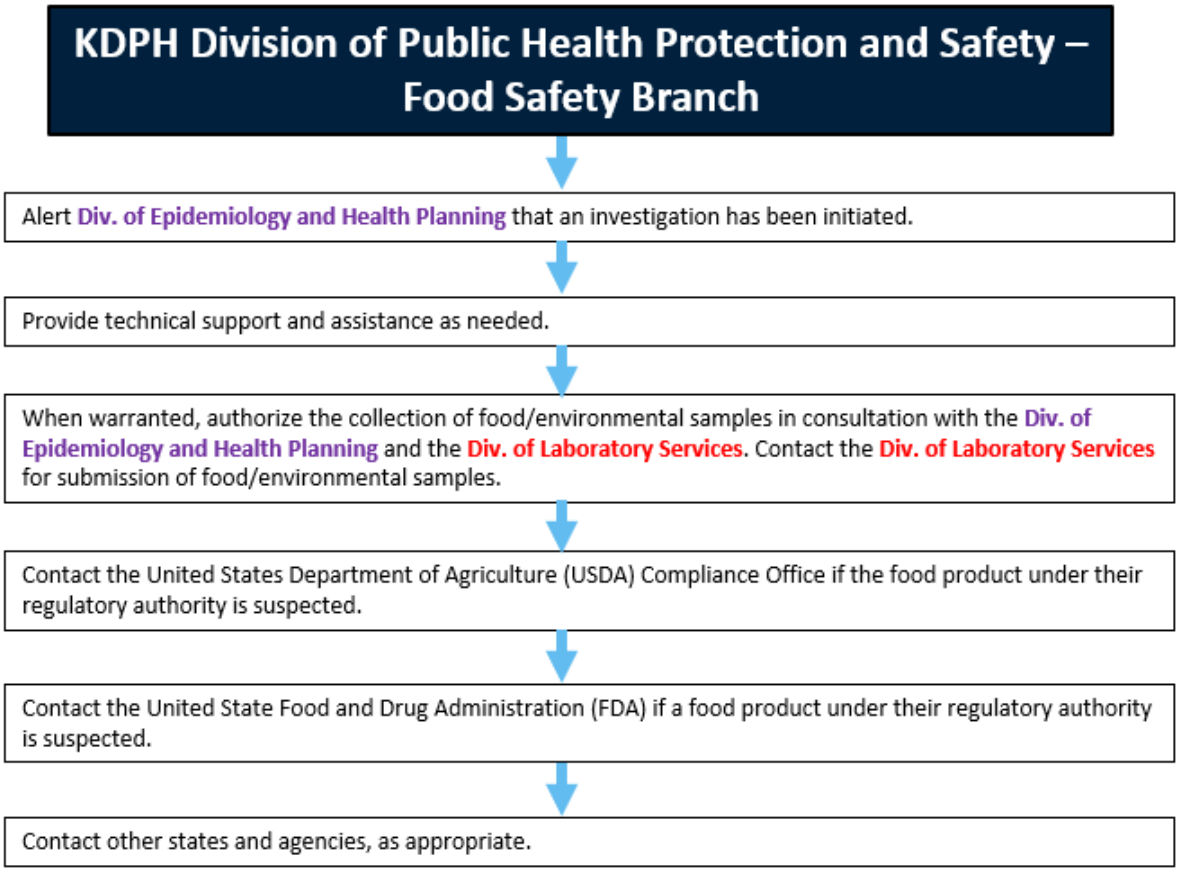
Collect and submit suspect food/water samples if available to the **Div. of Laboratory Services**. Food samples should be collected and submitted in accordance with the laboratory protocol (see collection sheet, Appendix E and Appendix F, as appropriate). Contact the **Division of Public Health Protection and Safety - Food Safety Branch** at 502-564-7178 before collection or submission of food samples. Food samples are generally submitted to determine the presence of a specific agent in the food that matches the agent found in the confirmed patient(s). **Food samples are not submitted to the lab for the purpose of diagnosis of the Suspect case.** Food samples must remain in the possession of the collector and always be accounted for until it is either directly released to a public health laboratory employee or packaged and shipped by a traceable courier. A Chain of Custody form is required and can be found in Appendix G.

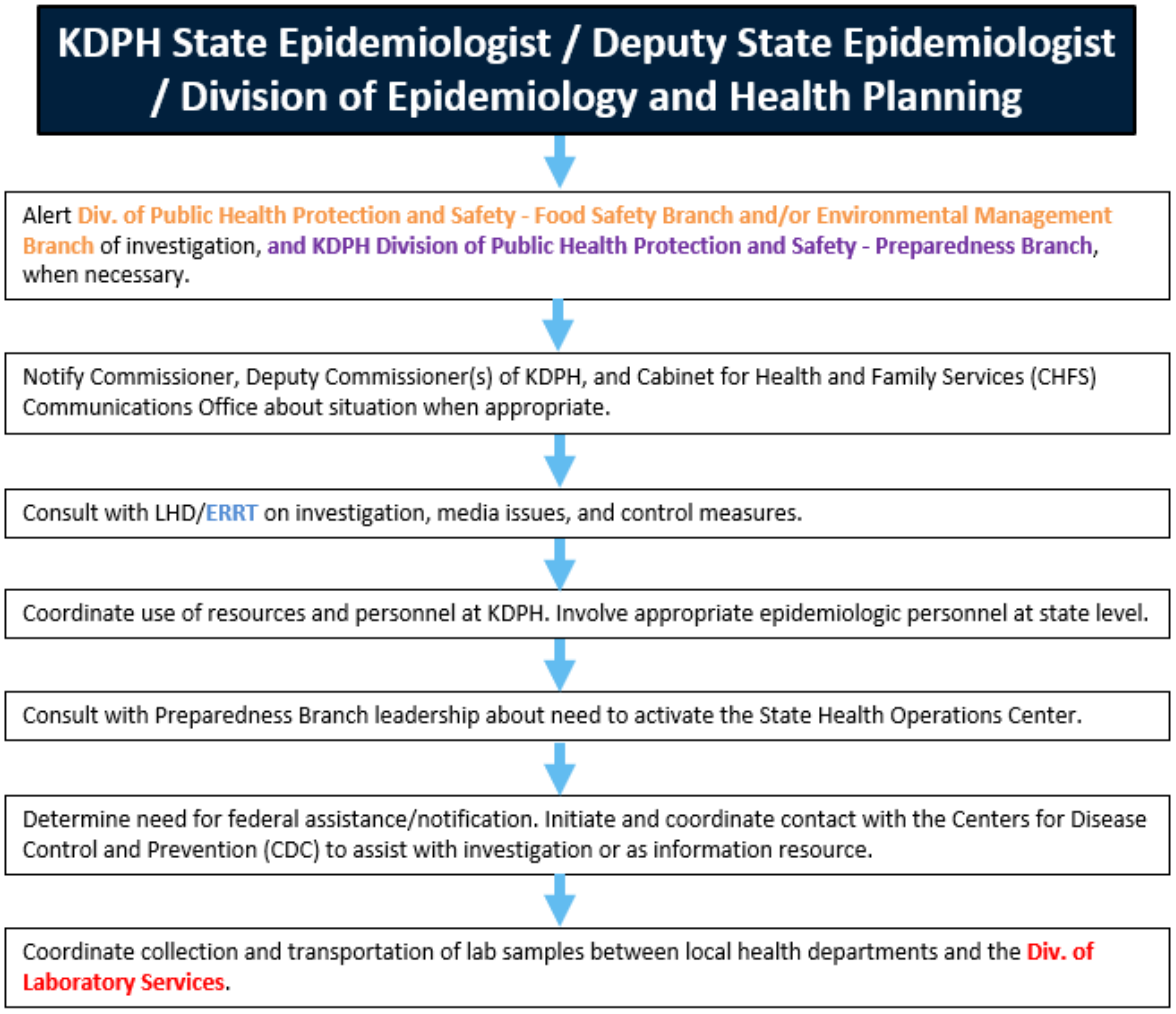
Utilize tools as warranted by the **Epi Rapid Response Team** to prevent the further spread of illness/injury from the food establishment. Examples: Quarantine suspect foods, voluntary closure of the food establishment, removal of ill food handler from the food establishment based upon the Kentucky Retail Food Establishment Code and the Kentucky Food, Drug, and Cosmetic Act, and elimination of improper food handling practices.

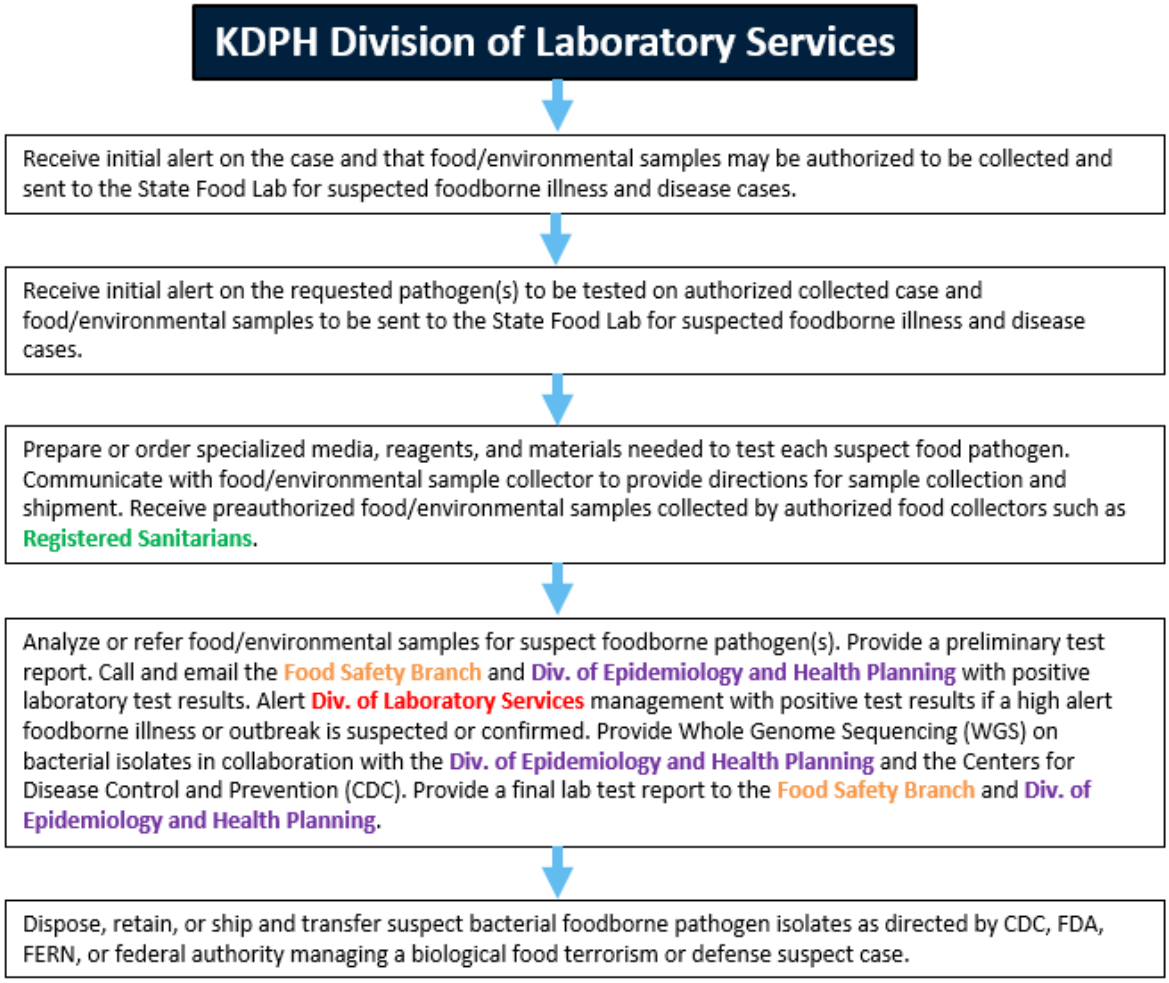
Contact the **Food Safety Branch** at 502-564-7181 if the suspect food is commercially manufactured or raw molluscan shellfish (Appendix K). Complete online complaint system, Kentucky Food Safety Reporting System, or the DFS-216 Record of Complaint and Investigation (see Appendix H). This will initiate further investigation.

Once the cause of the foodborne illness is determined, educate the food establishment manager on proper controls to prevent future illness, verify that the controls have been communicated to food handlers, and verify that the controls have been implemented. Initiate official enforcement action when appropriate, to include but not limited to product quarantine and facility closure.


Local Health Department Director
Ensure a competent workforce. Mobilize the Epi Rapid Response Team (ERRT) when necessary. Allow staff to leave clinic work to work on a field investigation as needed.
Serve as the spokesperson for the local health department with the support, cooperation and notification of the Kentucky Department for Public Health regarding the mutual approval of messages relating to foodborne/waterborne transmission and food safety measures.
Determine if preventive treatment is needed for those exposed to a foodborne or waterborne illness.


KDPH Division of Public Health Protection and Safety – Food Safety Branch
Alert Div. of Epidemiology and Health Planning that an investigation has been initiated.
Provide technical support and assistance as needed.
When warranted, authorize the collection of food/environmental samples in consultation with the Div. of Epidemiology and Health Planning and the Div. of Laboratory Services. Contact the Div. of Laboratory Services for submission of food/environmental samples.
Contact the United States Department of Agriculture (USDA) Compliance Office if the food product under their regulatory authority is suspected.
Contact the United State Food and Drug Administration (FDA) if a food product under their regulatory authority is suspected.
Contact other states and agencies, as appropriate.


KDPH State Epidemiologist / Deputy State Epidemiologist / Division of Epidemiology and Health Planning
Alert Div. of Public Health Protection and Safety - Food Safety Branch and/or Environmental Management Branch of investigation, and KDPH Division of Public Health Protection and Safety - Preparedness Branch, when necessary.
Notify Commissioner, Deputy Commissioner(s) of KDPH, and Cabinet for Health and Family Services (CHFS) Communications Office about situation when appropriate.
Consult with LHD/ERRT on investigation, media issues, and control measures.
Coordinate use of resources and personnel at KDPH. Involve appropriate epidemiologic personnel at state level.
Consult with Preparedness Branch leadership about need to activate the State Health Operations Center.
Determine need for federal assistance/notification. Initiate and coordinate contact with the Centers for Disease Control and Prevention (CDC) to assist with investigation or as information resource.
Coordinate collection and transportation of lab samples between local health departments and the Div. of Laboratory Services.


KDPH Division of Laboratory Services
Receive initial alert on the case and that food/environmental samples may be authorized to be collected and sent to the State Food Lab for suspected foodborne illness and disease cases.
Receive initial alert on the requested pathogen(s) to be tested on authorized collected case and food/environmental samples to be sent to the State Food Lab for suspected foodborne illness and disease cases.
Prepare or order specialized media, reagents, and materials needed to test each suspect food pathogen. Communicate with food/environmental sample collector to provide directions for sample collection and shipment. Receive preauthorized food/environmental samples collected by authorized food collectors such as Registered Sanitarians.
Analyze or refer food/environmental samples for suspect foodborne pathogen(s). Provide a preliminary test report. Call and email the Food Safety Branch and Div. of Epidemiology and Health Planning with positive laboratory test results. Alert Div. of Laboratory Services management with positive test results if a high alert foodborne illness or outbreak is suspected or confirmed. Provide Whole Genome Sequencing (WGS) on bacterial isolates in collaboration with the Div. of Epidemiology and Health Planning and the Centers for Disease Control and Prevention (CDC). Provide a final lab test report to the Food Safety Branch and Div. of Epidemiology and Health Planning.
Dispose, retain, or ship and transfer suspect bacterial foodborne pathogen isolates as directed by CDC, FDA, FERN, or federal authority managing a biological food terrorism or defense suspect case.

Chapter 3: Steps in Investigating an Outbreak

Section One: The 10 Steps in Investigating an Outbreak

1) Prepare for an Outbreak Investigation and Field Work
2) Confirm the Existence of an Epidemic or an Outbreak
3) Verify the Diagnosis
4) Define a Case and Identify and Count Cases
5) Describe the Data in Terms of Person, Place, and Time
6) Develop Hypotheses
7) Evaluate Hypotheses (Analyze and Interpret the Data)
8) Refine Hypotheses and Carry Out Additional Studies
9) Implement Control and Prevention Measures
10) Communicate Findings, Provide Documentation and Enter into the REDCap Outbreak Management System

Section Two: Management of Multiple Outbreak Investigations

Overview of Steps in Investigating an Outbreak

Introduction

Epidemiology is the basic science of public health practice. An epidemiologic investigation is the data gathering and analytic process that ties together the evidence of epidemiologic, clinical, laboratory, and environmental components of the investigation to arrive at supportable conclusions about the likely cause(s) and outcome(s) of an outbreak. Each part of the investigation (epidemiologic, clinical, lab, and environmental) complements the others. **Teamwork and open communication are the hallmarks of effective and successful outbreak investigations and so are of utmost importance.**

The purpose of the epidemiologic investigation is to identify the causes of a public health problem by collecting data and formulating and testing hypotheses. It also involves implementing control measures to prevent additional illness and evaluating the impact of those control measures to make sure that the problem has been adequately addressed.

When an outbreak has been identified, the local health department (LHD) should **immediately** notify the Infectious Disease Branch, Reportable Disease Section at the Kentucky Department for Public Health (KDPH) and/or any other state level office (e.g., Division of Public Health Protection and Safety, Division of Laboratory Services, etc.) that might have expertise that could bear on the investigation. The toll-free number is 1-888-973-7678. These offices may assist in coordinating the investigation, assist in the investigation itself if requested by the LHD, and can be consulted on collection of food, clinical, and/or environmental specimens.

Following, are 10 standard steps to an outbreak investigation. Though they are listed in sequential order, their order of implementation is often non-sequential. Knowing these steps prepares one to conduct an investigation properly, using common sense and logic to determine when, how often, and to what extent the different steps should be implemented in a real-world investigation.

The following steps should be taken in all outbreak investigations:

1. Prepare for an outbreak investigation and field work.
2. Confirm the existence of an epidemic or an outbreak.
3. Verify the diagnosis.
4. Define a case and identify and count cases.
5. Describe the data in terms of person, place, and time.
6. Develop hypotheses.
7. Evaluate hypotheses (analyze and interpret the data).
8. Refine hypotheses and carry out additional studies.
9. Implement control and prevention measures.
10. Communicate findings and enter final outbreak data into the REDCap Outbreak Management System (i.e., final report form and National Outbreak Reporting System (NORS) instruments). This includes line list, epi curve, and other supporting documentation.

NOTE 1: It is important to note that while the above list of steps is in a particular order, the steps do not necessarily have to be carried out in that order. In fact, several steps may be put into action simultaneously. However, confirming the existence of an outbreak and verifying the diagnosis *always* deserve early attention.

NOTE 2: Depending on staffing, resources, and time, all the steps may not be covered thoroughly or even covered at all. As stated previously, KDPH is available for guidance and assistance. (Telephone numbers for KDPH are included in this chapter and in Appendix A.)

3.1.1 Step One: Prepare for Outbreak Investigation and Field Work

Although the steps in investigating an outbreak are not always implemented sequentially, preparing for an epidemiologic investigation may be considered as the initial step in any outbreak because at least part of the planning can be done before an outbreak occurs. The LHD can begin by training personnel in how to compile line lists, develop questionnaires, conduct interviews, and use software such as REDCap for data entry and analysis. Physicians, hospitals, and nursing homes should also be trained on the procedures for reporting infectious diseases. It is important to establish rapport with community stakeholders and to provide them with a copy of the Reportable Disease Desk Reference. The LHD should have 6-8 stool culture kits on hand or readily available should an outbreak occur because in most cases stool specimens must be collected within 72 hours of onset of illness to isolate and identify certain pathogens (e.g., *Clostridium perfringens, Bacillus cereus, Staphylococcus aureus*). The LHD should also maintain a supply of food collection kits and water collection kits so that prompt collect of the suspect food items or water may be collected. Lists of contacts, such as administrative contacts, additional personnel, sanitarians, regional contacts, physicians, clinical laboratories, or other persons who may become involved in outbreak investigations should be assembled. Resource materials, such as the Red Book or the Control of Communicable Diseases Manual (CCDM), describing signs and symptoms, incubation times, vectors, probable routes of exposure, and specifics regarding specimen collection (e.g., Appendices C, D, E and F of this manual) and appropriate collection kits to be used should be maintained and readily available to those responding to the initial calls. “Go kits” for typical outbreaks can be assembled with all of these materials ready to roll out the door at a moment’s notice.

These steps may help in fielding investigators faster and initiating an investigation. It is also very important for the LHD to realize the limits of the LHD’s resources; does the LHD have the means to properly conduct the investigation or is there a need to seek outside assistance? If an outbreak investigation requires additional resources, KDPH should immediately be notified. Once the investigation is underway, the proper clinical specimens should be collected as soon as possible before patients recover and become less likely to submit specimens, or are treated, and before general interest in the investigation wanes. Food and water specimens should also be collected as soon as possible. Being prepared in advance increases the likelihood that this will happen. A presumptive diagnosis may be misleading in the absence of a thorough laboratory work up. A determination must be made regarding the feasibility of conducting an investigation even if the time to collect proper clinical specimens has passed. Each step of the investigation can be impacted by prior preparation.

Once an outbreak is identified, final preparation for field work must occur. What will be needed in the field? Who should go? Will food, water, money, or hotel reservations be needed? Who needs to be informed in the office and at the investigation site? How will communications occur and are contact

information sheets and clear directions available? What will be the goal of the field work? What is the timeline? Who are the interested parties or stakeholders? Answers to these types of questions will be crucial to a successful investigation.

3.1.2 Step Two: Confirm the Existence of an Epidemic or an Outbreak

Once the health department staff have been alerted to the possibility of some unusual cases, or an unexpected increase in the number of cases of a particular disease or group of symptoms, the first step is to make sure that the information is correct and that there truly is an outbreak to investigate. What determines the existence of an outbreak? The general rule is to compare the current rate of occurrence of the disease to what "normally" occurs to determine if there is a rise in cases *beyond what is normally experienced.* However, for diseases not often seen in a given area, two or more cases are usually the general rule for declaring an outbreak.

Reporting of cases of illness can occur for any number of reasons that don't relate to a true outbreak. Misdiagnosis is a common occurrence and usually happens in the absence of proper lab testing. Increases in reporting cases of a disease may happen because a specialist starts practice in an area and identifies and reports previously unrecognized cases. Media coverage may cause clinicians to suspect a particular disease more often and report cases. The reportable disease case definition (see Step 4) may change to include more people as cases. Lab testing can bring about many false increases. For instance, a new lab test may be created making testing possible, a more sensitive lab test might be developed, more samples might be gathered and sent for testing because of increased awareness among clinicians, or an increase in inappropriate testing of people will naturally increase the false positive rate bringing about higher lab reports of the disease. In all of these cases, the rate of occurrence of the disease didn't actually increase, but the number of reported cases appears to indicate that it did.

Thus, one should always strive to establish the true existence of an outbreak by comparing the incidence of the disease in a specified population during a comparable previous time period. Often, individuals may exaggerate the number or severity of cases related to a particular event or report "lots of people have it" for a particular disease and once investigated this is not borne out by the facts. It is often unclear when to conduct a full epidemiologic investigation. There is usually no question when the team is notified about a large number of people getting ill at approximately the same time after eating at the same establishment or attending the same event. However, uncertainty arises when sporadic complaints are reported. The response team will need to consider whether the reports indicate that the affected cases are all suffering from the same illness and whether there is any evidence of an association between them. This underscores the need to follow-up (i.e., determine the validity of and initiate further action if necessary) on every complaint received. It often occurs that single complaints are actually related to an outbreak.

When a complaint implicates a food product, water source, or retail food establishment, the LHD environmentalist should be notified. The LHD environmentalist should conduct targeted inspection or conduct an environmental assessment of the facility when directed by the Food Safety Branch. This should include the collection of relevant environmental samples for laboratory testing. If samples cannot be collected at the time of the environmental assessment, the food items should be quarantined for later collection.

To make the task of establishing an outbreak easier, investigators must be familiar with the reportable disease system, know who to contact to find previous and current rates of diseases, and know common disease trends in the community. This can be done through diligent public health surveillance that provides an accurate assessment of the status of the health of the community and helps to determine any increases or decreases in communicable diseases in the local population. Surveillance data should be reviewed by the LHD on a regular basis to become familiar with the status of all communicable diseases in the area of jurisdiction. Be aware of artificial causes of increases such as: (1) changes in local reporting; (2) changes in case definitions of reportable diseases; (3) increased local or national interest in particular diseases; (4) new physicians in the area or those who might be specialists in certain diseases; (5) new diagnostic procedures which might identify new or existing infectious agents; and (6) increased populations or new arrivals into the area. When notified of an incident in which illness has resolved and no new cases have been identified, the decision to conduct an epidemiologic investigation should be based on an assessment of what will be gained. As stated above, an investigation always serves as a learning tool. But, if resources (time, personnel, etc.) are limited, a full investigation may not be warranted. Rather, one should ensure that appropriate control measures have been implemented to prevent future outbreaks.

This is especially true of home-based foodborne outbreaks. In many instances, the illness is confined to a finite number of people in a discrete time period. In addition, the health department is often notified well after the fact when there is little, or no material left for testing and people have recovered. In this case, the team should review food preparation techniques with the responsible parties and use the opportunity to educate on proper food handling and preparation methods. Whenever an increase in cases is reported, this is the perfect opportunity to give a “heads up” to each of the investigation partners in the health department. The epidemiologists, communicable disease nurses, and environmentalists should all be aware of the possibility of an investigation from this initial point. Each may have insight into how to determine whether this is truly an outbreak based on prior experience so the intake staff person should not waste an opportunity to collaborate early.

NOTE: Investigation of an outbreak of foodborne or waterborne illness is a team effort where each member has an essential role to perform. In some instances, the team may include a number of individuals at the local level (public health nurse, sanitarian, local or regional epidemiologist) and the state level (state epidemiologist, infectious disease branch, food safety branch, environmental management branch). At times, there may be only one person involved at the local level. **Whatever the circumstances, it is important to remember that KDPH is available for guidance and assistance throughout each step of the investigation.** Phone numbers are listed on the next page.

KDPH Contacts

Division of Public Health Protection and Safety, Food Safety Branch **(502) 564-7181**	For policy and technical assistance with the environmental investigation such as initiating enforcement actions and collecting food/environmental samples. On-site investigation assistance is available to coordinate multi-county or interstate outbreaks.
Division of Public Health Protection and Safety, Environmental Management Branch **(502) 564-4856**	For technical assistance with water sample collection.

Division of Epidemiology and Health Planning, Reportable Disease Section **(502) 564-3261** **1-888-9-REPORT or 1-888-973-7678**	For technical assistance with the epidemiologic investigation such as obtaining medical histories and developing questionnaires. On-site investigation assistance is often available for larger outbreaks.
Division of Laboratory Services **(502) 564-4446**	For technical assistance with the collection protocol for food and clinical specimens.

3.1.3 Step Three: Verify the Diagnosis

Verifying the diagnosis is done by obtaining appropriate clinical histories and proper specimens (patient and/or environmental), for laboratory study.

A diagnosis might already be established as is the case when someone notices an increase in positive lab results for a certain disease. It could also happen when area physicians report an increase in the number of patients they are seeing with similar symptoms and at least one doctor tested appropriately and thus already has a diagnosis for the outbreak (which of course must be further confirmed with respect to the actual outbreak but gives the investigator a definite starting point). However, if the diagnosis is not clearly established, then the first step is to obtain clinical histories on the patients.

Obtaining Clinical History
Obtaining accurate clinical histories involves interviewing ill persons, family members and/or physicians, either in person, on the phone, or through a formal survey (discussed in Step 4) to record all relevant symptoms, possible exposures, and other details that might reveal the disease in question. It is also a good time to ask questions that might illuminate the cause of the outbreak or ways to prevent further cases.

The important elements to cover when obtaining initial clinical histories include anything that might lead to the determination of a specific disease entity that is responsible for this outbreak. Primary among these are specific symptoms of the illness, details that could help determine the incubation period, contacts with other sick people who might already be diagnosed or offer a broader symptom profile, and prominent exposures that may have led to infection or poisoning. All of these categories of information could indicate what kind of disease is the etiologic agent in this outbreak. **Remember, the information gathered is confidential and should be shared with only those individuals involved in the investigation.**

Laboratory Specimen Collection
Review the method of laboratory testing, (e.g., sputum swabs, blood tests, stool culture, and select isolates). Be wary of verbal reports of any disease. Insist on obtaining laboratory evidence of positive test results from established laboratories and accepted tests. Other evidence to support the diagnosis (e.g., a lab-confirmed case in a contact) can sometimes be used in lieu of laboratory results. (Information on submitting clinical specimens is discussed in Step 4 of this chapter.) In some instances, there will be outbreaks of unknown etiology, and there will be no laboratory results forthcoming to confirm the diagnosis. This often happens because it is well after the outbreak when the investigation begins, or clinicians are likely to treat empirically rather than test so inadequate or no testing has occurred. Cases or outbreaks of diseases of unknown etiology are just as valid as those with known etiologies.

NOTE: Laboratory identification of a pathogen can validate the hypothesis and perhaps allow easier implementation of control and preventive measures. **Therefore, time is of the essence when requesting and collecting clinical, food and water specimens.**

- Refer to Appendix D for information on submission of clinical specimens.
- Refer to Appendix E for more information on submission of food specimens.
- Refer to Appendix F for more information on submission of water samples.

It is important to notify the lab prior to the submission of food samples and other specimens. Food pathogen testing is time consuming and involved and the lab needs time to plan and prepare. Each food pathogen has a unique protocol of media and incubation temperature. Media is made on demand because it is expensive and has short expirations.

When submitting any specimens to the Division of Laboratory Services for analysis, it is crucial to have an idea of what the disease or toxin is so that the lab can test appropriately. Specimens should be packaged and shipped using current transport regulations to arrive in the appropriate time frame (see appendix D for packaging, shipping, and transport time frame). Refer to: Appendix D: Collection and Submission of Clinical Samples; Appendix E: Collection and Submission of food sample; and Appendix F: Collection and Submission of Water Samples for specific guidance for collection packaging and shipping. Flowcharts which describe the basic lab testing process are also included in Appendix D, Appendix E, and Appendix F. Please keep in mind that these flowcharts do not reflect the entire work process for testing of laboratory specimens. Rather, they have been simplified to provide a basic description of specimen flow through the lab and the testing process. These flow charts are intended to provide a general idea of the steps and time required for testing.

It is very expensive to run tests on stool or food samples. A request to “test for all gastrointestinal illnesses that could be in stool sample,” or “test for whatever could make people sick in this food,” will not be performed without further specification by the Division of Laboratory Services. Use symptomatology, probable incubation periods, and other characteristics of the outbreak (e.g., likelihood of waterborne, foodborne, or environmental contaminants vs. infectious etiologies), to assist in making educated guesses about the agents to be tested for in order to request specific tests to be performed. Appendix C contains this information and may assist investigation team members in identifying agents to be tested for.

3.1.4 Step Four: Define a Case and Identify and Count Cases

Develop the Case Definition

After establishing that an outbreak is occurring and attempting to verify the correct diagnosis, a *crucial* step is to define what constitutes a case in this investigation. This is called the **Case Definition**. The case definition is then used to identify and count cases.

A case definition is a set of criteria for deciding whether an individual ill person should be classified as a case. The case definition places boundaries on who will be counted as a case, so the investigation does not include those with illnesses unrelated to the outbreak. This step helps to get an idea of the magnitude of the problem and records all cases for follow-up in the investigation.

The common elements of a case definition include information on symptoms, laboratory results, and the essential elements of person, place, and time.

a) Symptoms: People with the same illness do not always have the same symptoms, but they will experience similar ones. It is important to remember that the symptoms of some foodborne and waterborne illnesses can mimic other foodborne and waterborne diseases. For assistance in determining the incubation period and possible etiologic agent, please refer to the Kentucky Field Guide for Foodborne and Waterborne Diseases in Appendix C as well as the Control of Communicable Diseases Manual.

b) Laboratory results: When a laboratory confirmation is made, the task of defining a case is much easier. Hospitals or local clinicians in the affected jurisdiction may be notified that an outbreak exists and asked to notify the LHD of additional cases of the illness under investigation. **Note: during an outbreak of foodborne illness, efforts should be made to send specimens and/or isolates to the Kentucky Division of Laboratory Services (DLS) for further identification, confirmation and to assure coordination of the investigation. Please contact the Infectious Disease Branch before sending specimens.** (See Appendices D, E, and F for more information on what testing is done at DLS.)

c) Person: The outbreak may or may not take place within a particular group of people. Therefore, characteristics such as age, sex, occupation, ethnic group, social affiliations or association with particular events greatly assist in qualifying the case definition.

d) Place: When there is a common meal involved, the place is already established. But sometimes the only information available may be that cases are occurring in several different locations over the same time period. It is only after more information becomes available that the case definition will become more specific as to the location of the outbreak. For example, case-patients identified through lab results may reside in different counties, but investigation shows that they all work at the same company or visited the same store in a given time frame, making the place element more specific.

e) Time: If there appears to be a common meal involved, then the time between consumption of that meal and the onset of symptoms provides an indication of the incubation period. The incubation period and symptoms are helpful in determining which etiologies should be considered as possible causes of the outbreak, and thus may facilitate decision-making regarding what types of laboratory tests should be run. As with symptoms, incubation periods can vary among individuals; therefore, one should consider a range of time of exposure for the case definition. For example, in the case of a Salmonella outbreak, cases may be defined to include those persons who experienced symptoms consistent with the case definition anywhere from 6 – 72 hours after the meal in question.

The initial case definition is usually broad ("**Sensitive**") so that potential cases are not left out. Once more information is obtained about the outbreak and the team is more certain of the characteristics of true cases, the case definition may be refined to be more "**Specific**" in order to filter out individuals that are not as likely to be part of the actual outbreak. This allows analysis to focus in on true risk factors because ill persons who are probably not related to the current outbreak are excluded.

Case definitions are often broken into sub-categories based on the strength of evidence that this is a true case of the disease or is truly related to the particular outbreak being investigated. These designations are usually, "suspect," "probable," and "confirmed." A suspect case is usually one that has some symptoms similar to known cases but may be missing a crucial symptom or may not link clearly to known cases and is not lab-confirmed. A probable case usually has all the crucial characteristics but is missing a final component of confirmation, such as a required final lab test, or an epidemiologic link to a known case. A confirmed case meets all the characteristics established in the case definition for a true case. CDC has established guidelines for the suspect, probable and confirmed case definitions for many diseases. Investigators will usually add to or modify these for an active outbreak investigation to cover elements of person, place, and time, or other case definition needs specific to the current investigation.

Finding Cases

With the case definition in place, the next half of the equation is to decide how to find additional cases, (i.e., routine methods versus more intensive methods). Is it reasonable to rely on regular lab submissions and standard case reports from clinicians (**passive surveillance**)? Should case reports be actively solicited from area physicians, laboratories, or hospitals (**active surveillance**)? Should the help of the local media be enlisted? In an outbreak setting, more active surveillance may be warranted, but this is a judgment call which must be made by taking into account the severity of the disease, how widespread it is, the urgency of intervention, and the manpower available to find and interview case patients.

Develop a Line Listing

At this step (or even in Step 2 or 3), is a great time to start a line list. A line listing is a simple list of case patients used to keep track of pertinent basic data for cases and potential cases as they are identified. Case names and numbers are listed down the left-hand column, and the heading row at the top of the table should contain pertinent information such as the case's age, sex, onset time, and symptoms. This type of organization permits a simple means for comparison of many characteristics at one time, giving a quick way to look for possible patterns, similarities, or associations. Later in the investigation, the team may need to conduct a survey (discussed below) which would be facilitated by having all the case patients listed in one succinct table. As the investigation progresses, one may refine the line list to only include cases that meet a more specific case definition (see *Develop a Case Definition* section above), but initially it may be very inclusive of all potential cases in order to facilitate a broader look at verifying the outbreak and the diagnosis.

Example of a Line Listing Table

#	Name	Age	Sex	Onset Date	Onset Time	Symptoms
1	Mary	32	F	6/4/15	1:00 PM	Diarrhea, abd. cramps
2	Bob	25	M	6/4/15	1:30 PM	Diarrhea
3	Carol	26	F	6/4/15	10:15 AM	Diarrhea, nausea
4	Mark	18	M	6/3/15	11:30 PM	Diarrhea, abd. cramps

Develop the Questionnaire/Survey

A common method of finding cases and simultaneously gathering, organizing, and analyzing initial risk factor data is to conduct a questionnaire or survey among the population believed to be at risk. This is particularly effective when the exposure event is already known (e.g., attendees of a wedding). A questionnaire that targets specific questions about foods eaten and symptoms experienced is a valuable epidemiologic tool. A questionnaire is solicited from those ill and well who are associated with the

incident and assists in developing better hypotheses about the etiologic agent's identity, the source of the infection, and the mode and time of transmission.

Key questions to consider when developing a questionnaire:

- What are the demographic characteristics of the individual? (name, age, sex, occupation, home and work addresses, phone numbers)
- Was the individual exposed to potential sources of infection and when?
- What are the symptoms, date of onset, their order of occurrence and duration?
- What medical treatment has been sought and received?
- Did anyone affected get a diagnosis and/or do they have laboratory results?
- Who else has been exposed to a case during his or her infectious period? (secondary contacts)
- What foods were consumed in the last 72 hours, or other appropriate time frame, before the time of onset? It is also important to interview and obtain food histories from those who ate the same suspect food and did not get sick.

These questions are intended as a guide. They will require modification to fit the particular circumstances surrounding the investigation. Questionnaires can be designed for personal or telephone interviews by the investigator (epidemiologist, nurse, sanitarian, health agent, etc.). Once again, it is important to administer the questionnaire to **all** associated with the exposure event, **both ill and well**.

The KDPH Enteric Disease-Specific Investigation Forms should be completed for all confirmed or suspect Campylobacter, Cryptosporidium, Giardia, Salmonella, Shiga toxin-producing E. coli (STEC), and Shigella cases. This form may also be used for suspected foodborne or waterborne outbreaks when the specific source or pathogen is not known. See Appendix I for the KDPH Enteric Disease-Specific Investigation Forms.

NOTE: The KDPH Enteric Disease-Specific Investigation Forms can be found in Appendix I.

There is a secure web application for building and managing online surveys and databases called REDCap® (more information about this application can be found at https://www.project-redcap.org/). KDPH has a REDCap license and can develop just-in-time surveys for use during outbreak investigations. If interested in this option, contact the Division of Epidemiology and Health Planning, Reportable Disease Section (RDS) at (502) 564-3261 or (888) 973-7678 if calling after business hours.

3.1.5 Step Five: Describe the Data in Terms of PERSON, PLACE and TIME

The purpose of "describing the data" (data orientation, epidemiological characterization) is to arrange all incoming data so that patterns or anomalies will be illuminated, both of which might be the key to determining the cause or source of the outbreak. The investigator searches for common associations to strengthen or amend current hypotheses and unusual occurrences to give additional clues. A common method of data orientation is plotting on a graph the cases by time of symptom onset to get an **epidemic curve**.

NOTE: An **epidemic curve** is a graph that depicts the association of the time of illness onset of all cases that are associated with the outbreak. It helps to determine whether the outbreak originated from a common source or is spread person-to-person. Time is plotted on the horizontal axis and the number of cases is plotted on the vertical axis.

A description of how to prepare an epidemic curve in Excel can be found at the following link provided in the *FOCUS on Field Epidemiology* newsletter, a product of the University of North Carolina Center for Public Health Preparedness.

https://nciph.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_flash.pdf?_ga=2.78395026.747350813.1629382839-2124671519.1629382839

From the line listing and/or survey described above (Steps 3 and 4), information will have been collected on the characteristics of the ill persons (age, sex, occupation, exposures to specific foods or other items). Along with these descriptive aspects and the diagnosis, plotting an **epidemic curve** can help to define who is at risk by showing when exposure likely occurred. Once the population at risk has been determined, appropriate control measures can be targeted.

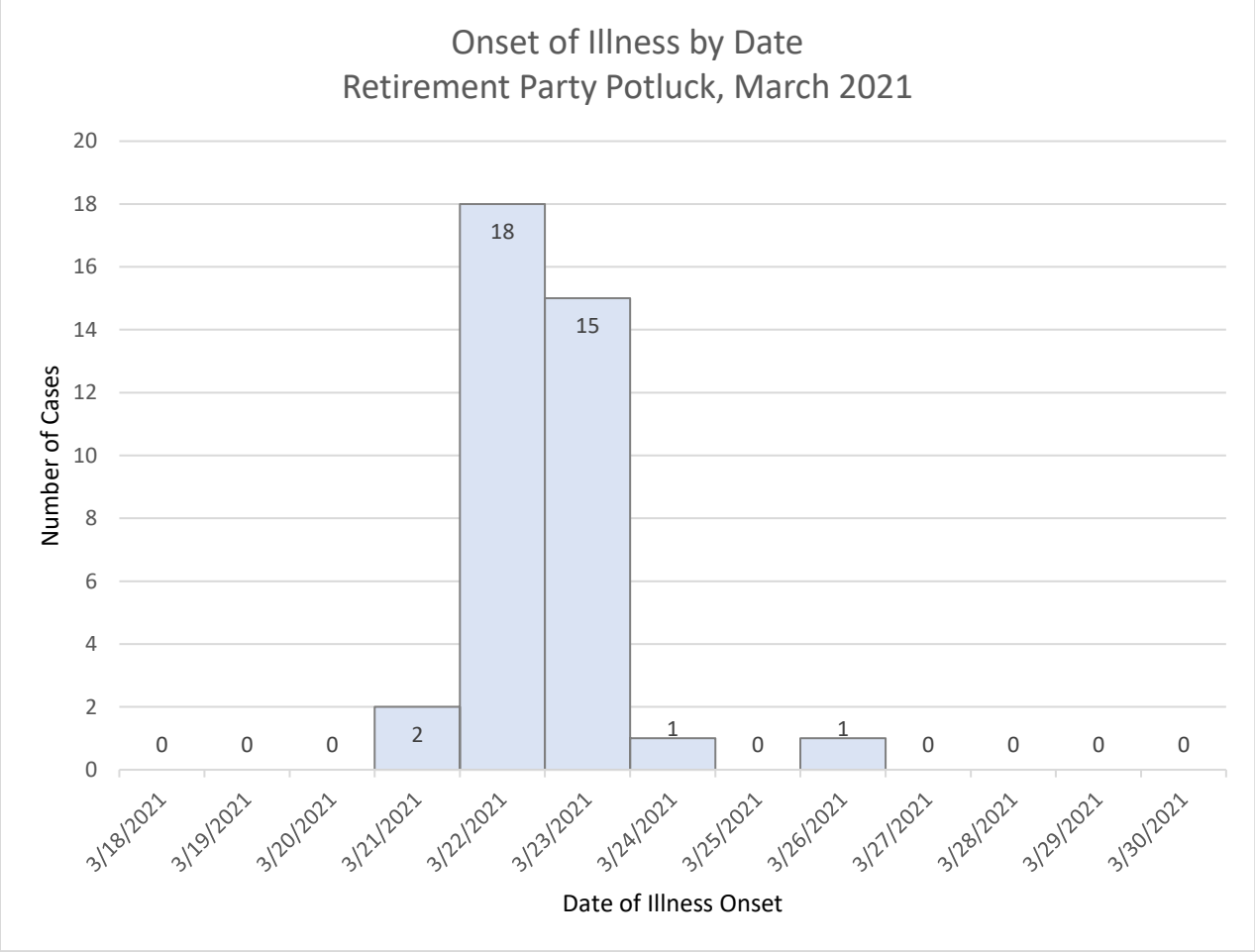
The shape of the epidemic curve may suggest what kind of outbreak is occurring. A *common-source* or *point-source outbreak* looks different than a *propagated-source, a person-to-person outbreak,* or *a continual source outbreak*. Definitions of these kinds of outbreaks, and an example of each epidemic curve are found below. Epidemic curves are not only useful in pursuit of the investigation but are also helpful when communicating to lay persons (consumers, restaurant operators, etc.) the nature and magnitude of the outbreak spread.

NOTE: The following pages contain definitions and examples of the different kinds of outbreaks:

- Common-Source Outbreak or Point-Source Outbreak
- Propagated-Source Outbreak or Person-to-Person Outbreak
- Continual-Source Outbreak
- Intermittent-Source Outbreak

Common-Source Outbreak or Point-Source Outbreak: An outbreak of illness in which susceptible individuals are exposed simultaneously to one source of infection. For example: guests at a company retirement party potluck. The epidemic curve for this type of outbreak is characterized by a sharp rise to a peak followed by a decline usually less abrupt than the rise. See Example 3.1 below. The slower decline is related to the manifestation of varying incubation periods in different individuals. Most people will get sick in a short time frame, but others may have delayed onset based on several characteristics, such as the dose of infectious or toxic material they received, their body's defenses, when they ate the meal, and other factors specific to the person.

