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9/2013	Appendix G: Chain of Custody. Forms updated and example of completed form added (pg. 181)	9/2013	Lea Jacobsen
9/2013	Appendix H: Record of Complaint and Investigation. Example of completed form added.	9/2013	Jasie Logsdon Mark Reed Lea Jacobsen David Radle
9/2013	Appendix M: Kentucky Reportable Disease Statutes and Regulations. 214.990 Penalties Section added (pg. 244)	9/2013	Lea Jacobsen
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Manual Review and Maintenance

The Kentucky Foodborne and Waterborne Outbreak Investigation Manual will be reviewed on an 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.

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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

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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 M). 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. 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 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.

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

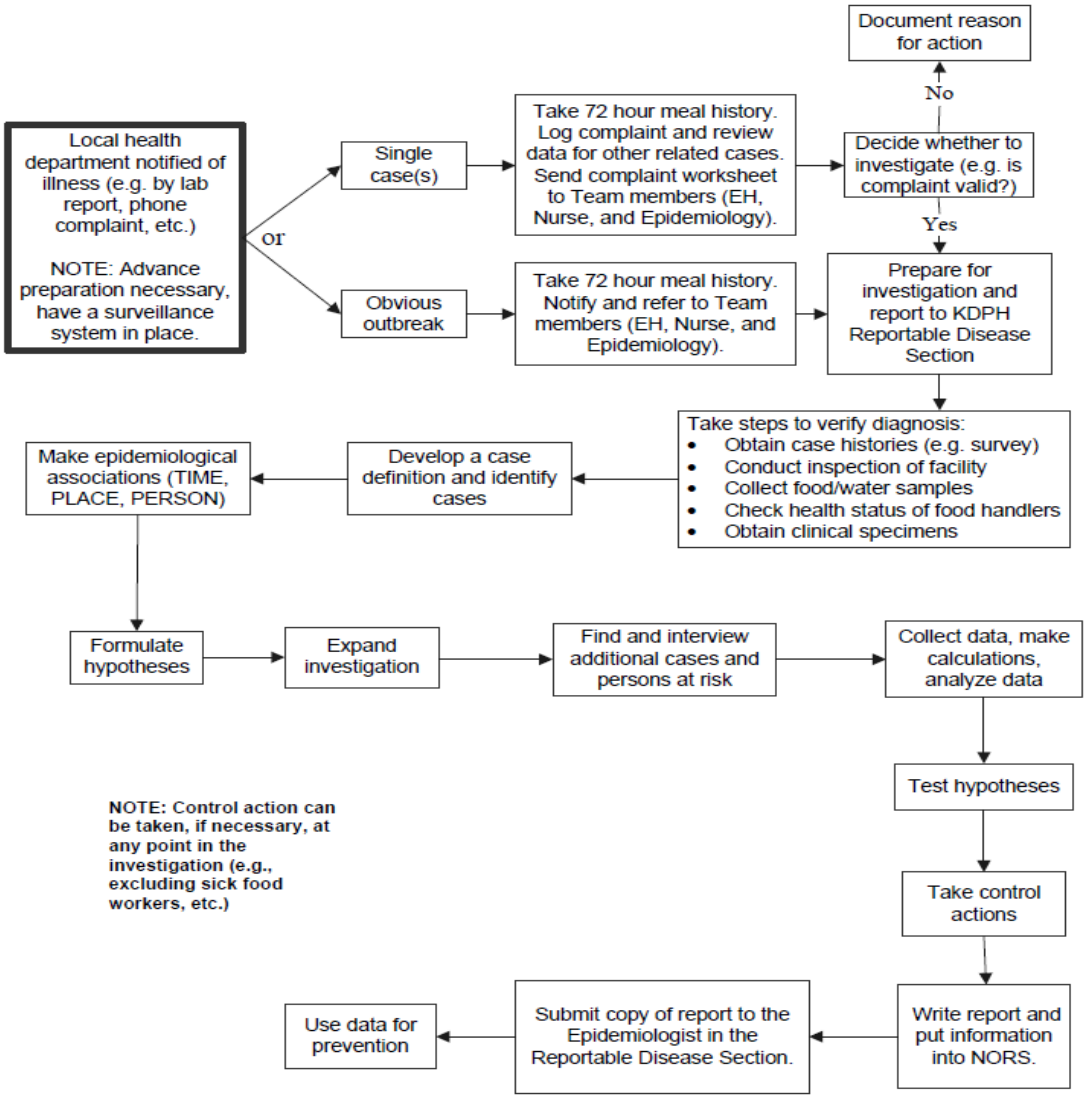
Once a foodborne or waterborne related disease has been reported, the outbreak team should respond quickly and appropriately. A listing of the steps in an outbreak investigation is included in this section. While not all steps may follow in the order listed, all should be considered in a proper investigation. 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, write a report, and enter into the National Outbreak Reporting System (NORS).

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



EH = Environmental Health
KDPH = Kentucky Department for Public Health
NORS = National Outbreak Reporting System

Adapted from Bryan et al 1988 and the Massachusetts Foodborne Illness Investigation and Control Reference Manual

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

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

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 seven to ten 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 it refrigerated. Arrangements should be made to collect and analyze the food samples pending further investigation. Arrangements must be made by the LHD to collect and hold the food items under refrigeration. Questions regarding sample collecting/testing of food samples should be directed to the KDPH 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 food sources, etc.)
- Name of physician (if different than reporter), address, telephone number

General Definition of a Foodborne Outbreak:

2 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

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 seven to ten 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. Samples requiring chain of custody precautions are to be iced and taken to the nearest certified lab within **6 hours** of collection. 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 food sources, etc.)
- Name of physician (if different than reporter), address, telephone number

General Definition of a Waterborne Outbreak:

2 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**: 2 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**: 2 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; and/or
3) require increased communication between private and public partners, the media and the public.

TRIGGERS:

Very large outbreak

- 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 PFGE patterns over a short period of time
- Multiple states reporting lab confirmed cases with matching PFGE 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*, etc.)
- Unusual symptoms or treatment response for a known pathogen

Intentional outbreak

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

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

Upon activation of the Epidemiology Rapid Response Team

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
- PFGE-indistinguishable isolates from apparently unrelated foods
- PFGE-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. PFGE 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

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
    - Preparedness Program Manager
    - Reportable Diseases Section Supervisor
    - Division of Public Health Protection and Safety
    - Food Safety Branch
    - Environmental Health Branch

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

    - Preparedness Program Manager
    - Reportable Diseases Section Supervisor
    - Division of Public Health Protection and Safety
        - Food Safety Branch
        - Environmental Health Branch
    - Regional Preparedness Coordinators
    - State Emergency Management Agency
        - Emergency Management Duty Officer
    - Bordering State Department of Health (if applicable)
        - State Health Officer
        - State Epidemiologist
        - Preparedness Program Manager
- Respective Local Healthcare Jurisdictions (that may be affected by the incident)
    - Heath Department Directors
    - Environmental Health Directors
    - Regional 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
- Where incident occurred
- Impacted area
- 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:

- 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

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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 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. 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.
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.

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 regards 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 LHD Nurse 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) 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 Pulsed Field Gel Electrophoresis (PFGE) testing.
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 Investigation Form).
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. 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.

21. Enter outbreak information into the National Outbreak Reporting System (NORS). See Appendix J for the NORS report form.

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 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 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 of investigation.**
6. Notify appropriate LHD administration/Public Health Director as necessary.
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 Pulsed Field Gel Electrophoresis (PFGE) testing.
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. (The KDPH Enteric Disease Investigation Form is located in Appendix I.)
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).)
16. Prepare nursing write-up for inclusion in final report.

2.6 Regional or LHD Sanitarian or Environmentalist

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 an inspection of the suspect food establishment if the definition of a foodborne/waterborne outbreak is met.
5. Interview all food preparation employees regarding the detailed preparation of the suspect food.
6. Interview the food manager regarding ill employees and any consumer complaints.
7. Share and coordinate interviews with other team members.
8. Collect and submit suspect food/water samples if available to the Kentucky Division of Laboratory Services. Food and/or water samples should be collected and submitted 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 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.**
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 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. Complete in full a DFS-216 Record of

Complaint and Investigation (See Appendix H). This will initiate a product trace back and/or recall if warranted.

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 samples must 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 recommended and can be found in Appendix G.