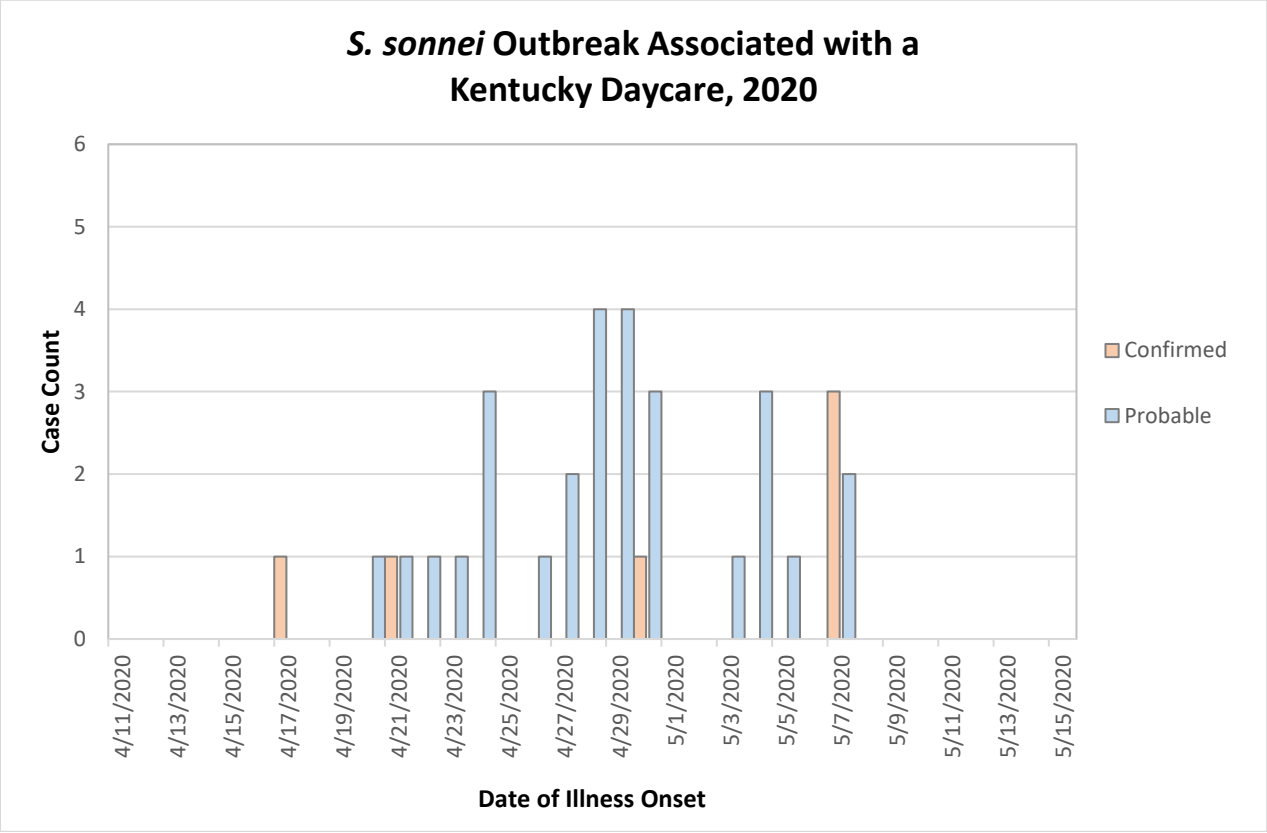
Example 3.1
Point Source Outbreak Epidemic Curve



Graph generated using fictitious data.

Propagated-Source Outbreak or Person-to-Person Outbreak: An outbreak of disease or illness that is spread from one person to another rather than from a single source. For example: a community-wide outbreak of shigellosis or pertussis. The epidemic curve for this type of outbreak is characterized by a relatively slow, progressive rise. The curve will continue for the duration of several incubation periods of the disease. Propagated outbreaks may exhibit periodic peaks that correspond to incubation cycles of the disease, particularly if the disease is highly infectious. This typically occurs earlier in the outbreak rather than later when infection is more widespread. See Example 3.2 below.

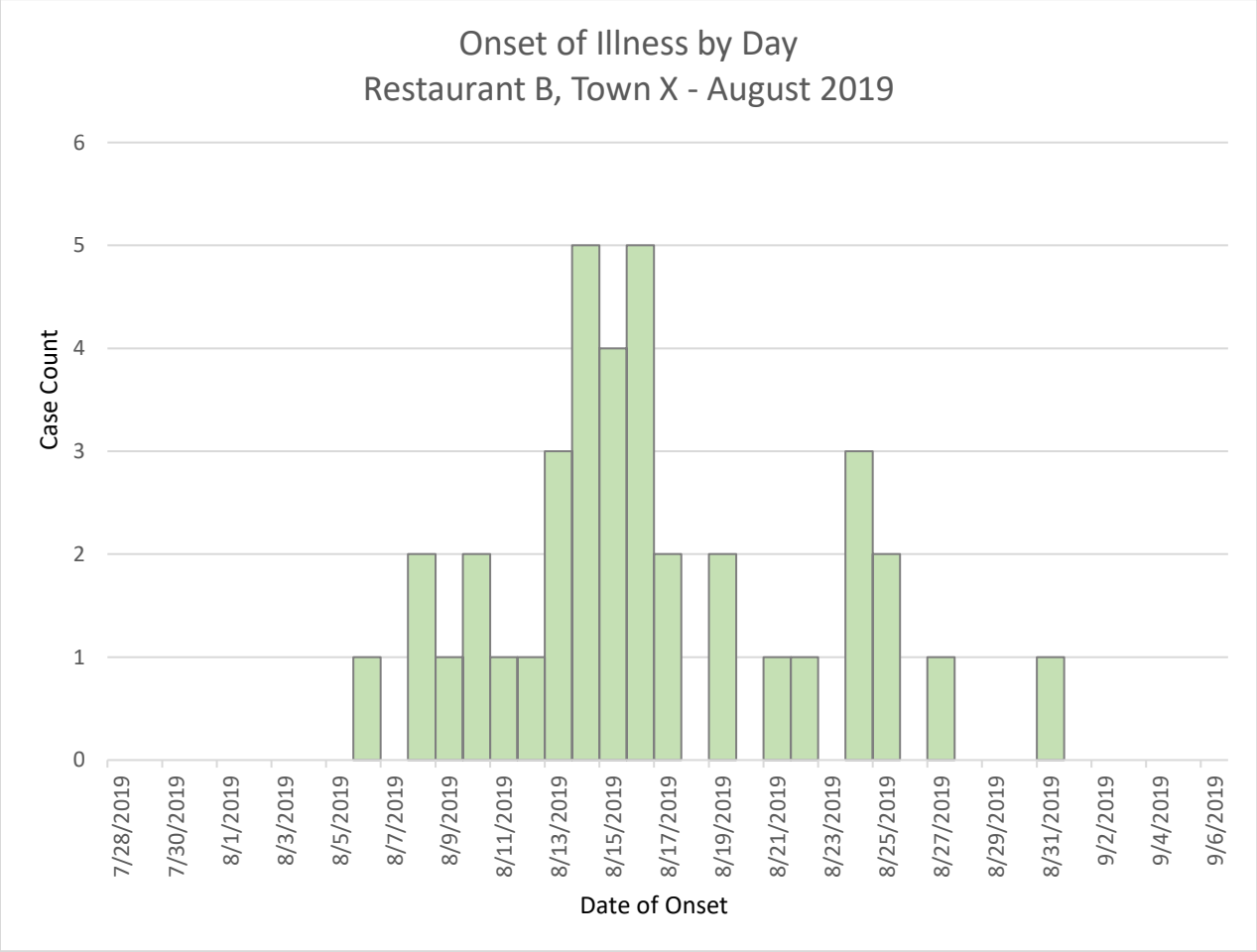
Example 3.2
Propagated-Source Outbreak Epidemic Curve



Graph generated using fictitious data.

Continual-Source Outbreak: An extended outbreak of disease or illness caused by a source that continues to be contaminated. For example: an outbreak where food is continuously contaminated by an infected food handler. The epidemic curve for this type of outbreak is characterized by ongoing peaks over time (e.g., weeks, months). The peaks may not be as dramatic as a common-source epidemic curve, and the outbreak may not be as obvious (i.e., lower incidence). See Example 3.3 below.

Example 3.3

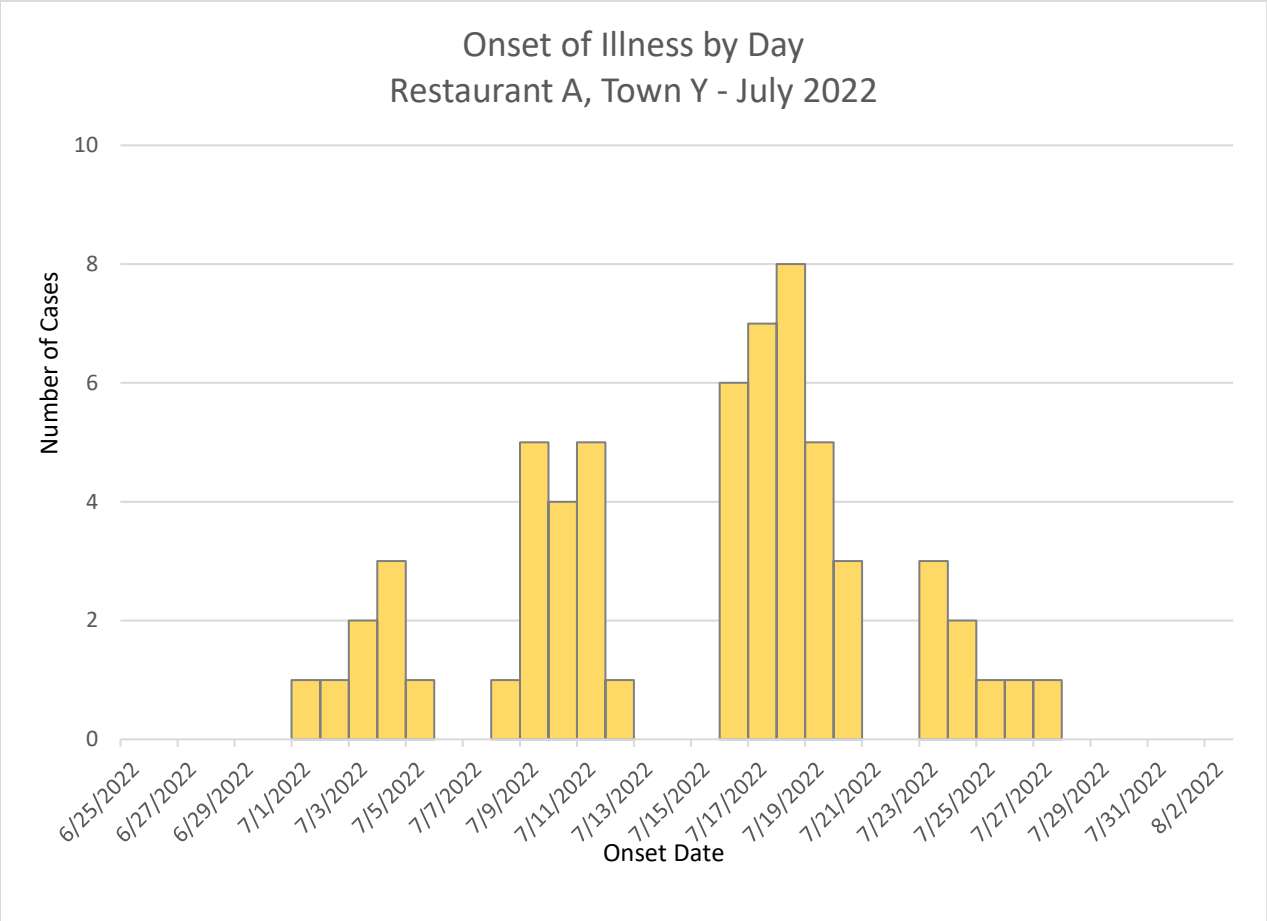


Continual-Source Outbreak Epidemic Curve

Graph generated using fictitious data.

Intermittent-Source Outbreak: An extended outbreak of disease or illness caused by a source in which exposure is not consistent but intermittent in nature. This type of outbreak is characterized by an epidemic curve with irregular peaks and valleys and the incubation period is often unclear. Examples include chemical exposures at a worksite related to specific work processes that occur at different times, irregular emissions from a factory, or a sick food worker who serves on different days at restaurant while infectious over a period of time.

Example 3.4



Intermittent Source Outbreak Epidemic Curve

Graph generated using fictitious data.

3.1.6 Step Six: Develop Hypotheses

Using the information gathered so far, the next step is to consider which specific exposure(s) may have caused the disease and develop a hypothesis (or several hypotheses). A useful hypothesis is testable, sensible, and fits the full picture of what has been learned as much as is possible. One example of a simple hypothesis is: The cases became ill after eating at a local restaurant. A more specific example, arrived at after further investigation, might be: The illness was caused by eating the potato salad at the Restaurant X's salad bar on Tuesday, June 5th.

As stated in Step 5 above, very often simply by knowing the descriptive aspects, the diagnosis, and then plotting an epidemic curve, the source, mode of transmission and who is at risk can be determined. To test or prove the hypothesis, analytical techniques such as statistical testing need to be applied using the data collected. The epidemiologist is usually the team member who specializes in statistical analysis

and should be in charge of this part or consulted about analytic techniques. This may also be carried out by an epidemiologist at the state level or done in collaboration with the state staff.

One very important point in hypothesis development is that it is the job of the team to find the actual cause of the outbreak and not to prove or disprove any particular theory. Many times, a cause may seem obvious at first review but as the investigation progresses facts seem to conflict with this theory. It can be a strong temptation, especially when a scenario fits into the category of "what usually happens" in a certain type of outbreak, to bend the facts to fit the theory rather than bending the theory to fit the facts. The latter course is what should happen and needs to be protected against over-exuberant team members who have a pet hypothesis to prove.

NOTE: Although implementing control and prevention measures is not noted as a step on the outbreak investigation until Step 9, it should be noted that if at any time throughout the entire investigation, an ongoing, potentially hazardous source of illness is discovered, recommendations for control measures should be implemented immediately. Regulatory actions may also need to be taken.

3.1.7 Step Seven: Evaluate Hypotheses (Analyze & Interpret the Data)

In order to evaluate a hypothesis, one must compare the hypothesis with established facts. There are many ways to do this, including lab testing and environmental investigation, which may confirm or deny the plausibility of a given hypothesis. The primary tools that epidemiologists use in foodborne and waterborne outbreaks are specific study designs. These study designs are particular ways of collecting and analyzing data that allow easy comparisons of hypotheses to facts (the data collected). The basic epidemiologic study designs are the **"Case/Control"** and **"Cohort"** studies.

Cohort Study

Cohort studies are used when a whole group of people who might have been exposed can be surveyed to test hypotheses about what caused the illness. This is the typical study done in foodborne outbreaks when one can identify all who ate at a restaurant, for example. All people had an equal chance of being exposed but only some got sick. This type of study can be done retrospectively and is commonly used in foodborne outbreak investigations. *All* people who ate at the restaurant during a given period of time are asked what specific food items they ate and if they became ill. We then compare food exposures to illness status to determine what food items might have caused the outbreak.

To do this in a foodborne illness outbreak, food-specific **Attack Rates** (AR) are calculated. Attack rates are used to determine if one or more food items were responsible for causing the illness. The food that caused the problem shows a higher attack rate in persons who ate the food than in those who did not. The AR is usually expressed as a percent. It represents the proportion of ill persons observed due to a specific exposure or event.

Attack Rate (AR)

The Attack Rate is simply the percentage of people who become ill out of all who were exposed. Example: If 228 people attended the catered wedding banquet and 46 got sick, the Attack Rate would be 46 / 228 x 100 or 20.2%.

When doing analysis in a cohort study design, the common measure of exposure is the **Relative Risk (RR)**. When several sources of exposure are implicated (a fairly common situation), the epidemiologist can run a model on the computer that compares all the food items at once and arrives at relative risks for each item compared to all the others so that the one with the greatest likelihood of being the culprit can be identified.

Risk
Risk is the percentage of people who become ill divided by all who were at risk; in an acute outbreak setting is represented by the Attack Rate.

and

Relative Risk (RR)
A Relative Risk is a ratio. It is the risk among those exposed to some risk factor divided by the risk among those who were not exposed. For example, in a restaurant outbreak, if 28 of 90 people who ate asparagus got ill (31.11%) while only 3 of 98 who didn't eat it got sick (3.06%), the RR is 31.11 / 3.06 = 10.2. In other words, people who ate asparagus were 10.2 times more likely to become ill than those who did not eat asparagus.

Case/Control Study
Case/control studies are used primarily when the illness is rare or when it is easier to select participants for the study based on illness status. This is different from a cohort study because participants are selected not on where they ate, or swam, or lived, but on whether they got sick or not. This can be used in the typical restaurant outbreak when there are so many patrons that surveying them all would not be possible. In this case, all or a random selection of sick patrons can be enrolled in the study and then controls, or well people who also ate at the restaurant, can be selected randomly from restaurant patrons or groups of patrons. The primary measure of association that is used with case/control studies is the **Odds Ratio (OR)**. This compares the "odds of exposure" to particular sources of infection between cases and controls, indicating the most likely sources.

Odds
An "Odds" of something happening is the probability of it happening divided by the probability of it not happening. In the case of outbreak investigation, it is applied to the probability of having a risk factor among those who are ill or not ill. For example, if we have 31 sick people in a particular outbreak and 28 of them ate the asparagus, then the odds of exposure to asparagus among the sick is (28/31) / {1 – (28/31)} = 9.33.

and

Odds Ratio (OR)
The Odds Ratio is a ratio of the odds of having exposure to a particular risk factor among the sick divided by the odds of having the risk factor among those who are not ill. To continue the example above, if we find additionally that 26 ate asparagus among 62 people who did not get sick then the odds of exposure

to asparagus among these controls is (26/62) / {1 – (26/62)} or 0.72. Thus, the Odds Ratio for the odds of this, ill people were nearly 13 times as likely as not ill people to have eaten asparagus.

3.1.8 Step Eight: Refine Hypotheses and Carry Out Additional Studies

Analytic studies often reveal results that require modifications of, or fail to confirm, the hypotheses that were originally generated. Additional sources of infection may be identified through the investigation. The existing hypotheses may need to be modified or new hypotheses generated. In either case, the hypotheses will need to be tested requiring further studies be conducted.

For example, based on evidence gathered, the team generates a hypothesis that the salad was the vehicle of transmission in a Salmonella outbreak. The next logical questions are, "How did the salad become contaminated with salmonella, and could this be verified with the results of the environmental investigation?" In other words, are the epidemiologic results plausible and consistent with other investigational findings? For instance, salad is not usually a food that harbors Salmonella. However, it can become contaminated when ill or infected food handlers prepare the salad without adequate hand washing or use of gloves. Compare hypotheses to the results of the environmental investigation. Did the inspector note how the salad was made and served? Was it possible for this scenario to have happened? Was any of the salad available for lab testing? Can laboratory results confirm that Salmonella found on the salad matches that found in a patient's stool specimen? Some of the questions that need to be addressed to make sure that the hypothesis is not only statistically sound, but makes sense in the real world are:

- Could the hypothesized events actually have happened?
- Is the hypothesis consistent with environmental aspects of the investigation?
- Is it likely the vehicle of transmission identified became contaminated with the organism that has been isolated?

NOTE: Not all outbreaks have a resolution. In fact, it is rare when everything comes together, and a cause can be definitively determined. Investigators should not become discouraged. Careful development of epidemiologic inferences coupled with persuasive clinical and environmental evidence will almost always provide convincing evidence of the source and mode of the spread of a disease. In most cases, there will be enough evidence to present a plausible hypothesis.

3.1.9 Step Nine: Implement Control and Prevention Measures

Control Measures

Once an outbreak is identified, control measures are important for interrupting disease transmission and/or limiting exposure to the source of infection. If a pathogen or other suspected source of the outbreak is identified, control measures should target specific agents, sources, or reservoirs of infection.

The objectives of foodborne and waterborne outbreak control measures are:

- Control of Source
- Control of Secondary Transmission
- Prevention Future Outbreaks

NOTE: **Be advised that control measures can sometimes be implemented very early in an outbreak investigation.**

Control measures should be implemented at the first available point in the investigation and should occur concurrently with other investigation steps. Often, non-specific control measures can be put into place regardless of the type of disease or source. Decisions should be made based on available evidence and control measures should be prioritized in consultation with Epidemiologists, Environmentalists, and Laboratory personnel, if available.

Control of Source

Known Pathogen, Unknown Source

If a source of infection has not been implicated but the pathogen is known, control measures will include non-specific recommendations in order to prevent secondary spread among known cases. Non-specific control measures may include:

- Communication with healthcare providers
    - Advice about specific treatment and follow up
    - Ways to avoid spread
    - Infection control precautions for hospitalized or institutionalized patients
    - Reporting newly identified cases to the local health department
- Communication with cases and the public
    - Practical measures to decrease risk
    - Basic food/water safety recommendations
    - Instructions on what to do if illness is suspected
    - Contact information for public health officials
    - Outbreak communications with the public must balance the potential for legal or economic consequences for implicated sources and the health consequences of no communication (harm to industry vs. harm to consumers)

Known Pathogen, Suspected Source

Once an association between an exposure and illness has been identified, control measures should be implemented based upon the known exposure and the suspected pathogen. Information such as suspected source of infection (i.e., food item/water exposure), incubation period, symptom profile, and duration of illness can assist the investigator in narrowing down the list of suspected pathogens (Appendix C contains information to support this process). If a facility (either restaurant or food processing) has been implicated as a common exposure but no specific food or water item has been identified, some steps to implement regardless of the disease include:

- Review the history of the implicated establishment to identify previous outbreaks or issues.

- Environmental Assessment by Environmental Health Personnel from the Local Health Department
    - Including an inspection of the implicated facility
        - Educate employees about the implicated disease and about general infection control precautions
        - Observe food preparation processes
        - Assess food holding temperatures
        - Observe food service processes
        - Observe employee hygiene practices
        - Review appropriate logs for quality control
        - Interview facility manager and food service workers
        - Determine if any employees are ill
        - Determine if there have been any issues with systems and processes at the facility (e.g., pool filters, water treatment systems, coolers, etc.)
        - Obtain menus of food served for 1 week prior to earliest case illness onset
        - Menu modification to remove a suspected food from the menu until control measures are in place
    - Restrict/exclude ill food workers in accordance with current FDA Food Code
    - Quarantine or collect any suspect food item(s) for testing (if applicable)
    - Collect environmental samples for testing (if applicable)
    - Collect water samples for testing (if applicable)
    - Recommendations for control measures should be made, based upon inspection findings, including, but not limited to:
        - Properly holding the leftovers for further laboratory analysis if warranted
        - Eliminate bare-hand contact with ready-to-eat foods
        - Emphasizing hand washing
        - Monitoring time and temperature control of food
        - Excluding employees ill with gastrointestinal symptoms (vomiting and diarrhea)
        - Prohibiting serving of uncooked foods if any possibility of norovirus exists
        - Cleaning/sanitizing of equipment and other high-touch areas
        - Corrective actions for treatment or chemical balance of recreational water (if applicable)
        - Closing of specific parts of a facility (e.g., kiddie pool, a specific food service area, etc.)
    - Modifying a facility's process:
        - Once the investigation identifies the specific issues in a facility's process that may have contributed to the outbreak, corrective action should be taken immediately to avoid recurrences. Examples of corrective action are modification of water treatment procedures, modification of recipe or process, reorganization of working practices, change in storage temperatures, or modification of instructions to consumers.

- Closing the facility:
  - If site inspections reveal a situation that poses a continuing health risk to consumers, it may be advisable to close the premises until the problem has been solved. Ideally, this will be done with:
    - the agreement of the business, or
    - enforced by law through a closing order.
  - Once closed, they should be monitored by the appropriate authorities and remain closed until reopening is approved by public health authorities.
  - Potential consequences (economic or legal) for closing a facility should be weighed against the likelihood of additional cases occurring if the facility is not closed.
- Removing implicated foods from the market:
  - The objective of food recall and food quarantine is to remove implicated foods as efficiently, rapidly, and completely as possible from the market.
  - A **food recall** may be initiated by an authorized regulatory agency or a business responsible for the manufacture, wholesale, distribution, or retailing of the suspect food and may be initiated by the business itself or undertaken at the request of an appropriate health authority.
  - **Food quarantine** is the process where the regulatory authority issues an enforcement order prohibiting the suspect product from entering commerce.
  - The longer the time that passes between a food appearing on the market and it being identified as a potential source, the less likely is the recovery of that food. This should be coordinated with appropriate food safety agencies.

  <u>*Remember*:</u> Those participating in facility improvement recommendations (corrective actions), facility closures, food quarantine, or food recalls must balance potential consequences (economic/legal) against the likelihood that any action taken will prevent further cases of disease.

- Public Health Agency communication with the public regarding suspected source

  Although the business may have already issued a press release, the Public Health agency may decide to notify the public. Ideally, this should be coordinated with the business and done on the same day as the decision to close a facility or recall a food product. Information given to the public should include:
  - Actions the consumers should take to prevent further exposure and illness
  - Name and brand of the food product (including labeling) being recalled
  - Name and location of the implicated facility (e.g., swimming pool name, city, state)
  - The nature of the problem, the reason for the facility closure or recall of the product, and information about how the problem was discovered
  - Names and locations of the food producing establishment and point of contact
  - Locations where the product is likely to be found

- Product numbers, amounts, and distribution
- A description of common symptoms of the illness associated with the contamination
- Appropriate food-handling information for consumers
- Appropriate water safety information for consumers
- Actions that consumers should take if illness occurs

Control of Secondary Transmission

Communication with Healthcare Providers

- Encourage reporting newly identified cases to the local health department or the Kentucky Department for Public Health
- Provide specific treatment guidelines
- Provide infection control guidance
- Encourage appropriate specimen collection

Public Advice

If contamination of the water or food product cannot be controlled at the source, or a facility cannot be temporarily closed, steps need to be taken to eliminate or minimize the opportunities for further transmission of the pathogen. Depending on the situation, appropriate public advice may be issued during a period of hazard. For example:

- Cleaning/disinfecting high-touch or high-risk areas, such as areas in the bathroom
- Boiling microbiologically contaminated water or avoidance of chemically contaminated water
- Advice on proper preparation of foods
  - Avoid cross-contamination
  - Thoroughly wash fruits and vegetables prior to cutting
- Advice on proper disposal of implicated foods
- Emphasizing personal hygiene measures (e.g., washing hands after defecation and urination and before preparing or consuming food)
- Avoid eating food that has not been handled properly (e.g., hot food that has not been kept hot, cold food that has not been kept cold)
- If an individual has diarrhea, do not prepare food for others, until symptoms have stopped
- If an individual has diarrhea, do not swim in pools or hot tubs, until symptoms have stopped
- Public notices to avoid swimming/bathing in suspected bodies of water

Exclusion of Infected Person from Work and School

The risk of infection being spread person-to-person depends on their clinical state and personal hygiene. People with diarrhea are more likely to spread infection than asymptomatic individuals with subclinical illnesses. For certain illnesses, individuals in high-risk settings may be required to have two negative stool cultures collected 24 hours apart and 48 hours after completion of antibiotic treatment, before being cleared to return to work/school. Disease-specific criteria may be found in the American Academy of Pediatrics *Red Book*, the *Control of Communicable Diseases Manual (CCDM),* the Reportable Disease Desk Reference (RDDR) or FDA Retail Food Code. In general, the following groups with diarrhea or vomiting should be excluded from work or school until they are no longer infectious:

- Food handlers

- People who have direct contact with highly susceptible patients or persons in whom gastrointestinal infection would have particularly serious consequences (i.e., health care workers, daycare workers)
- Children under age 5
- Older children and adults that are unable to perform adequate hygiene practices without assistance or with unsatisfactory toilet, handwashing, or hand drying facilities at home, work, daycare or school.

In accordance with the FDA Retail Food Code, RDDR, CCDM, steps should be taken to either restrict or exclude the individual based on the specific circumstance (e.g., symptoms, work duties, etc.).

When making decisions to exclude individuals, the legal and economic impact of exclusion of individuals from work or school should be considered.

Food or Water Potentially Contaminated by an Infected Individual

Identify potentially contaminated food items or water sources that may be contaminated by an infected individual.

- Quarantine and voluntary destruction of potentially contaminated food items
- Treat or take other measures necessary to control the spread of disease through water sources potentially contaminated by an infected individual (e.g., shock treatment of pools, draining and cleaning of hot tubs, etc.)

Facility Control Measures

The facility should create a risk-control plan or have an infection control plan in place, including but not limited to:

- Employee training
- Adequate oversight to ensure procedures are being followed
- Staff education
    - Implicated disease
        - Symptoms
        - Mode of transmission
        - Prevention of spread
    - Infection control precautions
        - Procedures for proper food handling
        - Proper personal hygiene practices
        - Personal Protective Equipment (PPE)
        - Cleaning/Sanitizing surfaces and equipment
        - Isolation of ill individuals in hospitals, healthcare facilities, or institutions
        - Disposal or decontamination of contaminated clothing, surfaces, or bedding

Recommendations for infection control practices are frequently changed and updated; therefore, check key sources such as CDC to ensure the organization or facility's recommended practices are up to date.

3.1.10 Step Ten: Communicate Findings, Provide Documentation and Enter into the REDCap Outbreak Management System

After analysis of epidemiologic, clinical, laboratory and environmental data, conclusions should be summarized in a report and sent to KDPH. This is one of the most important steps in the outbreak investigation. Not only does the report detail the agency's efforts but identifies a potential source(s) of the outbreak and suggests control measures to prevent future illness.

Sometimes an After-Action Report is written following a complex investigation and should follow this outline: Handling Instructions; Contents; Executive Summary; Section 1: Event Overview, including Event Details, Event Leadership, and Participating Organizations; Section 2: Event Summary, including Event Purpose, Objectives, Capabilities and Activities, Scenario Summary, Supporting Events or Event; Section 3: Analysis of Capabilities; Section 4: Conclusion; and the following appendices, as appropriate: Appendix A: Improvement Plan; Appendix B: Lessons Learned (optional); Appendix C: Participant Feedback Summary (optional); Appendix D: Event Summary Table (optional); Appendix E: Performance Ratings (optional); Appendix F: Acronyms.

Do not use the names of case-patients, but LHD personnel or authorized personnel involved in the investigation may be included. The names of facilities or locations where the outbreak occurred may be included at the discretion of the LHD.

NOTE: For detailed information on writing an after-action report see Chapter 4**.**

NORS

During the process of preparing the outbreak report or immediately after submitting the final report to KDPH, the regional epidemiologist should enter the outbreak into NORS report form instruments in the 20xx DEHP Outbreak Management Project in the KDPH REDCap instance. NORS is a Centers for Disease Control and Prevention (CDC) developed web-based outbreak data entry system for waterborne, foodborne, enteric person-to-person, animal contact, and environmental contact disease outbreaks. This is an important step to ensure that the CDC is aware of Kentucky's foodborne and waterborne outbreak responses. A sample of the NORS reporting forms are included in Appendix L. Questions regarding NORS should be directed to the KDPH Division of Epidemiology and Health Planning, Reportable Disease Section at (502) 564-3261 or (888) 973-7678 if calling after business hours.

3.2.1 Steps in Investigating and Managing Multiple Outbreaks Occurring Simultaneously

Large-scale outbreaks (any outbreak for which the response needs exceed the ability of the jurisdiction to manage with existing resources), outbreaks involving multiple jurisdictions, or multiple outbreaks occurring simultaneously may overwhelm local health departments or the Kentucky Department for Public Health. This section provides information related to the process of managing multiple outbreaks occurring simultaneously.

The KDPH Disease Outbreak Investigation Support Plan contains the detailed protocol for the management of investigations of multiple outbreaks occurring simultaneously, regardless of etiology.

This section in this manual provides a basic overview of the process for foodborne and/or waterborne illness outbreaks.

Command

All large-scale outbreaks, outbreaks involving multiple jurisdictions, or multiple outbreaks occurring simultaneously should be managed using the Incident Command System (ICS). The Incident Command System is a standardized, incident management approach that enables a coordinated response among various jurisdictions and agencies, establishes common processes for planning and managing resources, and allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

In the event of a large-scale outbreak, outbreaks involving multiple jurisdictions, or multiple outbreaks occurring simultaneously, the State Health Operations Center (SHOC) will be activated in order to manage the overall response to these events.

The following is a basic command structure that may be used when the KDPH SHOC is activated in response to disease outbreaks.

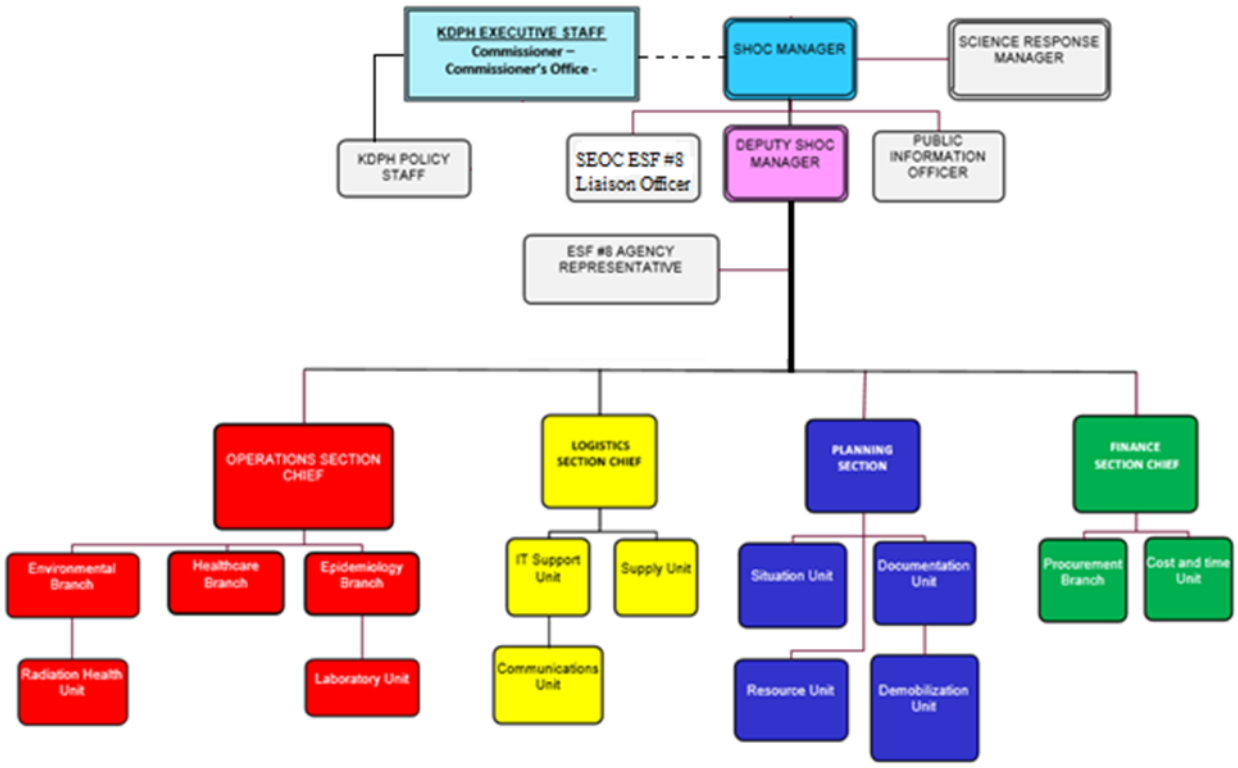


Image Source: Kentucky Department for Public Health Department of Epidemiology and Health Planning

The KDPH SHOC Plan provides the framework for management of any type of incident of public health significance, including disease outbreaks. The KDPH SHOC Plan provides detailed information related to activation levels and operations during any event of public health significance, including multiple outbreaks occurring simultaneously.

Roles and Responsibilities

No matter the size of the outbreak, all outbreak investigations follow the same process as outlined previously in this chapter. During large-scale outbreaks, outbreaks involving multiple jurisdictions, or multiple outbreaks occurring simultaneously, it is imperative that resources be managed so that the most effective and efficient response can be executed.

Subject-matter experts will be assigned to specific operational roles based upon their area of expertise. Subject matter experts will be responsible for providing disease-specific consultation and recommendations to the Operations Section.

In Kentucky's ICS structure, a role titled "Science Response Manager" is included and co-leads the response with the SHOC Manager. The Science Response Manager is typically the State or Deputy State Epidemiologist and serves as a leader and guide in how the epidemiologic and disease response activities are implemented and evaluated. This has risen as a critical piece of the incident command structure to tie together the scientific and preparedness functions in complex responses.

The Operations Section Chief should be an individual who has an epidemiology background but does not need to be a disease subject-matter expert. The role of the Operations Section Chief is to facilitate the epidemiological operations for the Department.

The Operations Section may be divided into multiple sub-sections, depending upon the number of outbreaks occurring. Each sub-section will have a "lead" that will be responsible for the coordination of the KDPH response to a specific outbreak. This sub-section lead will be responsible for maintaining situational awareness related to their assigned sub-section, to include providing situational report drafts to the Planning Section Chief; the individual sub-section Lead's skills may be used across multiple outbreaks due to the multiple operations proceeding simultaneously. The division of the Operations Section into multiple sub-sections is the key to a successful response to multiple, simultaneous outbreaks, as this provides outbreak-specific management and a single point of contact for each investigation/response for situational awareness.

Collaboration with other Agencies

Multi-disciplinary coordination is crucial to an effective and efficient response to foodborne and/or waterborne outbreaks. Support for outbreak investigations may come from various divisions or departments within the Kentucky Department for Public Health or from other Agencies within the State and Federal Government. The nature of the outbreak will dictate the involvement of other agencies, although typically managed through Liaison Officers (LNOs) from each agency who serve in the SHOC.

Support Agencies:

- Local Health Departments
- Regional Childcare Consultants
- KDPH Division of Epidemiology and Health Planning
    - Public Health Preparedness Branch
- KDPH Division of Public Health Protection and Safety
    - Preparedness Branch
    - Food Safety Branch
    - Milk Safety Branch
    - Environmental Management Branch
    - Division of Water

- KDPH Division of Laboratory Services
- KDPH Division of Maternal and Child Health – Early Childhood Development Branch – Early Childhood Promotion Section
- Cabinet for Health and Family Services (CHFS) Office of the Inspector General
- CHFS Office of Communications
- Kentucky Department of Corrections
- Kentucky Department of Agriculture
- Kentucky Department of Fish and Wildlife
- Kentucky Energy and Environment Cabinet
- Kentucky Emergency Management
- Centers for Disease Control and Prevention (CDC)
- U.S. Food and Drug Administration (FDA)
- U.S. Department of Agriculture (USDA)

Surge Capacity

When LHDs and KDPH have exceeded their ability to respond, there are resources available to assist in the response.

- **Epidemiology Rapid Response Team (ERRT)** – the ERRT is a state-wide cadre of individuals, environmentalists, nurses, and epidemiologists, who are trained in epidemiological methods and have the expertise to conduct outbreak investigations. Each ERRT member has a sign-off sheet on file with KDPH signifying agreement by their health department Director that they may be used as surge capacity during epidemiological investigations anywhere in the Commonwealth of Kentucky.
    - This resource may be accessed by making a request the respective LHD housing the ERRT members. This process is further outlined in the Disease Outbreak Investigation Support Plan.
- **KDPH Program Staff –** In addition to the ERRT, there are KDPH staff members who can assist with data entry, data analysis, interviews, and other epidemiological activities. These individuals are employed in various Divisions across the Department and may be accessed by a request to their supervisor.
- **Other Departments and Agencies** – staff from other departments or agencies in the State may be available to assist with various aspects of outbreak investigations, these may include regulatory and inspection functions related to food or water.
- **Medical Reserve Corps** – Kentucky maintains a volunteer program, sponsored by the Office of the Surgeon General of the United States, for both medical and non-medical volunteers. Each county in Kentucky is covered by a Medical Reserve Corps unit, with most units being sponsored by local health departments in conjunction with local emergency management agencies. All MRC volunteers are pre-credentialed and trained to respond during large-scale public health emergencies to provide surge capacity. These volunteers may be called upon during large-scale outbreaks; outbreaks involving multiple jurisdictions; or multiple outbreaks occurring simultaneously, to assist with various aspects of data collection, entry, or analysis.

Declaring the End of an Outbreak and Deactivation of the SHOC

As noted earlier, an infectious disease outbreak is usually considered over when at least two incubation periods of the etiologic agent have passed with no additional cases identified. However, this may depend on other factors, as well. For instance, Legionella cases associated with a healthcare facility may be sporadic, so a lengthy monitoring period may be needed to verify that no further exposures have

occurred. For the 2017-2020 Kentucky hepatitis A outbreak associated with illicit drug use and homelessness, an end to the outbreak was only declared after annual rates of hepatitis A returned to pre-outbreak levels. For any large-scale outbreak, declaring the end of the outbreak should be determined on a case-by-case basis depending on and accounting for factors specific to that outbreak.

Deactivation of the SHOC is a mutual decision between the SHOC Manager and the Science Response Manager and depends primarily on the level of support needed for the ongoing response. The SHOC has four levels of activation: Level 1 – Full Activation; Level 2 – Partial Activation; Level 3 – Limited Activation; Level 4 – Monitoring Activation. The level and duration of activation will vary depending on the outbreak severity, response needs, and resources available. The SHOC may not be activated at the beginning of an outbreak and might be deactivated before an outbreak is declared over if the level of assistance needed and can be covered by normal daily operational capacity.

After-Action Report and Corrective Action Plan

After an activation of the SHOC in response to large-scale outbreaks, outbreaks involving multiple jurisdictions, or multiple outbreaks occurring simultaneously, an evaluation of the response must be completed. All outbreak responders should assemble and participate in an event de-brief and response hotwash. During this debrief and hotwash, an overall summary of the response will be given, along with a discussion of response successes and lessons learned. Successes and lessons learned should be recorded for inclusion in an After-Action Report. An After-Action Report must be completed, including an Improvement Plan, within 120 days of an event. Following completion of the After-Action Report and Improvement Plan, an After-Action Conference shall occur, where these documents are discussed with all stakeholders. During this conference, corrective actions noted in the Improvement Plan shall be discussed, including the identification of the primary responsible agency for each corrective action and the assignment of a completion date for each task.

After-Action Reports and Corrective Action Plans from all foodborne and/or waterborne outbreak investigations shall be reviewed on an annual basis in conjunction with the bi-annual review of this manual, thereby allowing any corrections or additions to be addressed during the manual update.

Reporting Requirements

Report all outbreaks in NORS and as appropriate, the AAR/IP should be recorded in the Homeland Security Exercise and Evaluation Program (HSEEP) Corrective Action Program System (CAP).

Chapter 4: Overview of Documenting the Investigation

1) **Investigation Documentation**
2) **Purpose of Documenting the Investigation**
3) **After-Action Report**
4) **Example of After-Action Report**

Overview of Documenting the Investigation

Introduction

When an investigation is complete, the final responsibility is to provide written documentation of events (e.g. line list, epi curve, lab results, etc.). This is necessary not only for large outbreaks involving many people but also for complaints of possible foodborne or waterborne illness. An after-action report template is also included as a guide.

While this chapter focuses on documenting a more complex outbreak, even single complaints should be documented as completely as possible (on a complaint form). The single complaint must always be regarded as the possible first indication of a larger problem.

4.1 Investigation Documentation

When closing an investigation, it is important to document what happened in the foodborne or waterborne illness investigation. It is public record and must be objective, accurate, clear and timely.

Details in the documentation should reflect the complexity of the incident under investigation. A single complaint might result in a "complaint form" being completed with a list of action steps and any follow-up. A more complicated occurrence (i.e., a large outbreak) might involve people outside your local jurisdiction and require additional supporting documentation.

4.2 Purpose of Documenting the Investigation

Whether the investigation was initiated in response to an outbreak or a single complaint, complete documentation is important for the following reasons:

A document for action
As part of an investigation, it is important to document the "official" findings. In some cases, control and prevention measures will only be instituted in response to a written report. Until an outbreak is documented and summarized in a formally, it is easy for the implicated establishment operator to shift responsibility.

A record of performance
A well-documented investigation reflects the magnitude of health problems and justifies program activities. Sufficient documentation clearly states events that occurred and the process that was followed. It should include all steps undertaken by everyone involved and should reflect the complexity of the investigation. This accurately documents events and clearly illustrates staffing resources required to undertake the investigations.

A document for potential legal issues
Investigation documents must be written objectively, honestly and fairly. Do not include opinions as to causes that are not supported by evidence or subjective assessment of the situation or case-patients involved. Information in these investigations is frequently used in legal actions. Thus, it is very important that a record exists that accurately documents events in a timely manner to aid in any legal investigations that might ensue.

An instrument to present control and preventive measures
The primary reason to undertake an investigation is to control and prevent disease. The written documentation is an official medium to present control and preventive measures and perform needs assessments. One may identify new trends, introduce new regulations or policies, identify training needs and reinforce existing regulations. When documentation is presented to the owners and managers, encourage them to use it as a catalyst for change. Additionally, documentation is an educational tool and may help to prevent the same problems from reoccurring.

4.3 Outbreak Report Format

There are a variety of ways to compile the information obtained during an investigation into a professional, understandable, and usable document. Below is an after-action report (AAR) template. For large outbreak investigations an AAR is necessary to document the activities of multiple agencies/stakeholders, as well as to meet HSEEP (Homeland Security Exercise and Evaluation Program) requirements.

4.4 After-Action Report (AAR)

After-Action Report outbreak report should include the following sections:

Handling Instructions
Contents
Executive Summary
Section 1: Event Overview
- **Event Details**
- **Event Leadership**
- **Participating Organizations**

Section 2: Event Summary
- **Event Purpose**
- **Objectives, Capabilities and Activities**
- **Scenario Summary**
- **Supporting Events or Event**

Section 3: Analysis of Capabilities
Section 4: Conclusion
Appendix A: Improvement Plan
Appendix B: Lessons Learned (optional)

Appendix C: Participant Feedback Summary (optional)
Appendix D: Event Summary Table (optional)
Appendix E: Performance Ratings (optional)
Appendix F: Acronyms

Administrative Handling Instructions
This is a basic description of the document, which includes the title of the document, information handling instructions, and points of contact for the report.

Executive Summary
This includes an overall summary of the event and response, to include Major Strengths and Primary Areas for Improvement identified during the outbreak investigation process. In addition, this section provides a description of whether the response was successful or unsuccessful and should state areas where agencies or jurisdictions should focus to improve future outbreak investigation responses.