2.7 Regional Child Care Consultant

1. Alert the Regional Epidemiologist or the public health nurse of potential foodborne/waterborne disease outbreak in a child care center.
2. Alert the Early Childhood Mental Health Program Administrator at the KDPH of potential foodborne/waterborne disease outbreak in a child care center.
3. Collaborate with regional epidemiologist, nurse, and environmentalist to prepare and distribute information to local child care 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 child care center.
6. Educate child care 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 / 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 Epidemiology and Health Planning - 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. Activate state response team and potentially Department Operations Center when needed.
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.
10. Follow-up with Regional Epidemiologist on NORS.

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, 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.

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

1. Alert the State 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. Contact the Division of Laboratory Services for submission of food samples.
4. Contact the United States Department of Agriculture (USDA) Compliance Office if a meat or poultry product under federal-inspection is suspected.
5. Contact the United States Food and Drug Administration (FDA) if the food product under their regulatory authority is suspected.
6. Contact appropriate regulatory authorities in sister states, as warranted.
7. Where warranted, conduct/coordinate recall effectiveness checks with FDA.

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

1. Alert the State Division of Epidemiology and Health Planning – Reportable Disease Section that an investigation has been initiated.
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.

2.12 KDPH Division of Laboratory Services

1. Receive initial alert on the number and expected arrival time of food samples 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 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 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. Call 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 PFGE 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.

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

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

2.14 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. Will investigate as needed based on OIG guidelines.

2.15 CHFS Office of Communications

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 area who are familiar with public health and commonly cover your agency – 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. Familiarize yourself 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 affect communications are having on public feedback.

2.16 Kentucky Department of Corrections (KYDOC)

1. Will be notified by the KDPH Reportable Disease Section when a gastrointestinal illness is reported to the LHD by the correctional facility in the LHD district.
2. Ensures that the correctional facility and the LHD conduct investigations as needed based on the guidelines of KYDOC and LHD staff, respectively.

2.17 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 in accordance with the Incident Command System.

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.

2.18 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.

2.19 Kentucky Energy and Environment Cabinet

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

2.20 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.

2.21 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. Work closely with KDPH and local public health epidemiologists and laboratorians to identify illnesses and clusters of illness.

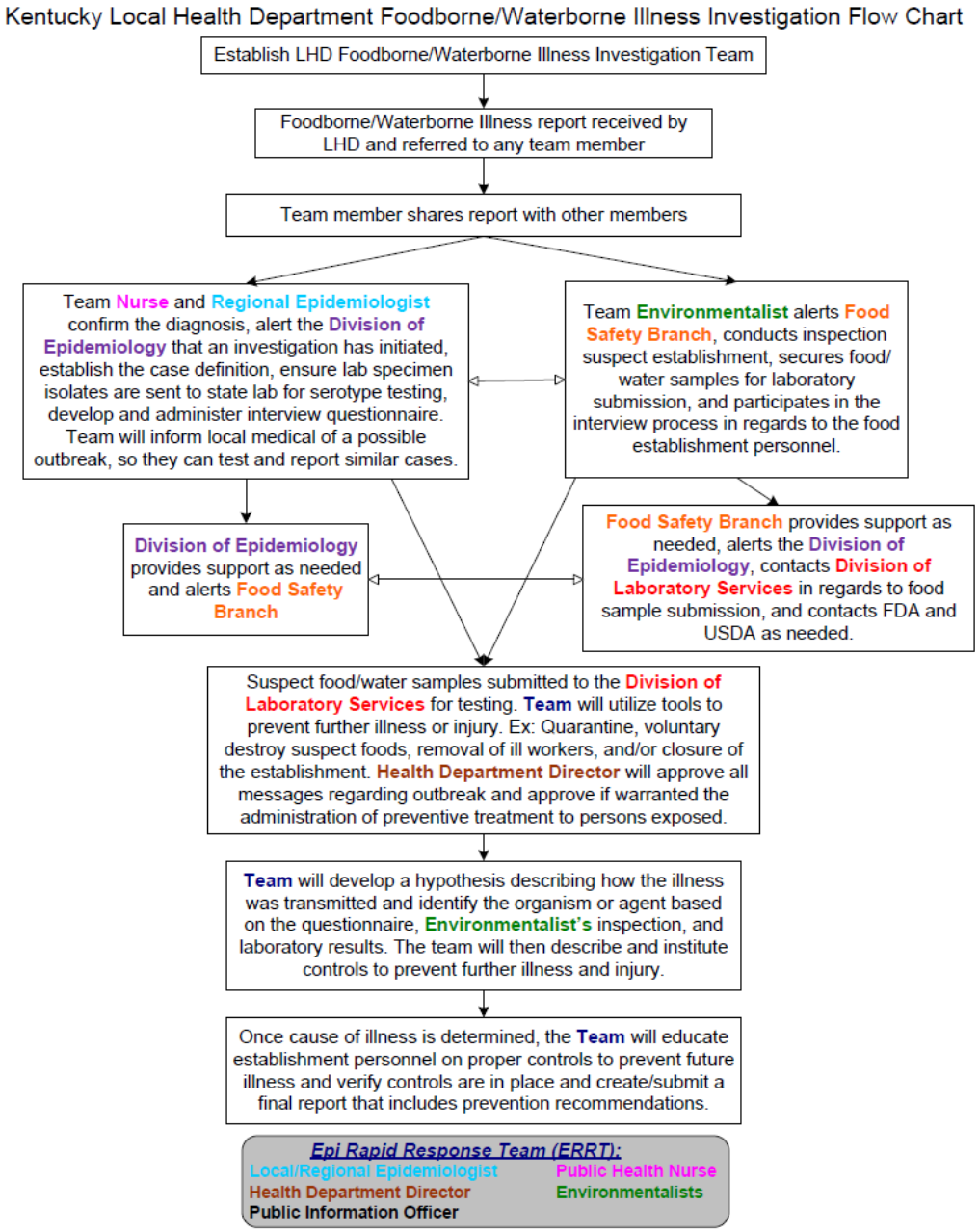
2.22 U.S. Food and Drug Administration

1. Coordinate a voluntary recall of FDA-regulated products that are linked to outbreaks of foodborne disease.
2. Conduct/coordinate recall effectiveness 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.

2.23 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.

Figure 2: Flowcharts for certain job titles and programs



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 diagnositc tests, symptoms, and the onset and duration of illness.

Confirm diagnosis with the medical provider

Contact the case(s) after conferring with the medical provider

Alert **KDPH Division of Epidemiology and Health Planning - Reportable Disease Section (502-564-3261)** of investigation

Notify appropriate LHD adminstration/**Public Health Director** as necessary

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

Encourage private labs to send laboratory isolates to the **Div. of Laboratory Services** for serotyping and Pulse Field Gel Electrophoresis (PFGE) testing.

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.

Administer questionnaire/investigation form (Appendix I: KPDH Enteric Disease Investigation Form)

Conduct meal history (72 hours).

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.

Formulate a tentative hypothesis and share hypothesis with **ERRT**.

Determine study design if necessary.

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 National Outbreak Reporting System (NORS) See appendix J 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 diagnositc tests, symptoms, and the onset and duration of illness.

Confirm diagnosis with the medical provider

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)** of investigation

Notify appropriate LHD adminstration/**Public Health Director** as necessary.

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

Encourage private labs to send laboratory isolates to the **Div. of Laboratory Services** for serotyping and Pulse Field Gel Electrophoresis (PFGE) testing.

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 Investigation Form)

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)

Prepare nursing write-up for inclusion in final report.

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** and **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 an inspection of the suspect food establishment if the definition of a foodborne/waterborne outbreak is met.

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**.