Section 1: Event Overview
This is a listing of pertinent event details: Event Name, Type of Event, Start Date, End Date, Duration, Location, Mission, Capabilities Scenario, Event Leadership (name, agency, and contact information), Participating Organizations, and Number of Participants.

Section 2: Event Summary
This is a detailed description of the Event Purpose and Design; Event Objectives, Capabilities, and Activities; a Scenario Summary: Supporting Event or Events.

Event Purpose and Design
This is a summation of why the event occurred, what participants hoped to learn, and a brief history of how/why the event was organized, designed, funded, etc.

Event Objectives, Capabilities, and Activities
This section should list the event objectives, which should be aligned with associated capabilities from the Target Capabilities List (TCL). For each TCL, there is an Event Evaluation Guide (EEG) which lists specific activities which must be performed to demonstrate a capability. In addition to the TCL capabilities, the EEG activities relevant to each objective should also be included in this section.

Scenario Summary
This is a basic summation of the scenario or situation as it was initially presented to participants, along with any subsequent key events during the outbreak investigation and the time in which they occurred.

Supporting Event and Events
This is the section where any previous events that supported the current response are listed.

Section 3: Analysis of Capabilities
This section is where the agency may review the performance of event capabilities, activities, and tasks. This section is organized by Capability, then Activity. This section should include the TCL Capability description and a description of how the capability was performed during the event. The specific activities selected from the EEG should be identified below its associated capability. For each Activity, an Observation, References, Analysis, and Recommendations should be recorded. Observations may be either a “strength” or “area for improvement” and should be organized by capability and associated activities. References are a listing of plans, policies, procedures, laws, and/or regulations which may

apply to each observation. The Analysis section should include a description of the behavior or action at the core of the observation, as well as a brief description of what happened and the consequences of the action or behavior. Recommendations apply to areas identified for improvement and are generally ways that the response may be improved in the future (agency specific or multiple agencies).

Section 4: Conclusion
This is an overall summary of the report, which includes demonstrated capabilities, lessons learned, major recommendations, and a summary of what steps should be taken to address areas of improvement.

Appendix A: Improvement Plan
This appendix should include key recommendations and corrective actions identified in Section 3: Analysis of Capabilities, the After-Action Conference, and the EEGs. These should be uploaded into the Corrective Action Program System (CAP) on the HSEEP website so that progress may be measured.

Appendix B: Lessons Learned (optional)
This appendix provides jurisdictions and organizations with an opportunity to nominate lessons learned from exercises for sharing on *LLIS.gov*. This includes Lessons Learned, Best Practices, Good Stories, and/or Practice Notes.

Appendix C: Participant Feedback Summary (optional)
This section provides a summary of the Participant Feedback Survey, if administered after the event is over.

Appendix D: Event Summary Table (optional)
This section should summarize what actually happened during the outbreak investigation in a timeline table format. Focus of this section is on what events occurred during the outbreak and what actions the investigation team took during the outbreak. Successful development of this section is aided by using a log or other method to record key events occurring during the outbreak investigation.

Appendix E: Performance Ratings (optional)
This section is used when a jurisdiction/organization elects to use performance ratings, or when initiatives require a rating within the AAR/IP. A qualitative performance rating is assigned to each activity demonstrated within its capability area. The performance rating is based on a systemic review by the investigation leader of outbreak investigation performance based on leader/team analysis of how well the participants demonstrated the capability outcome. The performance rating categories refer to how well each activity was performed during the event. The results should be summarized within this appendix and should be based on the supporting narrative contained within the body of the AAR/IP.

Appendix F: Acronyms
Any acronym used in the AAR/IP should be recorded in this section, listed alphabetically and spelled out.

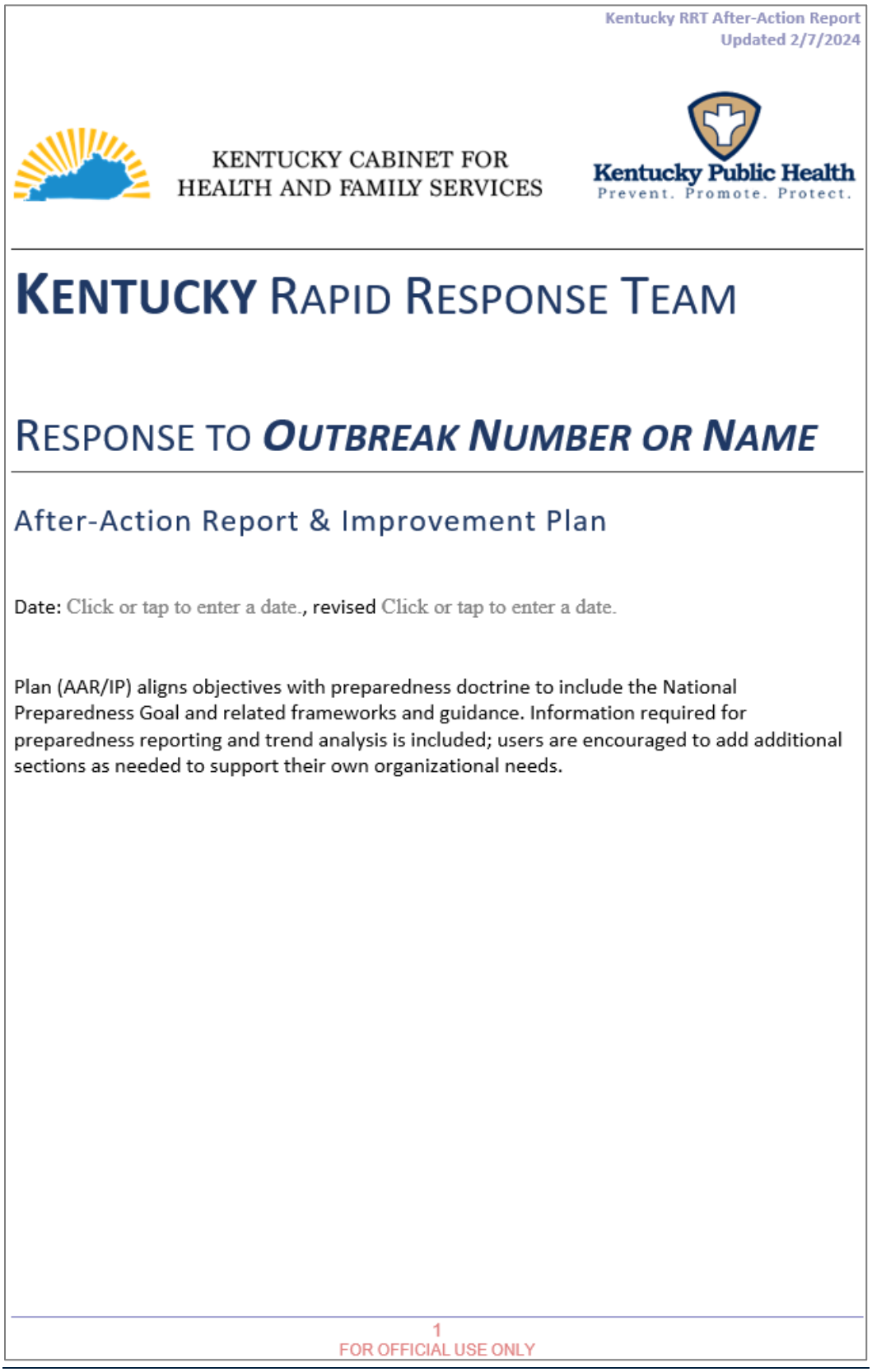
When compiling material, be aware of confidentiality issues.

Information that can lead to the identification of individual cases (e.g., test results that include personal identifiers), should not be included in the outbreak report or AAR/IP. The name of the facility or establishment under question is part of the public record and can be disclosed. Data that *cannot* be

used to identify individuals can be presented. People cooperate in investigations on the basis of protected confidentiality, and this should be respected.

Distributing the Report
Copies of the report should be made available to all parties involved in the investigation. This would include, but not be limited to, the owner and/or managers of the establishment, the KDPH, and any other local or state agencies affected by or involved in the outbreak or the investigation.

Example 4.4 Outbreak After-Action Report



Kentucky RRT After-Action Report
Updated 2/7/2024

KENTUCKY CABINET FOR HEALTH AND FAMILY SERVICES

Kentucky Public Health
Prevent. Promote. Protect.

KENTUCKY RAPID RESPONSE TEAM

RESPONSE TO *OUTBREAK NUMBER OR NAME*

After-Action Report & Improvement Plan

Date: Click or tap to enter a date., revised Click or tap to enter a date.

Plan (AAR/IP) aligns objectives with preparedness doctrine to include the National Preparedness Goal and related frameworks and guidance. Information required for preparedness reporting and trend analysis is included; users are encouraged to add additional sections as needed to support their own organizational needs.

1
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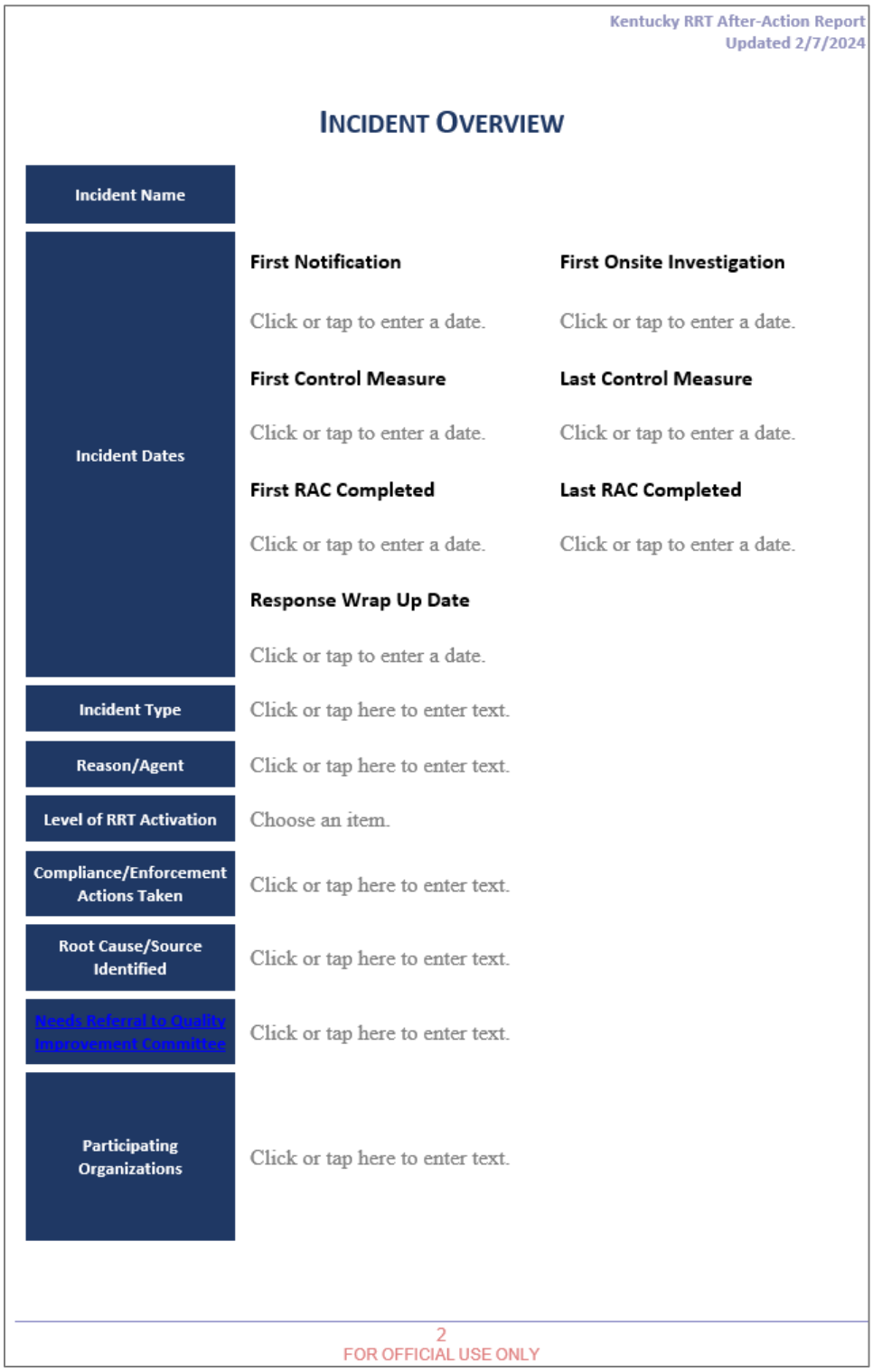
Image Source: Kentucky Department for Public Health Food Safety Branch



Kentucky RRT After-Action Report
Updated 2/7/2024

INCIDENT OVERVIEW

Incident Name		
Incident Dates	**First Notification**	**First Onsite Investigation**
	Click or tap to enter a date.	Click or tap to enter a date.
	First Control Measure	**Last Control Measure**
	Click or tap to enter a date.	Click or tap to enter a date.
	First RAC Completed	**Last RAC Completed**
	Click or tap to enter a date.	Click or tap to enter a date.
	Response Wrap Up Date	
	Click or tap to enter a date.	
Incident Type	Click or tap here to enter text.	
Reason/Agent	Click or tap here to enter text.	
Level of RRT Activation	Choose an item.	
Compliance/Enforcement Actions Taken	Click or tap here to enter text.	
Root Cause/Source Identified	Click or tap here to enter text.	
Needs Referral to Quality Improvement Committee	Click or tap here to enter text.	
Participating Organizations	Click or tap here to enter text.	

2
FOR OFFICIAL USE ONLY

Image Source: Kentucky Department for Public Health Food Safety Branch

CONTACTS

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Image Source: Kentucky Department for Public Health Food Safety Branch

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Image Source: Kentucky Department for Public Health Food Safety Branch

Image Source: Kentucky Department for Public Health Food Safety Branch

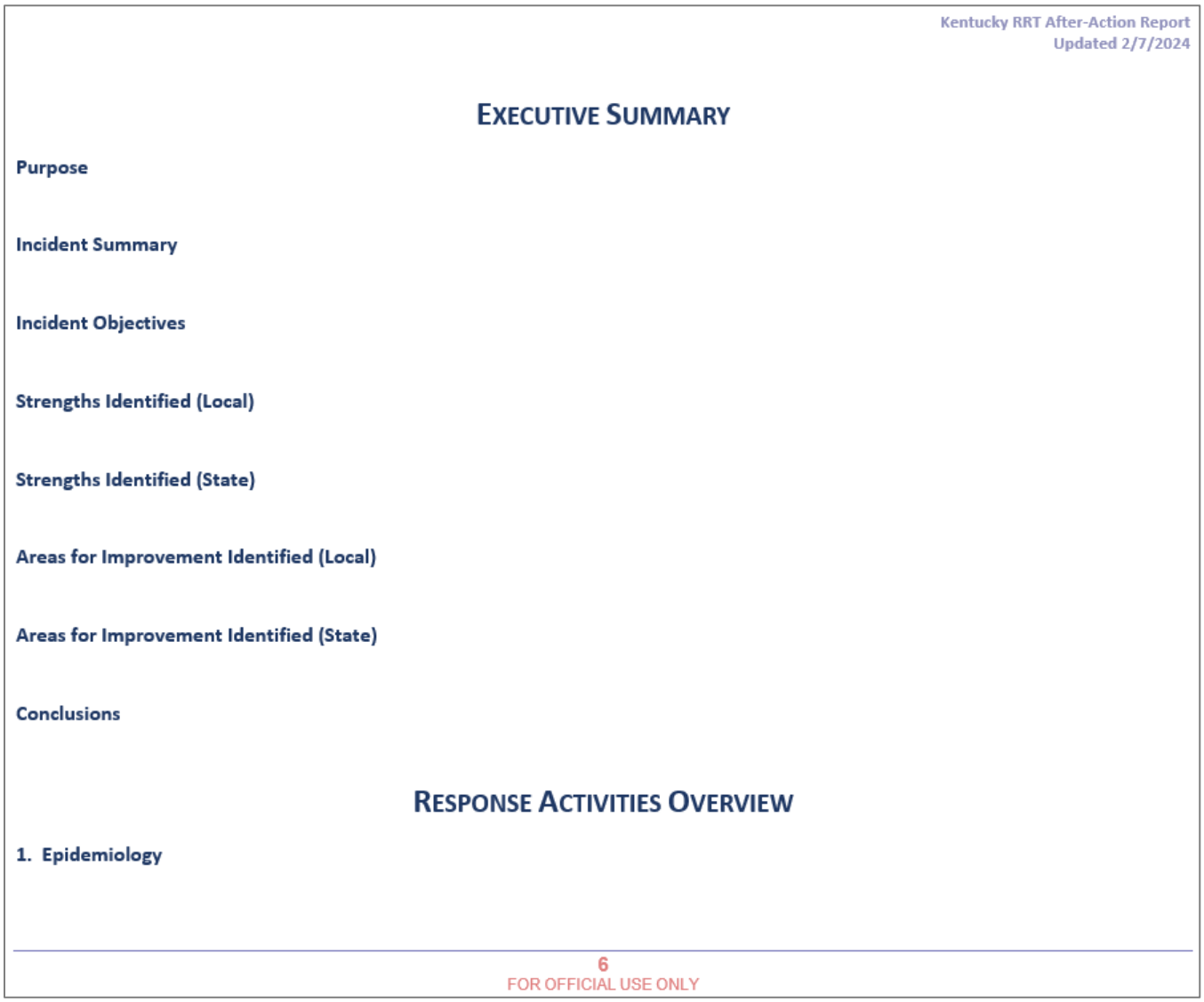


Image Source: Kentucky Department for Public Health Food Safety Branch

Phases:

1. Preparedness
2. Response
3. Recovery

9. Other

IMPROVEMENT PLAN

Response Activity	Observation	Recommendation/Description	POC	Start Date	Due Date
1. Epidemiology					
2. Traceback					
3. Recall Audit					

Image Source: Kentucky Department for Public Health Food Safety Branch

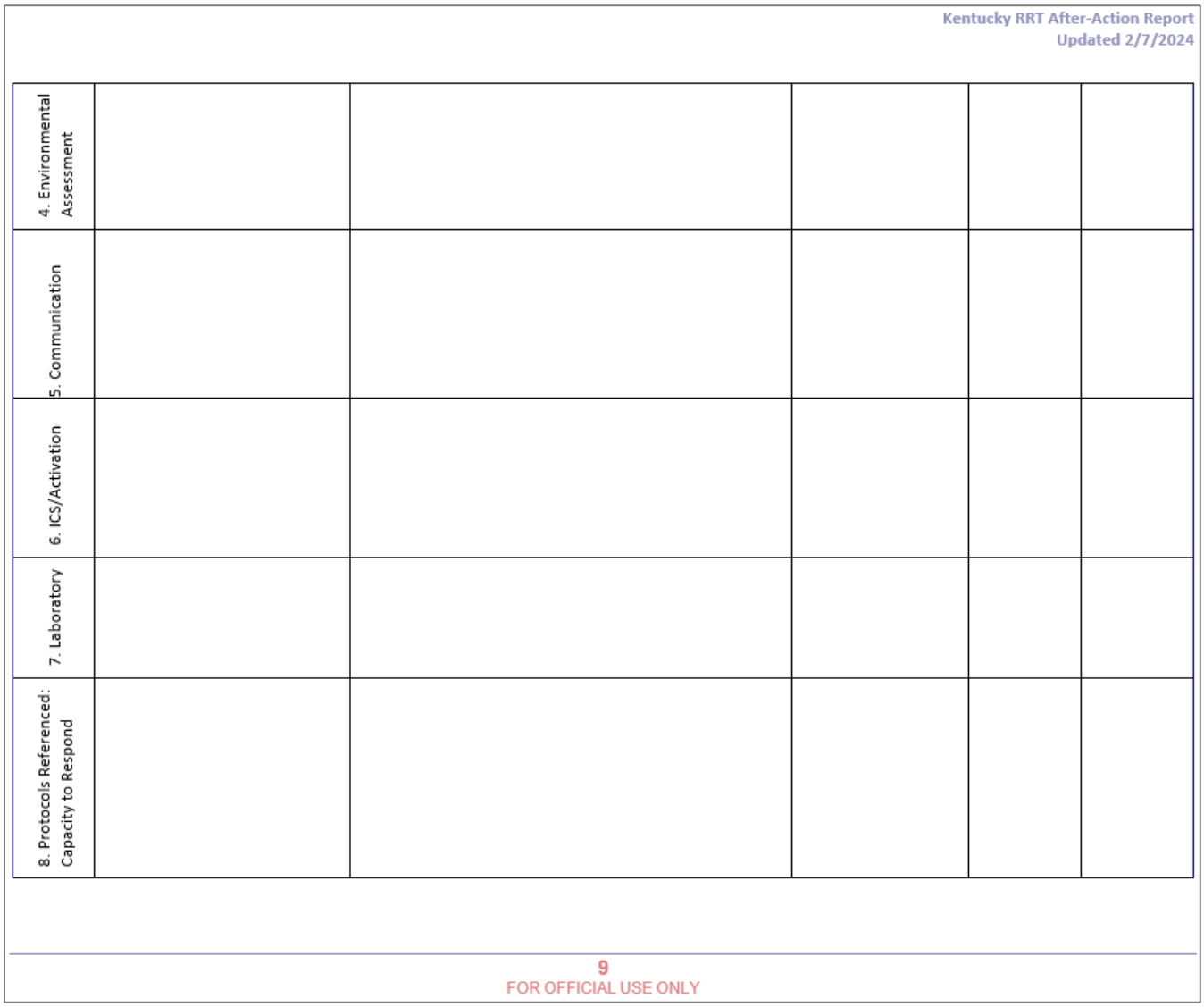
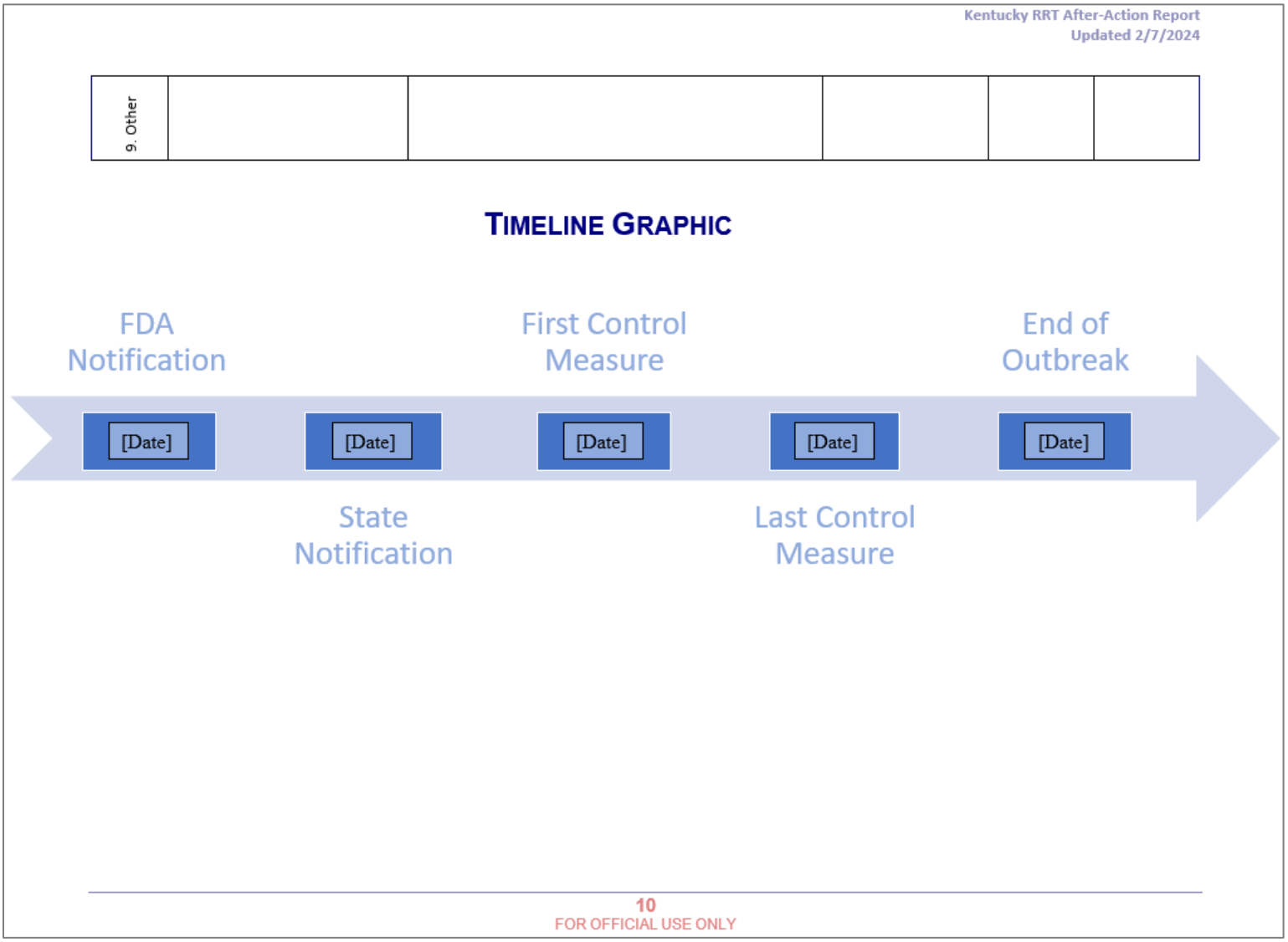


Image Source: Kentucky Department for Public Health Food Safety Branch



Pages 77-86. Image Source: Kentucky Department for Public Health Food Safety Branch

Appendix A: Contact Agencies and Personnel

Contacts for Outbreak Investigations

Kentucky Department for Public Health (KDPH)

KDPH Division of Epidemiology and Health Planning

275 East Main St. HS2GW-C
Frankfort, KY 40621
502-564-3418
https://chfs.ky.gov/agencies/dph/dehp/Pages/default.aspx

Reportable Disease Hotline
1-888-9-REPORT or
1-888-973-7678

Name	Title	Telephone Number	Email Address
Dr. Kathleen Winter	State Epidemiologist	502-892-9895	Kathleen.Winter@ky.gov
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Dr. Kelly Giesbrecht	State Public Health Veterinarian	502-682-4048	Kelly.Giesbrecht@ky.gov
Dr. Doug Thoroughman	Career Epidemiology Field Officer (CDC)	502-564-7167	Douglas.Thoroughman@ky.gov
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ESF-8 / Public Health Preparedness

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502-564-7243
https://chfs.ky.gov/agencies/dph/dphps/phpb/Pages/default.aspx

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KDPH Division of Public Health Protection and Safety

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KDPH Division of Water, Drinking Water Branch

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KDPH Division of Laboratory Services

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https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

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Contacts for Outbreak Investigations

Additional Contacts

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Frankfort, KY 40602
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www.kyem.ky.gov

Kentucky Department of Agriculture
111 Corporate Drive
Frankfort, KY 40601
Phone: 502-573-0282
Fax: 502-564-2133
www.kyagr.com

Kentucky Department of Fish and Wildlife Resources
1 Sportsman's Lane
Frankfort, KY 40601
Phone: 1-800-858-1549
www.fw.ky.gov

Kentucky Energy and Environment Cabinet Department for Environmental Protection
300 Sower Blvd, 2nd Floor
Frankfort, KY 40601

Phone: 502-564-0323
Fax: 502-564-4245
To report environmental emergencies, call 1-800-928-2380 or 502-564-2380
https://eec.ky.gov/Environmental-Protection/Pages/default.aspx

Centers for Disease Control and Prevention
Phone: 1-800-232-4636
www.cdc.gov

U.S. Food and Drug Administration
Phone: 1-888-463-6332
www.fda.gov

U.S. Department of Agriculture
Phone: 202-720-2791
www.usda.gov

Local Health Departments (LHDs)

BARREN RIVER

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	Regional Preparedness	Anita Adams			Anita.Adams@ky.gov
	Regional Infection Preventionist	Betty Prochaska	502-871-2625		Betty.Prochaska@ky.gov
BARREN RIVER DISTRICT (BARREN, BUTLER, EDMONSON, HART, LOGAN, METCALFE, SIMPSON, WARREN)					
	Local Health Department Director	Matt Hunt	270-781-8039 ext. 131	270-796-8946	Matt.Hunt@barrenriverhealth.org
	Nurse Administrator	Chelsey Lindsey	270-781-8039 ext.	270-796-8946	Chelsey.Fuller@barrenriverhealth.org
	NEDSS & Surveillance Nurse	Bethany Kinney	270-781-8039 ext. 183	270-796-8946	Bethany.Kinney@barrenriverhealth.org
	Local Epi	India Martinez	270-781-8039 ext. 105	270-796-8946	India.Martinez@barrenriverhealth.org
	Environmental Supervisor	Jama Jepson	270-781-8039 ext. 351	270-796-8946	Jama.Jeperson@barrenriverhealth.org
	Emergency/24-hr contact number		270-781-8039		
ALLEN COUNTY					
	Local Health Department Director	David Williams	270-622-0673	270-237-4777	DavidS.Williams@ky.gov
	Nurse Administrator	Vacant		270-237-4777	
	NEDSS & Surveillance Nurse	April Woods Melanie Hartson	270-237-4423	270-237-4777	AprilR.Wood@ky.gov MelanieK.Hartson@ky.gov
	Environmental Supervisor	Peyton Donisi	270-237-4423 ext. 112	270-237-4777	PeytonM.Donisi@ky.gov
	Emergency/24-hr contact number		270-237-4423 ext. 106	270-237-4777	
MONROE COUNTY					
	Local Health Department Director	Jill Ford	270-487-6782	270-487-4547	JillA.Ford@ky.gov
	Nurse Administrator	Amy Comer	270-487-6782	270-487-4547	AmyL.Comer@ky.gov
	NEDSS & Surveillance Nurse	Jacklyn Moore	270-487-6782	270-487-4547	JacklynM.Moore@ky.gov
	Environmental Supervisor	Jason Holland	270-487-6782	270-487-4547	JasonJ.Holland@ky.gov
	Emergency/24-hr contact number		270-487-8083	270-487-4547	

BIG SANDY/FIVCO

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Ciaran Allen-Guy	606-205-3239		Ciaran.Allenguy@ky.gov
	Regional Preparedness	Steven Little	502-330-0716		Steven.little@ky.gov
	Regional Infection Preventionist-FIVCO	Pat Lewis	502-871-2350		Patricia.Lewis@ky.gov
	Regional Infection Preventionist-Big Sandy	Lana Newkirk	502-871-2632		Lana.Newkirk@ky.gov
BOYD COUNTY					
	Local Health Department Director	Matthew Anderson	606-329-9444 ext. 232	606-324-5423	matthew.anderson@ky.gov
	Nurse Administrator	Erin Crace	606-324-7181 ext. 262	606-324-5423	erine.crace@ky.gov
	NEDSS & Surveillance Nurse	Erin Crace	606-324-7181 ext. 262	606-324-5423	erine.crace@ky.gov
	Environmental Supervisor	Shelby Hall	606-324-7141 ext. 295	606-324-5423	shelbyl.hall@ky.gov
	Emergency/24-hr contact number		606-329-9444	606-324-5423	
FLOYD COUNTY					
	Local Health Department Director	Martha Ellis	606-886-2788	606-886-9318	MarthaN.Ellis@fchdky.org
	Nurse Administrator/NEDSS & Surveillance Nurse	Tammie Ratliff	606-886-2788 ext. 242	606-886-9318	TammieK.Ratliff@fchdky.org
	NEDSS & Surveillance Nurse	Pam McManus	606-886-2788	606-886-9318	PamelaI.McManus@fchdky.org
	Environmental	Scott Young	606-886-2788 ext. 205	606-886-9318	ChristopherS.Young@fchdky.org
	Emergency/24-hr contact number		606-886-2788	606-886-9318	
JOHNSON COUNTY					
	Local Health Department Director	Julie Bush	606-789-2590	606-789-8888	juliea.bush@ky.gov
	Nurse Administrator	Christi Eller	606-789-2590	606-789-8888	christi.eller@ky.gov
	NEDSS & Surveillance Nurse	Christi Eller	606-789-2590	606-789-8888	christi.eller@ky.gov
	Environmental Supervisor	David Sellards	606-789-2590	606-789-8888	davidt.sellards@ky.gov
	Emergency/24-hr contact number		606-789-2590		
LAWRENCE COUNTY					
	Local Health Department Director	Debbie Miller	606-638-4389 ext. 261	606-638-3008	debbiea.miller@ky.gov
	Nurse Administrator	Kristinia Robinette	606-638-4389	606-638-3008	KristiniaM.Robinette@ky.gov

	NEDSS & Surveillance Nurse	Kristina Robinette	606-638-4389	606-638-3008	KristiniaM.Robinette@ky.gov
	Environmental Supervisor	Richard Helton	606-638-4389	606-638-3008	richardl.helton@ky.gov
	Emergency/24-hr contact number		606-989-5617	606-638-3008	
MAGOFFIN COUNTY					
	Local Health Department Director	James Shepherd	606-349-6212	606-349-6216	JamesM.Shepherd@ky.gov
	Nurse Administrator	Marlene Robertson	606-349-6212	606-349-6216	marlene.robertson@ky.gov
	NEDSS & Surveillance Nurse	Marlene Robertson	606-349-6212	606-349-6216	marlene.robertson@ky.gov
	Environmental Supervisor	Patrick Boyd	606-349-6212	606-349-6216	patricko.boyd@ky.gov
	Emergency/24-hr contact number		606-349-6212		
MARTIN COUNTY					
	Local Health Department Director	Eric Mills	606-298-7752	606-298-0413	Eric.Mills@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Penny Dye	606-289-7752	606-298-0413	PennyJ.Dye@MartinHealthKY.org
	Environmental	Richard Helton	606-638-4389	606-298-0413	richardl.helton@ky.gov
	Emergency/24-hr contact number		606-298-7752	606-298-0413	
PIKE COUNTY					
	Local Health Department Director	Tammy Riley	606-437-5500	606-437-0873	tammym.riley@ky.gov
	Nurse Administrator	Stephanie Bentley	606-437-5500 ext. 536	606-437-0873	stephanier.bentley@ky.gov
	NEDSS & Surveillance Nurse	Stephanie Bentley	606-437-5500 ext. 536	606-437-0873	stephanier.bentley@ky.gov
	Environmental Supervisor	Crystal Newsome	606-437-5500	606-437-0873	crystal.newsome@ky.gov
	Emergency/24-hr contact number		606-509-5500	606-437-0873	

BLUEGRASS

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Amber Burkhart	859-200-0373		Amber.Burkhart@ky.gov
	Regional Preparedness	Rebecca Hardin	502-352-8319		RebeccaL.Hardin@ky.gov
	Regional Infection Preventionist	Holly Swift	502-395-8440		holly.swift@ky.gov
BOYLE COUNTY					
	Local Health Department Director	Brent Blevins	859-236-2053	859-236-2053	Brent.Blevins@ky.gov
	NEDSS & Surveillance Nurse	Vicki Ratliff	859-236-2054	859-236-2053	VickiL.Ratliff@ky.gov

	NEDSS & Surveillance Nurse	Amelia Miller	859-236-2055	859-236-2053	AmeliaD.Miller@ky.gov
	Environmental	Merl Baldwin	859-236-2056	859-236-2053	Merl.Baldwin@ky.gov
	Emergency/24-hr contact number		859-319-4823	859-236-2053	
CLARK COUNTY					
	Local Health Department Director	Becky Kissick	859-744-4482	859-737-2618	Rebecca.Kissick@cchdky.org
	Nurse Administrator/NEDSS & Surveillance Nurse	Jennifer Burchett		859-737-2618	JenniferM.Burchett@cchdky.org
	Local Epi	Ali Stith		859-737-2618	Alexandrac.finch@cchdky.org
	Environmental/Preparedness	Amanda Coomer		859-737-2618	AmandaF.Coomer@cchdky.org
	Environmental	Amber Turner		859-737-2618	Amber.Turner@cchdky.org
	Emergency/24-hr contact number		859-576-6222		
ESTILL COUNTY					
	Local Health Department Director	Elizabeth Walling	606-723-5181	606-723-5254	ElizabethB.Walling@estillcohd.org
	NEDSS/Surveillance Nurse	Mandy Watson		606-723-5254	MarandaG.Watson@estillcohd.org
	Environmental	Kenny Cole		606-723-5254	KennyW.Cole@estillcohd.org
	Environmental	Candie McMaine		606-723-5254	CandieL.McMaine@estillcohd.org
	Emergency/24-hr contact number		606-723-2205		
GARRARD COUNTY					
	Local Health Department Director	J Dawn Smith	859-792-2153		Jdwan.Smith@ky.gov
	NEDSS/Surveillance Nurse	Renee Davis	859-792-2153		Doris.Davis1@ky.gov
	Environmental/Preparedness	Tonya Watkins	859-792-2153		TonyaD.Watkins@ky.gov
	Emergency/24-hr contact number				
LINCOLN COUNTY					
	Local Health Department Director	Judy Collins	606-365-3106	606-365-1640	Judy.Collins@ky.gov
	NEDSS & Surveillance Nurse	Brittany Caldwell		606-365-1640	Brittany.Caldwell@ky.gov
	Environmental	Teresa Baldwin		606-365-1640	TeresaA.Baldwin@ky.gov
	Environmental	Randall Carrier		606-365-1640	RandallW.Carrier@ky.gov
	Environmental/Preparedness	Alphanso Miller		606-365-1640	AlphansoM.Miller@ky.gov
	Emergency/24-hr contact number				
MADISON COUNTY					
	Local Health Department Director	Dr. Nikita Vundi	859-626-4241	606-365-1640	Nikita.Vundi@madisoncohd.com

	Nurse Administrator/NEDSS & Surveillance Nurse	April Whitaker		606-365-1640	AprilL.Whitaker@madisoncohd.com
	NEDSS/Surveillance Nurse	Ava Wright		606-365-1640	AvaM.Wright@madisoncohd.com
	Environmental	Jacob Cook	859-623-4249	606-365-1640	JacobM.Cook@madisoncohd.com
	Emergency/24-hr contact number		859-623-7312 opt. 8		
MERCER COUNTY					
	Local Health Department Director	Cathy Adkins	859-734-4522		CatherineM.Adkins@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Elizabeth Blevins			ElizabethM.Blevins@ky.gov
	NEDSS/Surveillance/Preparedness	Stacy Blacketer			StacyC.Blacketer@ky.gov
	Environmental	Kevin Gabhart			Kevin.Gabhart@ky.gov
	Environmental	Ben White			BenD.White@ky.gov
	Emergency/24-hr contact number				
POWELL COUNTY					
	Local Health Department Director	Stacy Crase	606-663-4360	606-663-9790	StacyL.Crase@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Jamie Duncan	606-663-4360	606-663-9790	
	Environmental Supervisor	Rusty Griffith	606-663-4360	606-663-9790	Rusty.Griffith@ky.gov
	Preparedness	Ray Haddix	606-663-4360		clarencer.haddix@ky.gov
	Emergency/24-hr contact number		606-663-4116		

BUFFALO TRACE-GATEWAY

ROLE	NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF				
Regional Epidemiologist	Anne Goodman	502-229-3925		Anne.Goodman@ky.gov
Regional Preparedness	Brandon Stacy	502-229-7624		Brandon.Stacy@ky.gov
Regional Infection Preventionist	Pat Lewis	502-871-2350		patricia.lewis@ky.gov
BUFFALO TRACE DISTRICT (MASON, ROBERTSON)				
Local Health Department Director	Victor McKay	606-564-9447 ext. 131		VictorC.McKay@ky.gov
Nurse Administrator/NEDSS & Surveillance Nurse	Allison Alexander	606-564-9447 ext. 103		AllisonL.Alexander@ky.gov
Environmental Supervisor	Brit Combess	606-564-9447 ext. 125		Brit.Combess@ky.gov

	Emergency/24-hr contact number	Victor Mckay	606-564-9447 press 7		VictorC.McKay@ky.gov
GATEWAY DISTRICT (BATH, ELLIOTT, MENIFEE, MORGAN, ROWAN)					
	Local Health Department Director	Greg Brewer	606-674-6396 ext. 29		GregoryD.Brewer@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Dr. Jessica Lykins	606-210-0605		JessicaS.Lykins@ky.gov
	NEDSS & Surveillance Nurse	Vacant			
	Environmental				
	Emergency/24-hr contact number	606-336-1091			
BRACKEN COUNTY					
	Local Health Department Director	John Dells	606-735-2157		JohnT.Dells@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Nicole Cracraft	606-735-2157		NicoleL.Cracraft@ky.gov
	Emergency/24- hour contact number				
FLEMING COUNTY					
	Local Health Department Director	Stephanie Fryman	606-748-9031		StephanieO.Fryman@ky.gov
	Nurse Administrator				
	NEDSS & Surveillance Nurse	Patricia Tolliver	606-845-6511		PatriciaT.Tolliver@ky.gov
	Environmental Supervisor				
	Emergency/24-hr contact number				
LEWIS COUNTY					
	Local Health Department Director	Anita Bertram	606-584-1538		AnitaJ.Bertram@ky.gov
	Nurse Administrator				
	NEDSS & Surveillance Nurse	Katie Brannon	606-584-8787		AllysonK.Brannon@ky.gov
	Environmental Supervisor				
	Emergency/24-hr contact number				
MONTGOMERY COUNTY					
	Local Health Department Director	Allison Napier	502-662-2388		AllisonL.Napier@mchdky.org
	Nurse Administrator	Kelly Allen	859-404-7326		VirginiaK.Allen@mchdky.org
	Reportable Disease and TB Coordinator	Sherry Fletcher	859-497-2419		sherry.fletcher@mchdky.org
	Environmental				

	Emergency/24-hr contact number				
CARTER COUNTY					
	Local Health Department Director	Jeffery Barker	606-225-1168		jefferyd.barker@ky.gov
	Nurse Administrator	Jana McGlone	606-225-0070		jana.mcglone@ky.gov
	NEDSS & Surveillance Nurse	Jordan Mauk	606-474-6685		jordan.mauk@ky.gov
	Environmental Supervisor	Jeffery Barker	606-225-1168		jefferyd.barker@ky.gov
	Emergency/24-hr contact number				
GREENUP COUNTY					
	Local Health Department Director	Chris Crum	606-473-9838 ext. 109		ChrisG.Crum@ky.gov
	Nurse Administrator	Connie Wilburn	606-473-9838 ext. 108		ConnieD.Wilburn@ky.gov
	NEDSS & Surveillance Nurse	Cassie Mace	606-473-9838 ext. 128		cassiea.mace@ky.gov
	Environmental Supervisor	David Floyd	606-473-9838 ext. 111		davidw.floyd@ky.gov
	Emergency/24-hr contact number				

CAPITAL

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Rudrani Ghosh	859-885-4149 ext. 1033		Rudrani.Ghosh@ky.gov
	Regional Preparedness	Vicki Sanderson	502-352-8263		Vicki.Sanderson@ky.gov
	Regional Infection Preventionist	Holly Swift	502-395-8440		holly.swift@ky.gov
WEDCO DISTRICT (HARRISON, SCOTT, NICHOLAS)					
	Local Health Department Director	Crystal Miller	1-866-75-WEDCO		Crystal.Miller@ky.gov
	Nurse Administrator	Samantha Jones	1-866-75-WEDCO		SamanthaW.Jones@ky.gov
	NEDSS & Surveillance Nurse-Nicholas	Karvel Stull	1-866-75-WEDCO		KarvelJ.Stull@ky.gov
	NEDSS & Surveillance Nurse-Harrison	Ashley Lakes	1-866-75-WEDCO		AshleyL.Lakes@ky.gov
	Environmental Supervisor	Kayla Kiser	1-866-75-WEDCO		Kayla.Kiser@ky.gov
	Emergency/24-hr contact number				
ANDERSON COUNTY					
	Local Health Department Director	Amanda Blair	502-839-4551		amanda.blair@achky.org
	Nurse Administrator	Renee Durr	502-839-4551		Jacqueline.Durr@achdky.org
	Environmental Supervisor	Ben Livingstone	502-839-4551		Ben.livingstone@achdky.org

	Emergency/24-hr contact number				
BOURBON COUNTY					
	Local Health Department Director	Andrea Brown	859-987-1915		AndreaD.Brown@ky.gov
	Nurse Administrator	Debbie Eubanks	859-987-1915		DeborahM.Eubanks@ky.gov
	Emergency/24-hr contact number				
FRANKLIN COUNTY					
	Local Health Department Director	Judy Mattingly	502-564-7647		JudyA.Mattingly@ky.gov
	Nurse Administrator	Leah Aubrey	502-564-7647		LeahM.Aubrey@ky.gov
	Environmental Supervisor	Judy Mattingly	502-564-7647		JudyA.Mattingly@ky.gov
	Emergency/24-hr contact number				
JESSAMINE COUNTY					
	Local Health Department Director	Ann Stevens	859-885-4149 ext. 1011		Ann.Stevens@jessaminehealth.org
	Nurse Administrator	Ann Stevens	859-885-4149 ext. 1007		Ann.Stevens@jessaminehealth.org
	NEDSS & Surveillance Nurse	Jodie Campbell	859-885-4149 ext. 1003		Jodie.Campbell@jessaminehealth.org
	Environmental Supervisor	Lisa Bolton	859-885-4149 ext. 1015		Lisa.Bolton@jessaminehealth.org
	Emergency/24-hr contact number				
WOODFORD COUNTY					
	Local Health Department Director	Cassie Prather	859-873-4541		CassieH.Prather@ky.gov
	Nurse Administrator	Kelly Simpson	859-873-4542		KellyM.Simpson@ky.gov
	Environmental Supervisor	Barrett Shoeck	859-873-4543		BarrettC.Schoeck@ky.gov
	Emergency/24-hr contact number				

CUMBERLAND VALLEY

ROLE	NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF				
Regional Epidemiologist	Beth Vanover	606-224-5674		Beth.Vanover@ky.gov
Regional Preparedness	Becki Patton	502-682-4052		Rebecca.Patton@ky.gov
Regional Infection Preventionist	Jennie Long	502-871-2349		Jennie.Long@ky.gov
CUMBERLAND VALLEY DISTRICT (CLAY, JACKSON, ROCKCASTLE)				
Local Health Department Director	Christie Green	606-598-5564	606-598-6615 (District office)	ChristieL.Green@ky.gov

	Nurse Administrator	Angie Thacker	606-224-3444	606-598-6615 (District office)	AngelaR.Thacker@ky.gov
	Nurse Administrator/ NEDSS/Surveillance Nurse: Clay	Sharon Downey	606-598-2425	606-598-4448 (Clay)	SharonD.Downey@ky.gov
	Nurse Administrator/ NEDSS/Surveillance Nurse: Jackson	Ashley Cavins	606-287-8421	606-287-4199 (Jackson)	AshleyB.Cavins@ky.gov
	Nurse Administrator/ NEDSS/Surveillance Nurse: Rockcastle	Janet Kirby	606-256-1841	606-256-5482 (Rockcastle)	JanetR.Kirby@ky.gov
	Environmental Supervisor	Shawn Reynolds	606-287-8421	606-598-6615 (District office)	Shawn.Reynolds@ky.gov
	Emergency/24-hr contact number		606-598-5564		
BELL COUNTY					
	Local Health Department Director	Taneisha Brummett	606-337-9076 ext. 149	606-337-9424 (Pineville); 606-248-2876 (Middlesboro)	Taneisha.Brummett@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Trissa Wilder	606-337-9076 ext. 127		Trissa.Wilder@ky.gov
	Additional Epi Surveillance	Donna Jenkins	606-248-2862 ext. 328		DonnaF.Jenkins@ky.gov
	Environmental	Charles Treece	606-337-9076 ext. 135		CharlesE.Treece@ky.gov
	Emergency/24-hr contact number		606-337-7046		
HARLAN COUNTY					
	Local Health Department Director	Bobbie Crider	606-573-3700 ext. 140	606-573-6128	BobbieV.Crider@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Elena Creech	606-573-3700 ext. 122	606-573-6128	ElenaS.Creech@ky.gov
	NEDSS & Surveillance Nurse	Denise Baird	606-573-3700 ext. 139	606-573-6128	DeniseD.Baird@ky.gov
	Environmental	Curtis (Lee) Freyer	606-573-3219	606-573-6128	CurtisL.Freyer@ky.gov
	Emergency/24-hr contact number		606-573-1121		
KNOX COUNTY					
	Local Health Department Director	Rebecca Rains	606-546-3486	606-277-2126	Rebecca.Rains@kchdky.org
	Nurse Administrator	Tammy Owens	606-546-3486	606-277-2126	TammyR.Owens@kchdky.org
	NEDSS/Surveillance Nurse	Rhonda Kollar	606-546-3486	606-277-2126	RhondaK.Kollar@kchdky.org
	NEDSS/Surveillance Nurse	Tabatha Blevins	606-546-3486	606-277-2126	TabathaR.Blevins@kchdky.org

	Environmental	Chaz Bargo	606-546-3486	606-277-2126	chaz.bargo@kchdky.org
	Environmental	Rick Dye	606-546-3486	606-277-2126	johnr.dye@kchdky.org
	Emergency/24-hr contact number		606-546-3510		
LAUREL COUNTY					
	Local Health Department Director	Mark Hensley	606-878-7754 ext. 241	606-864-8295	MarkA.Hensley@ky.gov
	Nurse Administrator	Carolee Epperson	606-864-5244 ext. 229	606-864-8295	CaroleeB.Epperson@ky.gov
	Environmental	Rick Evans	606-878-7754	606-864-8295	RickyD.Evans@ky.gov
	Environmental	Brian Bell	606-878-7754	606-864-8295	BrianA.Bell@ky.gov
	Emergency/24-hr contact number		London Police Dept: 606-878-7004		
WHITLEY COUNTY					
	Local Health Department Director	Marcy Rein	606-765-7117	606-549-8940	MarcyE.Rein@ky.gov
	NEDSS/Surveillance Nurse	Tamara Phelps	606-549-3380	606-549-8940	Tamara.Phelps@whitleyhealth.org
	NEDSS/Surveillance Nurse	Lia Vanover	606-549-3380	606-549-8940	Lia.Vanover@whitleyhealth.org
	Environmental Supervisor	Bryan Angel	606-765-9008	606-549-8940	bryan.angel@whitleyhealth.org
	Emergency/24-hr contact number		606-549-3380		

GREEN RIVER

ROLE	NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF				
Regional Epidemiologist	Dalen Traore	502-229-9073		Dalen.Traore@ky.gov
Regional Preparedness	Margaret Hibbs	502-352-3947		Margaret.Hibbs@ky.gov
Regional Infection Preventionist	Mattheus Smit	502-871-2631		mattheus.smit@ky.gov
GREEN RIVER DISTRICT HEALTH DEPARTMENT (DAVIESS, HANCOCK, HENDERSON, MCLEAN, OHIO, UNION, WEBSTER)				
Local Health Department Director	Clay Horton	270-925-3790	270-926-9862 (District)	clayton.horton@grdhd.org
Nurse Administrator/NEDSS/ Surveillance Nurse: Daviess	Lyndsey Hagan	270-314-5120	270-926-8677	lyndsey.hagan@grdhd.org
Nurse Administrator/NEDSS/ Surveillance Nurse: Hancock	Tina Stiles	270-344-5624	270-927-9467	tina.stiles@grdhd.org
Nurse Administrator/NEDSS/ Surveillance Nurse: Henderson	Jan Bratcher	270-344-5492	270-827-5527	janis.bratcher@grdhd.org

	Nurse Administrator/NEDSS/ Surveillance Nurse: McLean	Evon Shocklee	270-273-3062	270-273-9983	evon.shocklee@grdhd.org
	Nurse Administrator/NEDSS/ Surveillance Nurse: Ohio	Laura Brown	270-298-3663	270-298-4777	Laura.Brown@grdhd.org
	Nurse Administrator/NEDSS/ Surveillance Nurse: Union	Jen Hagan	270-389-1320	270-389-9031	Jennifer.Hagan@grdhd.org
	Nurse Administrator/NEDSS/ Surveillance Nurse: Webster	Tiffany Nalley	270-639-9315	270-639-7866	Tiffany.Hagan@grdhd.org
	Environmental Director	Rebecca Logan	270-344-5628	270-926-9862 (District)	rebecca.logan@grdhd.org
	Emergency/24-hr contact number				

KY RIVER

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Hannah Hartley			Hannah.Hartley@ky.gov
	Regional Preparedness	Cory Waddell	502-209-0126		Cory.Waddell@ky.gov
	Regional Infection Preventionist	Lana Newkirk	502-871-2632		Lana.Newkirk@ky.gov
KENTUCKY RIVER DISTRICT (KNOTT, LEE, LETCHER, LESLIE, OWSLEY, PERRY, WOLFE)					
	Local Health Department Director	Scott Lockard	606-438-6888	606-439-0870	AnthonyS.Lockard@ky.gov
	Nurse Administrator	Elizabeth Turner	606-216-1797	606-439-0870	ElizabethH.Turner@ky.gov
	NEDSS & Surveillance Nurse	Vacant	Vacant		Vacant
	Environmental Supervisor	James Ed Whisman	606-216-6345	606-666-6076	JamesE.Whisman@ky.gov
	Emergency/24-hr contact number		606-439-2361		
BREATHITT COUNTY					
	Local Health Department Director	Beth Miller	606-666-7755	606-666-3820	beth.miller@bchdky.org
	Nurse Administrator	Chelsea Hays	606-666-7755	606-666-3820	chelsea.hays@bchdky.org
	NEDSS & Surveillance Nurse	Vacant	Vacant		Vacant
	Environmental Supervisor	William Sizemore	606-666-7755	606-666-3820	william.sizemore@bchdky.org
	Emergency/24-hr contact number		606-666-8052		

LAKE CUMBERLAND

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Amanda England	270-864-2206 ext. 2640		amandaj.england@lcdhd.org
	Regional Preparedness	Aaron Denney	502-330-3932		Aaron.Denney@ky.gov
	Regional Infection Preventionist	Jennie Long	502-871-2349		Jennie.Long@ky.gov
LAKE CUMBERLAND DISTRICT (ADAIR, CASEY, CLINTON, CUMBERLAND, GREEN, McCREARY, PULASKI, RUSSELL, TAYLOR, WAYNE)					
	Local Health Department Director	Amy Tomlinson	606-678-4761 ext. 1138	606-678-2708	amyc.tomlinson@lcdhd.org
	Nurse Administrator	Laura Woodrum	606-678-4761 ext. 1103	606-678-2708	laura.woodrum@lcdhd.org
	Epi Team/Nurse Program Manager	Janae Tucker	606-678-4761 ext. 8251	606-678-2708	annaj.tucker@lcdhd.org
	Epi Team Nurse	Ashley Day	606-678-4761 ext. 7242	606-678-2708	ashley.day@lcdhd.org
	Epi Team Nurse	Connie Arnold	606-678-4761 ext. 7267	606-678-2708	conniem.arnold@lcdhd.org
	Environmental Supervisor	Stuart Spillman	606-678-4761 ext. 2231	606-678-2708	stuart.spillman@lcdhd.org
	Emergency/24-hr contact number		1-800-295-8253		

LEXINGTON-FAYETTE

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Hollie Sands	859-899-4238		hollier.sands@lfchd.org
	Regional Epidemiologist	Mia Williams	859-899-4239		miad.williams@lfchd.org
	Regional Preparedness	Vicki Sanderson	502-352-8263		Vicki.Sanderson@ky.gov
	Regional Infection Preventionist	Holly Swift	502-395-8440		holly.swift@ky.gov
LEXINGTON-FAYETTE COUNTY HEALTH DEPARTMENT					
	LFCHD Commissioner of Health	Vacant			
	Community Health Officer	Jessica Cobb	859-899-4229	859-288-7512	jessicae.cobb@lfchd.org
	Clinical Team Lead	Jill Keys	859-288-2316	859-288-7512	jillk.keys@lfchd.org
	Clinical Nurse Manager	Lindsey Todd	859-288-2346	859-288-7512	lindseyk.todd@lfchd.org
	Nurse Practitioner	Trenna Vandergrift	859-288-2483	859-288-7512	trennal.vandergrift@lfchd.org

Infectious Disease and Preparedness Manager	Kala Adams	859-288-2318	859-288-7512	kalam.adams@lfchd.org
Epidemiologist	Omotese Oaikhena	859-288-2360	859-288-7512	omotese.oaikhena@lfchd.org
Epidemiologist	Christian McKinney	859-288-2350	859-288-7512	christian.mckinney@lchd.org
Emergency Preparedness Coordinator	Ralph McCracken	859-899-4242	859-288-7512	ralph.mccracken@lfchd.org
Epidemiologist, Surveillance	Peggy Iverson	859-288-2322	859-288-7512	peggye.iverson@lfchd.org
Environmental Assistant Team Lead	Skip Castleman	859-899-4277	859-288-7512	skip.castleman@lfchd.org
Environmental Assistant Team Lead	Amy Sullivan	859-899-4234	859-288-7512	AmyMSullivan@lfchd.org
Epidemiology General Contact	Monitored Daily	859-899-5222	859-288-7512	epidemiology@lfchd.org
Emergency/24-hr contact number		859-335-7071		

LINCOLN TRAIL

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Stephanie Taylor	502-682-8174		Stephanie.Taylor@ky.gov
	Regional Preparedness	Janine Edelen	502-352-3046		Jedelen@ky.gov
	Regional Infection Preventionist	Cheryl Hooper	502-871-2627		Cheryl.Hooper@ky.gov
LINCOLN TRAIL DISTRICT (HARDIN, LARUE, MARION, MEADE, NELSON, WASHINGTON)					
	Local Health Department Director	Sara Jo Best	270-769-1601	270-209-0403	Sara.Best@ltdhd.org
	Nurse Administrator	Stefanie Goff	270-769-1601	270-209-0403	Stefanie.Goff@ltdhd.org
	Environmental Director	Bryan Carroll	270-769-1601	270-209-0403	bryan.carroll@ltdhd.org
	NEDSS/Surveillance Nurse	Tami Moore	270-769-1601	270-209-0403	tammi.moore@ltdhd.org
	Emergency/24-hr contact number		877-509-7054		
GRAYSON COUNTY					
	Local Health Department Director	Joshua Horton	270-259-3141	270-259-5388	joshua.horton@gchdky.org
	Nurse Administrator/NEDSS & Surveillance Nurse	Angee McCreery	270-259-3141	270-259-5388	angeem.mcreery@gchdky.org
	Environmental Director	Jerry Brackett	270-971-1611	270-259-5388	jerry.brackett@gchdky.org
	Emergency/24-hr contact number		270-617-4143		
BRECKINRIDGE COUNTY					

	Local Health Department Director	Scott Shrewsberry	270-759-5121	270-756-9090	JosephS.Shrewsberry@ky.gov
	Nurse Administrator/NEDSS & Surveillance Nurse	Jenny Pile	270-756-5121	270-756-9090	JennyF.Pile@ky.gov
	Environmental	Jeremy Hinton	270-756-2462	270-756-9090	JeremyC.Hinton@ky.gov
	Environmental	Pam Pollock	270-580-4016	270-756-9090	PamA.Pollock@ky.gov
	Emergency/24-hr contact number		270-756-6266		

LOUISVILLE-METRO

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Molly Parsch	502-216-2673		Molly.Parsch@louisvilleky.gov
	Regional Preparedness	Jessica Gordon	502-682-3788		JessicaR.Gordon@ky.gov
	Regional Infection Preventionist	Komal Gurjar	502-871-2347		komal.gurjar@ky.gov
LOUISVILLE METRO PUBLIC HEALTH & WELLNESS					
	Local Health Department Director	Connie Mendel	502-574-6639	502-574-5865	Connie.Mendel@louisvilleky.gov
	Community Health Nurse	Bridget Webster	502-574-5303	502-574-5865	Bridget.Webster@louisvilleky.gov
	Epidemiology Administrator	Terrel Young	502-356-9023	502-574-5865	Terrel.Young@louisvilleky.gov
	Epidemiologist	Jasmine Blue	502-322-5771	502-574-5865	Jasmine.Blue@louisvilleky.gov
	Epidemiologist	Lexus Cabiness	502-565-7488	502-574-5865	Lexus.Cabiness@louisvilleky.gov
	Epidemiologist	Justin Oliver	502-595-7395	502-574-5865	Justin.Oliver@louisvilleky.gov
	Epidemiologist	Hannah Kay	502-679-6896	502-574-5865	Hannah.Kay@louisvilleky.gov
	Health Services Director	Stacie Ingram	502-574-6191	502-574-5865	Stacie.Ingram@louisvilleky.gov
	Environmental Administrator	Kelly Monahan		502-574-6657	Kelly.Monahan@louisvilleky.gov
	Environmental Administrator	Patrick Rich	502-574-6560	502-574-6657	Patrick.Rich@louisvilleky.gov
	Communicable Disease On-Call Info		502-574-6677		Goes to answering service at 5p
	Emergency/24-hr contact number		Epi/RN: 502-574-6677; Env: 502-574-6650		

NORTH CENTRAL & THREE RIVERS

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Kaylee Stickler	502-564-1554		Kaylee.Stickler@ky.gov
	Regional Preparedness - North Central	Jessica Gordon	502-682-3788		JessicaR.Gordon@ky.gov
	Regional Preparedness - Three Rivers	Kelly Joe Aylor	502-382-8015		KellyJ.Aylor@ky.gov
	Regional Infection Preventionist- Bullitt, Shelby, Spencer	Cheryl Hooper	502-871-2627		cheryl.hooper@ky.gov
	Regional Infection Preventionist - Three Rivers	Irene Williams	502-871-2630		Naomi.Williams@ky.gov
NORTH CENTRAL DISTRICT (HENRY, SHELBY, SPENCER, TRIMBLE)					
	Local Health Department Director	Roanya Rice	502-633-1243	502-633-7658	roanya.rice@ky.gov
	Deputy Director	Vacant			
	Nurse Administrator	Adrianna Cash	502-220-3789	502-633-7658	adrianac.cash@ky.gov
	NEDSS & Surveillance Nurse	Adrianna Cash	502-220-3789	502-633-7658	adrianac.cash@ky.gov
	Local Epidemiologist	Colleen Kaelin	502-220-3748	502-633-7658	colleenm.kaelin@ky.gov
	Environmental Supervisor	Tony Millet	502-255-7701	502-633-7658	tonyl.millet@ky.gov
	Emergency/24-hr contact number		502-633-1243		
THREE RIVERS DISTRICT (CARROLL, GALLATIN, OWEN, PENDLETON)					
	Local Health Department Director	Georgia Heise	502-330-2670	Carroll: 502-732-8681	georgiaf.heise@ky.gov
	Nurse Administrator	Amy Marston	502-484-3412	Gallatin: 859-567-2845	amy.marston@ky.gov
	NEDSS & Surveillance	Michelle Wilburn	859-750-4268	Owen: 502-484-5737	micheller.wilburn@ky.gov
	Environmental Supervisor	Justin Pitman	502-682-0294	Pendleton: 859-654-6986	justinl.pittman@ky.gov
	Emergency/24-hr contact number		859-750-4268		
BULLITT COUNTY					
	Local Health Department Director	Robert Faherty	502-955-7837	502-543-2998	robert.flaherty@bullitthealth.org

	Nurse Administrator	Marci Flechler	502-797-3513	502-543-2998	marci.flechler@bullitthealth.org
	NEDSS & Surveillance Nurse	Micha Compton	502-759-4128	502-543-2998	micha.compton@bullitthealth.org
	Local Epidemiologist	VACANT			
	Environmental Supervisor	Heath Stone	502-955-7867	502-543-2998	heath.stone@bullitthealth.org
	Emergency/24-hr contact number		502-955-7837		
OLDHAM COUNTY					
	Local Health Department Director	Matthew Rhodes	502-222-3516	502-222-8723	matthewt.rhodes@ky.gov
	Nurse Administrator	Kristin Peck	502-222-3516	502-222-8723	kristinn.peck@ky.gov
	NEDSS & Surveillance Nurse	Miranda Kasey	502-222-3516	502-222-8723	MirandaM.Kasey@ky.gov
	Local Epidemiologist	Peyton Brock	502-758-5866	502-222-8723	peytona.brock@ky.gov
	Environmental Supervisor	Charlie Ward	502-222-3516	502-222-8723	charliew.ward@ky.gov
	Emergency/24-hr contact number		502-222-0111		

NORTHERN KENTUCKY

ROLE	NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF				
Regional Epidemiologist	Lina Eshete	502-352-0776		Hermella.Eshete@ky.gov
Regional Preparedness	Kelly Jo Aylor	502-382-8015		KellyJ.Aylor@ky.gov
Regional Infection Preventionist	Irene Williams	502-871-2630		Naomi.Williams@ky.gov
NORTHERN KENTUCKY DISTRICT				
Local Health Department Director	Jennifer Mooney	859-341-4264	859-363-2057	Jennifer.Mooney@nkyhealth.org
Director of Population of Health	Stephanie Vogel	859-363-2087	859-363-2057	Stephanie.Vogel@nkyhealth.org
Population of Health and Epi Program Manager	Philip Graham	859-363-2086		philip.graham@nkyhealth.org
Director of Environmental	Steve Divine	859-363-2023	859-363-2057	Steve.Divine@nkyhealth.org
Director of Clinical Services	Pamela Millay	859-363-2006	859-363-2057	Pamela.Millay@nkyhealth.org
Epidemiology Program Supervisor	Molly Frankel	859-363-2065	859-363-2057	Molly.Frankel@nkyhealth.org
Emergency/24-hr contact number		859-391-5357		

PENNYRILE

ROLE		NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF					
	Regional Epidemiologist	Faith Boldt	270-552-8121 ext. 210		faith.boldt@ky.gov
	Regional Preparedness	Lisa Hopper	502-229-5518		LisaR.Hopper@ky.gov
	Regional Infection Preventionist-Christian, Todd, Caldwell, Trigg, Lyon, Livingston	Linda Smit	502-871-2629		Linda.Smit@ky.gov
	Regional Infection Preventionist-Crittenden, Hopkins, Muhlenberg	Mattheus Smit	502-871-2631		Mattheus.Smit@ky.gov
PENNYRILE DISTRICT (CALDWELL, CRITTENDEN, LIVINGSTON, LYON, TRIGG)					
	Local Health Department Director	Elisha Kite	270-388-9747 ext. 110	270-914-2500	ElishaA.Kite@ky.gov
	Nurse Administrator/NEDSS Surveillance Nurse	Ashley Tyler	270-388-9747 ext. 105	270-914-2500	Ashley.Tyler@ky.gov
	Environmental Director	Josh Ramage	270-388-9763 ext. 511	270-914-2500	JoshuaM.Ramage@ky.gov
	Emergency/24-hr contact number		270-388-0911		
CHRISTIAN COUNTY					
	Local Health Department Director	Devin Brumfield	270-887-4160 ext. 165	270-887-4165	DevinR.Brumfield@ky.gov
	Nurse Administrator	Leslie Allen	270-821-5242 ext.303	270-887-4165	Leslien.allen@ky.gov
	NEDSS/Surveillance Nurse	Beth Campbell	270-887-4160 ext. 132	270-887-4165	Beth.Campbell@ky.gov
	Environmental Director	Chad Burch	270-887-4160 ext. 150	270-887-4165	ChadB.Burch@ky.gov
	Emergency/24-hr contact number		270-305-4026		
HOPKINS COUNTY					
	Local Health Department Director	Denise Beach	270-821-5242 ext. 222	270-825-0138	DeniseL.Beach@ky.gov
	Nurse Administrator/NEDSS Surveillance Nurse	Leslie Allen	270-821-5242 ext. 303	270-825-0138	LeslieN.Allen@ky.gov
	NEDSS/Surveillance Nurse	Amy Wortham	270-821-5242 ext. 260	270-825-0138	Amym.Wortham@ky.gov
	Environmental Director	John Montgomery	270-821-5242 ext. 263	270-825-0138	JohnD.Montgomery@ky.gov
	Emergency/24-hr contact number		270-821-5242		
MUHLENBERG COUNTY					
	Local Health Department Director	Cathy Bethel	270-754-4671 ext. 239	270-757-9855	CathyS.Bethel@muhhd.com
	Nurse Administrator	Leesa Vincent	270-754-3200 ext. 227	270-757-9855	LeesaB.Vincent@muhhd.com

	NEDSS/Surveillance Nurse	Christi Dukes	270-754-3200 ext. 244	270-757-9855	ChristiA.Dukes@muhhd.com
	Environmental	Steve Stedham	270-754-1208	270-757-9855	StevenC.Stedman@muhhd.com
	Preparedness Coordinator	Carolyn Bullock	270-754-3200 ext. 248	270-757-9855	CarolynF.Bullock@muhhd.com
	Emergency/24-hr contact number		270-754-3200		
TODD COUNTY					
	Local Health Department Director	Jennifer Harris	270-265-2362 ext. 205	270-265-0602	JenniferM.Harris@ky.gov
	Nurse Administrator/NEDSS Surveillance Nurse	Christie Baumann	270-265-2362 ext. 212	270-265-0602	ChristieJ.Baumann@ky.gov
	Environmental Director	Kristi Wyatt	270-265-2362 ext. 207	270-265-0602	KristiR.Wyatt@ky.gov
	Emergency/24-hr contact number		270-604-7008		

PURCHASE

ROLE	NAME	TELEPHONE	FAX	EMAIL
REGIONAL STAFF				
Regional Epidemiologist	Blake Johnson	502-382-6438		BD.Johnson@ky.gov
Regional Preparedness	Tina Massengill	502-352-8504		Tina.Massengill@ky.gov
Regional Infection Preventionist	Linda Smit	502-871-2629		Linda.Smit@ky.gov
PURCHASE DISTRICT (MCRACKEN, BALLARD, CARLISLE, HICKMAN, FULTON)				
Local Health Department Director	Kent Koster	270-994-1880	270-442-8769	Kent.Koster@ky.gov
District Nurse Administrator	Hailey Wallace	270-444-9631	270-442-8769	hwallace@purchasehealth.org
Epi Nurse	Crystal Knight-Roach	270-556-0401	270-442-8769	Cknight@purchasehealth.org
Environmental Director/ Preparedness Coordinator	Joel Barrett	270-556-3031	270-442-8769	Jbarrett@purchasehealth.org
Emergency/24-hr contact number		270-444-9631		
MCCRACKEN COUNTY				
Nursing Supervisor	Tracy Moss	270-556-2827		tmoss@purchasehealth.org
BALLARD COUNTY				
Nursing Supervisor	Melissa Ballard	270-665-5432		mballard@purchasehealth.org
CARLISLE COUNTY				
Nursing Supervisor	Cinda Wilson	270-628-5431		cwilson@purchasehealth.org
HICKMAN COUNTY				

	Nursing Coverage	Crystal Knight-Roach	270-556-0401		Cknight@purchasehealth.org
FULTON COUNTY					
	Nursing Supervisor	Debora Barnes	270-472-1982		dbarnes@purchasehealth.org
MARSHALL COUNTY					
	Local Health Department Director	Billy Pitts	270-970-1957	270-912-2500	Bpitts@mcphd.org
	Assistant Local Health Dept. Director	Wendy Rose	270-252-2702	270-912-2500	Wrose@mcphd.org
	Director of Nursing	Joanna Colson	270-703-0686	270-912-2500	Jcolson@mcphd.org
	Back-up Epi Surveillance	Kayle Sanders	270-703-0393	270-912-2500	ksanders@mcphd.org
	Back-up Epi Surveillance	Nicole Kinnes	270-527-1496	270-912-2500	nkinnes@mcphd.org
	Environmental Director	Mike Carlson	270-252-2720	270-912-2500	mcarlson@mcphd.org
	Preparedness Coordinator	Wendy Rose	270-252-2702	270-912-2500	Wrose@mcphd.org
	Emergency/24-hr contact number		270-527-1333		
CALLOWAY COUNTY					
	Local Health Department Director	Stephanie Hayes	270-753-3381	270-753-8455	stephaniej.hays@ky.gov
	Director of Nursing	Angela Thomas	270-293-5580	270-753-8455	Angela.thomas@ky.gov
	Epi Nurse	Noah Cunningham		270-753-8455	noah.cunningham@ky.gov
	Environmental Director	Carson Barnett		270-753-8455	Carsonw.barnett@ky.gov
	Preparedness Coordinator	Corbie Gomez		270-753-8455	Corbiem.gomez@ky.gov
	Emergency/24-hr contact number		270-293-5580		
GRAVES COUNTY					
	Local Health Department Director	Riley Beth Willett	270-804-1742	270-247-0391	Rileye.willett@ky.gov
	Assistant Local Health Dept. Director	Amanda Duke		270-247-0391	AmandaR.Duke@graveshealth.org
	Director of Nursing	Kathy Gifford		270-247-0391	Kathyj.gifford@graveshealth.org
	Epi- Surveillance Nurse	Alicia Thompson	270-705-3991	270-247-0391	AliciaK.Thompson@graveshealth.org
	Environmental Director/ Preparedness Coordinator	Shea Rodgers	270-293-7172	270-247-0391	shea.rodgers@graveshealth.org
	Emergency/24-hr contact number		270-247-1621		

Appendix B: Kentucky Timeline for Disease Reporting

Image Source: https://www.chfs.ky.gov/agencies/dph/dehp/idb/Pages/diseasesummary.aspx Amended Table of Reportable Diseases and Conditions in Kentucky

Appendix C: Kentucky Field Guide for Foodborne and Waterborne Diseases

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized Alphabetically by Agent)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Bacillus cereus "emetic" variety)	2 - 4 hours (1 - 6 hours)	Vomiting, with nausea and diarrhea (abrupt onset)	24 hours	Not communicable (preformed enterotoxin)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food, **OR** Isolation of *B. cereus* from stool or vomitus of ill person. ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Bacillus cereus ("diarrheal" variety)	6 - 24 hours	Cramps and diarrhea	24 - 48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food, **OR** Isolation of *B. cereus* from stool of ill person. ▪ Feces, rectal swabs, vomitus. ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 ▪ Can only report Bacillus sp. For food. No toxin confirmation available.
Campylobacter jejuni	48 hours - 5 days (24 hours – 10 days)	Cramps and diarrhea (sometimes bloody), with vomiting and fever	48 hours - 10 days	2 - 7 weeks	Raw milk, poultry, water	▪ Isolation of *C. jejuni* from implicated food, **OR** Isolation of *C. jejuni* from stool or blood of ill person ▪ Feces, rectal swabs

[1] *The Kentucky Field Guide to Foodborne and Water-Borne Diseases* is based on the *Oregon Health Services Compendium of Acute Food-borne Diseases* and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 2015, page 1288-1289 (Table 103-3).

[2] CDC. Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Healthcare Professionals. MMWR 2004; 53(RR04). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available online at https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5304a1.htm. CDC. Guidelines for Confirming Cause of Foodborne Disease Outbreaks at https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html Heymann, DL, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2015.

[3] CDC. Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Healthcare Professionals. MMWR 2004; 53(RR04). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5304a1.htm.

[4] "Characteristic foods" for each foodborne and water-borne agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Program, Center for Disease Control and Epidemiology, Oregon Health Division, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 2015, page 1288-1289 (Table 103-3).

[5] Division of Laboratory Services, Kentucky Department for Public Health Division of Laboratory Services - Cabinet for Health and Family Services (ky.gov). (502)564-4446. 504 Form /Chain of Custody needs to be completed to proceed with any testing for food samples.

Kentucky Department for Public Health, 275 East Main St., Frankfort, KY 40621. (502) 564-3261. 24 hour Division of Epidemiology Emergency HOTLINE: 1-888-9REPORT, 1-888-973-7678.
Revised February 2024

Kentucky Public Health
Prevent. Promote. Protect.

KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized Alphabetically by Agent)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
						▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Do not freeze food samples if possible. Outreach requisition or Form 219
Ciguatera poisoning	1 - 6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (grouper, amberjack barracuda, snapper)	▪ Demonstration of ciguatoxin in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning ▪ Collect epidemiologically implicated fish ▪ Food testing not available at DLS.
Clostridium botulinum	12 – 48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	▪ Detection of *C. botulinum* toxin from implicated food, OR Detection of *C. botulinum* toxin from human sera, or feces, **OR** Isolation of *C. botulinum* from stool of persons with clinical syndrome, **OR** Consistent clinical syndrome in persons known to have eaten same food as persons with laboratory proven cases. ▪ 25 - 50 gm feces, 10 mL sera in red top tube[6] ▪ Sterile, leak-proof unbreakable container. Outreach requisition or Form 219
Clostridium perfringens	10 - 12 hours (6 - 24 hours)	Cramps and diarrhea	24 - 48 hours	Not communicable (enterotoxin formed in vivo)	Meat, poultry, gravy, Mexican foods	▪ Isolation of $>10^6$ *C. perfringens*/gm of implicated food, **OR** Isolation of *C. perfringens* in stool of ill persons, **OR** Detection of enterotoxin by latex agglutination (from stool extracts or culture isolates). ▪ 5 - 50 gm stool ▪ Kit #10

[6] DLS staff must be contacted before any specimens for botulism will be tested.

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized Alphabetically by Agent)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
						▪ Sample must be received by DLS is 24hr from onset (48hrs by CDC). ▪ Anerobic conditions are best for best for this organism. Toxin testing not available for food.
Cronobacter sakazakii	6-8 hours	Infants (less than one year old)- fever, poor feeding, excessive crying, low energy, seizures; can lead to meningitis or sepsis People of all ages- wound infections, UTI, no symptoms; can lead to meningitis or sepsis		Unknown if communicable; mostly found in the environment	Powdered infant formula, powdered milk, herbal teas, starches	▪ Treated as a regular miscellaneous specimen. ▪ Specimen needs to be an isolate.
Cryptosporidium parvum	2 - 10 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all)	2 - 3 weeks	Weeks to months	Fruits, produce, or water	▪ Demonstration of *C. parvum* oocysts from implicated food, **OR** Demonstration of *C. parvum* oocysts from stool of ill persons, **OR** Demonstration of *C. parvum* in intestinal fluid, or small bowel biopsy specimens, **OR** Demonstration of *C. parvum* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay (ELISA). ▪ Walnut-sized stool ▪ 10% formalin ▪ Food testing not available at DLS.

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Cyclospora cayetanensis	1 – 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or protracted	3 – 5 weeks If untreated, symptoms can return	Direct Fecal-Oral does not occur, shredded oocysts need 1 – 2 weeks to mature in environment before infectious.	Raspberries, basil, snow peas, mesclun lettuce	▪ Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons **OR** ▪ Demonstration of the parasite in epidemiologically implicated food ▪ Food testing not available at DLS.
Escherichia coli Enteroinvasive (EIEC)	12 - 48 hours	Cramps and diarrhea, with fever, headache	5 - 10 days	Weeks to months	Uncooked vegetables, salads, water, cheese	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219
Escherichia coli enterotoxigenic (ETEC)[7]	24 - 48 hours (21 - 68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours - 11 days (medium 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219

[7] Symptom profiles and characteristic foods are taken from Dalton CB, Mintz ED, Wells JG et al. Outbreaks of enterotoxigenic Escherichia coli infection in American adults: a clinical and epidemiologic profile. Epidemiol Infect 1999; 123:9–16.
[8]Period of Communicability and Characteristic Foods are taken from Los Angeles County Department of Public Health. GIARDIASIS. Acute Communicable Disease Control Manual (B-73). October 2018.

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Escherichia coli enterohemorrhagic (*E. coli* O157:H7 and others)	48 hours - 8 days (24 hours - 10 days)	Bloody diarrhea, with cramps, vomiting, fever; hemolytic uremic syndrome (2 - 7% of cases)	5 - 10 days	1 - 4 weeks	Beef, venison, raw milk, water, produce	▪ Demonstration of *E. coli* isolates from stools that are enterotoxigenic or enterohemorrhagic. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Form 219 ▪ STEC, O157 and certain non-O157 food testing available. Lab needs to be informed of the non-O157 varieties ASAP so kits can be obtained for testing.
Free Living Ameba – *Acanthamoeba spp., Balamuthia mandrillaris, Naegleria fowlerii* (referenced below in its own section), *Sappina spp.*	Weeks- several years	*Acanthamoeba spp.*- inflammation of lungs or sinuses, skin infections/lesions/abscesses, neurological impairment, ocular symptoms (eye pain, swelling, redness, excessive tearing, light sensitivity) *Balamuthia mandrillaris*- similar to *Acanthamoeba spp.;* plague like lesions on skin and face, headache, vomiting, lethargy, fever, seizures, paralysis, confusion	*Acanthamoeba spp.*- several weeks to months *Balamuthia mandrillaris*- usually fatal	Not communicable	*Acanthamoeba spp.*- Soil, fresh, brackish, and seawater, field grown vegetables, swimming pool, tap water *Balamuthia mandrillaris*- soil, dust	▪ Clinical testing is performed at CDC and requires pre-approval. ▪ Food testing not available at DLS. ▪ *Acanthamoeba spp*- brain tissue is preferred specimen type (will also accept cerebrospinal fluid [CSF], corneal scraping, and skin tissue for certain subtypes); 0.2 tissue, 1 mL fluids, 5 mm cornel scraping; must be refrigerated or frozen. ▪ *Balamuthia mandrillaris*- brain tissue is preferred specimen type(will also accept cerebrospinal fluid, and skin tissue for certain subtypes); 0.2 g tissue, 1 mL fluids; must be refrigerated or frozen.
Giardia intestinalis[8]	3 – 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 – 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	▪ Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons ▪ Food testing not available at DLS.
Heavy Metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes – 8 hours (usually <1 hour)	Vomiting, with nausea, cramps, and diarrhea	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	▪ Demonstration of high concentration of metal in epidemiologically implicated food ▪ Collect suspect food or metal container

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Listeria monocytogenes	24 hours (2-3 weeks)	Fever, with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3 - 7 days	Not known	Inadequately pasteurized milk, precooked meat	▪ Isolation of *Listeria monocytogenes* of the same serotype from two or more ill persons exposed to epidemiologically implicated food or to food from which the same-type *Listeria monocytogenes* has been isolated ▪ Isolation from a normally sterile site: blood, CSF, amniotic fluid, fetal/placental tissue ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Naegleria fowleri-primary amebic meningoencephalitis (PAM)	1-12 days (Average 5 days)	Stage 1: Severe frontal headache, fever, nausea, vomiting Stage 2: stiff neck, seizures, altered mental status, hallucinations, coma, death	1-18 days (almost always fatal)	Not communicable	Lakes, rivers, hot springs, warm water discharge from industrial and power plants, poorly maintained swimming pools, water heaters, soil, rarely tap water *has to enter the body nasally to infect people.*	▪ Clinical testing is performed at CDC and requires pre-approval. ▪ CSF is preferred specimen type. Also accept fresh or frozen brain tissue. ▪ 0.2 mL (CSF); 1mL preferred. 0.1 g brain tissue; 0.2 g preferred. ▪ Must be refrigerated or frozen. ▪ Food testing not available at DLS.
Norovirus and other caliciviruses	24 - 48 hours (10 - 72 hours)	Vomiting, with diarrhea, headache and myalgia Usual symptom profile: diarrhea 80% vomiting 60% nausea 75% fever 30%	24 - 72 hours	Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods	▪ Diagnosed is often based on symptoms, onset times, and ruling out other enteric pathogens, **OR** Identification of virus in stool by polymerase chain reaction (PCR). ▪ Stool of ill person ▪ Sterile, leak-proof container **without** preservatives. Must be refrigerated. Form 275 ▪ Food testing not available at DLS.

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Paralytic shellfish poisoning	30 minutes – 3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, double vision, dysarthia, shortness of breath	Days	Not communicable	Clams, mussels, cockles	▪ Detection of toxin in epidemiologically implicated fish, **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect epidemiologically implicated fish ▪ Food testing not available at DLS
Poisonous mushrooms (muscimol, muscarine, psilocybin, coprinus artrementaris, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually self-limited	Not communicable	Wild mushrooms	▪ Clinical syndrome among persons who have eaten mushroom identified as toxic type, **OR** demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms ▪ Collect mushrooms or food containing mushrooms ▪ Food testing not available at DLS
Salmonella spp (non-typhoidal)	12 - 36 hours (6 hours – 10 days)	Cramps and diarrhea, with vomiting and fever	4 - 7 days	Several days to several years, depending on type Concentrations/ infectivity typically higher when symptomatic	Poultry, eggs, meat, raw milk (cross contamination important)	▪ Isolation of *Salmonella* from implicated food or water, **OR** Isolation of *Salmonella* from stool from ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219
Scombroid fish poisoning (histamine fish poisoning)	1 minute – 3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3 - 6 hours	Not communicable	Mishandled fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	▪ Demonstration of histamine in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with histamine fish poisoning (fish of order Scombroidei) ▪ Collect epidemiologically implicated fish ▪ Food testing not available at DLS

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Shellfish poisoning (diarrheic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Days	Not communicable	Mussels, oysters	▪ Detection of toxin in epidemiologically implicated food **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect any amount of epidemiologically implicated shellfish ▪ Food testing not available at DLS
Shigella	24 - 48 hours (12 hours - 6 days)	Cramps and diarrhea (may be bloody), with fever	4 - 7 days	4 weeks after illness	Eggs, salads, lettuce	▪ Isolation of *Shigella* from implicated food, **OR** Isolation of *Shigella* from stool of ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219
Staphylococcus aureus	2 - 4 hours (30 minutes - 8 hours)	Vomiting, with nausea, cramps, and diarrhea (abrupt onset)	24 -48 hours	Not communicable (preformed enterotoxin)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	▪ Isolation of an enterotoxin producing strain of *S. aureus* in implicated food, **OR** Isolation of enterotoxin producing strain of *S. aureus* from stool of ill persons ▪ *Staphylococcus aureus* Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Form 219 ▪ Quantification/culture and toxin testing available for food. Lab needs to know ahead of time which test is being requested to determine testing procedure

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Vibrio cholerae non-O1 and non-O139	12 - 24 hours (12 hours - 5 days)	Profuse watery diarrhea and vomiting, which can lead to severe dehydration and death within hours	72 hours - 7 days; causes life threatening dehydration	Several days	Shellfish	▪ Isolation of *V. cholerae* non-01 or non-O139 from stool of ill person. Isolation of *V. cholerae* non-01 or non-O139 from implicated food is supportive evidence. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Vibrio cholerae O1 and O139	24 - 72 hours (12 hours - 5 days)	Diarrhea, vomiting water	72 hours - 7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	▪ Isolation of toxigenic *V. cholerae* 01 or 0139 from implicated food, **OR** Isolation of *V. cholerae* 01 or 0139 from stool or vomitus of ill persons, **OR** Significant rise (fourfold) in vibriocidal antibodies. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Vibrio parahaemolyticus	12 - 24 hours (2 - 48 hours)	Cramps watery diarrhea, with nausea, vomiting, and fever	2 - 5 days	Not communicable	Seafood, especially crabs and oysters	▪ Isolation of 10/g *V. parahaemolyticus* from implicated food (usually seafood), **OR** Isolation of *V. parahaemolyticus* from stool of ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.

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Vibrio vulnificus	12 - 72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or immunocompromising conditions		Not communicable	Seafood	▪ Isolation of *V. vulnificus* from implicated food (usually seafood) **OR** Isolation of *V. vulnificus* from a clinical specimen (blood, wound, stool). ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Yersinia enterocolitica	36 - 48 hours (24 hours – 10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudoappendicitis	1 - 3 weeks	2 - 3 weeks	Milk, tofu, pork	▪ Isolation of organism from clinical specimens from two or more ill persons **OR** isolation of organism from epidemiologically implicated food ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219

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(Organized by Incubation Period)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Scombroid fish poisoning (histamine fish poisoning)	1 minute–3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3-6 hours	Not communicable	Mishandled fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	▪ Demonstration of histamine in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with histamine fish poisoning (fish of order Scombroidei) ▪ Collect epidemiologically implicated fish Food testing not available at DLS
Heavy Metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes - 8 hours (usually <1 hour)	Vomiting with nausea, cramps, and diarrhea	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	▪ Demonstration of high concentration of metal in epidemiologically implicated food ▪ Collect suspect food or metal container
Shellfish poisoning (diarrheic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Days	Not communicable	Mussels, oysters	▪ Detection of toxin in epidemiologically implicated food **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect any amount of epidemiologically implicated shellfish Food testing not available at DLS

[1] *The KY Field Guide to Foodborne and Water-Borne Diseases* is based on the *Oregon Health Services Compendium of Acute Foodborne Diseases* and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

[2] CDC. Diagnosis and management of foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm
CDC. Guide to confirming the diagnosis in Foodborne diseases at https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html Chin, J, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2000.

[3] CDC. Diagnosis and management of Foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm

[4] "Characteristic foods" for each foodborne and water-borne agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Program, Center for Disease Control and Epidemiology, Oregon Health Division, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

[5] Division of Laboratory Services, Kentucky Department for Public Health https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx 1-502-564-4446.

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Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Paralytic shellfish poisoning	30 minutes–3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, double vision, dysarthia, shortness of breath	Days	Not communicable	Clams, mussels, cockles	▪ Detection of toxin in epidemiologically implicated fish, **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect epidemiologically implicated fish Food testing not available at DLS
Ciguatera poisoning	1-6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (Grouper, amberjack barracuda, snapper)	▪ Demonstration of ciguatoxin in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning ▪ Collect epidemiologically implicated fish Food testing not available at DLS.
Poisonous mushrooms (muscimol, muscarine, psilocybin, coprinus artrementaris, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually selflimited	Not communicable	Wild mushrooms	▪ Clinical syndrome among persons who have eaten mushroom identified as toxic type, **OR** demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms ▪ Collect mushrooms or food containing mushrooms Food testing not available at DLS
Bacillus cereus ("emetic" variety)	2-4 hours (1-6 hours)	Vomiting with nausea and diarrhea (abrupt onset)	24 hours	Not communicable (preformed enterotoxin)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food, **OR** Isolation of *B. cereus* from stool or vomitus of ill person. Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Staphylococcus aureus	2-4 hours (30 minutes-8 hours)	Vomiting with nausea, cramps, and diarrhea (abrupt onset)	24-48 hours	Not communicable (preformed enterotoxin)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	▪ Isolation of an enterotoxin producing strain of *S. aureus* in implicated food, **OR** Isolation of enterotoxin producing strain of *S. aureus* from stool of ill persons ▪ *Staphylococcus aureus* Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Form 219 Quantification/culture and toxin testing available for food. Lab needs to know ahead of time which test is being requested to

| Agent[1] | Usual Incubation Period (Range)[2] | Symptom Profile | Duration of Illness[3] | Period of Communicability | Characteristic Foods[4] | Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5] |

						determine testing procedure

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Cronobacter sakazakii	6-8 hours	Infants (less than one year old)- fever, poor feeding, excessive crying, low energy, seizures; can lead to meningitis or sepsis People of all ages- wound infections, UTI, no symptoms; can lead to meningitis or sepsis		Unknown if communicable; mostly found in the environment	Powdered infant formula, powdered milk, herbal teas, starches	▪ Treated as a regular miscellaneous specimen. Specimen needs to be an isolate.
Bacillus cereus ("diarrheal" variety)	6-24 hours	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food, **OR** Isolation of *B. cereus* from stool of ill person. ▪ Feces, rectal swabs, vomitus. ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 Can only report Bacillus sp. For food. No toxin confirmation available.
Clostridium perfringens	10-12 hours (6-24 hours)	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Meat, poultry, gravy, Mexican foods	▪ Isolation of $>10^6$ *C. perfringens*/gm of implicated food, **OR** Isolation of *C. perfringens* in stool of ill persons, **OR** Detection of enterotoxin by latex agglutination (from stool extracts or culture isolates). ▪ 5 - 50 gm stool ▪ Kit #10 ▪ Sample must be received by DLS is 24hr from onset (48hrs by CDC).
Vibrio cholerae non-O1 and non-O139	12-24 hours (12 hours-5 days)	Profuse watery diarrhea and vomiting, which can lead to severe dehydration and death within hours	72 hours-7 days; causes life threatening dehydration	Several days	Shellfish	▪ Isolation of toxigenic *V. cholerae* 01 or 0139 from implicated food, **OR** Isolation of *V. cholerae* 01 or 0139 from stool or vomitus of ill persons, **OR** Significant rise (fourfold) in vibriocidal antibodies. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Vibrio parahaemolyticus	12-24 hours (2-48 hours)	Cramps, watery diarrhea with nausea, vomiting, and fever	2-5 days	Not communicable	Seafood, especially crabs and oysters	▪ Isolation of 10/g *V. parahaemolyticus* from implicated food (usually seafood), **OR** Isolation of *V. parahaemolyticus* from

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(Organized by Incubation Period)

						stool of ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Salmonella spp (non-typhoid)	12-36 hours (6 hours-10 days)	Cramps and diarrhea, with vomiting and fever	4-7 days	Several days to several years, depending on type Concentrations/infectivity typically higher when symptomatic	Poultry, eggs, meat, raw milk (cross contamination important)	▪ Isolation of *Salmonella* from implicated food or water, **OR** Isolation of *Salmonella* from stool from ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219
Clostridium botulinum	12–48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	▪ Detection of *C. botulinum* toxin from implicated food, OR Detection of *C. botulinum* toxin from human sera, or feces, **OR** Isolation of *C. botulinum* from stool of persons with clinical syndrome, **OR** Consistent clinical syndrome in persons known to have eaten same food as persons with laboratory proven cases. ▪ 25 - 50 gm feces, 10 mL sera in red top tube[6] Sterile, leak-proof unbreakable container. Outreach requisition or Form 219
Escherichia coli Enteroinvasive (EIEC)	12-48 hours	Cramps and diarrhea with fever, headache	5-10 days	Weeks to months	Uncooked vegetables, salads, water, cheese	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219
Vibrio vulnificus	12-72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or		Not communicable	Seafood	▪ Isolation of *V. vulnificus* from implicated food (usually seafood) **OR** Isolation of *V. vulnificus* from a clinical specimen (blood, wound, stool). ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated.