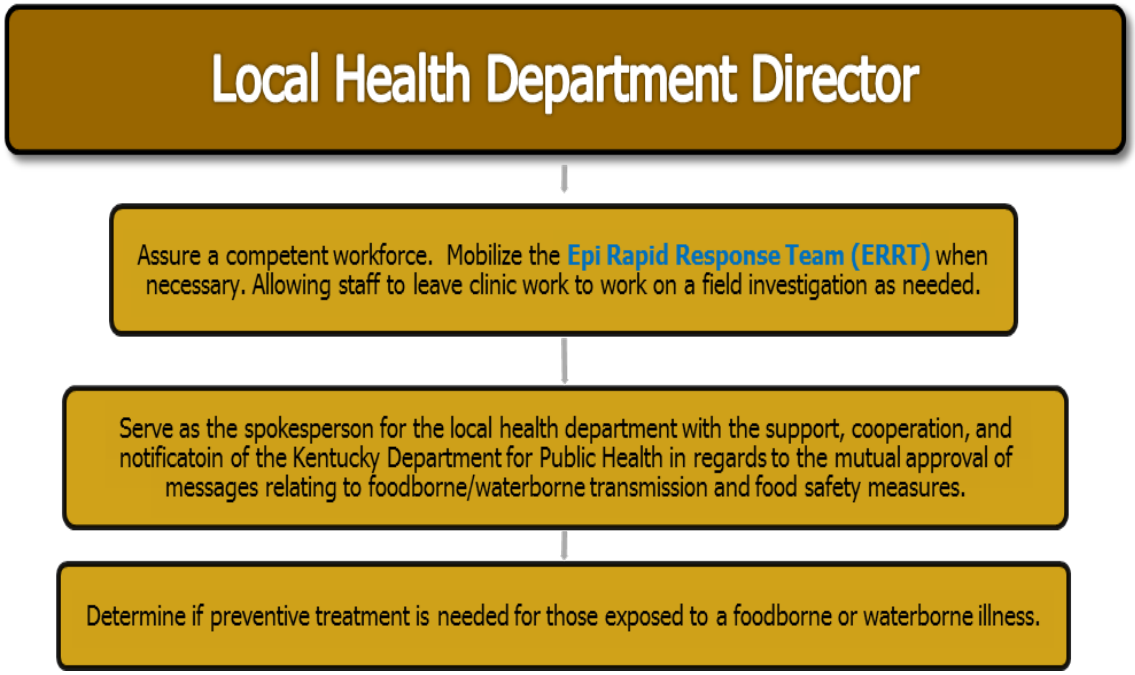
Collect and submit suspect food/water samples if abailable to the **Div. of Laboratory Services**. Food samples should be collected and submitted in accordance with the laboratory protocol (see collection sheet, Appendix E and Appendix F, as appropriate). Contact the **Division of Public Health Protection 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.**

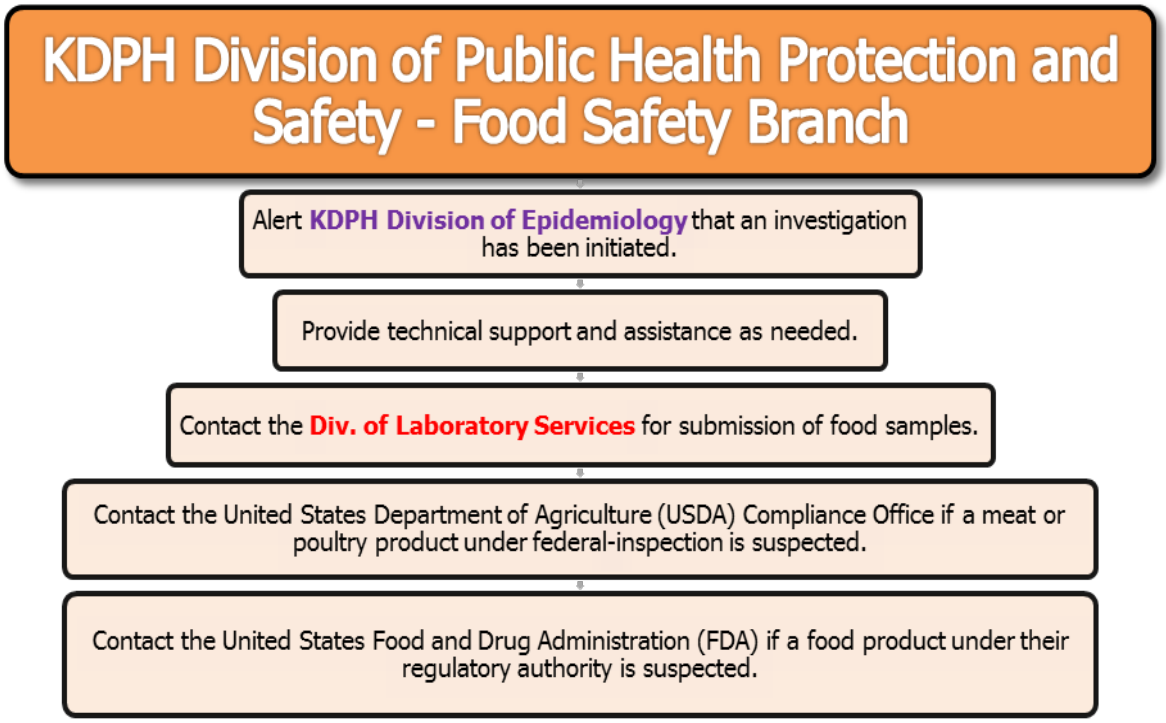
Utilize tools as warranted by the **Epi Rapid Response Team** to prevent the further spread of illness/injury from the food establishment. Examples: Quarantine suspect foods, voluntary closure of the food establishement, removal of ill food handler from the food establishment based upon the Kentucky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

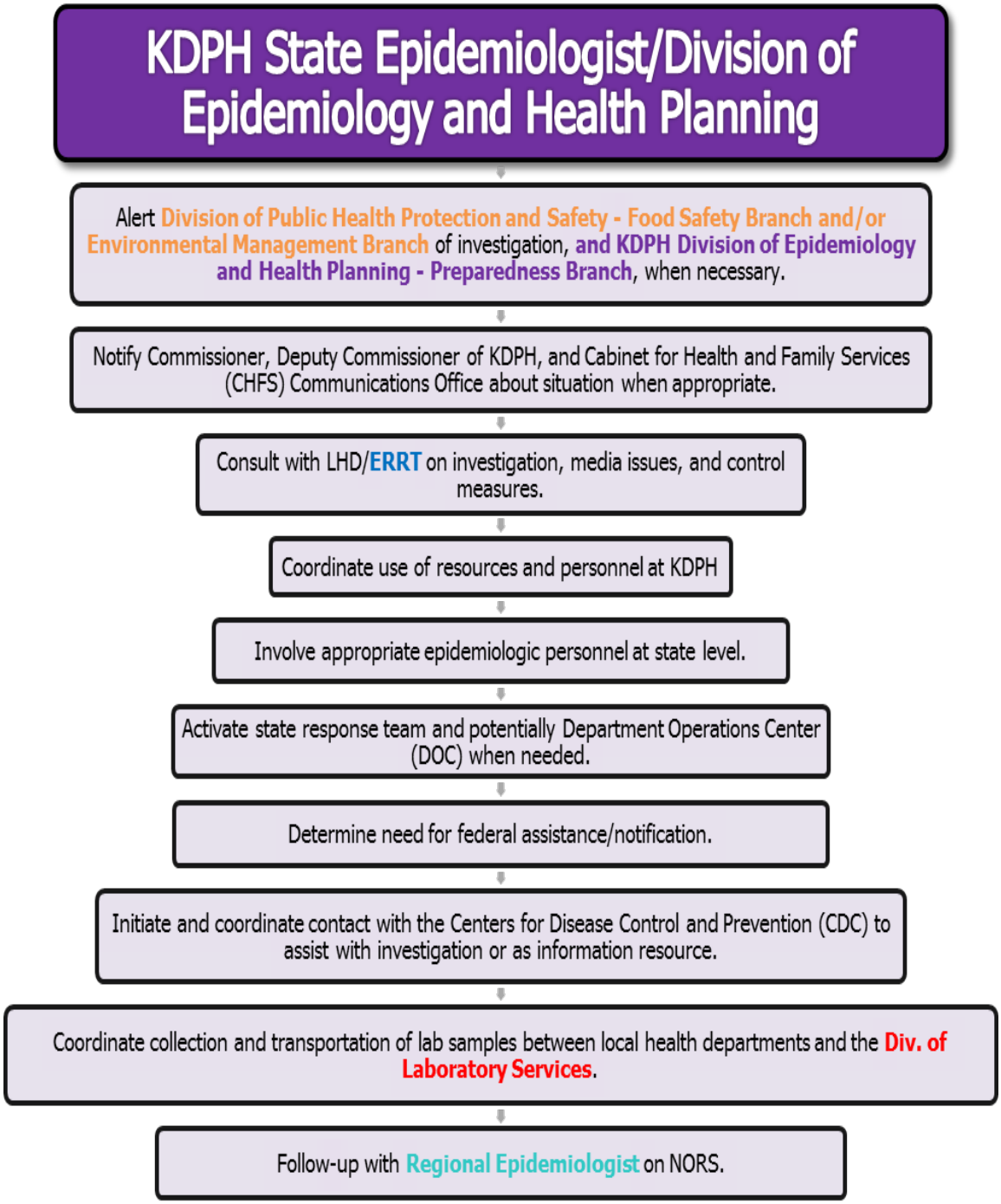
Contact the **Food Safety Branch** at 502-564-7181 if the suspect food is commercially manufactured. Complete in full a DFS-216 Record of Complaint and Investigation (see Appendix H). This will initiate a product traceback and/or recall if warranted.

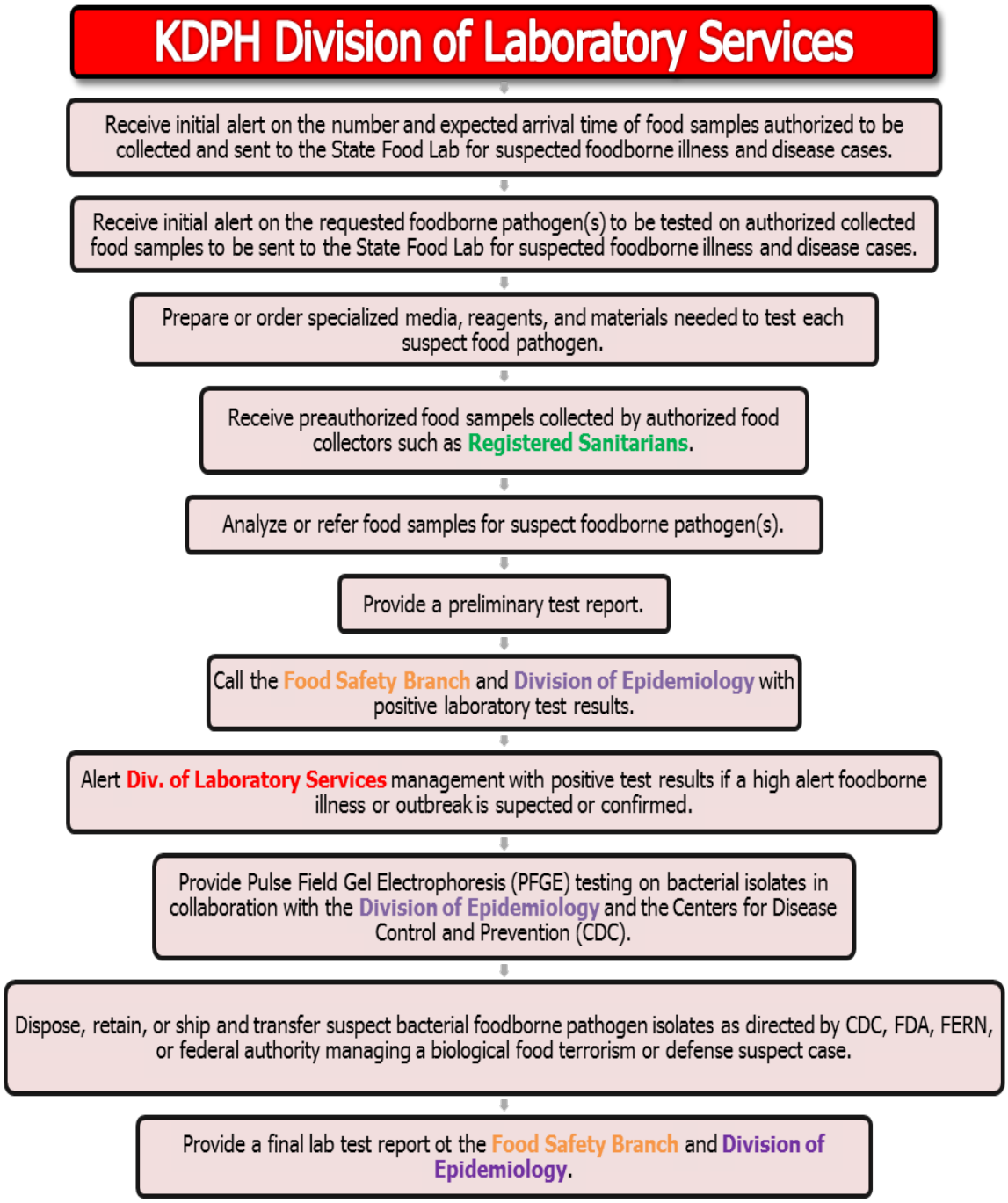
Once the cause of the foodborne illness is determined, educate the food establishment manager on proper controls to prevent future illness, verify that the controls have been communicated to food handlers, and verify that the controls have been implemented.

Food samples must remain in the possession of the collector and be accounted for at all times 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 recommended and can be found in Appendix G.


Local Health Department Director
Assure a competent workforce. Mobilize the Epi Rapid Response Team (ERRT) when necessary. Allowing 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 notificatoin of the Kentucky Department for Public Health in regards to 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 KDPH Division of Epidemiology that an investigation has been initiated.
Provide technical support and assistance as needed.
Contact the Div. of Laboratory Services for submission of food samples.
Contact the United States Department of Agriculture (USDA) Compliance Office if a meat or poultry product under federal-inspection is suspected.
Contact the United States Food and Drug Administration (FDA) if a food product under their regulatory authority is suspected.


KDPH State Epidemiologist/Division of Epidemiology and Health Planning
Alert Division of Public Health Protection and Safety - Food Safety Branch and/or Environmental Management Branch of investigation, and KDPH Division of Epidemiology and Health Planning - Preparedness Branch, when necessary.
Notify Commissioner, Deputy Commissioner 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.
Activate state response team and potentially Department Operations Center (DOC) when needed.
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.
Follow-up with Regional Epidemiologist on NORS.


KDPH Division of Laboratory Services
Receive initial alert on the number and expected arrival time of food samples authorized to be collected and sent to the State Food Lab for suspected foodborne illness and disease cases.
Receive initial alert on the requested foodborne pathogen(s) to be tested on authorized collected food 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.
Receive preauthorized food sampels collected by authorized food collectors such as Registered Sanitarians.
Analyze or refer food samples for suspect foodborne pathogen(s).
Provide a preliminary test report.
Call the Food Safety Branch and Division of Epidemiology with positive laboratory test results.
Alert Div. of Laboratory Services management with positive test results if a high alert foodborne illness or outbreak is supected or confirmed.
Provide Pulse Field Gel Electrophoresis (PFGE) testing on bacterial isolates in collaboration with the Division of Epidemiology and the Centers for Disease Control and Prevention (CDC).
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.
Provide a final lab test report ot the Food Safety Branch and Division of Epidemiology.

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, Write a Report and Enter into the National Outbreak Reporting System (NORS)

Section Two: Management of Multiple Outbreak Investigations

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Overview of Steps in Investigating an Outbreak

Introduction

An epidemiologic investigation is an important part of the complete foodborne or waterborne illness investigation which also includes environmental and laboratory investigations. Each part of the investigation compliments the others. **Teamwork and open communication 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 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, write a report, and enter into the National Outbreak Reporting System (NORS).

NOTE 1: It is important to note that while the above list of steps is in a particular order, they 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 Epi Info 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*). 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.

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, 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 samples. On-site investigation assistance is often available for larger 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. 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," would also be too time consuming for 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.

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 function attendance 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.

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 illnesses 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 general 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 “weed out” extraneous cases. This allows analysis to be more sensitive to 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 may

want to modify these for a particular outbreak investigation to fit the current investigation needs.

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 telephone reporting from physicians? Should case reports be actively solicited from area physicians, laboratories, or hospitals? Should the help of the local media be enlisted? These are all "judgment calls" which must be made while 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

During this step (or even in Step 2 or 3), is a great time to start a line listing. 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	6/4/99	1:00 PM	Diarrhea, abd. cramps
2	Bob	25	M	6/4/99	1:30 PM	Diarrhea
3	Carol	26	F	6/4/99	10:15 AM	Diarrhea, nausea
4	Mark	18	M	6/3/99	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 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 Investigation Form should be completed for all confirmed or suspect Campylobacter, Cryptosporidium, 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 Investigation Form.

NOTE: The KDPH Enteric Disease Investigation Form can be found in Appendix I.

There is a computer software program called Epi Info™ which can be used to develop questionnaires and analyze data. (The software is free. A copy can be obtained via the internet at www.cdc.gov/epiinfo). For more information about when to use a questionnaire, contact the Division of Epidemiology and Health Planning, Reportable Disease Section at (502) 564-3261.

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

The purpose of data orientation or epidemiological characterizations 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.

http://cphp.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_flash.pdf

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). Very often, simply by knowing these descriptive aspects and the diagnosis, and then plotting an **epidemic curve**, the source, mode of transmission, and who is at risk can be determined. Once the population at risk has been determined, appropriate control measures can be targeted.