[6] DLS staff must be contacted before any specimens for botulism will be tested.

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized by Incubation Period)

		immunocompromising conditions				Outreach requisition or Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Listeria monocytogenes	24 hours (9-50 hours)	Fever with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3-7 days	Not known	Inadequately pasteurized milk, precooked meat	▪ Isolation of *Listeria monocytogenes* of the same serotype from two or more ill persons exposed to epidemiologically implicated food or to food from which the same-type *Listeria monocytogenes* has been isolated ▪ Isolation from a normally sterile site: blood, CSF, amniotic fluid, fetal/placental tissue Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Escherichia coli enterotoxigenic (ETEC)[7]	24-48 hours (21-68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours-11 days (average 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219
Norovirus and other caliciviruses	24-48 hours (10-72 hours)	Vomiting, with diarrhea, headache and myalgia Usual symptom profile: diarrhea 80% vomiting 60% nausea 75% fever 30%	24-72 hours	Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods	▪ Diagnosed is often based on symptoms, onset times, and ruling out other enteric pathogens, **OR** Identification of virus in stool by polymerase chain reaction (PCR). ▪ Stool of ill person ▪ Sterile, leak-proof container **without** preservatives. Must be refrigerated. Outreach requisition or Form 275 Food testing not available at DLS.
Shigella	24-48 hours (12 hours-6 days)	Cramps and diarrhea (may be bloody) with fever	4-7 days	4 weeks after illness	Eggs, salads, lettuce	▪ Isolation of *Shigella* from implicated food, **OR** Isolation of *Shigella* from stool of ill persons. ▪ Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219

[7] Symptom profiles and characteristic foods are taken from Dalton CB, Mintz ED, Wells JG et al. Outbreaks of enterotoxigenic Escherichia coli infection in American adults: a clinical and epidemiologic profile. Epidemiol Infect 1999; 123:9–16.

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(Organized by Incubation Period)

Vibrio cholerae O1 and O139	24-72 hours (12 hours-5 days)	Diarrhea, vomiting water	72 hours-7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	• Isolation of toxigenic *V. cholerae* 01 or 0139 from implicated food, **OR** Isolation of *V. cholerae* 01 or 0139 from stool or vomitus of ill persons, **OR** Significant rise (fourfold) in vibriocidal antibodies. • Feces, rectal swabs • Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Naegleria fowleri-primary amebic meningoencephalitis (PAM)	1-12 days (Average 5 days)	Stage 1: Severe frontal headache, fever, nausea, vomiting Stage 2: stiff neck, seizures, altered mental status, hallucinations, coma, death	1-18 days (almost always fatal)	Not communicable	Lakes, rivers, hot springs, warm water discharge from industrial and power plants, poorly maintained swimming pools, water heaters, soil, rarely tap water *has to enter the body nasally to infect people.*	• Clinical testing is performed at CDC and requires pre-approval. • CSF is preferred specimen type. Also accept fresh or frozen brain tissue. • 0.2 mL (CSF); 1mL preferred. 0.1 g brain tissue; 0.2 g preferred. • Must be refrigerated or frozen. Food testing not available at DLS.
Campylobacter jejuni	48 hours-5 days (24 hours-10 days)	Cramps and diarrhea (sometimes bloody) with vomiting and fever	48 hours-10 days	2-7 weeks	Raw milk, poultry, water	• Isolation of *C. jejuni* from implicated food, **OR** Isolation of *C. jejuni* from stool or blood of ill person • Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Do not freeze food samples if possible. Outreach requisition or Form 219
Escherichia coli enterohemorrhagic (*E. coli* O157:H7 & others)	48 hours-8 days (24 hours-10 days)	Bloody diarrhea with cramps, vomiting, fever; hemolytic uremic syndrome (2-7% of cases)	5-10 days	1-4 weeks	Beef, venison, raw milk, water, produce	• Demonstration of *E. coli* isolates from stools that are enterotoxigenic or enterohemorrhagic. • Feces, rectal swabs • Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Form 219 • STEC, O157 and certain non-O157 food testing available. Lab needs to be informed of the non-O157 varieties ASAP so kits can be obtained for testing.
Cyclospora cayetanensis	1 – 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or	3 – 5 weeks If untreated, symptoms can return	Direct Fecal-Oral does not occur, shredded oocysts need 1 – 2 weeks to mature in environment	Raspberries, basil, snow peas, mesclun lettuce	• Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons

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		protracted		before infectious.		**OR** ▪ Demonstration of the parasite in epidemiologically implicated food ▪ Food testing not available at DLS.
Cryptosporidium parvum	2-12 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all.)	1-2 weeks	Weeks to months	Fruits, produce, or water	▪ Demonstration of *C. parvum* oocysts from implicated food, **OR** Demonstration of *C. parvum* oocysts from stool of ill persons, **OR** Demonstration of *C. parvum* in intestinal fluid, or small bowel biopsy specimens, **OR** Demonstration of *C. parvum* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay (ELISA). ▪ Walnut-sized stool ▪ 10% formalin ▪ Food testing not available at DLS.
Giardia intestinalis[8]	3 – 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 – 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	▪ Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons ▪ Food testing not available at DLS.

[8]Period of Communicability and Characteristic Foods are taken from Los Angeles County Department of Public Health. GIARDIASIS. Acute Communicable Disease Control Manual (B-73). October 2018.

Free Living Ameba – *Acanthamoeba spp., Balamuthia mandrillaris, Naegleria fowlerii (*referenced above in its own section), *Sappina spp.*	Weeks- several years	*Acanthamoeba spp.*- inflammation of lungs or sinuses, skin infections/lesions/abscesses, neurological impairment, ocular symptoms (eye pain, swelling, redness, excessive tearing, light sensitivity) *Balamuthia mandrillaris*- similar to *Acanthamoeba spp.;* plague like lesions on skin and face, headache, vomiting, lethargy, fever, seizures, paralysis, confusion	*Acanthamoeba spp.*- several weeks to months *Balamuthia mandrillaris*- usually fatal	Not communicable	*Acanthamoeba spp.*- Soil, fresh, brackish, and seawater, field grown vegetables, swimming pool, tap water *Balamuthia mandrillaris*- soil, dust	▪ Clinical testing is performed at CDC and requires pre-approval. ▪ Food testing not available at DLS. ▪ *Acanthamoeba spp*- brain tissue is preferred specimen type (will also accept cerebrospinal fluid [CSF], corneal scraping, and skin tissue for certain subtypes); 0.2 tissue, 1 mL fluids, 5 mm cornel scraping; must be refrigerated or frozen. *Balamuthia mandrillaris*- brain tissue is preferred specimen type(will also accept cerebrospinal fluid, and skin tissue for certain subtypes); 0.2 g tissue, 1 mL fluids; must be refrigerated or frozen.

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(Organized by Symptomology)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Agents typified by nausea and vomiting, without fever, within 8 hours of consuming.						
Bacillus cereus ("emetic" variety)	2-4 hours (1-6 hours)	Vomiting, with nausea and Diarrhea (abrupt onset)	24 hours	Not communicable (preformed enterotoxin)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food **OR** Isolation of *B. cereus* from stool of ill person. ▪ Enteric pathogens kit with Cary-Blair media. Refrigerate. Outreach requisition or Complete Form 219.
Staphylococcus aureus	2-4 hours (30 minutes-8 hours)	Vomiting, with nausea, cramps, and diarrhea (abrupt onset)	24-48 hours	Not communicable (preformed enterotoxin)	Sliced/chopped ham and meats, custards, cream fillings, mushrooms, egg salad	▪ Isolation of an enterotoxin producing strain of *S. aureus* in implicated food **OR** Isolation of enterotoxin producing strain of *S. aureus* from stool of ill persons. ▪ *Staphylococcus aureus* Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219 ▪ Quantification/culture and toxin testing available for food. Lab needs to know ahead of time which test is being requested to determine testing procedure

[1] *The KY Field Guide to Foodborne and Water-Borne Diseases* is based on the *Oregon Health Services Compendium of Acute Foodborne Diseases* and a similar table developed by epidemiologists at the Foodborne and Diarrheal Disease Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Centers for Disease Control and Prevention, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

[2] CDC. Diagnosis and management of foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm
CDC. Guide to confirming the diagnosis in Foodborne diseases at https://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html Chin, J, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2000.

[3] CDC. Diagnosis and management of Foodborne illness: a primer for physicians. MMWR 2001; 50(RR2). Reprinted with the permission of the American Medical Association; the Center for Food Safety and Nutrition, FDA and the Food Safety Inspection Service, USDA. Available on-line at http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5002a1.htm

[4] "Characteristic foods" for each foodborne and water-borne agent are based on epidemiological data gathered by epidemiologists in the Acute and Communicable Disease Program, Center for Disease Control and Epidemiology, Oregon Health Division, and on Tauxe RV, Hughes JM. Foodborne Disease. In: Mandell GL, Benne HJE, Dolin R. Principles and Practice of Infectious Disease 4th ed. NY: Churchill Livingstone; 1995, page 1017 (table 6).

[5] Division of Laboratory Services, Kentucky Department for Public Health https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx 1-502-564-4446.

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(Organized by Symptomology)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Agents typified by abdominal cramps and diarrhea, without fever, within 24 hours of consuming.						
Bacillus cereus ("diarrheal" variety)	6-24 hours	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Fried rice, meats, vegetables	▪ Isolation of 10^5 *B. cereus*/gm of implicated food, **OR** Isolation of *B. cereus* from stool of ill person. ▪ Feces, rectal swabs, vomitus. ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 ▪ Can only report Bacillus sp. For food. No toxin confirmation available.
Clostridium perfringens	10-12 hours (6-24 hours)	Cramps and diarrhea	24-48 hours	Not communicable (enterotoxin formed in vivo)	Meat, poultry, gravy, Mexican foods	▪ Isolation of >10^6 *C. perfringens*/gm of implicated food, **OR** Isolation of *C. perfringens* in stool of ill persons, **OR** Detection of enterotoxin by latex agglutination (from stool extracts or culture isolates). ▪ 5 - 50 gm stool ▪ Kit #10 ▪ Sample must be received by DLS is 24hr from onset (48hrs by CDC). Anerobic conditions are best for best for this organism. Toxin testing not available for food.

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Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Agents typified by abdominal cramps and diarrhea, with fever, within 12-48 hours of consuming.						
Campylobacter jejuni	48 hours-5 days (24 hours-10 days)	Cramps and diarrhea (sometimes bloody) with vomiting and fever	48 hours-10 days	2-7 weeks	Raw milk, poultry, water	▪ Isolation of *C. jejuni* from implicated food, **OR** Isolation of *C. jejuni* from stool or blood of ill person ▪ Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Do not freeze food samples if possible. Outreach requisition or Form 219
Cyclospora cayetanensis	1 – 14 days (usually 7 days)	Diarrhea, nausea, anorexia, weight loss, cramps, gas, fatigue, low-grade fever; may be relapsing or protracted	3 – 5 weeks If untreated, symptoms can return	Direct Fecal-Oral does not occur, shedded oocysts need 1 – 2 weeks to mature in environment before infectious.	Raspberries, basil, snow peas, mesclun lettuce	▪ Demonstration of the parasite by microscopy or molecular methods in stool or in intestinal aspirate or biopsy specimens from two or more ill persons **OR** ▪ Demonstration of the parasite in epidemiologically implicated food ▪ Food testing not available at DLS.

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Escherichia coli Enteroinvasive (EIEC)	12-48 hours	Cramps and diarrhea with fever, headache	5-10 days	Weeks to months	Uncooked vegetables, salads, water, cheese	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219
Salmonella spp (non-typhoid)	12-36 hours (6 hours-10 days)	Cramps and diarrhea with vomiting and fever	4-7 days	Several days to several years, depending on type Concentrations/ infectivity typically higher when symptomatic	Poultry, eggs, meat, raw milk (cross contamination important)	▪ Isolation of *Salmonella* from implicated food or water, **OR** Isolation of *Salmonella* from stool from ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219
Shigella	24-48 hours (12 hours-6 days)	Cramps and diarrhea (may be bloody) with fever	4-7 days	4 weeks after illness	Eggs, salads, lettuce	▪ Isolation of *Shigella* from implicated food, **OR** Isolation of *Shigella* from stool of ill persons. ▪ Feces, rectal swabs Enteric pathogens kit with buffered glycerol saline. Outreach requisition or Form 219
Vibrio parahaemolyticus	12-24 hours (2-48 hours)	Cramps watery, diarrhea with nausea, vomiting, and fever	2-5 days	Not communicable	Seafood, especially crabs and oysters	▪ Isolation of 10/g *V. parahaemolyticus* from implicated food (usually seafood), **OR** Isolation of *V. parahaemolyticus* from stool of ill persons. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.

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Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Vibrio vulnificus	12-72 hours	Fever, diarrhea, abdominal cramps, nausea, vomiting hypotension, septicemia in individuals with chronic liver disease, chronic alcoholism, hemochromatosis, or immunocompromising conditions		Not communicable	Seafood	▪ Isolation of *V. vulnificus* from implicated food (usually seafood) **OR** Isolation of *V. vulnificus* from a clinical specimen (blood, wound, stool). ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Yersinia enterocolitica	36-48 hours (24 hours–10 days)	Cramps, diarrhea, fever, headache, vomiting, pseudoappendicitis	1-3 weeks	2-3 weeks	Milk, tofu, pork	▪ Isolation of organism from clinical specimens from two or more ill persons **OR** isolation of organism from epidemiologically implicated food ▪ Feces, rectal swabs Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Agents typified by abdominal cramps and diarrhea, without fever, within 72-96 hours of consuming.						
Giardia intestinalis[6]	3 – 25 days (usually 7 days)	Diarrhea, gas, cramps, nausea, fatigue	2 – 6 weeks	Variable, as long as carrier status persists	Water, direct fecal oral, food contaminated by ill handler	▪ Demonstration of the parasite in stool or small-bowel biopsy specimen of two or more ill persons ▪ Food testing not available at DLS.

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Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Agents typified by vomiting, diarrhea, cramps, myalgias, and headache with fever, within 24 hours of consuming.						
Listeria monocytogenes	24 hours (9-50 hours)	Fever with diarrhea, myalgia, headache Usual symptom profile: fever 72% diarrhea 68% myalgia 56% cramps 55% vomiting 35%	3-7 days	Not known	Inadequately pasteurized milk, precooked meat	▪ Isolation of *Listeria monocytogenes* of the same serotype from two or more ill persons exposed to epidemiologically implicated food or to food from which the same-type *Listeria monocytogenes* has been isolated ▪ Isolation from a normally sterile site: blood, CSF, amniotic fluid, fetal/placental tissue Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219
Agents typified by vomiting, diarrhea, cramps, myalgias, and headache without fever, within 24-48 hours of consuming.						
Norovirus and other caliciviruses	24-48 hours (10-72 hours)	Vomiting, with diarrhea, headache and myalgia Usual symptom profile: diarrhea 80% vomiting 60% nausea 75% fever 30%	24-72 hours	Duration of vomiting and diarrhea	Shellfish, water, salads, frosting, "handled" foods	▪ Diagnosed is often based on symptoms, onset times, and ruling out other enteric pathogens, **OR** Identification of virus in stool by polymerase chain reaction (PCR). ▪ Stool of ill person ▪ Sterile, leak-proof container **without** preservatives. Must be refrigerated. Outreach requisition or Form 275 Food testing not available at DLS.
Agents typified by watery diarrhea and headache without fever, within 24-48 hours of consuming.						

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Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Escherichia coli enterotoxigenic (ETEC)[6]	24-48 hours (21-68 hours)	Cramps, watery diarrhea, some vomiting Usual symptom profile: Diarrhea 80-100% cramps 82% vomiting <50% nausea <50% fever <50% myalgia <50% headache <50%	24 hours-11 days (medium 3 days)	Weeks to months	Seafood (crab, shrimp and scallops), salads and other foods served cold	▪ Demonstration of *E. coli* of same serotype in implicated food and stools in persons, **OR** Isolation of *E. coli* of the same serotype shown to be enteroinvasive or enterotoxigenic from stool of ill persons ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219
Vibrio cholerae O1 and O139	24-72 hours (12 hours-5 days)	Diarrhea, vomiting water	72 hours-7 days	Usually a few days after recovery except carrier state	Shellfish, water or foods contaminated by infected food handlers	▪ Isolation of toxigenic *V. cholerae* 01 or 0139 from implicated food, **OR** Isolation of *V. cholerae* 01 or 0139 from stool or vomitus of ill persons, **OR** Significant rise (fourfold) in vibriocidal antibodies. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.
Vibrio cholerae non-O1 and non-O139	12-24 hours (12 hours-5 days)	Profuse watery diarrhea and vomiting, which can lead to severe dehydration and death within hours	72 hours-7 days; causes life threatening dehydration	Several days	Shellfish	▪ Isolation of *V. cholerae* non-01 or non-O139 from stool of ill person. Isolation of *V. cholerae* non-01 or non-O139 from implicated food is supportive evidence. ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Outreach requisition or Form 219 ▪ All Vibrio testing is currently sent from DLS to FDA lab for food testing. FDA needs to approve testing before samples can be sent.

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Agents typified by bloody diarrhea without fever, within 48 hours of consuming.						
Escherichia coli enterohemorrhagic (*E. coli* O157:H7 & others)	48 hours- 8 days (24 hours- 10 days)	Bloody diarrhea with cramps, vomiting, fever; hemolytic uremic syndrome (2-7% of cases)	5-10 days	1-4 weeks	Beef, venison, raw milk, water, produce	• Demonstration of *E. coli* isolates from stools that are enterotoxigenic or enterohemorrhagic. • Feces, rectal swabs • Enteric pathogens kit with buffered glycerol saline. Must be refrigerated. Outreach requisition or Form 219 • STEC, O157 and certain non-O157 food testing available. Lab needs to be informed of the non-O157 varieties ASAP so kits can be obtained for testing.

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Botulism						
Clostridium botulinum	12–48 hours (2 hours to 8 days)	Nausea, vomiting, diarrhea, with or just before onset of descending paralysis	Days to months	Not communicable (preformed enterotoxin)	Improperly canned or similarly preserved foods; honey (infants)	• Detection of *C. botulinum* toxin from implicated food, OR Detection of *C. botulinum* toxin from human sera, or feces, **OR** Isolation of *C. botulinum* from stool of persons with clinical syndrome, **OR** Consistent clinical syndrome in persons known to have eaten same food as persons with laboratory proven cases. • 25 - 50 gm feces, 10 mL sera in red top tube[7] Sterile, leak-proof unbreakable container. Outreach requisition or Form 219

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]

[7] DLS staff must be contacted before any specimens for botulism will be tested.

Kentucky Department for Public Health, 275 East Main St., Frankfort, KY 40621. (502) 564-3261. 24 hour Division of Epidemiology Emergency HOTLINE: 1-888-9REPORT, 1-888-973-7678.
Revised August 2021

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized by Symptomology)

Cryptosporidiosis						
Cryptosporidium parvum	2-12 days (usually 7 days)	Profuse watery diarrhea, abdominal cramps, nausea, low-grade fever, anorexia, vomiting (Some infected individuals have no symptoms at all.)	1-2 weeks	Weeks to months	Fruits, produce, or water	▪ Demonstration of *C. parvum* oocysts from implicated food, **OR** Demonstration of *C. parvum* oocysts from stool of ill persons, **OR** Demonstration of *C. parvum* in intestinal fluid, or small bowel biopsy specimens, **OR** Demonstration of *C. parvum* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay (ELISA). ▪ Walnut-sized stool ▪ 10% formalin ▪ Food testing not available at DLS.
Free Living Ameba						
Free Living Ameba – *Acanthamoeba spp., Balamuthia mandrillaris, Naegleria fowlerii* (referenced below in its own section), *Sappina spp.*	Weeks- several years	*Acanthamoeba spp.*- inflammation of lungs or sinuses, skin infections/lesions/abscesses, neurological impairment, ocular symptoms (eye pain, swelling, redness, excessive tearing, light sensitivity) *Balamuthia mandrillaris*- similar to *Acanthamoeba spp.;* plague like lesions on skin and face, headache, vomiting, lethargy, fever, seizures, paralysis, confusion	*Acanthamoeba spp.*- several weeks to months *Balamuthia mandrillaris*- usually fatal	Not communicable	*Acanthamoeba spp.*- Soil, fresh, brackish, and seawater, field grown vegetables, swimming pool, tap water *Balamuthia mandrillaris*- soil, dust	▪ Clinical testing is performed at CDC and requires pre-approval. ▪ Food testing not available at DLS. ▪ *Acanthamoeba spp*- brain tissue is preferred specimen type (will also accept cerebrospinal fluid [CSF], corneal scraping, and skin tissue for certain subtypes); 0.2 tissue, 1 mL fluids, 5 mm cornel scraping; must be refrigerated or frozen. *Balamuthia mandrillaris*- brain tissue is preferred specimen type(will also accept cerebrospinal fluid, and skin tissue for certain subtypes); 0.2 g tissue, 1 mL fluids; must be refrigerated or frozen.

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized by Symptomology)

Naegleria fowleri						
Naegleria fowleri- primary amebic meningoencephalitis (PAM)	1-12 days (Average 5 days)	Stage 1: Severe frontal headache, fever, nausea, vomiting Stage 2: stiff neck, seizures, altered mental status, hallucinations, coma, death	1-18 days (almost always fatal)	Not communicable	Lakes, rivers, hot springs, warm water discharge from industrial and power plants, poorly maintained swimming pools, water heaters, soil, rarely tap water *has to enter the body nasally to infect people.*	▪ Clinical testing is performed at CDC and requires pre-approval. ▪ CSF is preferred specimen type. Also accept fresh or frozen brain tissue. ▪ 0.2 mL (CSF); 1mL preferred. 0.1 g brain tissue; 0.2 g preferred. ▪ Must be refrigerated or frozen. Food testing not available at DLS.
Agents most readily diagnosed from the history of eating a particular type of food.						
Heavy Metals (antimony, arsenic, cadmium, copper, iron, lead, mercury, tin, zinc)	5 minutes - 8 hours (usually <1 hour)	Vomiting with nausea, cramps, and diarrhea	Usually self-limited	Not communicable	Acidic foods and beverages prepared, stored or cooked in containers coated, lined or contaminated with offending metal	▪ Demonstration of high concentration of metal in epidemiologically implicated food ▪ Collect suspect food or metal container
Poisonous mushrooms (muscimol, muscarine, psilocybin, coprinus artrementaris, ibotenic acid)	<2 hours	Vomiting, diarrhea, confusion, visual disturbances, salivation, diaphoresis, hallucinations, disulfiram-like reaction	Usually selflimited	Not communicable	Wild mushrooms	▪ Clinical syndrome among persons who have eaten mushroom identified as toxic type, **OR** demonstration of toxin in epidemiologically implicated mushroom or food containing mushrooms ▪ Collect mushrooms or food containing mushrooms Food testing not available at DLS
Shellfish poisoning (diarrheic, neurotoxic, amnesic)	20 minutes - 2 hours	Cramps, diarrhea, headaches, vomiting, amnesia, seizures	Days	Not communicable	Mussels, oysters	▪ Detection of toxin in epidemiologically implicated food **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect any amount of epidemiologically implicated shellfish Food testing not available at DLS

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KENTUCKY FIELD GUIDE FOR FOODBORNE AND WATERBORNE DISEASES[1]

(Organized by Symptomology)

Agent[1]	Usual Incubation Period (Range)[2]	Symptom Profile	Duration of Illness[3]	Period of Communicability	Characteristic Foods[4]	Criteria for Confirmation: Type and amount of specimens and handling requirements for shipping to DLS[5]
Ciguatera poisoning	1-6 hours; usually within 24 hours	Diarrhea, nausea, vomiting, paresthesias, reversal of temperature sensation	Days to weeks to months	Not communicable	Large ocean fish (grouper, amberjack barracuda, snapper)	▪ Demonstration of ciguatoxin in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with ciguatera fish poisoning ▪ Collect epidemiologically implicated fish Food testing not available at DLS.
Scombroid fish poisoning (histamine fish poisoning)	1 minute–3 hours; usually within 6 hours	Cramps, diarrhea, headache, nausea, flushing, urticaria	3-6 hours	Not communicable	Mishandled fish (mahi-mahi, tuna, mackerel, bluefish, salmon, bonito, skipjack)	▪ Demonstration of histamine in epidemiologically implicated fish, **OR** clinical syndrome among persons who have eaten a type of fish previously associated with histamine fish poisoning (fish of order Scombroidei) ▪ Collect epidemiologically implicated fish Food testing not available at DLS
Paralytic shellfish poisoning	30 minutes–3 hours	Paresthesias, feeling of floating, loss of balance, dry mouth, double vision, dysarthia, shortness of breath	Days	Not communicable	Clams, mussels, cockles	▪ Detection of toxin in epidemiologically implicated fish, **OR** detection of large numbers of shellfish-poisoning associated species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect epidemiologically implicated fish Food testing not available at DLS
Cronobacter sakazakii	6-8 hours	Infants (less than one year old)- fever, poor feeding, excessive crying, low energy, seizures; can lead to meningitis or sepsis People of all ages- wound infections, UTI, no symptoms; can lead to meningitis or sepsis		Unknown if communicable; mostly found in the environment	Powdered infant formula, powdered milk, herbal teas, starches	▪ Treated as a regular miscellaneous specimen. Specimen needs to be an isolate.

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Appendix D: Collection and Submission of Clinical Samples

1) **Collection and Packaging of Enteric and Norovirus Specimens**
2) **Lab Form 219**
3) **Lab Form 275**
4) **Request for Laboratory Kits and Supplies**
5) **Reference List of Tests**
6) **Bacteriology Flow Charts**
7) **WGS Flow Chart**

Collection and Packaging of Enterics and Norovirus

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Information on each test can be found in the Reference List of Tests
https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Kit Components: Kit can be used to test one/both test codes. Please indicate on label which laboratory should receive sample.

Multishipper with Cold Pack/Inmark Ambient
95kPa Bag with absorbent
Two vial pack - Empty vial and Cary Blair Vial
Zip Bag with absorbent
Outreach Form
Lab Form 275 - Norovirus
Lab Form 219 - Enterics

Collection of Specimen

1. Check expiration date of specimen vials.
2. Make sure two identifiers or lab label is on specimen vial.
3. Fill out lab or Outreach form completely.

Store specimen vials at room temperature.

*Stool Specimens *Remel package insert

1. Collect stool specimen into clean container.
   DO NOT mix urine or water with sample.
2. Open vials carefully.
   - Using the collection spoon attached to the cap, add enough specimen until the liquid reaches the arrow on the label.
   - Fill empty vial, to one-half full with stool specimen.

Fill only one vial at a time and replace the cap onto the same vial. DO NOT mix caps.

Important: Sample areas of the specimen which appear bloody, slimy, or watery. If the stool is hard, sample from each end and the middle of the specimen.

If larger specimen collection containers are used for Norovirus, contact KY DLS for additional instructions.

Packaging and Shipping

Norovirus must be sent on cold pack.

1. Place sample vial/vials into zip bag with Zorb sheet.
2. Place sample into 95kPa bag.
3. Plasce sample bag on top of frozen cold pack and replace styrofoam lid.
4. Place Outreach/Lab Form on top of styrofoam lid.
5. Close box and place label on top of box.



Enterics only - Ambient Inmark box can be used.

1. Place sample vial into zippered bag with Zorb sheet.
2. Place zippered bag into 95kPa bag and seal.
3. Place air pillows inside box and place lab form on top.
4. Close box and place label on top of box.

Instructions for closure are on the flap of box.


Ship samples for overnight delivery to the KY Division of Laboratory Services

Refer to 49CFR 173.199 for current regulations on packaging and shipping of Category B infectious substances

KY Division of Laboratory Services (502)564-4446

08/2022

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx - Collection and Packaging of Enteric and Norovirus Specimens

Lab Form 219

Form 219
Revised 9/2018

"This form, when filled in, contains patient information that must be protected in accordance with the Health Insurance Portability & Accountability Act."

KY Division of Laboratory Services
100 Sower Blvd. Suite 204
Frankfort, Kentucky 40601
Phone: 502/564-4446 Fax: 502/564-7019

Kentucky Public Health

Special Microbiology

Please complete a separate form for each specimen.

PATIENT INFORMATION:

Name (Last, First, MI)

Social Security # Sex Race Age DOB

Home Address

City State Zip Code County

Please Use "L" Label or Fill in Completely

Send Report To:

Submitter

Street Address (PO BOX)

City State Zip Code

Specimen Information:

Purpose of Exam _____

Specimen Source _____

Date of Collection _____

☐ Clinical Specimen

☐ Referred Culture

Bloody Diarrhea ☐ Yes ☐ No

Examination Requested: *(Please mark one)*

☐ Enteric Pathogens

☐ *Miscellaneous Bacterial Culture

☐ Other _____

Organism Suspected:

Other pertinent Medical Data: **Please complete this section when submitting Miscellaneous Bacterial Cultures*

FOR LABORATORY USE ONLY:

Date Received:	**Laboratory Number:**

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Lab Form 219

Lab Form 275

"This form, when filled in, contains patient information that must be protected in accordance with the Health Insurance Portability Accountability Act."

Lab 275 (Rev 4/2021)

Kentucky Public Health
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Viral Isolation and Immunology

KY Division of Laboratory Services
100 Sower Blvd Suite 204
Frankfort KY 40601
(502) 564-4446 FAX (502) 564-7019

Patient Information:

(Use label or fill in completely)

Name (Last, First, MI)

Social Security # Sex EO Birthdate (yyyy-mm-dd)

Home Address

City

State ZIP County

Send Reports to:

Submitter

Street Address / P O Box

City

State ZIP

Phone Fax

Physician (if other than Submitter)

Tests Requested

COVID-19	☐
Influenza	☐
Was patient prescreened for flu?	
Result of prescreening:	
Respiratory Panel	☐
Herpes/VZV	☐
Measles	☐
Mumps	☐
Norovirus	☐
Other	☐

Specimen Source / Date Collected

Throat Swab	☐	
NP Swab	☐	
OP Swab	☐	
Nasal Swab	☐	
Genital Swab	☐	
CSF	☐	
Stool	☐	
Serum	☐	
Other	☐	
Hospitilization		Yes ☐ No ☐
Pregnant		_____weeks

Testing approved?
COVID Sequencing
Yes ☐ No ☐

CLINICAL DATA

Purpose of request:
☐ diagnostic (give onset)
☐ immune status
☐ antibody status
☐ Deceased
Other _____

Date of Onset:

Symptoms:	YES	NO
Fever	☐	☐
Neurological	☐	☐
Headache	☐	☐
Respiratory	☐	☐
Gastrointestinal	☐	☐
Fatigue	☐	☐
Rash	☐	☐
Lesions	☐	☐

Other_____

Immunizations / Date

None ☐
MMR_____
Influenza_____
Varicella_____
COVID_____

Contacts / Recent Travel

Tick bite _____
Mosquito bite _____
Community _____
Other_____
Travel _____

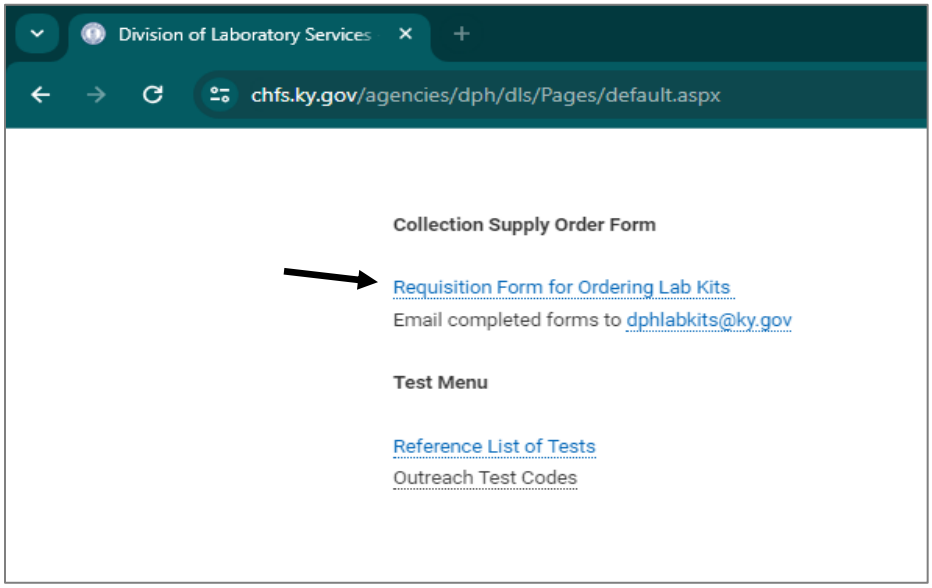
**********DLS Laboratory Findings**********

Date Received	Laboratory #	Tech	Date Reported

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Lab Form 275

Request for Laboratory Kits and Supplies

1. Using web browser, navigate to chfs.ky.gov/agencies/dph/dls/Pages/default.aspx and scroll down to find "Requisition Form for Ordering Lab Kits."



2. Download the form (web browser should begin downloading automatically after clicking the hyperlink "Requisition Form for Ordering Lab Kits."

3. Fill out the information in the form (requisition form shown on the next page).

4. Send completed form as an email attachment to DPHLabKits@ky.gov.

5. Save document as a different file name if you want to retain the information for future use.

If you have problems connecting to the website (chfs.ky.gov/agencies/dph/dls/Pages/default.aspx) or downloading the forms, please contact Leigh Ann Bates at (502) 782-7703.

REQUISITION FOR LABORATORY SUPPLIES

Email to: DPHLabKits@ky.gov or Fax to: (502) 564-7019

Date:
Facility:
Delivery Address:
Attention To:
Phone Number:

Clinical Testing Supplies			Shipping Supplies	
Gonorrhea/Chlamydia Kits (Genprobe kits) Number of kits requested	SWAB	URINE	Multi-Shippers (Ship CT/GC, Syphilis, HIV, etc.)	
			Multi-Shippers with Cold Pack (Ship Flu, Herpes, Hep C)	
Enteric Pathogen/Norovirus Kit (Cary Blair)			Category B Ambient Box	
TB Sputum Kit			Tube Shuttles	
Viral Isolation Swab Kit (Includes shipper)			95kPa Bags	
Viral Transport Media (Swab/ Media; used for Virus & Flu)			Labels- Purple PO Box Only	
Red Stopper Blood Tubes				
PPT Blood Tubes (HCV Testing)				

Environmental Testing Supplies		Courier Shipping Supplies **Only for facilities on current courier route**	
Rabies Collection Kit		Gray Courier Bags	
Water Bacteriology Kit		Specimen Bags	
Food Collection Kit			

Other

KY Division of Laboratory Services (502)564-4446

7/2023

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Requisition For Laboratory Supplies

Reference List of Tests

Virology (Norovirus): pages 5 and 6 of DLS Reference List of Tests

VIRAL PCR

Tests for the following are performed under Viral PCR:

Chickenpox
SARS-CoV-2
Herpes
Influenza
Measles
Mumps
Norovirus ←
Respiratory Panel

Methodology: Polymerase Chain Reaction (PCR)

Specimen:

- Chickenpox – Swab of lesion in Viral Transport Media
- SARS-CoV-2– Nasopharyngeal swab, Nasal swab, Throat swab in Viral Transport Media; Throat swab or nasal swab in Aptima Multitest Swab Collection Kit
- Herpes – Swab of lesion in Viral Transport Media
- Influenza – Nasopharyngeal swab, Nasal, Tissue, Bronchial wash, Throat swab, Nasal wash all in Viral Transport Media. If sending lung tissue, send in a sterile container. No Formalin or Fixative.
- Measles – Throat swab, NP swab, or NP aspirate in Viral Transport Media
- Mumps – Buccal or throat swab in Viral Transport Media
- Norovirus – Stool, Emesis in sterile empty collection vial ←
- Respiratory Panel – Nasopharyngeal swab in Viral Transport Media

Kit components ordered as needed:

- Electronic OUTREACH form or Lab Form #275 printed from Internet
- Address label
- Multi-shipper with cold pack- outside box, with Styrofoam inside container/or comparable refrigerated cooler
- 1 freezer pack
- 1 95kPa bag/Absorbent Sheet
- 1 Viral Transport Media/swab
- Sterile empty collection vial (Norovirus)
- Red Stoppered Tube

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Collection and Packaging Instructions:
Specimen should be stored at 2-8°C prior to shipping. Ship ASAP. If possible, ship on cold pack. Send Viral Transport Media specimen on cold pack. Ship Viral Transport Media frozen if delayed shipping.

https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx
Multi-shipper with Cold Pack and Multi-shipper with Cold Pack Virus

	Outreach Test Code	CPT Code	Reference Range
Respiratory Panel	RESP	87633	Not Detected
Chickenpox	HSVP	87798	Varicella Zoster Virus DNA Not Detected
SARS-CoV-2	NCOV	CDC Panther GeneXpert - 87635-QW[2]	COVID-19 Not Detected SARS-COV-2 Not Detected SARS-COV-2 Negative
Herpes	HSVP	87529 x2	Herpes Virus Type 1 DNA Not Detected Herpes Virus Type 2 DNA Not Detected
Influenza	FPCR	87501	Negative Influenza A/B by PCR
Measles	MEPCR	87798	Not Detected
Mumps	MUPCR	87798	Not Detected
Norovirus	NORX	87798 x2	Negative for Norovirus by PCR

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Hepatitis A: pages 14 and 16 of DLS Reference List of Tests

Hepatitis - Collection and Packaging Instructions:
Specimen should be stored at 2-8°C prior to shipping. Ship ASAP. If possible, ship on cold pack
https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx
Multi-shipper, Multi-shipper with cold pack Hepatitis C, Multi-shipper with cold pack Hepatitis A, Multi-shipper with cold pack Blood

	Outreach Test Code	CPT Code	Reference Range
Hepatitis A	HAV	86709	Non-reactive
Hepatitis B surface antigen	HBSG	87340, 87341	Non-reactive
Hepatitis B surface antibody	HBSB	86706	Non-reactive
Hepatitis B core antibody	HBCB	86704	Non-reactive
Hepatitis C	HEPC	Antibody – 86803 Quantification - 87522	Non-reactive

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

HEPATITIS A

Tests for the following are performed under Hepatitis A:

- IgM

Methodology: EIA

Specimen:

- 2 ml Serum or 6ml whole blood in red-stoppered tube

Kit components ordered as needed:

- Red-stoppered tube
- Electronic OUTREACH form or Lab Form #213 printed from Internet
- Mailing label
- Multi-shipper container with medium canister, bubble wrap, tube shuttle absorbent material
- Specimen should be stored at 2-8°C prior to shipping. Ship ASAP. If possible, ship on cold pack - Multi-shipper with cold pack- outside box, with Styrofoam inside container, 95kPa bag, freezer pack

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

MICROBIOLOGY

BACTERIOLOGY

Tests for the following are performed under Bacteriology:

Bacillus cereus
Campylobacter
Carbapenems Resistant Organisms (CRO)
E. coli (Shigatoxin or O157 suspect)
Salmonella
Shigella
Miscellaneous Bacteria Identification (i.e. Bacillus cereus, Listeria)
Vibrio
Biothreat agents – Bacillus anthracis, Yersinia pestis, Brucella spp. Francisella tularensis, Burkholderia, Orthopox virus
Botulism

Specimen:

- Stool specimen in placed in Cary Blair w/Indicator within 2 hours of collection.
- Pure culture isolate. Agar slant: Heart infusion, trypticase soy, blood or chocolate
- Botulism – Serum (at least 10ml), Feces (10 to 50g), Enema (20ml)
- Orthopox virus – Dry swab, vesicle fluid, skin, or crust

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Methodology: Isolation, Identification, Antigenic typing

Collection Kit (Enteric pathogens) Furnished by State Lab Contains:

- Cary Blair w/Indicator preservative
- Electronic OUTREACH form or Lab Form #219 printed from Internet – Bacteriology
- Inmark Category B complete shipper

Notes:

- Stool-Mail immediately after collection; to be received within 24 hours.
- Provide fresh grown on slants and mail immediately at room temperature.
- CRO- Organism identification and AST results must be supplied with isolate.
- Botulism by request and approval of Epidemiology.
- Orthopox assay does not differentiate vaccinia virus or monkeypox virus from other Orthopox viruses detected by this assay. Does not detect Variola virus.
- Refer to Sentinel Guidelines at https://asm.org/Articles/Policy/Laboratory-Response-Network-LRN-Sentinel-Level-C

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Collection and Packaging Instructions:
Specimen should be stored at 2-8°C prior to shipping. Ship ASAP. If possible, ship on cold pack
https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx
Enteric Collection and Packaging Guidelines, Food Kit

	Outreach Test Code	CPT Code	Reference Range
Salmonella	SGT	Stool – 87045 ID and Typing - 87147	NA
Shigella	SHGR	Stool – 87045 ID and Typing - 87147	NA
Campylobacter	CAMP	Stool – 87046	NA
E. coli	ECO	Stool – 87045 ID and Typing - 87147	NA
Carbapenem Resistant	CRO	81750	No carbapenemase production detected
Miscellaneous Bacteria	MC		NA
Botulism	MEP	87158, 87076	Mouse Bioassay: No C. botulinum toxin detected by mouse bioassay Culture: No C. botulinum isolated

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Bacteriology Flow Charts

Please note that the following flow charts do not reflect the entire work process for testing of laboratory specimens. Rather, they have been simplified to provide a basic description of specimen flow through the lab and the testing process. These flow charts are intended to provide a general idea of the steps and time required for testing.