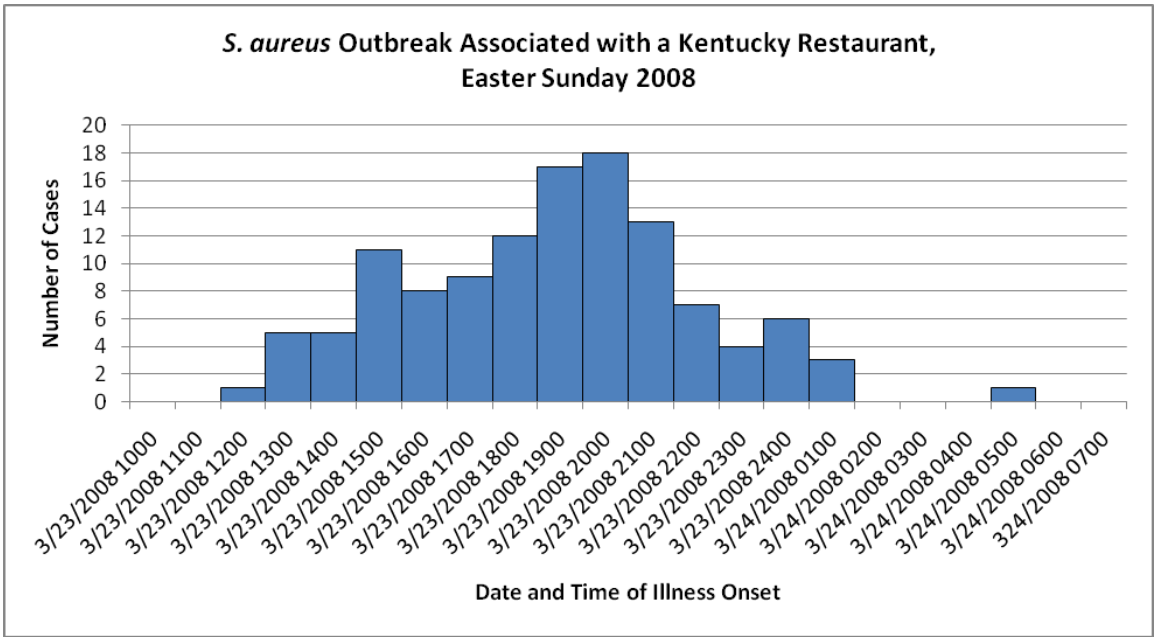
The shape of the epidemic curve may suggest what kind of outbreak is occurring. A *common-source* or *point-source outbreak* looks different than a *propagated-source, a person-to-person outbreak* or *a continual source outbreak*. Definitions of these kinds of outbreaks, and an example of each epidemic 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 or Point-Source Outbreak
- Propagated-Source Outbreak or Person-to-Person Outbreak
- Continual-Source Outbreak
- Intermittent-Source Outbreak

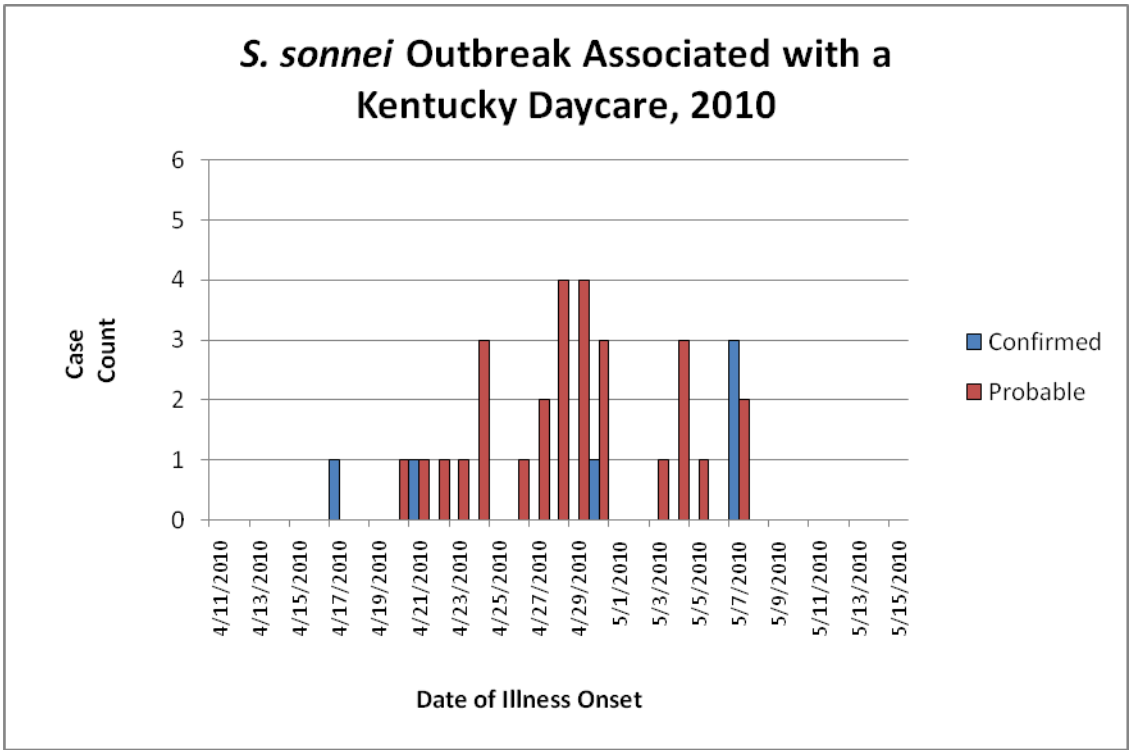
Common-Source or Point-Source Outbreak: An outbreak of illness in which susceptible individuals are exposed simultaneously to one source of infection. For example: guests at a company retirement party potluck. The epidemic curve for this type of outbreak is characterized by a sharp rise to a peak followed 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



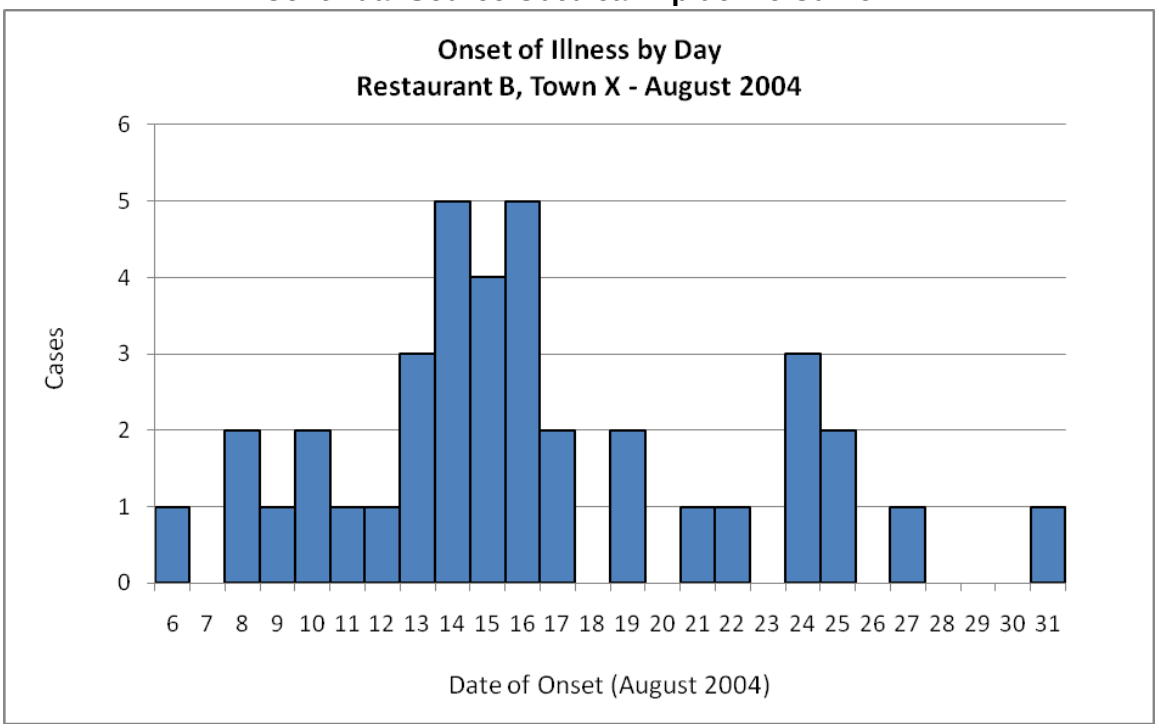
Propagated-Source Outbreak or Person-to-Person Outbreak: An outbreak of disease or illness that is spread from one person to another rather than from a single source. For example: a community-wide outbreak of shigellosis or pertussis. The epidemic curve for this type of outbreak is characterized by a 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