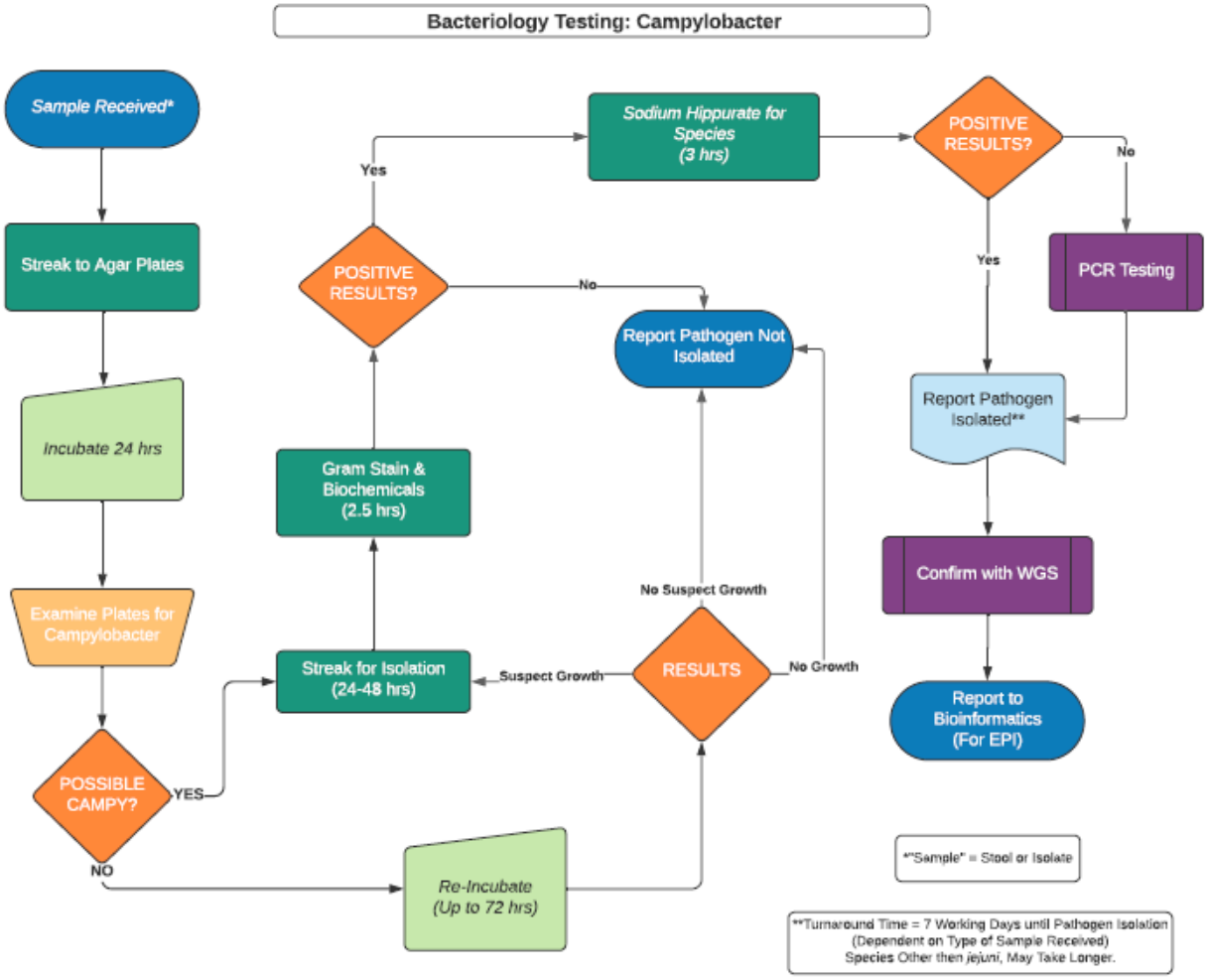


Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

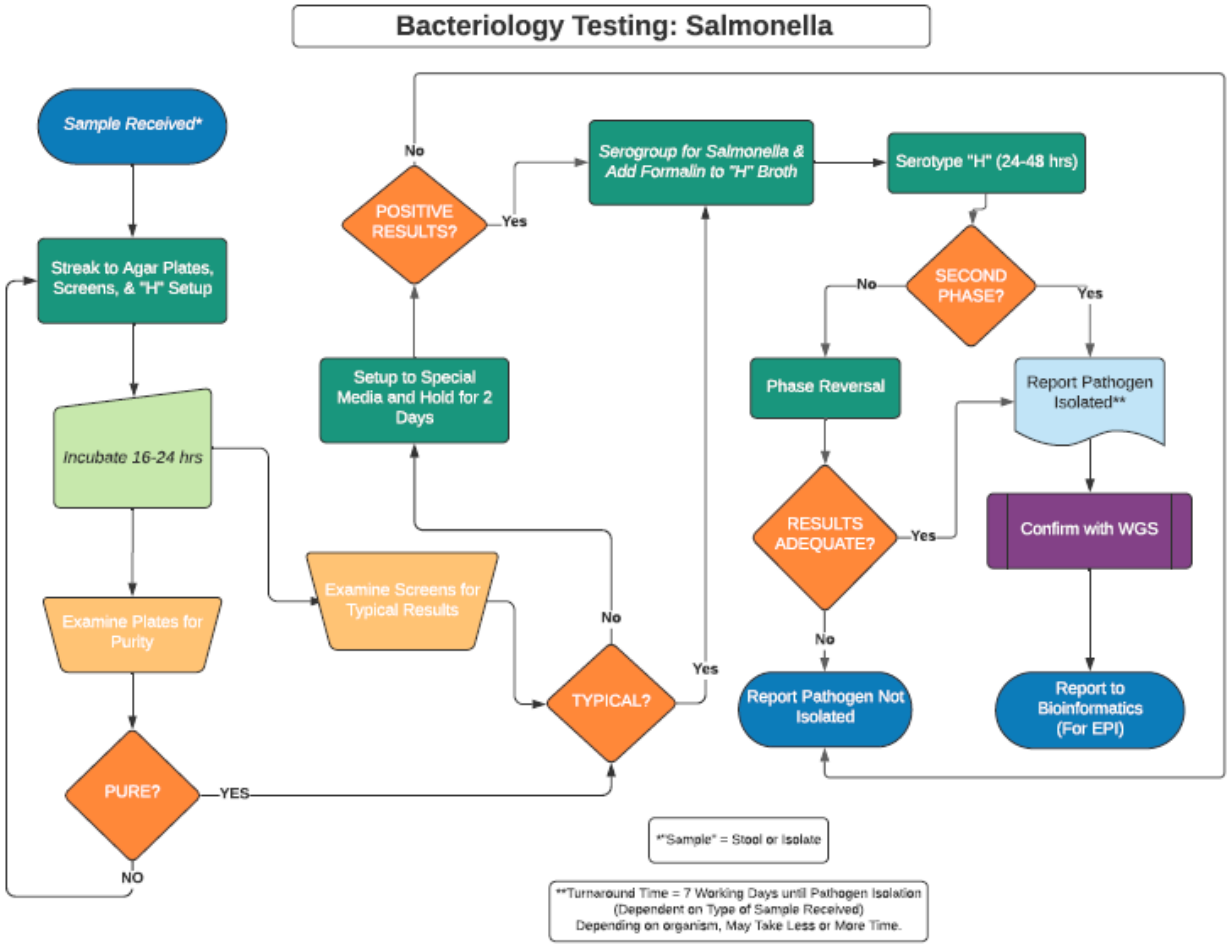


Image Source: Kentucky Department for Public Health Division of Laboratory Services
Image Source: Kentucky Department for Public Health Division of Laboratory Services

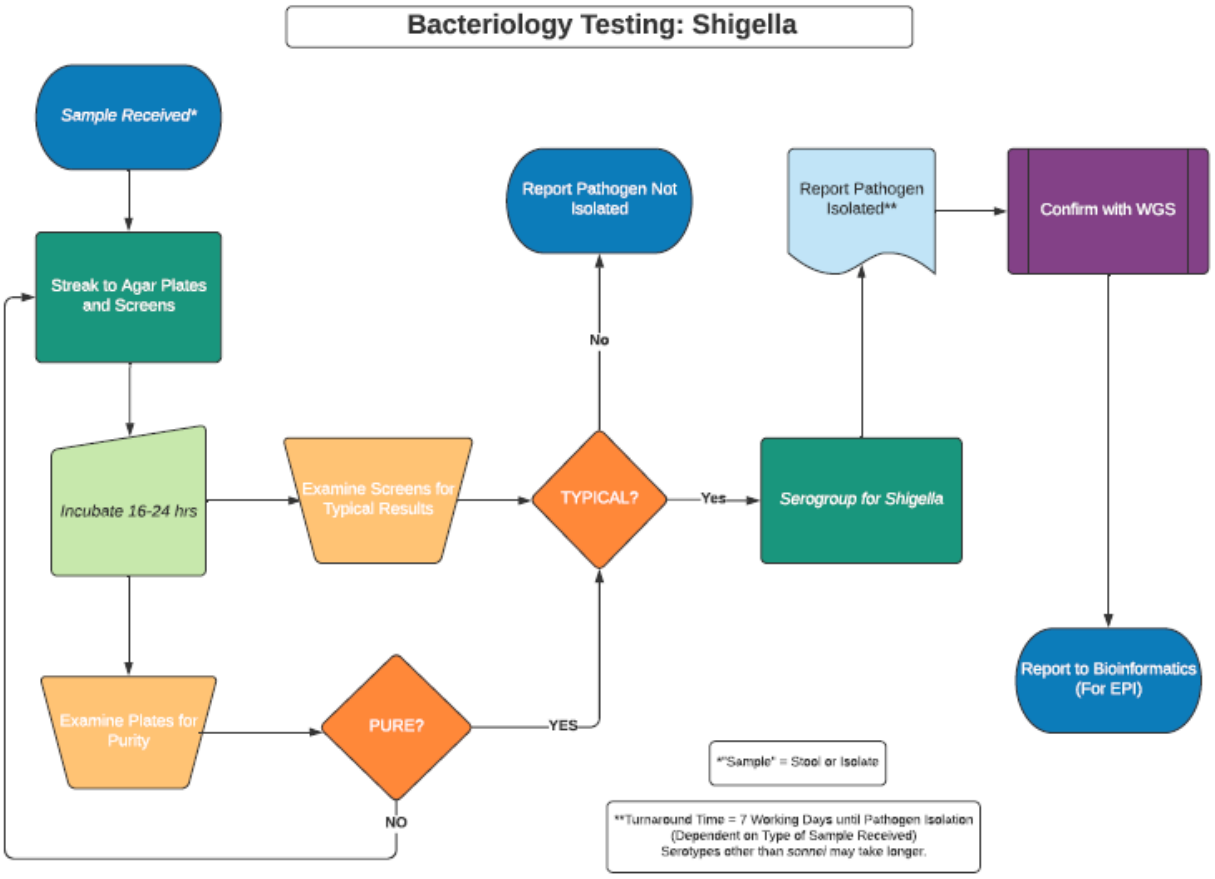


Image Source: Kentucky Department for Public Health Division of Laboratory Services

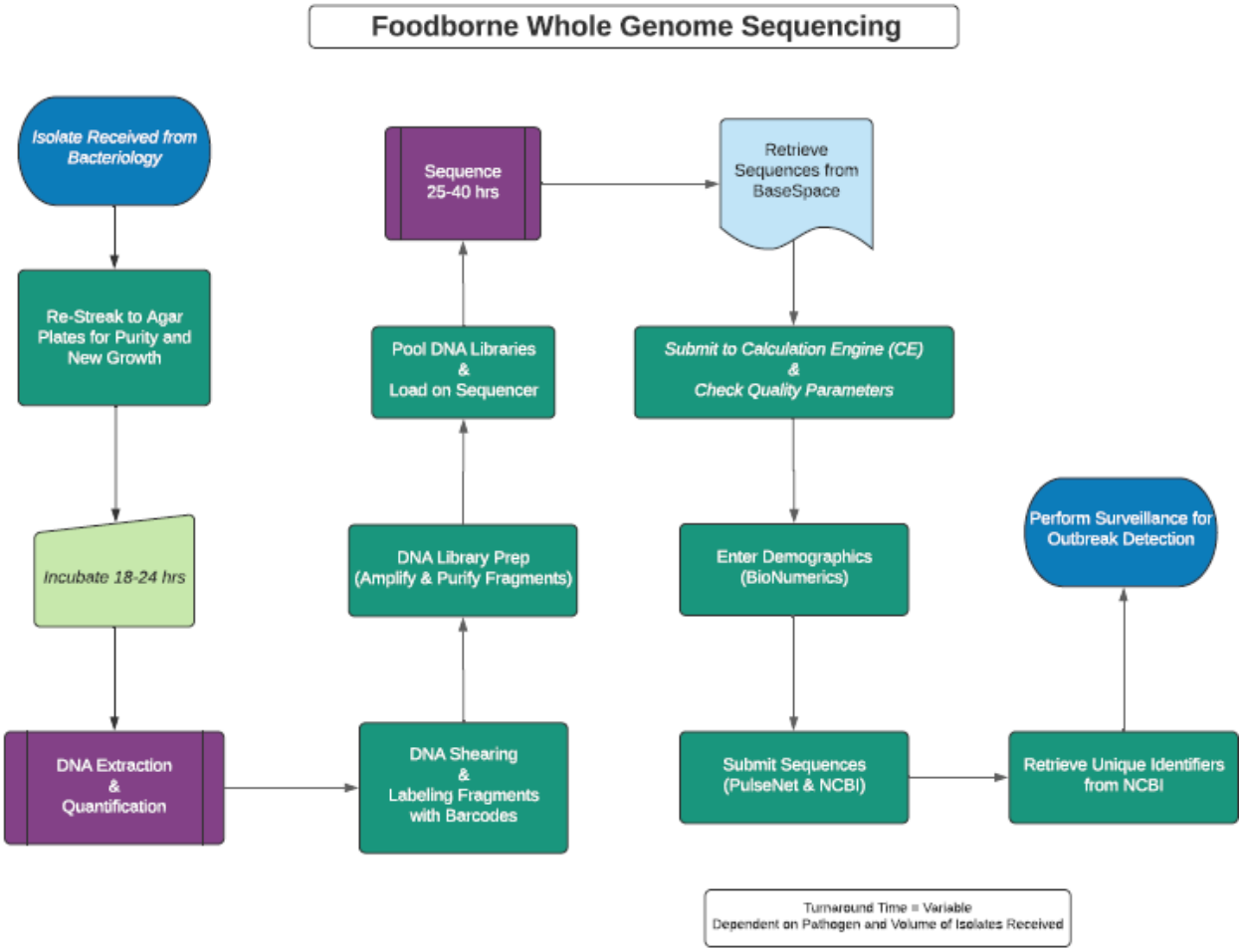
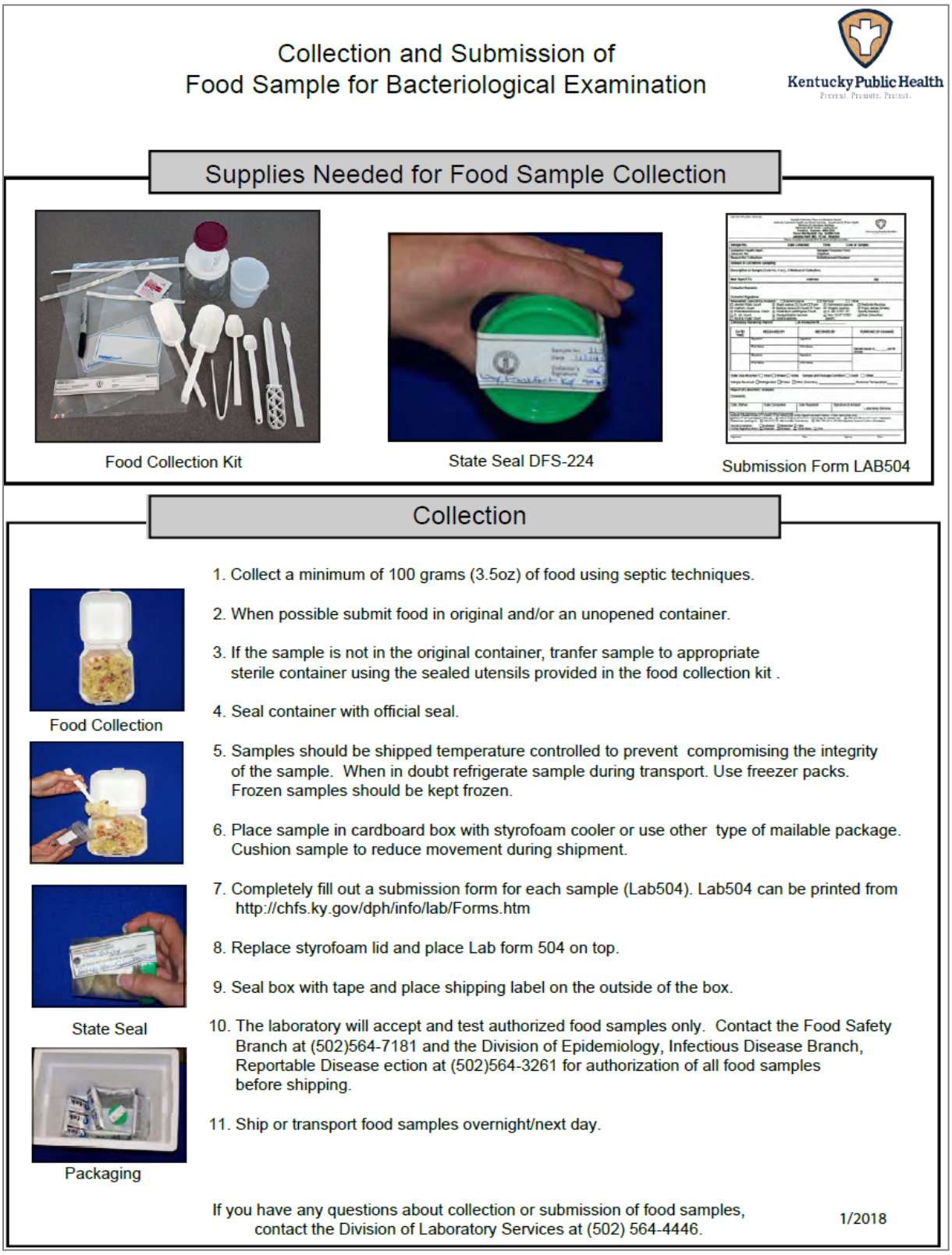


Image Source: Kentucky Department for Public Health Division of Laboratory Services - **WGS Flow Chart**

Appendix E: Collection and Submission of Food Samples

1) **Collection and Submission of Food Sample for Bacteriological Examination**
2) **Lab Form 504**
3) **Reference List of Tests**

Flow Charts for Food Sample Testing



Collection and Submission of
Food Sample for Bacteriological Examination

Kentucky Public Health
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Supplies Needed for Food Sample Collection

Food Collection Kit

State Seal DFS-224

Submission Form LAB504

Collection

Food Collection

State Seal

Packaging

1. Collect a minimum of 100 grams (3.5oz) of food using septic techniques.
2. When possible submit food in original and/or an unopened container.
3. If the sample is not in the original container, tranfer sample to appropriate sterile container using the sealed utensils provided in the food collection kit .
4. Seal container with official seal.
5. Samples should be shipped temperature controlled to prevent compromising the integrity of the sample. When in doubt refrigerate sample during transport. Use freezer packs. Frozen samples should be kept frozen.
6. Place sample in cardboard box with styrofoam cooler or use other type of mailable package. Cushion sample to reduce movement during shipment.
7. Completely fill out a submission form for each sample (Lab504). Lab504 can be printed from http://chfs.ky.gov/dph/info/lab/Forms.htm
8. Replace styrofoam lid and place Lab form 504 on top.
9. Seal box with tape and place shipping label on the outside of the box.
10. The laboratory will accept and test authorized food samples only. Contact the Food Safety Branch at (502)564-7181 and the Division of Epidemiology, Infectious Disease Branch, Reportable Disease ection at (502)564-3261 for authorization of all food samples before shipping.
11. Ship or transport food samples overnight/next day.

If you have any questions about collection or submission of food samples, contact the Division of Laboratory Services at (502) 564-4446.

1/2018

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Collection and Submission of Food Sample for Bacteriological Examination

Kentucky Public Health
Prevent. Promote. Protect.

Form 50-Food 504
Revision 000-October 2023

Sample Collection Data and Analysis Report
Kentucky Cabinet for Health and Family Services, Department for Public Health
Division of Laboratory Services
100 Sower Blvd. Suite 204
Frankfort, Kentucky 40601
Phone: (502)564-4446 Fax: (502)564-7019

Please complete a separate form for each sample submitted & 1 Chain of Custody Form per Box submitted.

Sample No.: **Date Collected:** **Time:** **Cost of Sample:**

Collector/ Health Dept.: **Sample Procured From:**
(Name and Title) SI#: Address:
City: State: Zip Code: County:

Reason for Collection: (Surveillance, Regulatory, Outbreak, Complaint)

Sample Collection Firm Type: (Dealer, Grower, Harvester, Ingredient supplier, Manufacturer, Repacker, Shipper)

Responsible Firm Type: (Dealer, Grower, Harvester, Ingredient supplier, Manufacturer, Repacker, Shipper)

Responsible Firm Name and Address:

Amount in Lot before Sampling:

Brand and Description of Sample (Code No. if any):

Lot Code (if any): **Lot Size:**

Method of Collection: (Describe how the sample was collected, Sterile vs Aseptically, Number and size of sample units and subsamples)

Mail Report To: **Address:** **Zip:**

Email Address:

Collector / Sample Collection Remarks: **(Note Submitter needed if sample submitted by someone other than who collected)**

Collector Signature: **Submitter Signature** **(when applicable, see note):**

Requested Laboratory Analysis

☐ **Chemical** ☐**Other (Describe):**
☐ Mercury in Fish ☐Pesticide Residue ☐TOX 1 ☐Trace Metals (Water) Specify Metal(s):

☐ **Bacteriological** ☐**Other (Describe):**

☐Aerobic Plate Count	☐Staph aureus ☐ Count ☐Toxin	☐Salmonella species
☐Coliform Count	☐Bacillus cereus ☐Count ☐Toxin	☐Shigella species
☐Clostridium perfringens Count	☐Cronobacter sp.	☐E. coli O157: H7
☐E. coli Count	☐Campylobacter species	☐Non- O157 STEC
☐Mold & Yeast Count	☐Listeria species	Specify:

Lab Accession # _____
FDA Lab Sample Number: _____ **Firm Establishment Identifier (FEI#):** _____
FDA Program Assignment Code (PAC): _____ **FDA Product Code:** _____

Report of Laboratory Analysis
Comments:

Date Started	Date Completed	Date Reported	Signature of Analyst: Laboratory Services

☐No Further Regulatory Action is indicated on this sample

Analysis indicates sample is in violation of the following law and/or regulations based thereon. (Check appropriate one):
☐KRS 217.801 Lead Based Paint Law; ☐KRS 217.005 to 217.215 KY Food, Drug, & Cosmetic Act;
☐KRS 217C KY Milk and Milk Products Act; ☐ KRS 217.650 to 217.710 KY Hazardous Substances Labeling Act;
☐ KRS 152.105 to 152.190 Regulates Use and Control of Radiation; ☐ KRS Chapter 260.765-260.772 Produce Safety
Sample Considered: ☐Adulterated ☐Misbranded ☐Other
Further Regulatory Action: ☐Resample ☐Reinspect ☐Official Action ☐Other

Signature Title Agency Date

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Lab Form 504

Lab Form 504

ONLY 1 Chain of Custody per Box of Samples

Sample Collection Data and Analysis Report
Kentucky Cabinet for Health and Family Services, Department for Public Health
Division of Laboratory Services
100 Sower Blvd. Suite 204
Frankfort, Kentucky 40601
Phone: (502)564-4446 Fax: (502)564-7019

Form 50-Food 504
Revision 000-October 2023

Kentucky Public Health
Prevent. Promote. Protect.

Please complete a separate form for each sample submitted & 1 Chain of Custody Form per Box submitted.

To Be Completed by Collector

Sample No.(s) in Box: **Date Collected:** **Time:** **Cost of Sample:**

Collector/ Health Dept.: **Sample Procured From:**

Chain of Custody

DATE/ TIME	RELEASED BY (Collector/Submitter)	RECEIVED BY (Lab staff, unless otherwise indicated)	PURPOSE OF CHANGE (Lab use, unless otherwise indicated)
	Signature:	**Signature:**	☐Transport ☐Storage (unit #)_____ ☐Testing
	Print Name:	**Print Name:**	
	Signature:	**Signature:**	☐Transport ☐Storage (unit #)_____ ☐Testing
	Print Name:	**Print Name:**	
	Signature:	**Signature:**	☐Transport ☐Storage (unit #)_____ ☐Testing
	Print Name:	**Print Name:**	
	Signature:	**Signature:**	☐Transport ☐Storage (unit #)_____ ☐Testing
	Print Name:	**Print Name:**	

To Be Completed by Laboratory

Lab Accession #_____

State Seal Attached? ☐ Intact ☐ Broken ☐None

Sample and Package Condition: ☐Good ☐Other (Describe) _____

Sample Received: ☐Refrigerated ☐Frozen ☐Room Temperature

☐Other (Describe) _____ Received Temperature: _____

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Lab Form 504

Reference List of Tests

Environmental Microbiology

MICROBIOLOGY

Qualifying Specimens:

- Consumer complaint of illness suspected from a food product
- Consumer complaint of visible contamination in a food product
- Consumer complaint of Chemical contamination in a food product
- Foodborne illness outbreak – by request of Epidemiology or Food Safety Branch
- Routine surveillance of a food manufacturing facility or process
- Regulatory check of a manufacturing process or facility

Specimen:

- 100 grams of food (25-50 grams of food per requested food pathogen testing)

Mailing:

- Food collection kits are mailed in a plain standard cardboard box (12x8x6)

Collection Kit Furnished by:

- **Kentucky State Public Health Lab (DLS) (502)564-4446**

Collection and Packaging Instructions:

Specimen should be stored at 2-8°C prior to shipping. Ship ASAP. If possible, ship on cold pack
https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx
Food Kit

Call laboratory before sending specimens.

Environmental Microbiology: page 30 of DLS Reference List of Tests

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Flow Charts for Food Sample Testing

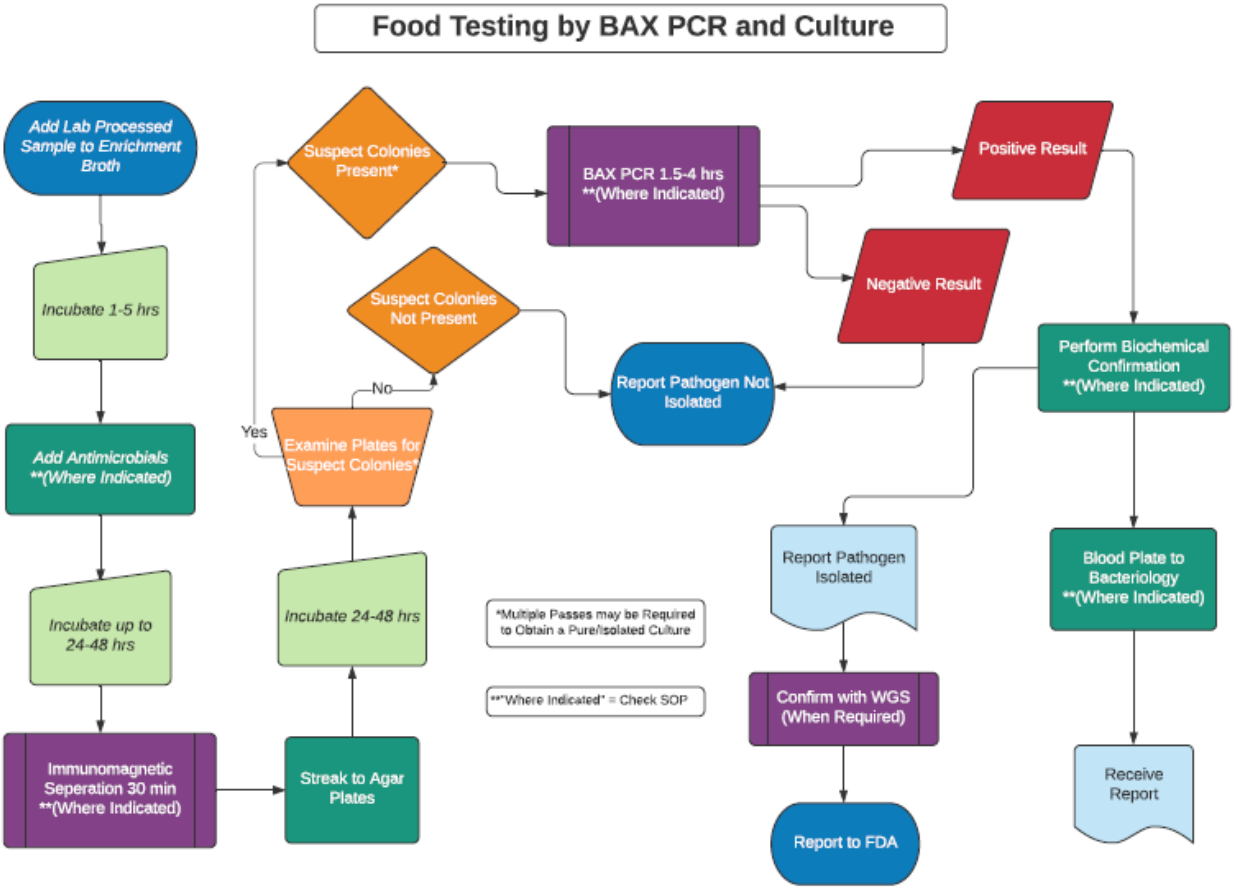

Image Source: Kentucky Department for Public Health Division of Laboratory Services

Please note that the following flow charts do not reflect the entire work process for testing of laboratory specimens. Rather, they have been simplified to provide a basic description of specimen flow through the lab and the testing process. These flow charts are intended to provide a general idea of the steps and time required for testing.

Appendix F: Collection and Submission of Water Samples

1) Important Information to Review Prior to the Collection of Water Samples

2) Collection and Submission of Water Samples for Bacteriological Examination

3) Lab Form 507

Water collection procedures and water submission times vary per suspected pathogen and technique used by the Kentucky Department for Public Health (KDPH), Division of Laboratory Services (DLS). For this reason, **the DLS must be consulted before any water samples are collected or submitted** in a waterborne illness outbreak.

DLS Phone Number: 502-564-4446

Important information to review prior to the collection of water samples

When investigating a waterborne illness outbreak, the collection and submission guide for bacteriological examination is a general guide for testing recreational water or private water supplies, which includes wells or cisterns. The DLS will test the water samples for coliforms. These are indicator organisms only, which suggest the water is contaminated with fecal material.

When a specific pathogenic bacteria or parasite is suspected as the cause of a waterborne outbreak, approval should be obtained from the Environmental Management Branch at (502) 564-4856 and the Division of Epidemiology and Health Planning, Infectious Disease Branch, Reportable Disease Section at (502) 564-3261 or at (888) 973-7678 (if calling after business hours) before collection of any water samples. Once approval is given, contact the DLS at (502) 564-4446 for guidelines on the collection and submission of water samples based on the suspected pathogen.

Collection and Submission of Water Sample for Bacteriological Examination

Collection and Submission of Water Sample for Bacteriological Examination

Kentucky Public Health
Prevent. Promote. Protect.

Supplies Needed for Water Sample Collection

Sterile, clear plastic sample bottle containing Sodium Thiosulfate Powder inside Zip seal bag with absorbent

Refrigerated Cooler with Ice Pack

Outreach Lab Form or Lab Form 507

- Check expiration date on water collection bottle. Samples will not be tested if they do not have an expiration date on the bottle or it is expired.
- Samples not requiring chain of custody precautions must arrive in the laboratory within 30hrs of collection and are to be kept at <8°C during transport. Use FedEx label provided. Recommend sample collection on Monday, Tuesday, or Wednesday and mail the same day.
- Samples requiring chain of custody precautions must arrive in the laboratory (DLS or another certified laboratory) within 6hrs of collection and are to be kept at <8°C during transport.

1. Identify sample source, Authorized Collector and Sanitarian ID, Date and Time of Collection, Owner/Occupant, County, and Submitter ID on sample form (LAB 507) to be entered into the Division of Laboratory Services' OUTREACH system at http://chfs.ky.gov/dph/info/lab.
2. Select a tap or hose bib which has been in use and does not leak. Do not sample from a drinking fountain or gate valve or at a swivel faucet. Remove all attachments from sample tap prior to sampling.
3. Flush tap for 25 minutes before collecting sample. Do not flush tap if source of contamination is suspected to be within the lines of the sampling site.
4. Fill the sample bottle to the 100 mL line and close the bottle securely.
5. Check the bottle for leaks by shaking and inverting several times.
6. Insert water bottle in the zip seal bag with absorbent provided with the water sample kit and seal.
7. Place sample bag/s on top of frozen ice pack in cooler and replace styrofoam lid.
8. Place printed OUTREACH form on top of styrofoam cooler lid.
9. Seal box and place mailing label on top.

Swimming pools and Beaches require 1 (one) 100 mL sample. Testing that will include Pseudomonas, for Public spas, whirlpool, hot tub or other therapeutic pools requires2 (two)100 mL samples.

If you have questions about submission of water samples, contact the Division of Laboratory Services at (502)-564-4446

03/2017

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Collection and Submission of Water Sample for Bacteriological Examination

LAB 507
REV. 9/2018

KY Division of Laboratory Services
100 Sower Blvd. Suite 204
Frankfort, Kentucky 40601
Phone: 502/ 564-4446 Fax: 502/ 564-7019

Kentucky Public Health
Prevent. Promote. Protect.

Water Bacteriology Analysis Report

(Please complete a separate form for each sample.)

Authorized Collector:_____

Collectors Phone #: _____Sanitarian Number:_____

Collection Date:_____ Collection Time:_____

Occupant or Owner:_____

Request Identifying No:_____Site No.:_____

Sample No.:_____ Sample Seq. No:_____

County:_____

Submitter *(Use LHN Site#):*_____

[] Drinking Water []Recreational Waters []Spas/Therapeutic Pools

[] Check here if accompanied by Chain-of-custody form

Collector's Remarks:

Laboratory Findings:

Date & Time Received	Laboratory Number	Date & Time Reported	Technologist

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Form 507

Reference List of Tests

Note: For bacteriological water analyses, all samples must be collected and submitted by authorized collectors. Samples not requiring chain of custody precautions must arrive in the laboratory within 30hrs of collection and are to be kept at <8°C during transport. Use FedEx label provided. Recommend sample collection on Monday, Tuesday, or Wednesday and mail the same day. Samples requiring chain of custody precautions must arrive in the laboratory (DLS or another certified laboratory) within 6hrs of collection and are to be kept at <8°C during transport.

If you have any questions about submission of water samples, contact DLS at 502-564-4446.

WATER BACTERIOLOGY ANALYSIS

Qualifying Water Sources:

E.coli and Total Coliforms

- Private drinking water; wells, cisterns, springs
- Public Swimming Beaches
- Public Swimming Pools
- Dairy Water

Legionella

- Private drinking water; wells, cisterns, springs
- Recreational water
- Commercial water

Methodology:

- E. coli and Total Coliforms - LTB/BGBB(SM9921D), Colilert(SM9223B)
- Legionella – Legiolert and culture

Specimen:

- 1 (100 ml) bottle (provided in the kit and filled just over the 100ml fill line with headspace)

Mailing Label:

- FedEx label

Environmental Microbiology: pages 32 and 33 of DLS Reference List of Tests
Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Collection Kit Furnished by:

Kentucky State Public Health Lab (DLS) (502)564-4446

- Idexx Bottle in zip bag with absorbent
- Refrigerated Cooler
- FedEx Label

Collection and Packaging Instructions:
https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx
Water Collection

	Outreach Test Code	CPT Code	Reference Range
Water Bacteriology	WATERB	NA	Acceptable limits for drinking water: <1 per 100ml (none detected) Acceptable limits for recreation water • Total Coliform limit not established for beach water • E. coli content shall not exceed 130 colonies per 100ml as a geometric mean based on not less than 5 samples taken during a 30-day period. Acceptable limits for Dairy water: Presence of total coliforms is unacceptable in dairy or food manufacturing source/processing water.
Legionella	WLEG	NA	<1 per 100ml (none detected)

Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

Appendix G: Chain of Custody

1) Division of Laboratory Services Chain of Custody Form

LAB USE ONLY

DIVISION OF LABORATORY SERVICES

CHAIN OF CUSTODY / PROPERTY FORM

LAB NUMBER: _____

EOC NUMBER: _____

NAME OF PERSON FROM WHOM RECEIVED:	
LOCATION WHERE SAMPLE WAS OBTAINED:	**ADDRESS:**
TIME OBTAINED: **DATE OBTAINED:**	**REASON OBTAINED:**

SAMPLE SCREENED FOR: **RADIOLOGICAL ( )** **CHEMICAL ( )** **EXPLOSIVE ( )** **BIOLOGICAL ( )**

RESULTS:

Rad	**Chem**	**Bio**	**Explosive**	**Result:**	**Instrument:**	Circle one
Rad	**Chem**	**Bio**	**Explosive**	**Result:**	**Instrument:**	Circle one
Rad	**Chem**	**Bio**	**Explosive**	**Result:**	**Instrument:**	Circle one
Rad	**Chem**	**Bio**	**Explosive**	**Result:**	**Instrument:**	Circle one
Rad	**Chem**	**Bio**	**Explosive**	**Result:**	**Instrument:**	Circle one

ITEM #	QUANTITY	DESCRIPTION OF ARTICLES

CHAIN OF CUSTODY

ITEM NO.	DATE/ TIME	RELEASED BY	RECEIVED BY	PURPOSE OF CHANGE
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	

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Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Chain of Custody Form

Chain of Custody p.2

EOC# _____ Lab #_____

ITEM NO.	DATE/ TIME	RELEASED BY	RECEIVED BY	PURPOSE OF CHANGE
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	
		Signature	Signature	
		Print Name	Print Name	

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Image Source: https://www.chfs.ky.gov/agencies/dph/dls/Pages/default.aspx Chain of Custody Form

Appendix H: Record of Complaint and Investigation

1) **Online Reporting System: Kentucky Food Safety Reporting System (**redcap.chfs.ky.gov/surveys/?s=FAW4DLJJKK)

2) **KY Food Complaint System | REDCap**

3) **Record of Complaint and Investigation Form (DFS – 216)**

4) **Example of Record of Complaint and Investigation Form (DFS-216).**

DFS-216(9-2013)

CABINET FOR HEALTH AND HUMAN SERVICES
KENTUCKY DEPARTMENT FOR PUBLIC HEALTH
Frankfort, KY 40621-0001
RECORD OF COMPLAINT AND INVESTIGATION

Est./Permit No.	Health Authority	Sanitarian Code	Action Code	County

FORM OF COMPLAINT	☐ Telephone ☐ Visit ☐ Email ☐ Other ☐ Letter	Date of Complaint (Month/Day/Year): ____/____/_____
SOURCE OF COMPLAINT	☐ Consumer ☐ Trade/Industry ☐ Other:_____	
COMPLAINT IDENTIFICATION	Name and Address (Including ZIP Code):	Home Telephone Number:
	Email:	Cell Telephone Number:
		Work Telephone Number:
DESCRIPTION OF COMPLAINT OR INJURY:		
Location the Illness/ Injury occurred (home, work, restaurant, etc.):		
Brand/Product Name	Product Description & labeling (attach pictures whenever possible)	
Name & Address of Store Where Purchased	Shoppers Card Used ☐ No ☐ Yes	a) Shopper's Card Number:
Container - Net WT & Type	☐ Import Yes ☐ Import No Country of Origin	Date Product Was Purchased
Package Code:	Product Used (If Yes, Enter Date; How & Where) ☐ Yes ☐ No	Amount Remaining: Can Samples Be Collected ☐ Y ☐ N
UPC Code:		
MANUFACTURER / DISTRIBUTOR OF PRODUCT	Name and Address (including ZIP Code):	

Image Source: https://www.chfs.ky.gov/agencies/dph/dphps/fsb/Pages/default.aspx Form DFS-216

INJURY OR ILLNESS RESULTED ☐ NO ☐ YES [If YES, Complete items (a) through (c)]	a) Type Symptoms/Injury-check appropriate symptoms and list onset date and time (if available) ☐ Nausea Onset date/time:_____ ☐ Fever (__°F) Onset date/time:_____ ☐ Vomiting Onset date/time:_____ ☐ Paralysis Onset date/time:_____ ☐ Diarrhea Onset date/time:_____ ☐ Prostration Onset date/time_____ ☐ Headache Onset date/time_____ ☐ Other (explain)_____ Onset date/time: _____	b) Medical Attention Sought ☐ No ☐ Yes (If yes, give date, name, address, phone#) Date ___/___/____ Name _____ Address_____ Phone #_____ Diagnosis:_____	c) Hospitalization Required ☐ No ☐ Yes (If yes, give admission date, discharge date, and facility name/address/phone #) Admission Date __/__/____ Discharge Date __/__/____ Facility Name_____ Address_____ Phone #: _____ Diagnosis: _____
Product Photos Attached? ☐ NO ☐ YES *(Please collect photos when possible)*			

Were Others Exposed to the Suspect Product? ☐ YES ☐ NO How Many Others Were Exposed? _____ If others were exposed to the suspect product, complete boxes A, B, C & D	A) Was Anyone Else made Ill/ Injured? ☐ YES ☐ NO If yes - attach a separate page with their contact information	C) Were Food samples Collected? ☐ YES ☐ NO Sample Description: Analysis Requested::	D) Were Patient specimens collected? ☐ YES ☐ NO Sample Description: Diagnoses:
	B) How Many Were injured/ made ill?		

List other products (food, drink, medicine) consumed during the 72 hour period before onset of illness:

Were Additional samples collected? ☐ Yes ☐ No Description of samples collected: _____

Analysis Requested? _____ Results _____

LHD investigator (Name and Title) _____

Remainder of form to be completed by the Food Safety Branch

FSB Sample Results:_____

Complaint investigation and action taken: _____

Other agency responsible: ☐ Yes ☐ No; Referred to:

Area Inspector _____	☐ FDA	☐ USDA	☐ State	☐ File	☐ Law enforcement

Remarks_____

Complaint Closed by (Name and Title)_____ Date _____

Please contact DPH at (502) 564-7181 for guidance on returning the completed DFS-216 form

Image Source: https://www.chfs.ky.gov/agencies/dph/dphps/fsb/Pages/default.aspx Form DFS-216

DFS-216(9-2013)

CABINET FOR HEALTH AND HUMAN SERVICES
KENTUCKY DEPARTMENT FOR PUBLIC HEALTH
Frankfort, KY 40621-0001
RECORD OF COMPLAINT AND INVESTIGATION

Est./Permit No.	Health Authority	Sanitarian Code	Action Code	County

FORM OF COMPLAINT	☑ Telephone ☐ Visit ☐ Email ☐ Other ☐ Letter	Date of Complaint (Month/Day/Year): 07/10/2014
SOURCE OF COMPLAINT	☑ Consumer ☐ Trade/Industry ☐ Other:	
COMPLAINT IDENTIFICATION	Name and Address (Including ZIP Code): John Smith, 214 Any Street, Somewhere, KY 41234	Home Telephone Number: 123-456-7891
	Email: john.smith@email.com	Cell Telephone Number: 987-654-3219
		Work Telephone Number: 456-789-1234

DESCRIPTION OF COMPLAINT OR INJURY:
mold found in Good Yogurt

Location the Illness/ Injury occurred (home, work, restaurant, etc.):
home

Brand/Product Name: Good Yogurt	Product Description & labeling (attach pictures whenever possible): 8 oz container of Good Yogurt. Plastic container with blue label, white writing. Single serve portion of vanilla yogurt.	
Name & Address of Store Where Purchased: Neighborhood Grocery, 1 Neighborly Way, Hometown, KY 41235	Shoppers Card Used: ☐ No ☑ Yes	a) Shopper's Card Number: 123-456-7891
Container - Net WT & Type: 8 oz plastic container	☐ Import Yes ☑ Import No Country of Origin	Date Product Was Purchased: 7/7/14
Package Code: 12345678910111213141516	Product Used (If Yes, Enter Date; How & Where) ☑ Yes ☐ No: 7/10/14. Opened at home to consume for breakfast. Didn't notice mold until a few bites had been taken.	Amount Remaining: 7 oz Can Samples Be Collected ☑ Y ☐ N
UPC Code:		
MANUFACTURER / DISTRIBUTOR OF PRODUCT	Name and Address (including ZIP Code): Friendly Yogurt Company, 479 Outgoing Way, Personable, KY 45897	

https://www.chfs.ky.gov/agencies/dph/dphps/fsb/Pages/default.aspx Example of Record of Complaint and Investigation Form

INJURY OR ILLNESS RESULTED	a) Type Symptoms/Injury-check appropriate symptoms and list onset date and time (if available)	b) Medical Attention Sought	c) Hospitalization Required
☐ NO ☑ YES [If YES, Complete items (a) through (c)]	☑ Nausea Onset date/time: 7/10/14, 7:15 AM ☐ Fever (__°F) Onset date/time: ☑ Vomiting Onset date/time: 7/10/14, 7:30 AM ☐ Paralysis Onset date/time: ☐ Diarrhea Onset date/time: ☐ Prostration Onset date/time ☐ Headache Onset date/time ☐ Other (explain) Onset date/time:	☑ No ☐ Yes (If yes, give date, name, address, phone#) Date ___/___/____ Name Address Phone # Diagnosis:	☑ No ☐ Yes (If yes, give admission date, discharge date, and facility name/address/phone #) Admission Date __/__/____ Discharge Date __/__/____ Facility Name Address Phone #: Diagnosis:
Product Photos Attached? ☐ NO ☑ YES *(Please collect photos when possible)*			

Were Others Exposed to the Suspect Product?	A) Was Anyone Else made Ill/ Injured?	C) Were Food samples Collected?	D) Were Patient specimens collected?
☐ YES ☑ NO How Many Others Were Exposed? _____ If others were exposed to the suspect product, complete boxes A, B, C & D	☐ YES ☑ NO If yes - attach a separate page with their contact information B) How Many Were injured/ made ill?	☐ YES ☑ NO Sample Description: Analysis Requested::	☐ YES ☑ NO Sample Description: Diagnoses:

List other products (food, drink, medicine) consumed during the 72 hour period before onset of illness:

Hamburger and Fries, fish sandwich, captain crunch/milk, steak, baked potato, salad, chicken salad sandwich, bagel with cream cheese

Were Additional samples collected? ☑ Yes ☐ No Description of samples collected: Remaining yogurt in original container collected from home

Analysis Requested? Yes Results

LHD investigator (Name and Title) Sal Monella, Health Environmentalist

Remainder of form to be completed by the Food Safety Branch

FSB Sample Results:

Complaint investigation and action taken:

Other agency responsible: ☐ Yes ☐ No; Referred to:

Area Inspector	☐ FDA	☐ USDA	☐ State	☐ File	☐ Law enforcement

Remarks

Complaint Closed by (Name and Title) Date

Please contact DPH at (502) 564-7181 for guidance on returning the completed DFS-216 form

Image Source: https://www.chfs.ky.gov/agencies/dph/dphps/fsb/Pages/default.aspx Example of Record of Complaint and Investigation Form

Appendix I: Environmental Assessment Form

Kentucky Department for Public Health

Foodborne Illness

Environmental Health Assessment Report

Kentucky Public Health
Prevent. Promote. Protect.

EA Information	Environmental Assessment Identification: Short Description: Outbreak Year:

Data Collector	
Name Data Collector:	
Job Function:	Agency Type:
☐ Collector Received Assessment Training	Date of Assessment

Establishment Information			
Establishment Name:			Type of Facility: ☐Restaurant ☐Grocery ☐Healthcare ☐Daycare ☐School ☐Detention Center ☐Private Home ☐Other _____
Address:	County:	Zip:	
Date Complaint Received:			
Complaint Short Description:			
Date of Suspected Meal:			
Suspected Meal Short Description:			
Implicated/Suspected Pathogen:	Number of Persons ill:		
Implicated/Suspected Food(s):			

1

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

Kentucky Public Health
Prevent. Promote. Protect.

Environmental Health Assessment Checklist	
Interview and Document Collection	
☒	Conduct interview and assessment with Person in Charge (PIC)
☐	Inform the PIC of the objectives of the assessment
☐	Obtain a list of food employees with contact numbers
☐	Obtain food employee work schedule
☐	Interview food employees about food preparation practices
☐	Interview food employees for evidence of illness
☐	Interview ill food employees to determine common exposures
☐	Determine food employee duties
☐	Obtain a copy of the menu of the foods served including daily specials that may not be on the menu
☐	Obtain the suppliers' receipts/invoices for the suspect foods
☐	Collect copies of actual facility information, written policies, invoices, labels, and other items if possible
Walkthrough and Observation	
☐	Conduct a walkthrough
☐	Observe all operations for product or process in question
☐	Collect leftover food samples and send to state lab for testing, if available. Obtain original packaging, if possible
☐	Observe general food preparation practices
☐	Collect photographic evidence and other sources of objective data that could be used to assess process control points (i.e. temperature logs, test results, records of sanitizer taken, etc.)
☐	If raw oysters are involved, obtain tag(s) from suspected lot(s). If possible, collect 10-12 oysters from suspect lot(s) and contact your regional foodborne disease epidemiologist
Assessment and Observation of Food Flow	
☐	Assessment of suspect food or process
☐	Develop and attach a facility layout diagram, if applicable
☐	Summarize and determine contributing factors
☐	Develop a flow chart or food flow diagram for the implicated food item or ingredient to capture detailed
☐	information about each step in the food handling process
☐	Conduct a trace back of suspect foods, if warranted
☐	Identify the source of suspect foods
Follow-up and Finalization of Assessment	
☐	Recommend actions to prevent future outbreaks
☐	Initiate and document corrective actions

2

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Interviews and Document Collection		
Person in Charge Interview (For any "Yes", collect documentation or evidence from facility)		
Quantity of Suspected Food(s) Sold/Served:		
Were any similar complaints received? If yes, collect information available	☐ YES	☐ NO
Were any food employees ill in the two weeks prior to the suspected event?	☐ YES	☐ NO
Did any food employee(s) become ill in the two weeks after the suspected event?	☐ YES	☐ NO
Does the facility have a sick leave policy?	☐ YES	☐ NO
Were any clinical specimens collected from food workers?	☐ YES	☐ NO
Were any food/water samples taken?	☐ YES	☐ NO
Does the facility routinely track and document temperatures or have an HACCP program?	☐ YES	☐ NO
Does the facility have a bare-hand contact with ready to eat (RTE) food policy?	☐ YES	☐ NO
Does the facility have a glove-hand contact with ready to eat (RTE) food policy?	☐ YES	☐ NO
Do you have an employee health policy?	☐ YES	☐ NO
Are you certified food protection manager?	☐ YES	☐ NO
Person In Charge Comments:		

Employee Interview (For any "Yes", collect documentation or evidence from facility)		
Were any similar complaints received? If yes, collect information available		
Were any food employees ill in the two weeks prior to the suspected event?	☐ YES	☐ NO
Were you ill in the two weeks prior to the suspected event?	☐ YES	☐ NO
Did any food employee(s) become ill in the two weeks after the suspected event?	☐ YES	☐ NO
Did you become ill in the two weeks after the suspected event?	☐ YES	☐ NO
Does the facility have a sick leave policy?	☐ YES	☐ NO
Did any food employee(s) work while sick?	☐ YES	☐ NO
Did you work while sick?	☐ YES	☐ NO
Does the facility routinely track and document temperatures or have an HACCP program?	☐ YES	☐ NO
Does the facility have a bare-hand contact with ready to eat (RTE) food policy?	☐ YES	☐ NO
Does the facility have a glove-hand contact with ready to eat (RTE) food policy?	☐ YES	☐ NO
Employee Comments:		

3

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Walkthrough and Observations

On-site Investigation

Y (Yes) **N** (No) **N/A** (Not Applicable) **N/O** (Not Observed)

1. Inadequate/Improper hand washing	☐ Y	☐ N	☐ N/A	☐ N/O
2. Food employees have visible cuts, burns, or infected sores on hands/arms	☐ Y	☐ N	☐ N/A	☐ N/O
3. Bare-hand contact by a food worker who is suspected to be infectious	☐ Y	☐ N	☐ N/A	☐ N/O
4. Glove-hand contact by a food worker who is suspected to be infectious	☐ Y	☐ N	☐ N/A	☐ N/O
5. Food or water not from approved sources	☐ Y	☐ N	☐ N/A	☐ N/O
6. Inadequate protection of suspected food(s)/Improper food storage	☐ Y	☐ N	☐ N/A	☐ N/O
7. Insufficient cold holding time/temperature(s) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
8. Prolonged cold storage (more than 7 days) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
9. Improper thawing of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
10. Insufficient cooking time/temperature(s) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
11. Insufficient cooling time/temperature(s) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
12. Insufficient reheating time/temperature(s) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
13. Insufficient hot holding time/temperature(s) of suspected food(s)	☐ Y	☐ N	☐ N/A	☐ N/O
14. Major equipment malfunctions or facility operations failures	☐ Y	☐ N	☐ N/A	☐ N/O
15. Calibrated food thermometer not available	☐ Y	☐ N	☐ N/A	☐ N/O
16. Cross-contamination of RTE foods with raw ingredients	☐ Y	☐ N	☐ N/A	☐ N/O
17. Cross-contamination of ingredients – Workers/Equipment/Utensils/Cloths	☐ Y	☐ N	☐ N/A	☐ N/O
18. Improper cleaning and sanitization of equipment/utensils/food contact surfaces	☐ Y	☐ N	☐ N/A	☐ N/O
19. Food additives not approved or not properly used	☐ Y	☐ N	☐ N/A	☐ N/O
20. Toxic substances identified, stored and used	☐ Y	☐ N	☐ N/A	☐ N/O
21. Addition of excessive quantities of ingredients that are toxic in large amounts	☐ Y	☐ N	☐ N/A	☐ N/O
22. Not compliant with variance, specialized process or HACCP Plan	☐ Y	☐ N	☐ N/A	☐ N/O
23. Insufficient/Improper use of chemical processes designed for pathogen destruction	☐ Y	☐ N	☐ N/A	☐ N/O
24. Person in charge not assigned, knowledgeable, or performing duties/responsibilities	☐ Y	☐ N	☐ N/A	☐ N/O
25. Food employees not knowledgeable about food safety or employee health reporting	☐ Y	☐ N	☐ N/A	☐ N/O
26. Consumer advisory requirements not posted, if applicable	☐ Y	☐ N	☐ N/A	☐ N/O
27. Insects, rodents or animals	☐ Y	☐ N	☐ N/A	☐ N/O
28. Toilet facilities not properly constructed, supplied and cleaned	☐ Y	☐ N	☐ N/A	☐ N/O
29. No proper date marking and disposition	☐ Y	☐ N	☐ N/A	☐ N/O
30. Food not properly labeled, or in original container	☐ Y	☐ N	☐ N/A	☐ N/O
31. The person in charge is not present and cannot demonstrate knowledge	☐ Y	☐ N	☐ N/A	☐ N/O

Walkthrough and Observations

Walkthrough and Observation Comments

4

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Assessment and Observation of Food Flow

Assessment of Implicated/Suspect Food or Process *(Required)* Describe the food flow for the implicated food item(s) or ingredient(s) to capture detailed information about each step in the food handling process, including who prepared what and when. Note size of containers, labels, and descriptive information on product(s). Complete a separate assessment of each implicated/suspected food, if applicable.

Food Source:	
Date Received: _____	Supplier/Distributor: _____
Brand Name: _____	Size and Package Type: _____
Product Name: _____	Product Code(s): _____
Manufacturer: _____	Expiration Date: _____

Condition Received: Temperature(s):
Storage: Temperature(s):
Preparation: Temperature(s):
Cooking: Temperature(s):
Cooling: Time/Temperature(s):
Reheating: Temperature(s):
Holding: Time/Temperature(s):
Assembling/Plating (including garnishing): Temperature(s):
Service: Temperature(s):

5

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Follow-up and Finalization of Assessment

Recommended Actions to prevent future outbreaks:

Initiate and Document Corrective Actions:

6

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Follow-up Survey

Please complete this follow up survey to ensure all necessary data for this assessment is collected.

Outbreak - General Characterization

1) Did this outbreak span multiple states?
- ◯ Yes
- ◯ No

2) What activities were conducted during the outbreak investigation to try to identify the contributing factors? (Check all that apply)
- ☐ Assumed based on etiology
- ☐ Clinical sampling
- ☐ Environmental sampling
- ☐ Epidemiologic investigation (case-control or cohort study)
- ☐ Food preparation review
- ☐ Food sampling
- ☐ Interviews with cases (but not controls)
- ☐ Interviews with establishment manager(s)
- ☐ Interviews with establishment worker(s)
- ☐ Observation of general food preparation activities during establishment visit
- ☐ Routine inspection
- ☐ Traceback
- ☐ Other (Please describe)

3) What control measures were implemented? (Check all that apply)
- ☐ Changed operational practice
- ☐ Cleaned and sanitized/disinfected restaurant
- ☐ Closed restaurant
- ☐ Discarded food
- ☐ Embargoed food products
- ☐ Excluded ill/infectious workers
- ☐ Public notification
- ☐ Re-trained or trained food worker(s)
- ☐ Repaired/replaced/removed equipment
- ☐ Other (Enter a new value)

7

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Follow-up Survey

Please complete this follow up survey to ensure all necessary data for this assessment is collected.

Outbreak - General Characterization

1) Did this outbreak span multiple states?
- ◯ Yes
- ◯ No

2) What activities were conducted during the outbreak investigation to try to identify the contributing factors? (Check all that apply)
- ☐ Assumed based on etiology
- ☐ Clinical sampling
- ☐ Environmental sampling
- ☐ Epidemiologic investigation (case-control or cohort study)
- ☐ Food preparation review
- ☐ Food sampling
- ☐ Interviews with cases (but not controls)
- ☐ Interviews with establishment manager(s)
- ☐ Interviews with establishment worker(s)
- ☐ Observation of general food preparation activities during establishment visit
- ☐ Routine inspection
- ☐ Traceback
- ☐ Other (Please describe)

3) What control measures were implemented? (Check all that apply)
- ☐ Changed operational practice
- ☐ Cleaned and sanitized/disinfected restaurant
- ☐ Closed restaurant
- ☐ Discarded food
- ☐ Embargoed food products
- ☐ Excluded ill/infectious workers
- ☐ Public notification
- ☐ Re-trained or trained food worker(s)
- ☐ Repaired/replaced/removed equipment
- ☐ Other (Enter a new value)

7

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Contributing Factors

4) Which contributing factor was identified?

- ☐ C1 - Toxic substance part of the tissue
- ☐ C2 - Poisonous substance intentionally/deliberately added
- ☐ C3 - Poisonous substance accidentally/inadvertently added (e.g., sanitizer or cleaning compound)
- ☐ C4 - Addition of excessive quantities of ingredients that are toxic in large amounts (e.g., niacin poisoning in bread)
- ☐ C5 - Toxic container (e.g., galvanized containers with acid foods)
- ☐ C6 - Contaminated raw product-food was intended to be consumed after a kill step
- ☐ C7 - Contaminated raw product-food was intended to be consumed raw or undercooked/ under-processed (e.g., raw shellfish, produce, eggs)
- ☐ C8 - Foods originating from sources shown to be contaminated or polluted (such as a growing field or harvest area) (e.g., shellfish)
- ☐ C9 - Cross-contamination of ingredients (cross-contamination does not include ill food workers)
- ☐ C10 - Bare-hand contact by a food handler/worker/preparer who is suspected to be infectious (e.g., with ready-to-eat-food)
- ☐ C11 - Glove-hand contact by a food handler/worker/preparer who is suspected to be infectious (e.g., with ready-to-eat-food)
- ☐ C12 - Other mode of contamination (excluding cross contamination) by a food handler/worker/preparer who is suspected to be infectious
- ☐ C13 - Foods contaminated by non-food handler/worker/preparer who is suspected to be infectious
- ☐ C14 - Storage in contaminated environment (e.g., storeroom, refrigerator)
- ☐ C15 - Other source of contamination (please describe)
- ☐ P1 - Food preparation practices that support proliferation of pathogens (during food preparation)
- ☐ P2 - No attempt was made to control the temperature of implicated food or the length of time food was out of temperature control (during food service or display of food)
- ☐ P3 - Improper adherence of approved plan to use time as a public health control
- ☐ P4 - Improper cold holding due to malfunctioning refrigeration equipment
- ☐ P5 - Improper cold holding due to an improper procedure or protocol
- ☐ P6 - Improper hot holding due to malfunctioning equipment
- ☐ P7 - Improper hot holding due to improper procedure or protocol
- ☐ P8 - Improper/slow cooling
- ☐ P9 - Prolonged cold storage
- ☐ P10 - Inadequate modified atmosphere packaging (e.g., vacuum-packed fish, salad in gas-flushed bag)
- ☐ P11 - Inadequate processing (e.g., acidification, water activity, fermentation)
- ☐ P12 - Other situations that promote or allow microbial growth or toxic production (please describe)
- ☐ S1 - Insufficient time and/or temperature during cooking/heat processing (e.g., roasted meats/poultry, canned foods, pasteurization)
- ☐ S2 - Insufficient time and/or temperature during reheating (e.g., sauces, roasts)
- ☐ S3 - Insufficient time and/or temperature control during freezing
- ☐ S4 - Insufficient or improper use of chemical processes designed for pathogen destruction
- ☐ S5 - Other process failures that permit the agent to survive (please describe)

8

Image Source: Kentucky Department for Public Health Food Safety Branch

EA ID: _____ Outbreak Year: _____

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Establishment	
5) Number of visits to the establishment to complete this environmental assessment	_____
6) Number of contacts with the establishment other than visits (phone calls, interviews with staff, email, etc.) to complete this environmental assessment:	_____
7) If applicable, how many critical violations/priority items/priority foundation items were noted during the last routine inspection?	_____
8) Was a translator needed to communicate with the manager or staff during the environmental assessment?	◯ Yes ◯ No
Manager Interview	
9) How long was the interview(s)?	_____
10) Approximately how many meals are served here daily?	_____
11) What is the establishment's busiest day?	_____
12) Are any foods prepared or partially prepared at a commissary or other location?	_____
Observation	
13) How long was the observation(s)?	_____
EA Form Feedback	
14) How easy was the online environmental assessment form to use?	◯ Very Easy ◯ Somewhat Easy ◯ Not Easy ◯ Somewhat Difficult ◯ Very Difficult
15) How useful has the online EA form been for you?	◯ Very Easy ◯ Somewhat Easy ◯ Not Easy ◯ Somewhat Difficult ◯ Very Difficult
16) How likely are you to use this form by default in the future?	◯ Very Easy ◯ Somewhat Easy ◯ Not Easy ◯ Somewhat Difficult ◯ Very Difficult
17) Please provide your thoughts or feedback on the EA form to help us improve this tool in the future.	_____

9

Image Source: Kentucky Department for Public Health Food Safety Branch

Appendix J: Enteric Disease-Specific Illness Investigation Forms

Fillable PDFs can be downloaded by following these links.

- **Campylobacter Form**

- **Giardia/Cryptosporidium Form**

- **Salmonella Form**

- **Shigella Form**

- **STEC/HUS Form**

Appendix K: Foodborne Illness Outbreak Food Specimen Sampling Criteria and Protocol

Sampling Criteria

Division of Epidemiology and Health Planning (DEHP)

- Food is potentially associated with outbreak **OR**
- Poses a potential public health threat
- Clinical presentation, suspected pathogen and suspected food item(s) make sense
- Other possible/more likely exposures ruled out
- Other considerations:
    - Food is consumed by vulnerable population
    - Pathogen virulence/disease severity

Division of Laboratory Services (DLS)

- Pathogen to test for identified
    - Positive clinical specimens
        - Unless testing for toxin
    - Negative clinical specimens
        - Norovirus has been ruled out
    - Clinical signs/symptoms, incubation period, symptom duration
- DEHP approval with known test organisms
- FSB approval to test

Division of Public Health Protection and Preparedness – Food Safety Branch (FSB)

The FSB will determine if collection of food samples and testing is warranted and will collaborate with Epi and Lab for further decision making. While the determination is being made, based on the below criteria, samples should remain with the collector until given further directions. Samples should be kept in its original container and state.

- Routine monthly sampling in conjunction with the Division of Laboratory Services
- Unopened samples with the same lot number that are associated with a potential outbreak.
- Testing an opened sample may be considered on a case-by-case basis by the FSB for vulnerable populations associated with a foodborne illness or outbreak.
- Unopened samples with the same lot number that are associated with a consumer complaint that has a positive clinical specimen.
- Food implicated in a recall and/or included in traceback/traceforward investigations.

Sampling Protocol

Division of Laboratory Services (DLS)

- If **anaerobic** bacteria are suspected (such as Clostridium perfringens) and approved by DEHP

    - Samples will not be tested for anaerobic bacteria after 48hrs of collection
- Testing options: (Average time it takes to complete testing)
    - Pathogenic E. coli (3-4 Days)
    - Salmonella sp. (6-7 Days)
    - Listeria sp. (4-5 Days)
    - Staph aureus count (2-3 Days)
    - Staph Toxin (1-2 Days)
    - Bacillus cereus count (2-3 Days)
    - Shigella sp. (2-3 Days)
    - Cronobacter sp. (2-3 Days)
    - Clostridium perfringens count (2-3 Days)
    - Campylobacter sp. (4-5 Days)
    - **Special requests with Lab approval**
- Food in original container and state (frozen, refrigerated, etc.)
    - Food samples should be collected aseptically and maintained and transported in controlled temperatures (frozen, refrigerated, etc.)
    - Open samples must be authorized by FSB manager and approvals should be in consultation with DLS and DEHP
    - Special storage considerations can be made with lab consultation
        - Consider shipping sample to DLS as soon as possible.
        - Notify DLS prior to shipping and how much sample to expect to determine storage availability.
        - If sample cannot be shipped overnight/next day or transported immediately to DLS, collector must store sample in its existing state at a dedicated, secure location at the LHD and contact DLS for further direction. DLS will determine if samples are viable for testing due to storage handling.
        - Wait as long as possible before freezing sample, especially for *Campylobacter.*
        - *There is a 15-day window to complete testing from date received at DLS. It becomes a non-conformance if past 15 days. It can be justified, but it affects lab's performance metrics.*
- 504 and Chain of Custody Forms **MUST** be filled out prior to food drop-off to the lab
- Food Samples **MUST** have state seal used over the opening of the bag/container
    - Fill out information on seal
    - Used as a tampering check

Division of Public Health Protection and Preparedness – Food Safety Branch (FSB)

1) When an outbreak is identified, Food Safety Branch (FSB) is to be notified by the Division of Epi within 24 hours.
2) FSB reviews the epi data to verify they have jurisdiction.
3) FSB notifies other agencies that also have jurisdiction.
4) FSB takes action to remove the suspect food from commerce and to prevent its further distribution.

5) FSB develops and coordinates a sample collection plan with the other agencies that have jurisdiction.
6) FSB organizes sample collection and transportation to the Division of Laboratory Services.
7) If the suspect food is manufactured within the State of Kentucky, FSB will conduct an inspection/investigation of the manufacturer and if appropriate, collect samples.
8) All samples collected in intact containers will be collected as "official" samples following the "Chain of Custody" procedure.
9) FSB will determine if regulatory action is warranted.
10) FSB will provide the Division of Epi with the findings for inclusion in the final incident report.

Appendix L: Shellfish-Implicated Investigations

Responsibilities of outbreak investigation team members when outbreaks are found to be associated with molluscan shellfish (i.e., oysters, mussels, clams, scallops)

- **Regional Epidemiologist:** Notify Food Safety Branch – Manufacturing Section
- **Regional or LHD Sanitarian or Environmentalist:** Notify Food Safety Branch – Manufacturing Section
- **Food Safety Branch:** Notify state from which product was received and FDA Shellfish Authority

Investigation strategies for shellfish (regardless of outbreak etiology)

- Collection of copy of shellfish tags
- Collection of copies of invoices of purchase of product
- Look specifically for improper handling, storage or holding temperatures and possibilities for cross-contamination

Information to collect about shellfish (regardless of outbreak etiology)

- How was product distributed to retail outlet?
- Date retail outlet received product
- Copy of shipping tags
- Copy of invoices
- Source of product
- Harvest site and date of harvest
- Evidence of improper storage, cross-contamination or improper holding temperatures. If yes, provide specific details.

Appendix M: National Outbreak Reporting System (NORS) Form and Guidance

1) **Complete NORS Form (CDC 52.14)**
   https://www.cdc.gov/nors/pdf/NORS-Form-CDC-52.14_508.pdf
   NORS Guidance
   https://www.cdc.gov/nors/downloads/guidance.pdf

For additional information contact the KDPH Division of Epidemiology and Health Planning, Reportable Disease Section, (502) 564-3261 or (888) 973-7678 if calling after business hours.

OR

CDC NORS website
https://www.cdc.gov/nors/index.html

Appendix N: Acronyms and Agency Abbreviations

AAR	After-Action Report
AR	Attack Rate
ASPR	HHS Office of the Assistant Secretary for Preparedness and Response
CAP	Corrective Action Program
CCDM	Control of Communicable Disease Manual
CDC	Centers for Disease Control and Prevention
CHFS	Cabinet for Health and Family Services
DLS	Division of Laboratory Services
EEG	Event Evaluation Guide
EFORS	Electronic Foodborne Outbreak Reporting System
EIS Officer	Epidemic Intelligence Service
ERRT	Epi Rapid Response Team
ESF-8	Emergency Support Function-8 (Health and Medical)
FDA	United States Food and Drug Administration
FERN	Food Emergency Response Network
GIS	Geographic Information Systems
HACCP	Hazard Analysis and Critical Control Point
HHS	U.S. Department for Health and Human Services
HSEEP	Homeland Security Exercise and Evaluation Program
ICS	Incident Command System
KAR	Kentucky Administrative Regulations
KDPH	Kentucky Department for Public Health
KRS	Kentucky Revised Statutes
KYDOC	Kentucky Department of Corrections
KYEPHRS	Kentucky Electronic Public Health Record System
LHD	Local Health Department
NEDSS	National Electronic Disease Surveillance System
NORS	National Outbreak Reporting System
OIG	Office of the Inspector General
OR	Odds Ratio
PFGE	Pulsed Field Gel Electrophoresis
POC	Point of Contact
PPE	Personal Protective Equipment
RDDR	Kentucky Reportable Disease Desk Reference
REDCap	Research Electronic Data Capture
RR	Relative Risk
SHOC	State Health Operations Center
TCL	Target Capabilities List
USDA	United States Department of Agriculture
WGS	Whole Genome Sequencing

Appendix O: Definition of Terms

2 x 2 Table: A cross-tabulation of data such that subcategories of one characteristic are indicated horizontally (in rows) and subcategories of another characteristic are indicated vertically (in columns). Tests of association between characteristics in the columns and rows can be readily applied. Also known as a contingency table.

	ill	not ill
Exposed	a	b
Not Exposed	c	d

Active surveillance: A type of surveillance in which case reports are actively solicited from area physicians, laboratories or hospitals. More active surveillance may be warranted in an outbreak setting.

Attack rate: A type of cumulative incidence rate which expresses the occurrence of a disease among a specific population at risk observed for a limited period of time, often due to a very specific exposure.

Carrier: A person or animal that harbors a specific infectious agent, is asymptomatic and is a potential source of infection for man or animals.

Case: a person who meets a defined case definition at a specific point of time.

Case-control study: A type of observational analytic study. Enrollment into the study is based on presence ("case") or absence ("control") of disease. Characteristics such as previous exposures are then compared between cases and controls.

Case definition: A set of criteria used for investigative purposes to decide whether a person has a particular disease or whether a person is to be included in a "case" category by specifying clinical and laboratory criteria and by specifying limitations on time, place and person.

Case finding: The process of identifying all possible cases; this typically uses a broad case definition and occurs early in the investigation. Later in the investigation, case finding might be performed to assess the extent of the outbreak.

Chain of custody: a record that establishes the complete chronological disposition of an entity of concern (e.g., laboratory specimen document).

Cluster: Aggregation of relatively uncommon events or diseases in space and/or time in amounts believe or perceived to be greater than could be expected by chance.

Cohort study: A type of observational analytic study. Enrollment in the study is based on exposure characteristics or membership in a group. Disease, death or other health-related outcomes are then ascertained and compared.

Common source outbreak: An outbreak that results from a group of persons being exposed to an infectious agent or toxin from a single source.

Confirmed case: A person who has a positive laboratory result of the disease or agent that is associated with an outbreak.

Contact: Exposure to a source of an infection or a person so exposed.

Controls: Subject with whom comparison is made in a case-control study or other type of epidemiologic study. Selection of appropriate controls is crucial to the validity of epidemiologic studies.

Control food sample: A portion of food that was prepared in similar manner but not involved in the outbreak.

Epidemic: The occurrence of more cases of disease than expected in a given area or among a specific group of people during a particular period of time.

Epidemic curve (Epi curve): A histogram plotting the distribution of cases by time of onset. Epi curves help characterize an outbreak and give clues about the source of the outbreak (e.g., point source vs. on-going outbreaks).

Epidemiology: The study of the distribution and determinants of health-related states or events in specified populations and the application of this study to the control of health problems.

Foodborne outbreak: A foodborne outbreak is the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food or different food in a common place.

High-risk group: A group in the community with an elevated risk for a particular disease.

Host: A person or other living organism that can be infected by an infectious agent under natural conditions.

Host factors: An intrinsic factor (e.g., age, sex, race, behaviors) which influences an individual's exposure, susceptibility or response to a causative agent.

Incidence rate: The measure of frequency of new cases of a particular disease in a population during a specified period of time.

Incubation period: The period of time between exposure to an infectious agent and the onset of signs and symptoms of disease.

Index case: The first case among a number of similar cases that are epidemiologically related.

Line listing: A table listing case names, age, sex, onset time, residence, symptoms, employment, etc. which facilitates comparisons of many characteristics for possible similarities or associations.

Morbidity: Any departure from a state of physiological or psychological wellbeing.

Original food sample: The actual sample portion of the food consumed at the time of the outbreak.

Onset: The time the first clinical signs or symptoms begin to occur.

Outbreak: Same as epidemic. Often the preferred word as it may avoid the sensationalism associated with the word epidemic.

Passive Surveillance: A type of surveillance that relies on regular lab submissions and standard case reports from clinicians.

PFGE: Pulsed-field gel electrophoresis – a molecular method that allows for the specific classification of pathogens by "fingerprinting" the DNA from the pathogen; this method generates visually observable patterns which can be digitized and then compared with other pathogens of the same genus and species.

Point source outbreak: Outbreak due to exposure of a group of persons to an infectious agent common to the individuals in the group.

Prevalence: The number or proportion of cases or events or conditions in a given population.

Prevalence rate: The measure of frequency of all current cases of a particular disease, regardless of the time of onset, within a particular population either at a specified instant or during a specified period of time.

Probable case: A case that has typical clinical features of the particular disease under investigation without laboratory confirmation.

PulseNet: The National Molecular Subtyping Network for Foodborne Disease Surveillance; a network of laboratories throughout the U.S. that perform testing on foodborne pathogens using WGS methods and compare results via images on a computer network.

Questionnaire: Predetermined set of questions used to collect data.

Recreational water: Waters used for swimming, whirlpools, hot tubs, spas and water parks; it may also include naturally occurring fresh and marine surface waters.

REDCap: Secure web application for building and managing online surveys and databases

Reservoir: The habitat or organism in which an infectious agent normally lives, grows and multiplies.

Serotype: Subdivision of a species or subspecies distinguishable from other strains therein on the basis of antigenic character.

Sensitive: Regarding case definitions, this would be using broad parameters to identify as many cases as possible, thereby minimizing the exclusion of possible outbreak-associated cases.

Specific: Regarding case definitions, this would be using detailed parameters in an effort to only include cases that are likely to be outbreak-associated. Using specific case definitions allows analysis to focus on true risk factors of ill persons.

Surveillance: The detection of health problems through the appropriate collection of data, followed by its collation, analysis, interpretation and dissemination.

Susceptible: A person lacking sufficient resistance to a particular disease agent to prevent disease if or when exposed.

Suspect case: A person who is associated with an outbreak with signs and symptoms of disease but no confirmed laboratory results.

Vehicle: An inanimate intermediary in the indirect transmission of an agent that carries the agent from a reservoir to a susceptible host.

Virulence: The degree of pathogenicity of an infectious agent.

Waterborne outbreak: Two or more people experience a similar illness after the ingestion of water or after exposure to water used for recreational purposes.

Whole Genome Sequencing: A laboratory procedure that determines the order of bases in the genome of an organism in one process.

Zoonosis: An infection or an infectious disease transmissible under natural conditions between animals and man.

Appendix P: Kentucky Reportable Disease Statutes and Regulations

1) 902 KAR 2:020. Disease Surveillance

2) KRS 211.180. Functions of Cabinet in Regulation of Certain Health Matters – Inspection Fees - Hearing

3) KRS 214.010. Physicians and Heads of Families to Report Diseases to Local Board of Health

4) KRS 214.020. Cabinet to Adopt Regulations and Take Other Action to Prevent Spread of Disease

5) HIPAA – Disclosures for Public Health Activities

902 KAR 2:020. Reportable disease surveillance.

RELATES TO: KRS 211.180(1), 214.010, 214.645, 215.520, 216B.015, 258.065, 258.990, 311.282, 311.571, 315.010, 333.020, 333.130

STATUTORY AUTHORITY: KRS 194A.050, 211.090(3), 211.180(1)(a), 214.010

NECESSITY, FUNCTION, AND CONFORMITY: KRS 211.180(1)(a) requires the cabinet to implement a statewide program for the detection, prevention and control of communicable diseases, chronic and degenerative diseases, dental diseases and abnormalities, occupational diseases and health hazards peculiar to industry, home accidents and health hazards, animal diseases that are transmissible to man and other diseases and health hazards that can be controlled. KRS 214.010 requires every physician, advanced practice registered nurse and every head of family to notify the local health department of the existence of diseases and conditions designated by administrative regulation of the cabinet. This administrative regulation establishes notification standards and specifies the diseases requiring immediate, urgent, priority, routine or general notification, in order to facilitate rapid public health action to control diseases and to permit an accurate assessment of the health status of the Commonwealth.

Section 1. Definitions. (1) "Acid fast bacilli" or "AFB" means the mycobacteria that, ifstained, retains color even after having been washed in an acid solution and can be detected under a microscope in a stained smear.

(2) "Health facility" is defined by KRS 216B.015(13).

(3) "Health professional" means a professional licensed under KRS Chapters 311 through 314.

(4) "Healthcare-associated infection" or "HAI" means an infection acquired by a person while receiving treatment for a separate condition in a health care setting.

(5) "Kentucky Public Health Advisory" means a notification to health professionals, health facilities and laboratories subject to this administrative regulation identifying a new health threat that warrants reporting through the procedures of this administrative regulation.

(6) "Laboratory-confirmed influenza" means influenza diagnosed through testing performed using:

(a) Reverse transcriptase polymerase chain reaction (RT PCR);

(b) Nucleic acid detection; or

(c) Viral culture.

(7) "Medical laboratory" is defined by KRS 333.020(3).

(8) "National Healthcare Safety Network" or "NHSN" means the nation's most widely used healthcare-associated infection (HAI) tracking system as provided to medical facilities by the CDC.

(9) "National reference laboratory" means a laboratory located outside of Kentucky that is contracted by a Kentucky health professional, laboratory or health facility to provide laboratory testing.

(10) "Novel influenza A virus" means an influenza virus that causes human infection but is different from the seasonal human influenza A virus subtypes and includes viruses predominately of avian and swine origin.

(11) "Nucleic acid amplification test" or "NAAT" means the laboratory test used to target and amplify a single deoxyribonucleic acid (DNA) or ribonucleic acid (RNA) sequence, usually for detecting a microorganism.

(12) "Outbreak" means:

(a) Two (2) or more cases, including HAIs, that are epidemiologically linked or connected by

person, place or time; or

(b) A single case of an HAI not commonly diagnosed.

(13) "Pharmacist" is defined by KRS 315.010(17).

(14) "Post-exposure prophylaxis" or "PEP" means taking an antiretroviral medicine after being potentially exposed to HIV to prevent becoming infected.

(15) "Pre-exposure prophylaxis" or "PrEP" means daily medicine intended to reduce the chance of getting HIV.

(16) "Select agent" means a biological agent or toxin that could pose a severe threat to public health, plant health, animal product or plant product as determined by the National Select Agent Registry (NSAR) at www.selectagents.gov.

(17) "Veterinarian" is defined by KRS 321.181(4).

Section 2. Notification Standards. (1) Health professionals and facilities.

(a) A health professional or a health facility shall give notification if:

1. The health professional or a health facility makes a probable diagnosis of a disease specified in Section 3, 6, 7, 8, 9, 12, 16, 17, 18 or 19 of this administrative regulation; and

2. The diagnosis is supported by:

a.(i) Clinical or laboratory criteria; and

(ii) Case classifications published by the Centers for Disease Control and Prevention at wwwn.cdc.gov/nndss; or

b. A health professional's medical opinion that the disease is present.

(b) A single report by a health facility of a condition diagnosed by a test result from the health facility's laboratory shall constitute notification on behalf of the health facility and its laboratory.

(c) A health facility may designate an individual to report on behalf of the health facility's laboratory, pharmacy and the health facility's other clinical entities.

(d) Notification shall be given to the local health department serving the county in which the patient resides.

(e) If the local health department cannot be reached, notification shall be given to the Kentucky Department for Public Health.

(f) The reporting health professional or health facility shall submit:

1. Information required in Section 5(6) of this administrative regulation; and

2. Clinical, epidemiologic and laboratory information pertinent to the disease including sources of specimens submitted for laboratory testing.

(2) Medical Laboratories.

(a) A laboratory test result that indicates infection with an agent associated with one (1) or more of the diseases or conditions specified in Section 3, 6, 7, 8, 9, 12, 16, 17, 18 or 19 of this administrative regulation shall be reported to the local health department serving the county in which the patient resides.

(b) If the local health department cannot be reached, notification shall be given to the Kentucky Department for Public Health.

(c) The reporting laboratory shall submit the information required in Section 5(6) of this administrative regulation.

(3) National Reference Laboratories.

(a) A test result performed by a national reference laboratory that indicates infection with an agent associated with one (1) or more of the diseases or conditions specified in Section 3, 6, 7,8, 9, 12,

16, 17, 18 or 19 of this administrative regulation shall be reported by the director of a medical laboratory, a health facility or the health professional that referred the test to the national reference laboratory to the local health department serving the county in which the patient resides.

(b) If the local health department cannot be reached, notification shall be given to the Kentucky Department for Public Health.

(c) The report shall include the information required by Section 5(6) of this administrative regulation.

Section 3. Submission of Specimens to the Kentucky Department for Public Health Division of Laboratory Services. (1) A medical laboratory and a national reference laboratory in receipt of diagnostic specimens originating from the Commonwealth of Kentucky shall send direct specimens or pure clinical isolates for diseases established in subsection (5) of this section to the Division of Laboratory Services for primary or confirmatory testing and related studies.

(2) A medical laboratory or national reference laboratory using non-culture techniques to identify bacterial agents of diarrheal disease, such as enzyme immunoassays (EIAs) or molecular assays, shall attempt isolation of the etiologic agent identified. Pure clinical isolates shall be submitted to the Division of Laboratory Services.

(3) If the culture attempts do not produce a clinical isolate, the direct specimen, submitted inthe appropriate preservative, shall be sent to the Division of Laboratory Services. A submitting laboratory shall provide the name of the etiologic agent detected by the non-culture technique at the time of specimen submission.

(4) A medical laboratory performing this test shall continue to follow the state's requirement for the submission of appropriate materials to the state public health laboratory.

(5) A medical or national reference laboratory shall submit pure isolates or, if not available, the direct specimen from the following diseases to the Division of Laboratory Services:

(a) Botulism, with prior approval from the Division of Epidemiology for testing;
(b) Brucellosis;
(c) Campylobacteriosis;
(d) Candida auris;
(e) Carbapenem-resistant Acinetobacter;
(f) Carbapenem-resistant Enterobacteriaceae;
(g) Carbapenem-resistant Pseudomonas;
(h) Cholera and diseases caused by other Vibrio species;
(i) Diphtheria;
(j) Escherichia coli O157:H7;
(k) Hemolytic Uremic Syndrome (HUS) – Post Diarrheal;
(l) Listeriosis;
(m) Measles;
(n) Meningococcal infections;
(o) Rabies, animal;
(p) Rubella;
(q) Salmonellosis;
(r) Shiga toxin-producing E. coli (STEC);
(s) Shigellosis;
(t) Tuberculosis;

(u) Tularemia;
(v) Typhoid fever;
(w) Vancomycin-intermediate Staphylococcus aureus;
(x) Vancomycin-resistant Staphylococcus aureus; and
(y) Zika, with prior approval from the Division of Epidemiology for testing.
(6) All direct specimens or clinical isolates from enteric disease shall be submitted within seventy-two (72) hours from collection.

Section 4. Laboratory Testing and Submission of Specimens to the Division of Laboratory Services for the Identification of M. tuberculosis.

(1) For the identification of M. tuberculosis, a medical laboratory or national reference laboratory shall perform AFB smear and culture, regardless of rapid molecular testing results (NAAT).
(2) Rapid molecular testing shall be performed for the identification of M. tuberculosis on:
(a) Any diagnostic specimen with an AFB smear positive result; or
(b) Any specimen that originates from an individual with clinical or epidemiological evidence suggesting active tuberculosis.
(3) If rapid molecular testing cannot be performed by the medical laboratory or national reference laboratory, the diagnostic specimen shall be sent to the Division of Laboratory Services.
(4) A medical laboratory or national reference laboratory that has a diagnostic specimen test positive for M. tuberculosis by rapid molecular testing shall send the remainder of that specimen to the Division of Laboratory Services.
(5) Any diagnostic specimen found to be positive for M. tuberculosis by rapid molecular testing or culture testing shall be reported in accordance with Section 7 of this administrative regulation.

Section 5. Reporting Classifications and Methods. (1) Immediate reporting.

(a) A report required by Section 12(1) and (2) of this administrative regulation to be made immediately shall be:
1. Made by telephone to the local health department serving the county in which the patient resides; and
2. Followed up by electronic or fax submission to the local health department serving the county in which the patient resides within one (1) business day.
(b) Upon receipt of a report for a disease requiring immediate reporting, the local health department shall:
1. Notify the Kentucky Department for Public Health by telephone; and
2. Assist the department in carrying out a public health response.
(c) Weekend, evening or holiday immediate notification. If local health department personnel cannot be contacted directly, notification shall be made by telephone using an emergency number provided by the local health department or the Kentucky Department for Public Health.
(d) For the protection of patient confidentiality, a report using the emergency number shall include:
1. The name of the condition being reported; and
2. A telephone number that can be used by the department to contact the reporting health professional or health facility.
(2) Urgent reporting.
(a) A report made within twenty-four (24) hours as required by Section 6 of this administrative

regulation shall be:

1. Submitted electronically, by fax or by telephone to the local health department servingthe county in which the patient resides; and

2. If submitted by telephone, followed up by electronic or fax submission to the local health department serving the county in which the patient resides within one (1) business day.

(b) Upon receipt of a report for a disease requiring urgent reporting, the local health department shall:

1. Notify the Kentucky Department for Public Health; and

2. Assist the department in carrying out a public health response.

(c) Weekend, evening or holiday urgent notification. If local health department personnel cannot be contacted directly, notification shall be made by telephone using an emergency number provided by the local health department or the Kentucky Department for Public Health.

(d) For the protection of patient confidentiality, notification using the emergency number shall include:

1. The name of the condition being reported; and

2. A telephone number that can be used by the department to contact the reporting health professional or health facility.

(3) Priority reporting.

(a) A report made within one (1) business day as required by Section 7, 11, 12(3), 17(4) or 18 of this administrative regulation shall be:

1. Submitted electronically, by fax or by telephone to the local health department servingthe county in which the patient resides; and

2. If submitted by telephone, followed up by electronic or fax submission of a report to the local health department serving the county in which the patient resides within one (1) business day.

(b) Upon receipt of a report for a disease requiring priority reporting, a local health department shall:

1. Investigate the report and carry out public health protection measures; and

2. Notify the Kentucky Department for Public Health of the case by electronic or fax submission within one (1) business day.

(c) The reporting health department may seek assistance in carrying out public health measures from the Kentucky Department for Public Health.

(4) Routine reporting.

(a) A report made within five (5) business days, as required by Section 8, 9, 10, 13(1), 16(1),17(7) or 20(1) of this administrative regulation, shall be made electronically, by fax or by mail to the local health department serving the county in which the patient resides.

(b) Upon receipt of a report of a disease or condition requiring routine reporting, a local health department shall:

1. Make a record of the report;

2. Answer inquiries or render assistance regarding the report if requested by the reporting entity; and

3. Forward the report to the Kentucky Department for Public Health by electronic or fax submission of a report or in writing within five (5) business days.

(5) General reporting. A report made within three (3) months, as required by Section 19 of this administrative regulation, shall be made electronically, by fax or by mail.

(6) Reporting requirements.

(a) A report submitted by fax or by mail shall be made using one (1) of the following reporting

forms:

1. EPID 200, Kentucky Reportable Disease Form;
2. EPID 250, Kentucky Reportable MDRO Form, to be used for priority reporting;
3. EPID 394, Kentucky Reportable Disease Form, Hepatitis Infection in Pregnant Women orChild (aged five (5) years or less);
4. EPID 399, Perinatal Hepatitis B Prevention Form for Infants;
5. Adult HIV Confidential Case Report Form; or
6. Pediatric HIV Confidential Case Report Form.

(b) Information to be reported. Except as provided in subsections (1)(d) and (2)(d) of this section, a report required by this administrative regulation shall include:

1. Patient name;
2. Date of birth;
3. Gender;
4. Race;
5. Ethnicity;
6. Patient address;
7. County of residence;
8. Patient telephone number;
9. Name of the reporting medical provider or facility;
10. Address of the reporting medical provider or facility; and
11. Telephone number of the reporting medical provider or facility.

(c) A reporting health professional shall submit the information listed in this subsection and Section 2(1)(f) of this administrative regulation.

Section 6. Notifiable Infectious Conditions Requiring Urgent Notification. (1) Notification of the following diseases shall be considered urgent and shall be made within twenty-four (24) hours:

(a) Anthrax;
(b) Botulism;
(c) Brucellosis (multiple cases, temporally or spatially clustered);
(d) Diphtheria;
(e) Hepatitis A, acute;
(f) Measles;
(g) Meningococcal infections;
(h) Middle East Respiratory Syndrome-associated Coronavirus (MERS-CoV) disease;
(i) Multi-system Inflammatory Syndrome in Children (MIS-C);
(j) Novel influenza A virus infections;
(k) Plague;
(l) Poliomyelitis;
(m) Rabies, animal;
(n) Rabies, human;
(o) Rubella;
(p) Severe Acute Respiratory Syndrome-associated Coronavirus (SARS-CoV) disease;
(q) Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (the virus that causes COVID-19);
(r) Smallpox;

(s) Tularemia;
(t) Viral hemorrhagic fevers due to:
1. Crimean-Congo Hemorrhagic Fever virus;
2. Ebola virus;
3. Lassa virus;
4. Lujo virus;
5. Marburg virus; or
6. New world arenaviruses including:
a. Guanarito virus;
b. Junin virus;
c. Machupo virus; and
d. Sabia virus; and
(u) Yellow fever.

(2) To track the spread of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV- 2), the virus that causes COVID-19, notification of testing results shall include both positive and negative test results.

Section 7. Notifiable Infectious Conditions and Notifiable Non-Infectious Conditions Requiring Priority Notification. Notification of the following diseases or conditions shall be considered priority and shall be made within one (1) business day:

(1) Arboviral diseases, neuroinvasive and non-neuroinvasive, including:
(a) California serogroup virus diseases, including diseases caused by:
1. California encephalitis virus;
2. Jamestown Canyon virus;
3. Keystone virus;
4. La Crosse virus;
5. Snowshoe hare virus; and
6. Trivittatus viruses;
(b) Chikungunya virus disease;
(c) Eastern equine encephalitis virus disease;
(d) Powassan virus disease;
(e) St. Louis encephalitis virus disease;
(f) Venezuelan equine encephalitis disease;
(g) West Nile virus disease;
(h) Western equine encephalitis virus disease; and
(i) Zika virus disease or infection or the birth of a child to a mother who was Zika-positive orZika-inconclusive during any stage of pregnancy or during the periconceptional period;
(2) Brucellosis (cases not temporally or spatially clustered);
(3) Campylobacteriosis;
(4) Carbon monoxide poisoning;
(5) Cholera;
(6) Cryptosporidiosis;
(7) Cyclosporiasis;
(8) Dengue virus infections;
(9) Escherichia coli O157:H7;

(10) Foodborne disease outbreak;
(11) Giardiasis;
(12) Haemophilus influenzae invasive disease;
(13) Hansen's disease (leprosy);
(14) Hantavirus infection, non-Hantavirus pulmonary syndrome;
(15) Hantavirus pulmonary syndrome (HPS);
(16) Hemolytic uremic syndrome (HUS), post-diarrheal;
(17) Hepatitis B, acute;
(18) Hepatitis B infection in a pregnant woman;
(19) Hepatitis B infection in an infant or a child aged five (5) years or less;
(20) Newborns born to Hepatitis B positive mothers at the time of delivery;
(21) Influenza-associated mortality;
(22) Legionellosis;
(23) Leptospirosis;
(24) Listeriosis;
(25) Mumps;
(26) Norovirus outbreak;
(27) Pertussis;
(28) Pesticide-related illness, acute;
(29) Psittacosis;
(30) Q fever;
(31) Rubella, congenital syndrome;
(32) Salmonellosis;
(33) Shiga toxin-producing E. coli (STEC);
(34) Shigellosis;
(35) Streptococcal toxic-shock syndrome;
(36) Streptococcus pneumoniae, invasive disease;
(37) Tetanus;
(38) Toxic-shock syndrome (other than Streptococcal);
(39) Tuberculosis;
(40) Typhoid fever;
(41) Varicella;
(42) Vibriosis; and
(43) Waterborne disease outbreak.