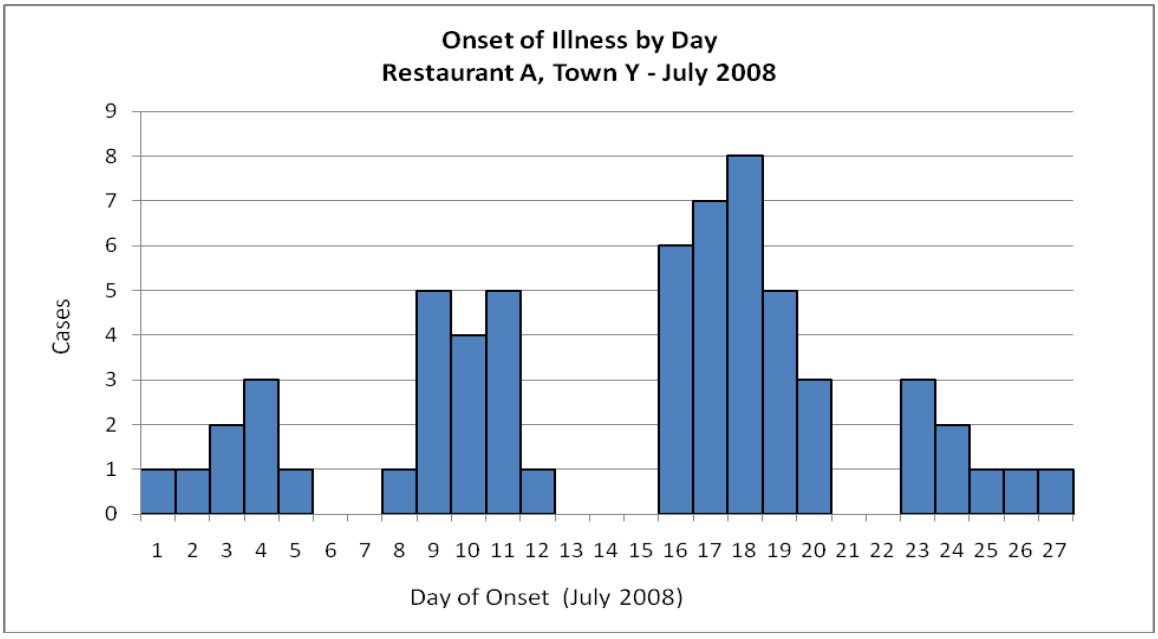
Continual-Source Outbreak: An extended outbreak of disease or illness caused by a source that continues to be contaminated. For example: an outbreak where food is continuously contaminated by an infected food handler. The epidemic curve for this type of outbreak is characterized by ongoing peaks over 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



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



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 commonly is 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 and in an acute outbreak setting is represented by the Attack Rate.

And

Relative Risk (RR)
A Relative Risk is a proportion. It is the risk among those exposed to some risk factor divided by the risk among those who are 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 exposure to asparagus between the ill (cases) and not ill (controls) is 9.33 / 0.72 or 12.96. Interpreting 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 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 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
        - 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
    - Quarantine or collect any suspect food item(s) 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
        - Stopping bare-hand contact

- 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.)

o 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.
- 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.

o Removing implicated foods from the market:
- The objective of food recall and food seizure is to remove implicated foods as efficiently, rapidly and completely as possible from the market.
- A **food recall** is undertaken by any 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 seizure** is the process by which an appropriate authority removes a food product from the market if the business does not comply with the request to recall.
- 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.

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

- 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.
- Menu modification to remove a suspected food from the menu until control measures are in place
- Excluding ill food workers

- 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 their 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* or the *Control of Communicable Diseases Manual (CCDM).* 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 with doubtful personal hygiene or with unsatisfactory toilet, hand-washing or hand drying facilities at home, work, or school.

If these individuals cannot be excluded from work, consider restricting them to specific areas and tasks that provide minimal risk for transmitting the disease.

*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.

- Embargo or dispose 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:

- 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 the Findings, Write a Report and Enter into the National Outbreak Reporting System (NORS)

After analysis of epidemiologic 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.

The report should follow one of two suggested formats: **1) scientific format** or **2) After Action Report format**. The usual scientific format follows the following outline: introduction, background, methods, results, discussion, recommendations, and references. The After Action Report format should be used if an LHD or KDPH Department Operations Center (DOC) is activated 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 a report and sample reports 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. 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 J. Questions regarding NORS should be directed to the KDPH Division of Epidemiology and Health Planning, Reportable Disease Section at (502) 564-3261.

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 (under development) 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.

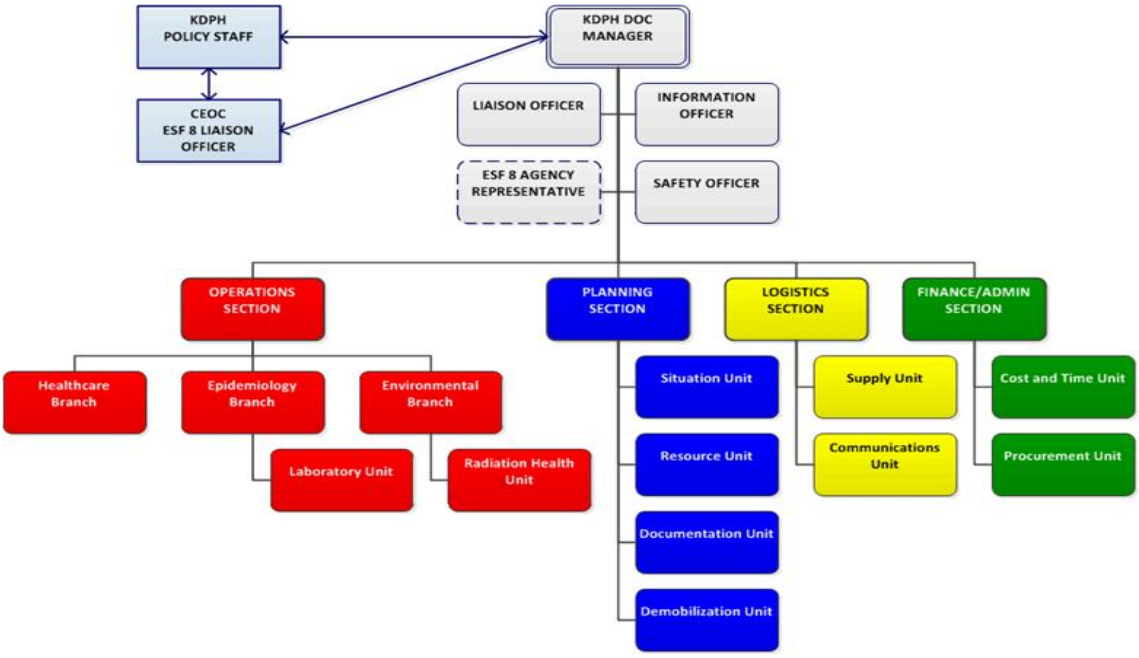
Command

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 KDPH Department Operations Center (DOC) shall 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 DOC is activated in response to disease outbreaks.



The KDPH DOC Plan provides the framework for management of any type of incident of public health significance, including disease outbreaks. The KDPH DOC 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.

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 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.

Support Agencies:

- Local Health Departments
- Regional Child Care Consultants
- KDPH Division of Epidemiology and Health Planning
    - Public Health Preparedness Branch
- KDPH Division of Public Health Protection and Safety
    - Food Safety Branch
    - Environmental Management Branch
- 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 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 (under development).
- **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.

- **Kentucky Public Health Assistance and Support Teams –** "K-PHASTs" are comprised of public health students and faculty from Kentucky Universities. Members of these support teams may be called on at both the State Health Department and Local Health Department levels to assist during public health emergencies or special projects. The Kentucky Department for Public Health is responsible for training these teams at each university on an annual basis. The training consists of an overview of the public health system in Kentucky, use of the incident command system during public health response, the steps in investigating an outbreak, and interview techniques. Just-in-time training may be provided for each K-PHAST team when deployed.