Section 8. Notifiable Infectious Conditions and Notifiable Non-Infectious Conditions Requiring Routine Notification. Notification of the following diseases shall be considered routine and shall be made within five (5) business days:

(1) Acute Flaccid Myelitis;
(2) Anaplasmosis;
(3) Babesiosis;
(4) Coccidioidomycosis;
(5) Creutzfeldt-Jakob disease;
(6) Ehrlichiosis;

(7) Hepatitis C, acute;
(8) Hepatitis C infection in a pregnant woman;
(9) Hepatitis C infection in an infant or a child aged five (5) years or less;
(10) Newborns born to Hepatitis C positive mothers at the time of delivery;
(11) Histoplasmosis;
(12) Laboratory-confirmed influenza;
(13) Lead poisoning;
(14) Lyme Disease;
(15) Malaria;
(16) Spotted Fever Rickettsiosis (Rocky Mountain Spotted Fever);
(17) Toxoplasmosis; and
(18) Trichinellosis (Trichinosis).

Section 9. Notifiable Infectious Conditions Requiring Routine Notification by Electronic Laboratory Reporting. (1) Notification of the following shall be considered routine and shall be electronically reported to the Kentucky Department for Public Health through the Kentucky Health Information Exchange within five (5) business days:

(a) Hepatitis B laboratory test results, which shall:
1. Be reported as positive or negative; and
2. Include the serum bilirubin levels or serum alanine aminotransferase taken within ten (10)days of the test of a patient who has tested positive;
(b) Hepatitis C laboratory test results, which shall:
1. Be reported as positive or negative; and
2. Include the serum bilirubin levels or serum alanine aminotransferase taken within ten (10)days of the test of a patient who has tested positive; or
(c) Varicella laboratory test results reported as positive for:
1. Isolation of varicella virus from a clinical specimen;
2. Varicella antigen detected by direct fluorescent antibody test; or
3. Varicella-specific nucleic acid detected by polymerase chain reaction (PCR).
(2) Reports made pursuant to this section shall include a diagnosis.

Section 10. Multi-Drug Resistant Organisms and Other Organisms Requiring Routine Notification by Electronic Laboratory Reporting. (1) Notification of the following diseases shall be considered routine and shall be electronically reported to the Kentucky Department for Public Health through the Kentucky Health Information Exchange within five (5) business days:

(a) Clostridioides (formerly Clostridium) difficile (C. difficile) identified from a positive laboratory test result for C. difficile toxin A or B (includes molecular assays {PCR} or toxin assays), or a toxin-producing organism detected by culture or another laboratory means performed on a stoolsample;
(b) Enterobacteriaceae species resistant to ceftazidime, ceftriaxone or cefotaxime.
(c) Methicillin-resistant Staphylococcus aureus (MRSA), which includes S. aureus cultured from any specimen that tests oxacillin-resistant, cefoxitin-resistant or methicillin-resistant by standard susceptibility testing methods or by a laboratory test that is FDA-approved for MRSA detection from isolated colonies. These methods may also include a positive result by any FDA-approved test for MRSA detection; and

(d) Vancomycin-resistant Enterococcus species (VRE), only those identified to the species level, that are resistant to Vancomycin by standard susceptibility testing methods or by results from any FDA-approved test for VRE detection from specific specimen sources.

(2) The report of an organism under this section shall include the:

(a) Date of specimen collection;

(b) Source of specimen;

(c) Susceptibility pattern; and

(d) Name of the ordering health professional.

(3) Upon a test result performed by a medical laboratory that indicates infection with an agent associated with one (1) or more of the diseases or conditions or a multi-drug resistant organism specified in this section, the director of the medical laboratory shall electronically report the result to the Kentucky Department for Public Health through the Kentucky Health Information Exchange within five (5) days.

(4) The report shall include a diagnosis.

Section 11. Multi-drug Resistant Organisms and Other Organisms Requiring Priority Reporting by EPID 250 and by Electronic Laboratory Reporting to the Kentucky Department for PublicHealth through the Kentucky Health Information Exchange within One (1) Business Day. Notification of the following diseases shall be considered priority:

(1) Candida auris - Laboratory Criteria for Diagnosis shall include:

(a) Confirmatory laboratory evidence for detection of Candida auris from anybody site usingeither culture or a culture independent diagnostic test (for example, Polymerase Chain Reaction {PCR}); or

(b) Presumptive laboratory evidence for detection of Candida haemulonii from anybody siteusing a yeast identification method that is not able to detect Candida auris and either the isolate or specimen is not available for further testing or the isolate or specimen has not yet undergone further testing.

(2) Carbapenem-resistant – Acinetobacter – Any Acinetobacter species testing resistant to imipenem, meropenem, or doripenem, with MIC value greater than or equal to eight (8) mg/mL by standard susceptibility testing methods or by identification of a carbapenemase using a recognized test;

(3) Carbapenem-resistant Enterobacteriaceae (CRE) – Any Enterobacteriaceae species testing resistant to imipenem, meropenem or doripenem, with MIC value greater than or equal to four (4) mg/mL, or ertapenem with MIC value greater than or equal to two (2) mg/mL, by standard susceptibility testing methods or by identification of a carbapenemase using a recognized test;

(4) Carbapenem-resistant – Pseudomonas – Any Pseudomonas species testing resistant to imipenem, meropenem or doripenem, with MIC value greater than or equal to eight (8) mg/mL by standard susceptibility testing methods or by identification of a carbapenemase using a recognized test;

(5) Vancomycin-intermediate Staphylococcus aureus (VISA), which includes S. aureus cultured from any specimen having a minimum inhibitory concentration (MIC) of four (4) to eight (8) mg/mL for vancomycin per standard laboratory methods; and

(6) Vancomycin-resistant Staphylococcus aureus (VRSA), which includes S. aureus culturedfrom any specimen having a minimum inhibitory concentration (MIC) of greater than or equal tosixteen (16) mg/mL for vancomycin per standard laboratory methods.

Section 12. Newly Recognized Infectious Agents, HAI Outbreaks, Emerging Pathogens and Pathogens of Public Health Importance. (1) The following shall be reported immediately by telephone to the Kentucky Department for Public Health:

(a) A suspected incidence of bioterrorism caused by a biological agent;

(b) Submission of a specimen to the Kentucky Division of Laboratory Services for select agent identification or select agent confirmation testing; or

(c) An outbreak of a disease or condition that resulted in multiple hospitalizations or death.

(2) An unexpected pattern of cases, suspected cases or deaths that could indicate the following shall be reported immediately by telephone to the local health department in the county where the health professional is practicing or where the facility is located:

(a) A newly recognized infectious agent.

(b) An outbreak;

(c) An emerging pathogen that may pose a danger to the health of the public;

(d) An epidemic; or

(e) A noninfectious chemical, biological or radiological agent.

(3) A report of the following shall be considered priority and shall be reported to the local health department in the county where the health professional is practicing or where the facilityis located within one (1) business day:

(a) Suspected Staphylococcal or other foodborne intoxication; or

(b) Salmonellosis or other foodborne or waterborne infection.

(4) The local health department shall:

(a) Investigate the outbreak or occurrence;

(b) Carry out public health protection measures to address the disease or condition involved; and

(c) Make medical and environmental recommendations to prevent future similar outbreaksor occurrences.

(5) The local health department may seek assistance from the Kentucky Department for Public Health.

Section 13. Laboratory Surveillance. (1) Medical or national reference laboratory results forthe following shall be considered routine:

(a) Influenza virus isolates;

(b) PCR-positive test results for influenza virus; and

(c) DNA molecular assays for influenza virus.

(2) The report shall include specific laboratory information pertinent to the result.

(3) Upon request by the Kentucky Department for Public Health, a health facility laboratory or a medical laboratory shall report the number of clinical isolates and information regardingthe antimicrobial resistance patterns of the clinical isolates at intervals no less frequently than three (3) months for:

(a) Acinetobacter baumannii complex;

(b) Enterobacter cloacae complex;

(c) Enterococcus species;

(d) Escherichia coli;

(e) Klebsiella oxytoca;

(f) Klebsiella pneumoniae;

(g) Pseudomonas aeruginosa;
(h) Staphylococcus aureus; or
(i) An organism specified in a request that includes a justification of its public health importance.
(4) A facility that reports antimicrobial resistance (AR) data to the National Healthcare Safety Network (NHSN) AUR (Antimicrobial Use & Resistance) module shall meet this reporting requirement through NHSN reporting.

Section 14. Healthcare-Associated Infection Surveillance. (1) A health facility in Kentucky that participates in CMS reporting programs shall authorize the CDC to allow the Kentucky Department for Public Health to access health care-associated infection data reported to NHSN.

(2) The Kentucky Department for Public Health shall preserve patient confidentiality andshall not disclose to the public any patient-level data obtained from any health care facility.
(3) The Kentucky Department for Public Health may issue reports to the public regarding healthcare-associated infections in aggregate data form that:
(a) May identify individual health care facilities; and
(b) Shall comply with methodology developed by the CDC and CMS for national reporting ofhealth care-associated infections.
(4) The Kentucky Department for Public Health may evaluate healthcare-associated infection data for accuracy and completeness.

Section 15. Antimicrobial Use Reporting. (1) A short-term acute-care hospital in Kentucky that participates in the Centers for Medicare and Medicaid Services (CMS) reporting programs shall report data on facility-wide inpatient antimicrobial use to the Kentucky Department for Public Health, Healthcare-Associated Infection/Antibiotic Resistance (HAI/AR) Prevention Program, on a quarterly basis, effective January 1, 2021. Critical access hospitals shall be exempt.

(2) Reporting deadlines shall be consistent with the CMS reporting program submission deadlines of data to the NHSN.
(3) The HAI/AR Prevention Program shall provide the specifications for data submission.
(4) Hospitals shall include aggregated antimicrobial use and patient day data for all inpatient units (facility-wide inpatient) included in the NHSN Laboratory-identified (LabID) MRSA Bacteremia reporting.

(5) The antimicrobial use numerator shall be days of therapy (DOTs) as defined by theNHSN Antimicrobial Use and Resistance (AUR) Module, available at www.cdc.gov/nhsn/pdfs/pscmanual/11pscaurcurrent.pdf.

(6) Total DOTs shall be submitted for each of the following antimicrobials:
(a) Azithromycin;
(b) Cefepime;
(c) Ceftazidime;
(d) Ceftriaxone;
(e) Ciprofloxacin;
(f) Clindamycin;
(g) Daptomycin;
(h) Ertapenem;

(i) Imipenem;
(j) Levofloxacin;
(k) Linezolid;
(l) Meropenem;
(m) Moxifloxacin;
(n) Piperacillin-tazobactam; and
(o) Vancomycin.
(7) Total DOTs for the listed drugs shall include only administrations via the intravenous and digestive tract routes.
(8) The denominator for antimicrobial use reporting shall be patient days as defined by the NHSN LabID Module available athttps://www.cdc.gov/nhsn/pdfs/pscmanual/12pscmdro_cdadcurrent.pdf.
(9) A hospital that reports antimicrobial use data to the NHSN AUR Module shall meet this reporting requirement through NHSN reporting.

Section 16. Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) Surveillance. (1) All case reports shall be submitted to the HIV/AIDS Surveillance Program of the Kentucky Department for Public Health, Division of Epidemiology and Health Planning or its designee, within five (5) business days of diagnosis on one (1) of the following forms:

(a) Adult HIV Confidential Case Report Form; or
(b) Pediatric HIV Confidential Case Report Form.
(2) Health professionals and medical laboratories shall report:
(a) A positive test result for HIV infection including a result from:
1. 3rd generation immunoassay;
2. 4th generation immunoassay;
3. Western Blot;
4. PCR;
5. HIV-1 or HIV-2 differentiating such as Multispot;
6. HIV antigen;
7. HIV antibody;
8. CD4+ assay including absolute CD4+ cell counts and CD4+%;
9. HIV Viral Load Assay including detectable and undetectable values;
10. HIV genetic sequencing; or
11. A positive confirmatory serologic test result for HIV infection; or
(b) A diagnosis of AIDS that meets the definition of AIDS established within the CDC guidelines.
(3) The most recent negative HIV test, if available, shall be submitted with the report required by subsection (2)(a) or (b) of this section.
(4) Any request for data related to HIV infection or AIDS shall be made to the Departmentfor Public Health, Division of Epidemiology and Health Planning.
(5) A case report for a person with an HIV infection without a diagnosis of AIDS or HIV infection with a diagnosis of AIDS shall include:
(a) The patient's full name;
(b) The patient's complete address;
(c) Date of birth using the format MMDDYYYY;
(d) Gender;
(e) Race;

(f) Ethnicity;
(g) Risk factor as identified by CDC;
(h) County of residence;
(i) Name of provider and facility submitting report including contact information;
(j) Specimen collected;
(k) Date and type of HIV test performed using the format MMDDYYYY;
(l) Results of CD4+ cell counts and CD4+%;
(m) Results of viral load testing;
(n) Results of PCR, HIV culture, HIV antigen and HIV antibody, if performed;
(o) Results of TB testing, if available;
(p) Any documented HIV negative test, if available;
(q) History of PrEP or PEP treatment, if available;
(r) Antiretroviral treatment, if available;
(s) HIV status of the person's partner, spouse or children, as applicable.
(t) Opportunistic infections diagnosed; and
(u) Date of onset of illness.

(6) A report of AIDS shall be made whether or not the patient has been previously reportedas having an HIV infection.

(7) If the patient has not been previously reported as having an HIV infection, the AIDS report shall also serve as the report of HIV infection.

Section 17. Sexually Transmitted Disease (STD). (1) Notification of a probable diagnosis ofan STD as specified in subsection (4) or (7) of this section shall be made.

(2) The report shall provide:
(a) Pregnancy status; and
(b) Clinical, epidemiologic, laboratory and treatment information pertinent to the disease.

(3) Upon a laboratory test result that indicates infection with an agent associated with one (1) or more of the diseases or conditions specified in subsection (4) or (7) of this section, a medical laboratory shall report to the Kentucky Department for Public Health information required by Section 5(6)(b) of this administrative regulation.

(4) Sexually Transmitted Diseases Requiring Priority Notification. A report of the followingshall be considered priority and shall be made within one (1) business day:
(a) Each pregnant female who has tested positive for syphilis regardless of stage; or
(b) Syphilis - primary, secondary or early latent.

(5) Upon receipt of a report for a disease or condition specified in subsection (4) of this section, a local health department shall:
(a) Investigate the report;
(b) Carry out public health protection measures to address the disease or condition; and
(c) Forward the report to the Kentucky Department for Public Health within one (1) businessday.

(6) The local health department may seek assistance from the Kentucky Department for Public Health.

(7) Sexually Transmitted Diseases Requiring Routine Notification. A report of the followingshall be considered routine and shall be made within five (5) business days:
(a) Chancroid;
(b) Chlamydia trachomatis infection;

(c) Gonorrhea;
(d) Granuloma inguinale;
(e) Lymphogranuloma venereum; or
(f) Syphilis, other than primary, secondary, early latent or congenital.
(8) Upon receipt of a report for a disease or condition specified in subsection (7) of this section, a local health department shall:
(a) Make a record of the report using Form EPID 200, Kentucky Reportable Disease Form;
(b) Forward the report to the Kentucky Department for Public Health within five (5) businessdays; and
(c) Render assistance if requested by the reporting entity or the Kentucky Department for Public Health.

Section 18. Tuberculosis. (1) A pharmacist shall give notice if two (2) or more of the following medications used for the initial treatment of active tuberculosis are dispensed to an inpatient in a health facility or to an ambulatory patient in a health facility or a pharmacy:

(a) Ethambutol;
(b) Isoniazid;
(c) Pyrazinamide; and
(d) Rifampin or rifabutin.

(2)(a) A report of tuberculosis shall be considered priority and shall be reported to the localhealth department serving the county in which the patient resides.
(b) If the local health department cannot be reached, notification shall be given to the Kentucky Department for Public Health.

(3) The report shall include:
(a) Information required in Section 5(6)(b) of this administrative regulation; and
(b) Names of the medications dispensed.

Section 19. Asbestosis, Coal Worker's Pneumoconiosis, and Silicosis. (1) A health professional shall report a diagnosis of the following to the Kentucky Department for Public Health within three (3) months of diagnosis:

(a) Asbestosis;
(b) Coal worker's pneumoconiosis; or
(c) Silicosis.

(2) A report required under this section shall include the information required in Section5(6)(b).

Section 20. Reporting of Communicable Diseases in Animals. (1) A diagnosis in an animalof a condition known to be communicable to humans, except for rabies, shall require routine notification.

(2) A veterinarian shall report the diagnosis within five (5) business days to the local health department serving the county in which the animal is located.
(3) If a laboratory test indicates infection of an animal with an agent associated with a condition known to be communicable to humans, the director of a medical laboratory shall report theresult to the local health department serving the county in which the animal is located within five (5) business days.

(4) The local health department receiving the report shall:
(a) Investigate the report;
(b) Carry out public health protection measures for the control of communicable diseases; and
(c) Forward the report to the Kentucky Department for Public Health within five (5) business days.
(5) The local health department may seek assistance from the Kentucky Department for Public Health.

Section 21. Kentucky Public Health Advisory. (1) If the Secretary of the Cabinet for Health and Family Services or the Commissioner of the Department for Public Health determines that a disease not presently listed in this administrative regulation requires reporting, the secretary or commissioner shall issue a Kentucky Public Health Advisory.

(2) The Kentucky Public Health Advisory shall include:
(a) Date and time the advisory is issued;
(b) A unique number to identify the advisory;
(c) Names for the disease or condition;
(d) A description of the disease or condition;
(e) Recommendations for health professionals, health facilities and laboratories; and
(f) Notification requirements including:
1. The notification time interval; and
2. Methods for notification.
(3) The duty to report by health professionals, health facilities and laboratories pursuant toa Kentucky Public Health Advisory shall begin upon receipt of the advisory and shall remain in effect until the advisory is rescinded by order of the secretary or the commissioner.

Section 22. Penalty. If the cabinet has cause to believe that a physician willfully neglects or refuses to notify the cabinet in accordance with this administrative regulation, pursuant to KRS 214.990(1) the cabinet shall make a referral to the appropriate professional licensing board.

Section 23. Incorporation by Reference. (1) The following material is incorporated by reference:

(a) "EPID 200, Kentucky Reportable Disease Form", 4/2020;
(b) "EPID 250, Kentucky Reportable MDRO Form", 10/2000;
(c) "EPID 394, Kentucky Reportable Disease Form, Hepatitis Infection in Pregnant Women or Child (aged five (5) years or less)", 9/2020;
(d) "EPID 399, Perinatal Hepatitis B Prevention Form for Infants", 6/2020;
(e) "Adult HIV Confidential Case Report Form", 11/2019; and
(f) "Pediatric HIV Confidential Case Report Form", 11/2019.
(2) This material may be inspected, copied or obtained, subject to applicable copyright law, at the Department for Public Health, 275 East Main Street, Frankfort, Kentucky 40621, Mondaythrough Friday, 8 a.m. to 4:30 p.m. (CDS-2; 1 Ky.R. 187; eff. 12-11-1974; Am. 2 Ky.R. 464; eff.4-14-1976; 11 Ky.R. 1518; 1786; eff. 6-4-1985; 16 Ky.R. 663; 1185; eff. 11-29-1989; 21 Ky.R. 128; eff. 8-17-1994; 23 Ky.R. 3119; 3597; 4131; eff. 6-16-1997; 27 Ky.R. 1099; 1489; eff. 12-21-2000; 29 Ky.R. 812; 1273; eff. 10-16-2002; 31 Ky.R. 873; eff. 1-4-2005; 41 Ky.R. 1213; 1674; eff. 2-26-2015; 43 Ky.R. 122, 568; eff, 11-16-2016; 47 Ky.R. 200, 1039; eff. 12-15-2020.)

211.180 Functions of cabinet in the regulation of certain health matters -- Inspection fees -- Hearing.

(1) The cabinet shall enforce the administrative regulations promulgated by the secretary of the Cabinet for Health and Family Services for the regulation and control of the matters set out below and shall formulate, promote, establish and execute policies, plans and comprehensive programs relating to all matters ofpublic health, including but not limited to the following matters:

(a) Detection, prevention and control of communicable diseases, chronic and degenerative diseases, dental diseases and abnormalities, occupational diseases and health hazards peculiar to industry, home accidents and health hazards, animal diseases which are transmissible to man and other diseases and health hazards that may be controlled;

(b) The adoption of regulations specifying the information required in and aminimum time period for reporting a sexually transmitted disease. In adoptingthe regulations the cabinet shall consider the need for information, protection for the privacy and confidentiality of the patient and the practical ability of persons and laboratories to report in a reasonable fashion. The cabinet shall require reporting of physician-diagnosed cases of acquired immunodeficiency syndrome based upon diagnostic criteria from the Centers for Disease Control and Prevention of the United States Public Health Service. No later than October 1, 2004, the cabinet shall require reporting of cases of human immunodeficiency virus infection by reporting of the name and other relevant data as requested by the Centers for Disease Control and Prevention and as further specified in KRS 214.645. Nothing in this section shall be construed toprohibit the cabinet from identifying infected patients when and if an effective cure for human immunodeficiency virus infection or any immunosuppression caused by human immunodeficiency virus is found or a treatment which would render a person noninfectious is found, for the purposes of offering or making the cure or treatment known to the patient;

(c) The control of insects, rodents and other vectors of disease; the safe handling of food and food products; the safety of cosmetics; the control of narcotics, barbiturates and other drugs as provided by law; the sanitation of schools, industrial establishments and other public and semipublic buildings; the sanitation of state and county fairs and other similar public gatherings; the sanitation of public and semipublic recreational areas; the sanitation of public rest rooms, trailer courts, hotels, tourist courts and other establishments furnishing public sleeping accommodations; the review, approval, or disapproval of plans for construction, modification or extension of equipmentrelated to food-handling in food-handling establishments; the licensure ofhospitals; and the control of other factors, not assigned by law to another agency, as may be necessary to insure a safe and sanitary environment;

(d) The construction, installation and alteration of any on-site sewage disposal system, except for a system with a surface discharge.

(e) Protection and improvement of the health of expectant mothers, infants, preschool and school-age children; and

(f) Protection and improvement of the health of the people through better nutrition.

(2) (a) The secretary shall have authority to establish by regulation a schedule of reasonable fees. The total fees for permitting and inspection:

1. Shall be the total of the operational and administrative costs of the programs to the cabinet and to agencies as defined in KRS 211.185;
2. Beginning on March 17, 2020, until December 31, 2020, shall not increase more than twenty-five percent (25%) of the fee amount on March 17, 2020; and
3. Beginning on or after January 1, 2021, shall not increase more than five percent (5%) for each year thereafter.

(b) The fees shall include travel pursuant to state regulations for travel reimbursement, to cover the costs of inspections of manufacturers, retailers and distributors of consumer products as defined in the Federal Consumer Product Safety Act, 15 U.S.C. secs. 2051 et seq.; 86 Stat. 1207 et seq. or amendments thereto and of youth camps for the purpose of determiningcompliance with the provisions of this section and the regulations adopted by the secretary pursuant thereto.

(c) Fees collected by the secretary shall be deposited in the State Treasury and credited to a revolving fund account for the purpose of carrying out theprovisions of this section. The balance of the account shall lapse to the generalfund at the end of each biennium.

(3) Any administrative hearing conducted under authority of this section shall be conducted in accordance with KRS Chapter 13B.

Effective: March 17, 2020
History: Amended 2020 Ky. Acts ch. 21, sec. 5, effective March 17, 2020. – Amended 2019 Ky. Acts ch. 104, sec. 10, effective July 1, 2019. -- Amended 2018 Ky. Acts ch. 136, sec. 7, effective July 1, 2019. -- Amended 2005 Ky. Acts ch. 99, sec. 345, effective June 20, 2005. -- Amended 2004 Ky. Acts ch. 102, sec. 1, effective July 13, 2004. -- Amended 2000 Ky. Acts ch. 432, sec. 2, effective July 14, 2000. – Amended 1998 Ky. Acts ch. 426, sec. 289, effective July 15, 1998. -- Amended 1996 Ky. Acts ch. 318, sec. 104, effective July 15, 1996. -- Amended 1990 Ky. Acts ch. 443, sec. 44, effective July 13, 1990. -- Amended 1982 Ky. Acts ch. 247, sec. 9, effective July 15, 1982; and ch. 392, sec. 5, effective July 15, 1982. -- Amended 1978 Ky. Acts ch. 117, sec. 18, effective February 28, 1980. -- Amended 1976 Ky. Acts ch. 299, sec. 42. -- Amended 1974 Ky. Acts ch. 74, Art. VI, sec. 107(17). -- Amended 1972 (1st Extra. Sess.) Ky. Acts ch. 3, sec. 29. -- Created 1954 Ky. Acts ch. 157, sec. 12, effective June 17, 1954.
2020-2022 Budget Reference. See State/Executive Branch Budget, 2020 Ky. Acts ch. 92, Pt. I, G, 5, (3) at 884.

KRS 214.010 Physicians and heads of families to report diseases to local board of health.

Every physician and advanced practice registered nurse shall report all diseases designated by administrative regulation of the Cabinet for Health and Family Services as reportable which are under his or her special treatment to the local board of health of his or her county and every head of a family shall report any of the designated diseases, when known by him or her to exist in his or her family, to the local board or to some member thereof in accordance with the administrative regulations of the Cabinet for Health and Family Services.

Effective: July 15, 2010
History: Amended 2010 Ky. Acts ch. 85, sec. 72, effective July 15, 2010. -- Amended 2005 Ky. Acts ch. 99, sec. 446, effective June 20, 2005. -- Amended 1998 Ky. Acts ch. 426, sec. 393, effective July 15, 1998. -- Amended 1974 Ky. Acts ch. 74, Art. VI, sec. 107(1) and (3). -- Amended 1968 Ky. Acts ch. 87, sec. 5. -- Recodified 1942 Ky. Acts ch. 208, sec. 1, effective October 1, 1942, from Ky. Stat. sec. 2055.

KRS 214.020 Cabinet to adopt regulations and take other action to prevent spread of disease.

(1) When the Cabinet for Health and Family Services determines that an infectious or contagious disease will invade this state, it shall take necessary action andpromulgate administrative regulations under KRS Chapter 13A to prevent the introduction or spread of such infectious or contagious disease or diseases within this state.
(2) Any administrative regulation promulgated under the authority of this sectionshall:
  (a) Be in effect no longer than thirty (30) days if the administrative regulation:
    1. Places restrictions on the in-person meeting or functioning of the following:
      a. Elementary, secondary or postsecondary educational institutions.
      b. Private businesses or non-profit organizations;
      c. Political, religious or social gatherings.
      d. Places of worship; or
      e. Local governments; or
    2. Imposes mandatory quarantine or isolation requirements;
  (b) Include the penalty, appeal and due process rights for violations of theadministrative regulation; and
  (c) Contain the public hearing and written comment period notice required byKRS 13A.270.

Effective: February 2, 2021
History: Amended 2021 Ky. Acts ch. 7, sec. 22, effective February 2, 2021. -- Amended 2005 Ky. Acts ch. 99, sec. 447, effective June 20, 2005. – Amended 1998 Ky. Acts ch. 426, sec. 394, effective July 15, 1998. -- Amended 1974 Ky.Acts ch. 74, Art. VI, sec. 107(1). -- Amended 1968 Ky. Acts ch. 87, sec. 6. – Recodified 1942 Ky. Acts ch. 208, sec. 1, effective October 1, 1942, from Ky. Stat. sec. 2049, 2056.

214.990 Penalties

(1) Every head of a family who willfully fails or refuses and every physician whofails or refuses to comply with KRS 214.010 shall be guilty of a violation for each day he neglects or refuses to report. Repeated failure to report is sufficient cause for the revocation of a physician's certificate to practice medicine in this state.
(2) Any person who willfully violates any administrative regulation promulgated under KRS Chapter 13A by the Cabinet for Health and Family Services underKRS 214.020 shall be guilty of a Class B misdemeanor.
(3) Any physician or other person legally permitted to engage in attendance upona pregnant woman during pregnancy or at delivery who fails to exercise duediligence in complying with KRS 214.160 and 214.170 shall be guilty of a violation.
(4) Any person who violates any of the provisions of KRS 214.280 to 214.310 shall be guilty of a Class A misdemeanor.
(5) Any person who violates any provision of KRS 214.034 or KRS 158.035 shallbe guilty of a Class B misdemeanor.
(6) Any person who violates any provision of KRS 214.420 shall be guilty of a violation. Each violation

shall constitute a separate offense.

(7) Any person who knowingly violates any provision of KRS 214.452 to 214.466shall be guilty of a Class D felony. Each violation shall constitute a separate offense.

Effective: February 2, 2021
History: Amended 2021 Ky. Acts ch. 7, sec. 23, effective February 2, 2021. Amended 2005 Ky. Acts ch. 99, sec. 470, effective June 20, 2005. – Amended 1998 Ky. Acts ch. 426, sec. 415, effective July 15, 1998. -- Amended 1992 Ky. Acts ch. 463, sec. 23, effective July 14, 1992. -- Amended 1988 Ky. Acts ch. 76, sec. 10, effective July 15, 1988. -- Amended 1986 Ky. Acts ch. 294, sec. 4, effective July 15, 1986. -- Amended 1984 Ky. Acts ch. 113, sec. 5, effective July 13, 1984. -- Amended 1978 Ky. Acts ch. 384, sec. 65, effective June 17, 1978. -- Amended 1974 Ky. Acts ch. 74, Art. VI, sec. 107(3). -- Amended 1968 Ky. Acts ch. 87, sec. 7. -- Amended 1962 Ky. Acts ch. 95, sec. 5. -- Amended 1954 Ky. Acts ch. 223, sec. 5. -- Recodified 1942 Ky. Acts ch. 208, sec. 1, effective October 1, 1942, from Ky. Stat. secs. 2049, 2055a, 2056, 2062b-3, 2062b-8, 2062d-9, 2635c-12, 3909, 4615, G.S., ch. 102, Art. II, sec. 8.

HIPAA – Disclosures for Public Health Activities

Downloaded from the Department for Health and Human Services Office Website
https://www.hhs.gov/hipaa/for-professionals/privacy/guidance/disclosures-public-health-activities/index.html

OCR HIPAA Privacy
December 3, 2002
Revised April 3, 2003

DISCLOSURES FOR PUBLIC HEALTH ACTIVITIES

[*45 CFR 164.512(b)*]

Background

The HIPAA Privacy Rule recognizes the legitimate need for public health authorities and others responsible for ensuring public health and safety to have access to protected health information to carry out their public health mission. The Rule also recognizes that public health reports made by covered entities are an important means of identifying threats to the health and safety of the public at large, as well as individuals. Accordingly, the Rule permits covered entities to disclose protected health information without authorization for specified public health purposes.

How the Rule Works

General Public Health Activities. The Privacy Rule permits covered entities to disclose protected health information, without authorization, to public health authorities who are legally authorized to receive such reports for the purpose of preventing or controlling disease, injury, or disability. This would include, for example, the reporting of a disease or injury; reporting vital events, such as births or deaths; and conducting public health surveillance, investigations, or interventions. See 45 CFR 164.512(b)(1)(i). Also, covered entities may, at the direction of a public health authority, disclose protected health information to a foreign government agency that is acting in collaboration with a public health authority. See 45 CFR 164.512(b)(1)(i). Covered entities who are also a public health authority may use, as well as disclose, protected health information for these public health purposes. See 45 CFR 164.512(b)(2).

A "public health authority" is an agency or authority of the United States government, a State, a territory, a political subdivision of a State or territory, or Indian tribe that is responsible for public health matters as part of its official mandate, as well as a person or entity acting under a grant of authority from, or under a contract with, a public health agency. See 45 CFR 164.501. Examples of a public health authority include State and local health departments, the Food and Drug Administration (FDA), the Centers for Disease Control and Prevention, and the Occupational Safety and Health Administration (OSHA).

Generally, covered entities are required reasonably to limit the protected health information disclosed for public health purposes to the minimum amount necessary to accomplish the public health purpose. However, covered entities are not required to make a minimum necessary determination for public health disclosures that are made pursuant to an individual's authorization, or for disclosures that are required by other law. See 45 CFR 164.502(b). For disclosures to a public health authority, covered entities may reasonably rely on

- Conducting post-marketing surveillance.

See 45 CFR 164.512(b)(1)(iii). The "person" subject to the jurisdiction of the FDA does not have to be a specific individual. Rather, it can be an individual or an entity, such as a partnership, corporation, or association. Covered entities may identify the party or parties responsible for an FDA-regulated product from the product label, from written material that accompanies the product (know as labeling), or from sources of labeling, such as the Physician's Desk Reference.

- Persons at risk of contracting or spreading a disease. A covered entity may disclose protected health information to a person who is at risk of contracting or spreading a disease or condition if other law authorizes the covered entity to notify such individuals as necessary to carry out public health interventions or investigations. For example, a covered health care provider may disclose protected health information as needed to notify a person that (s)he has been exposed to a communicable disease if the covered entity is legally authorized to do so to prevent or control the spread of the disease. See 45 CFR 164.512(b)(1)(iv).

- Workplace medical surveillance. A covered health care provider who provides a health care service to an individual at the request of the individual's employer, or provides the service in the capacity of a member of the employer's workforce, may disclose the individual's protected health information to the employer for the purposes of workplace medical surveillance or the evaluation of work-related illness and injuries to the extent the employer needs that information to comply with OSHA, the Mine Safety and Health Administration (MSHA), or the requirements of State laws having a similar purpose. The information disclosed must be limited to the provider's findings regarding such medical surveillance or work-related illness or injury. The covered health care provider must provide the individual with written notice that the information will be disclosed to his or her employer (or the notice may be posted at the worksite if that is where the service is provided). See 45 CFR 164.512(b)(1)(v).

Frequently Asked Questions

To see Privacy Rule FAQs, click the desired link below:

FAQs on Public Health Uses and Disclosures

FAQs on ALL Privacy Rule Topics

(You can also go to http://answers.hhs.gov/cgi-bin/hhs.cfg/php/enduser/std_alp.php, then select "Privacy of Health Information/HIPAA" from the Category drop down list and click the Search button.)

OCR HIPAA Privacy
December 3, 2002
Revised April 3, 2003

(You can also go to http://answers.hhs.gov/cgi-bin/hhs.cfg/php/enduser/std_alp.php, then select "Privacy of Health Information/HIPAA" from the Category drop down list and click the Search button.)

Pages 223-225 Image Source:
https://www.hhs.gov/hipaa/forprofessionals/privacy/guidance/disclosures-public-health-activities/index.html

Appendix Q: References

Reference Books and Journal Articles

- Heymann DL, ed. *Control of Communicable Diseases Manual*. 21st ed. Washington, DC: American Public Health Association, 2022.

- Kimberlin DW, ed. *Red Book: 2021-2024 Report of the Committee on Infectious Diseases*. 32nd ed. Elk Grove Village, IL. American Academy of Pediatrics; 2021.

- Kentucky Department for Public Health, *Kentucky Reportable Disease Desk Reference,* 2006. https://chfs.ky.gov/agencies/dph/dehp/idb/Documents/RDDR2006_11062007pdf.pdf

- Council to Improve Foodborne Outbreak Response (CIFOR). *Guidelines for Foodborne Disease Outbreak Response*. Atlanta: Council of State and Territorial Epidemiologists, 2020. https://cifor.us/downloads/clearinghouse/CIFOR-Guidelines-Complete-third-Ed.-FINAL.pdf

- Gregg, MB, ed. *Field Epidemiology*. 3rd ed. New York, NY: Oxford University Press, 2008.

- Centers for Disease Control and Prevention (CDC). Diagnosis and Management of Foodborne Illnesses: A Primer for Physicians and Other Health Care Professionals. *MMWR* 2004;53(No. RR-4):1-33.

- CDC. "Updated Norovirus Outbreak Management and Disease Prevention Guidelines:" *MMWR* 2011;60(No. RR-3):1-15.

- CDC. Surveillance for Foodborne Disease Outbreaks -- United States, 2009-2015. *MMWR* 2018 Jul 27;67(10):1-11.

- International Association for Food Protection (IAFP). Procedures to Investigate Foodborne Illness, 6th ed. Springer, NY. IAFP, 2011.

- Food and Drug Administration (FDA). Employee Health and Personal Hygiene Handbook https://www.fda.gov/food/retail-food-industryregulatory-assistance-training/retail-food-protection-employee-health-and-personal-hygiene-handbook

- Surveillance for Waterborne Disease Outbreaks and Other Health Events Associated with Recreational Water --- United States, 2007-2008. *MMWR* 2011;60(SS12); 1-32.

- Surveillance for Waterborne Disease and Outbreaks Associated with Drinking Water – United States, 2013-2014. *MMWR* 2017 Nov 10; 66(44); 1216-1221.

- Cryptosporidiosis Surveillance – United States, 2011-2012. *MMWR* 2015 May 1; 64(3); 1-14.

- Giardiasis Surveillance – United States, 2011-2012. *MMWR* 2015 May 1; 64(3);15-25.

Reference List of Infectious Disease Information on the Internet

Note: Care should be used when referencing materials from the Internet because misinformation may be present from any number of unofficial or independent sites. The web sites listed below are from state and federal government sources.

- **Kentucky Department for Public Health (KDPH), Division of Epidemiology and Health Planning - Reportable Disease Website**
  Includes information on reportable diseases
  https://www.chfs.ky.gov/agencies/dph/dehp/idb/Pages/diseasesummary.aspx
  Five-year disease summary
  https://www.chfs.ky.gov/agencies/dph/dehp/idb/Documents/RDSSummaryTable20172021.pdf

- **KDPH Epidemiology Rapid Response Team**
  Information on Epi Rapid Response Team Membership and Training
  https://chfs.ky.gov/agencies/dph/dphps/phpb/Pages/rapid-response.aspx

- **KDPH Division of Public Health Protection and Safety**
  Information on Environmental Management and Food Safety
  https://chfs.ky.gov/agencies/dph/dphps/Pages/default.aspx

- **KDPH Division of Laboratory Services**
  Information on responding to a foodborne or waterborne outbreak and lab forms for download
  https://chfs.ky.gov/agencies/dph/dls/Pages/default.aspx

- **Centers for Disease Control and Prevention (CDC) – OutbreakNet Site**
  Information on responding to a foodborne or waterborne outbreak
  https://www.cdc.gov/foodsafety/outbreaks/index.html

- **National Outbreak Reporting System (NORS) Training**

  Training on how to enter data into the NORS system
  https://www.cdc.gov/nors/training/index.html

- **Centers for Disease Control and Prevention (CDC) – Constructing an Epidemic Curve**

  Training on how to construct an epidemic curve
  https://www.cdc.gov/training/quicklearns/createepi/

- **University of North Carolina Center for Public Health Preparedness – *FOCUS on Field Epidemiology***

  Newsletters that include information on how to conduct an outbreak investigation
  https://sph.unc.edu/epid/focus/

  Instructions on **how to construct an epidemic curve in Excel**
  https://sph.unc.edu/nciph/epi-teams-training-epi-curve-activity/

- **Council to Improve Foodborne Outbreak Response – Guidelines for Foodborne Disease Outbreak Response**

  The Guidelines for Foodborne Outbreak Response describe the overall approach to foodborne disease outbreaks, including preparation, detection, investigation, control, and follow-up. The Guidelines also describe the roles of all key organizations in foodborne disease outbreaks. The Guidelines are targeted at local, state and federal agencies that are responsible for preventing and managing foodborne disease.
  https://cifor.us/clearinghouse/cifor-guidelines-for-foodborne-disease-outbreak-response

- **Council to Improve Foodborne Outbreak Response – CIFOR Food Safety Clearinghouse – Search**

  CIFOR'S Food Safety Clearinghouse is an online repository offering food safety resources developed by state and local health departments, laboratories, academic institutions, non-governmental organizations and governmental agencies in order to facilitate knowledge sharing across jurisdictions. CIFOR is the Council to Improve Foodborne Outbreak Response co-chaired by the Council of State and Territorial Epidemiologists (CSTE) and the National Association of County and City Health Officials (NACCHO) with support from the Centers for Disease Control and Prevention (CDC).
  http://cifor.us/clearinghouse

- **Council to Improve Foodborne Outbreak Response – CIFOR Foodborne Illness Response Guidelines for Owners, Operators and Managers of Food Establishments (CIFOR Industry Guidelines)**

  The CIFOR Industry Guidelines provide step-by-step approaches to important aspects of outbreak response such as preparation, detection, investigation, control and follow-up.

The CIFOR Industry Guidelines also describe key information to assist Industry in understanding what to expect when first notified of potential illnesses and provides tools to help guide Industry through the process. Additionally, the CIFOR Industry Guidelines serve to provide Industry with a better understanding of how efforts to implement recommended and/or required safe food practices on a day-to-day basis can inform and support a foodborne outbreak investigation.
https://cifor.us/clearinghouse/cifor-foodborne-illness-response-guidelines-for-owners-operators-and-managers-of-food-establishments

- **Massachusetts Department for Public Health, Foodborne Illness Investigations and Control Reference Manual**

  Reference manual for investigating foodborne outbreaks. Chapters 3 and 4 of the Kentucky Manual were adapted from the Massachusetts Manual.
  https://www.mass.gov/doc/foodborne-illness-investigation-and-control-reference-manual-introductory-information-0/download

- **Wisconsin Division of Public Health, Foodborne and Waterborne Disease Outbreak Investigation Manual**

  Reference manual for investigating foodborne and waterborne outbreaks. The overall outline of the Kentucky Manual was adapted from the Wisconsin Manual.
  https://www.dhs.wisconsin.gov/publications/p44722.pdf

- **Emerging Infectious Diseases Homepage**

  Current scientific articles on emerging diseases
  https://wwwnc.cdc.gov/eid/

- **National Food Safety Website**

  Consumer information related to food safety including recalls
  https://www.foodsafety.gov/

- **U.S. Dept. of Agriculture (USDA)**

  Current topics related to food issues
  https://www.fsis.usda.gov/

- **U.S. Environmental Protection Agency (EPA) – Water Topics**

  Water-related issues, waterborne disease, regulations
  https://www.epa.gov/environmental-topics/water-topics

- **U.S. Environmental Protection Agency (EPA) – Office of Ground Water and Drinking Water**

  Consumer site for current ground water and drinking water information, publications, and regulations

https://www.epa.gov/ground-water-and-drinking-water

- **U.S. Food & Drug Administration (FDA) – FDA News and Publications**
  Press releases, publications and issues related to current food issues
  https://www.fda.gov/news-events

- **US. Food & Drug Administration (FDA) – FDA News and Publications**
  Bad Bug Book
  Listing of foodborne and waterborne pathogens and the incubation period, duration and symptoms of illness. Go to https://www.fda.gov/food/foodborne-pathogens/bad-bug-book-second-edition

- **Food Emergency Response Network (FERN)**
  A network of food testing laboratories at the local, state and federal levels for response to emergencies involving biological, chemical or radiological contamination of food.
  https://www.fernlab.org/

- **U.S. Food & Drug Administration (FDA) – FDA Oral Culture Learner Project, Educational Materials for Food Employees**
  Website includes posters and storyboards designed to promote employee health and proper food handling techniques. The posters, designed to print on standard 8.5' x 11' paper cover three critical principles in safe food handling: 1) Using gloves or utensils to handle ready to eat foods, 2) Not working when ill, 3) proper hand washing.
  https://rmfoodsafety.org/wp-content/uploads/2016/12/FDAOralCultureLearnerProject.pdf

- **MEDLINE**
  Extensive collection of current published medical information, free Med-line searches
  https://www.nlm.nih.gov/

- **Kentucky Environmental Public Health Tracking**
  Gateway to access many data products from the Kentucky Department for Public Health. This site includes queryable datasets, interactive maps and links to other useful data websites.
  https://kyibis.mc.uky.edu/ehl/dataportal/Introduction.html

Mapping Resources:

- Policy Map: www.policymap.com
- Batchgeo: http://batchgeo.com/
- UDS Mapper: https://udsmapper.org/
- Community Commons: www.communitycommons.org

- Arc GIS: https://www.esri.com/en-us/arcgis/about-arcgis/overview?rsource=%2Fsoftware%2Farcgis
- QGIS: https://qgis.org/en/site/
- Open Street Mapping: https://www.openstreetmap.org/#map=4/38.01/-95.84

Public Health Data Resource Guide:

https://chfs.ky.gov/agencies/dph/Pages/dataresource.aspx

The Kentucky Public Health Data Resource Guide provides easy access to public health data sourced to a variety of Kentucky-specific health-related surveys, surveillance systems, and registries. The information provided on each data source includes types of data collected and data strengths and limitations. Contact information is provided for every resource and most contain web links for access to data available online.