After Action Report and Corrective Action Plan

After an activation of the DOC 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 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: Development of the Final Report

1) The Report

2) Purpose of the Report

3) Outbreak Report Format

4) After Action Report

5) Examples of Reports

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Overview of the Final Report Development

Introduction

When an investigation is complete, the final responsibility is to provide written documentation of events. This is necessary not only for large outbreaks involving many people but also for complaints of possible foodborne or waterborne illness. This chapter explains the importance of the report and its possible uses. Also included is a detailed explanation of a two workable formats for writing a report, what should be included in the report and who should receive it. Finally, samples of outbreak reports and after action reports are included as a guide.

While this chapter focuses on a report written for 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 The Report

The report documents what happened in a foodborne or waterborne illness investigation. It is public record and must be objective, accurate, clear, and timely.

Detail in the document 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 a more comprehensive report. It may be necessary to enlist all involved parties when writing a final report.

4.2 Purpose of the Report

Whether the report is being written in response to an outbreak or a single complaint, complete documentation is important for the following reasons:

A document for action

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 formal “outbreak report”, it is easy for the implicated establishment operator to shift responsibility. The document contains the “official” findings. It should be used in refuting rumors and speculation.

A record of performance
A well-written report documents the magnitude of health problems and justifies program activities. A report clearly states events that occurred and the process that was followed. It should include all steps undertaken by everyone involved. The person writing the report will need to gather that information. The comprehensiveness of the outbreak report should reflect the complexity of the investigation. This accurately documents events and also clearly illustrates staffing resources required to undertake the investigations.

A document for potential legal issues
An investigative report written by health professionals must be written objectively, honestly and fairly. 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 enhancement of the quality of the investigation
The process of writing a report and viewing the data in written form may result in new insights. It could precipitate new questions to be answered before a conclusion is reached. The more investigations and outbreaks one writes up, the better the understanding of process and results.

An instrument to present control and preventive measures
The primary reason to undertake an investigation is to control and prevent disease. The written report 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 the report is presented to the owners and managers, encourage them to use it as a catalyst for change. This document is an educational tool and may help to prevent the same problems from reoccurring. (For example, operators who have been educated about the availability and safety of a pasteurized egg product will probably choose that over pooled whole, shell eggs.)

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 are outlines and examples of two outbreak report formats recommended by the Kentucky Department for Public Health (KDPH). The first is a scientific outbreak report format and the second is an after action report (AAR) format. KDPH recommends the use of the scientific outbreak format for any outbreak where a Department Operations Center (DOC) is not activated. An AAR should be written for any outbreak where the DOC is activated to manage the event. KDPH recommends these specific formats because they both logically describe the events that occur during an investigation. However 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.

NOTE: This outbreak report format can be modified to reflect the complexity of the outbreak.

NOTE: Two outbreak report examples and an AAR example (4.1, 4.2, and 4.3) are provided at the end of this chapter.

Even if there is not the opportunity to compile a complex "outbreak report," it would be helpful to be familiar with the following scientific outbreak report format and the after action report format and understand what information is contained in each section. It will then be easier to adopt any or all of the sections for use when responding to and documenting smaller scale incidents.

A foodborne or waterborne illness scientific outbreak report should include the following sections:

I. Summary/Abstract
II. Background
III. Methods
- **A) Epidemiologic**
- **B) Environmental**
- **C) Laboratory and Clinical**

IV. Results
- **A) Epidemiologic**
- **B) Environmental**
- **C) Laboratory and Clinical**

V. Discussion
VI. Recommendations
VII. Acknowledgments
VIII. Supporting Documentation

I. Summary/Abstract

The summary or abstract should consist of a paragraph or two that provide the reader with an overview of the main points of the investigation (i.e., the WHO, WHAT, WHERE and WHEN of the outbreak). It should describe what the investigation found, such as what caused the outbreak or what the final causal hypothesis was, based on the evidence.

II. Background

Background information is important and includes anything pertinent to understanding the outbreak or the investigation. This section identifies setting and the type of establishment involved in the outbreak (e.g., take-out restaurant, banquet facility, caterer, fast food establishment, retail store). If applicable, it could also include whether the establishment is part of a national chain, a commissary, a dormitory or a buffet where attendees are likely to eat multiple foods. Such things as previous problems at the same location or outbreaks with similar characteristics that might have added to understanding or guiding the current investigation should be explained and referenced. Any point that is relevant, even the weather in some cases, may be included in the Background section. The Background should also include the specific events that led to the investigation, such as how the outbreak was first reported, steps undertaken to confirm its existence, and all who assisted in the investigation.

III. Methods

The Methods section records what procedures were followed to conduct the investigation. It is important to differentiate this from the Results section in that Methods should not include any findings of the investigation except in rare cases where it is crucial to determining or understanding the methods used. Three primary areas should be covered in most foodborne or waterborne outbreaks:

A. Epidemiologic

Explain how cases were defined. For example, are only laboratory confirmed cases included? Does a case have to experience diarrhea or is abdominal cramping sufficient? Also describe how cases were found or became identified. Include descriptions of interview techniques and copies of questionnaires or surveys if used. If an epidemiologic study, such as a case-control or cohort study is conducted, this should be described in detail, including how subjects were enrolled in the study, how the data were collected and how the analysis was performed.

B. Environmental

Clearly outline the number and kinds of environmental investigations that occurred and who conducted them. Was a Hazard Analysis and Critical Control Point (HACCP) risk assessment conducted of suspect foods as well as physical facility inspections? Were there any tracebacks of food products?

C. Laboratory and Clinical

It is important to note what kinds of and how many specimens were submitted for laboratory analysis. Was food available for testing? Did cases submit stool specimens or other clinical specimens for analysis? Were food handlers required to submit stool samples for testing? Note where the specimens were sent, what kinds of analyses were performed and who completed the testing. This could involve private, state or federal laboratories.

IV. Results

The previous section outlined steps taken to investigate the outbreak. The Results section informs the readers what was discovered. These results can be presented in tables, graphic figures and/or text:

A. Epidemiologic

- number of questionnaires mailed and returned
- number of people fitting the case definition
- symptoms experienced by cases
- duration of symptoms
- incubation period
- food or meal-specific attack rates
- statistical significance of foods eaten
- epidemic curve of the outbreak
- relationships among cases (if any)

B. Environmental

- the results of the physical facilities inspection (e.g., violations noted)
- the results of any food tracebacks

C. Laboratory and Clinical

- culture or other laboratory results on food handlers, patrons, or other individuals connected to the outbreak
- results on foods or water sources tested

V. Discussion

This section is where all aspects of the investigation are brought together and conclusions are drawn. Interpretation of the results and discussion of pertinent aspects of the investigation, such as reasons for unique associations not seen before as well as limitations to the investigation, are appropriate for the Discussion section.

NOTE: Not all outbreaks have a resolution. In fact, it is rare when everything comes together and a cause can be definitively determined. Do not be discouraged. In most cases, there will be enough evidence to present a plausible hypothesis. Be clear and present a detailed explanation on what has contributed to the conclusion.

VI. Recommendations

This is the opportunity to educate. Be detailed because these recommendations hopefully will be read by many people in the establishment that was investigated. The establishment has a vested interest in following the suggestions. If the outbreak has

been large and disruptive, the establishment will not want it to reoccur. In addition to listing general recommendations on good food handling procedures, include specific recommendations that address what might have been overlooked in the particular outbreak (e.g., attempting to transport food long distances at inadequate temperatures).

VII. Acknowledgments

In the spirit of cooperation, it is proper to thank those who assisted in the investigation. This might include health care personnel, the food handlers and/or management of the establishment or other local or state officials**.**

VIII. Supporting Documentation

When compiling the report, attach copies of all items that are relevant. These would include the following:

- inspection reports
- blank samples of the surveys or questionnaires
- letters to management
- menus
- copies of posted notices
- food testing results

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.

NOTE: Not all outbreaks have a resolution. In fact, it is rare when everything comes together and a cause can be definitively determined. Do not be discouraged. In most cases, there will be enough evidence to present a plausible hypothesis. Be clear and present a detailed explanation on what has contributed to the conclusion.

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 4.1 Outbreak Report

Hot Tub Folliculitis resulting from a stay in a rental unit at a Resort, March 2008

Education, proper maintenance, and regulation are keys to prevention

Jasie K. Logsdon, B.S., M.P.H., Regional Epidemiologist, Lake Cumberland District Health Department

Summary

On March 25, 2008 the environmentalist at the McCreary County Health Department received a phone call from a concerned parent whose daughter had spent the previous weekend in a cabin at a Resort on Lake Cumberland. Several cases of rash illness had developed among people who had spent time at the resort, including the daughter of the parent who contacted the health department. A total of 11 people were identified as having been at the suspect cabin during March 21 – 23, 2008. Jasie Logsdon, the Lake Cumberland District Health Department (LCDHD) epidemiologist began case finding on March 25, 2008. Through further telephone interviews using a standardized questionnaire, 8 total cases of folliculitis related to exposure to the resort's hot tubs were identified, ranging in age from 3 years old to 54 years old. Laboratory samples collected from three patients were positive for *Pseudomonas aeruginosa.* Environmental samples collected from the hot tub by the District Health Department's environmentalist also tested positive for this organism. On March 27, the Resort was asked to drain, thoroughly clean and sanitize all hot tubs. A follow-up inspection was made on April 1, 2008 to sample the hot tub after cleaning. Results of follow-up water sampling from April 1, were negative for *Psuedomonas aeruginosa* and *E. coli*, indicating that the hot tub was adequately cleaned and sanitized.

Background

Pseudomonas aeruginosa folliculitis (hot tub rash or hot tub folliculitis) is a well-recognized, community-acquired skin infection, which results from the bacterial colonization of hair follicles after exposure to contained, contaminated water (e.g. whirlpools, spas, swimming pools, water slides, bathtubs).[1] Diagnosis of hot tub folliculitis is usually made by visual examination and exposure history. However, a physician may obtain samples from the pus filled bumps for bacterial culture to confirm the diagnosis. Hot tub folliculitis first appears as itchy bumps and develops into dark red tender nodules and/or small pus-filled pimples. The eruptions typically involve the trunk and upper parts of the arms and legs. The rash can be extensive and may affect all areas of the body but is usually most severe under areas covered by a swimsuit. It may be accompanied by headache, nausea, vomiting, abdominal cramps, sore throat, rhinitis, sore eyes, and fever. In a one year period throughout the United States, eight

[1] Krivda, Stephen J. Pseudomoas Folliculitis. eMedicine from WebMD online. Available: http://www.emedicine.com/DERM/topic356.htm

confirmed and two suspected *Pseudomonas* water borne disease outbreaks were documented; five of these outbreaks involved spas, one involved a pool, and four involved both spas and pools[2]. This report describes the outbreak investigation performed at a Resort in Lake Cumberland through a coordinated effort between environmentalists and epidemiologists.

On March 25, 2008, the environmentalist at the McCreary County Health Department received a phone call from a concerned parent whose daughter had spent the previous weekend in a cabin at a Resort on Lake Cumberland. The daughter had subsequently developed a painful rash and swollen hands and feet, and reported that several others were exhibiting similar symptoms. The complainant, a physician's assistant and U.S. Public Health Service assignee to the United States Penitentiary in McCreary County, was concerned that his daughter had a *Staphylococcus aureus* infection. The complainant stated that approximately 30 people could have been exposed to the hot tub and potentially had symptoms. The LCDHD epidemiologist was contacted by another concerned parent stating that her daughter was sick. She was reported to have a rash, swollen hands and feet, and had been quarantined by the Marine Corps at a base in North Carolina.

Investigation Methods

The environmentalist in McCreary County, LCDHD Environmental Director, and LCDHD epidemiologist determined that an investigation must be conducted. LCDHD environmentalists contacted the Kentucky Department for Public Health (KDPH), Division of Public Health Protection and Safety on March 25, 2008 and were instructed to collect a 300 ml water sample from the suspect hot tub to be sent to a private laboratory for analysis. The LCDHD Epidemiologist contacted the KDPH, Division of Epidemiology and Health Planning to advise state officials and consult about the investigation.

Jasie Logsdon, the LCDHD epidemiologist began case finding on March 25, 2008. A case was defined as an individual who had visited the Lake Cumberland Resort over the weekend of March 21-23, 2008 who subsequently developed a rash within 24 hours of last exposure to the hot tub. Phone interviews were conducted by using a standardized questionnaire for the investigation. This questionnaire was developed by the LCDHD epidemiologist for outbreak investigations and contained questions about symptoms; medical treatment and diagnosis; lab testing; others with similar illness, including names and contact information; close contact with others; sharing of personal items; and exposure to pool, hot tub or sauna. Individuals were asked if they had shared any personal items or if they had other common exposures such as sleeping in

[2] Centers for Disease Control and Prevention. Surveillance for Waterborne Disease and Outbreaks Associated with Recreational Water --- United States, 2003—2004. MMWR 2006; 55(SS12);1-24 http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5512a1.htm

the same bed. Based upon symptoms and exposure history, the hot tub was suspected as the source of the outbreak.

Results

The initial investigation revealed that the involved resort on Lake Cumberland rents and manages cabins that are privately owned homes. This rental program is not inspected or permitted by the health department because the cabins are considered individually owned homes. The hot tubs in these cabins are "home-grade" hot tubs and do not fall under health department regulation.

A total of 11 people were identified as having been at the suspect cabin during March 21-23, 2008. A description of the initial two cases follows.

Case 1

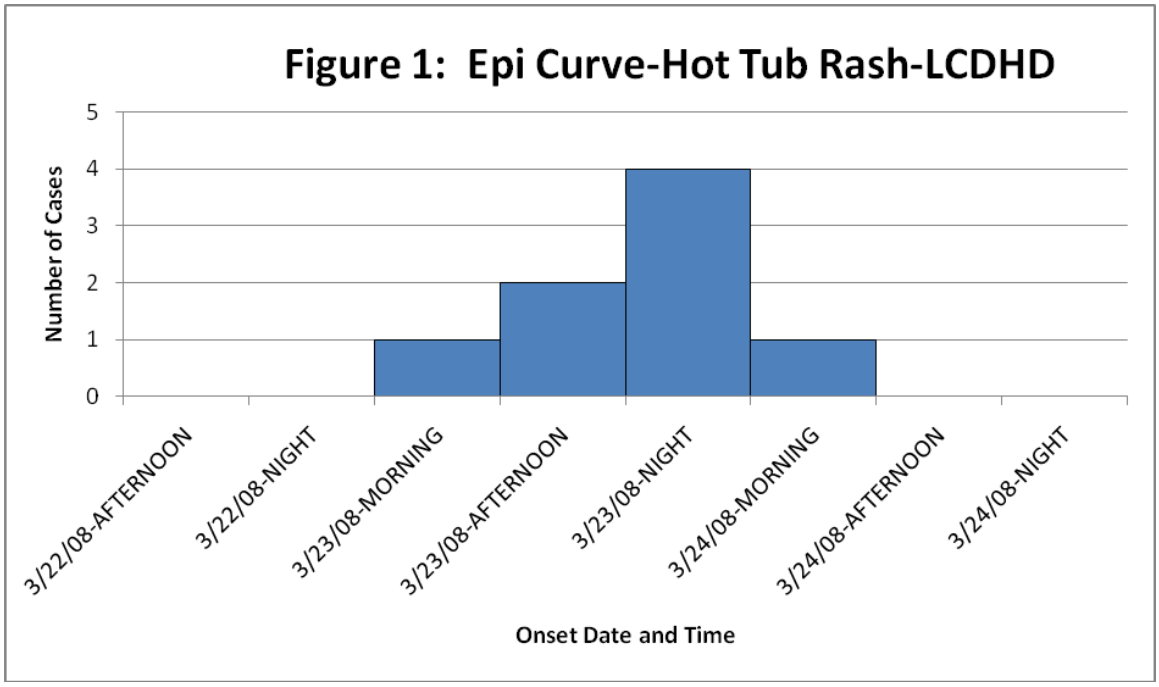
A 20 year old female had visited the resort over the weekend of March 21-23, 2008 and developed symptoms on March 23. She experienced painful swelling of lower extremities making it difficult to walk and a rash on her legs, stomach, thighs, back, and arms; she vomited all day after symptom onset. She sought medical attention on March 25 and was given the preliminary diagnosis of staph infection, from two physicians and one physician's assistant, scrapings of the rash were sent for laboratory testing.

Case 2

A 19 year old female Marine stationed in North Carolina who had visited the resort over the weekend of March 21-23, 2008, returned to North Carolina on March 24. She began exhibiting symptoms on March 24 during her drive back to North Carolina. She stated she had a rash on her legs, felt "funny", and her toes and hands were aching. She sought medical attention at the infirmary where she was immediately quarantined her to her room with a preliminary diagnosis of a Staph infection. Blood work was done, but the LCDHD was unable to gain contact with anyone in the infirmary at the base. Both individuals had spent time in a hot tub at the cabin.

Through further telephone interviews, 8 total cases of hot tub folliculitis were identified, ranging in age from 3 years old to 54 years old, who met the case definition. All of the cases sought medical treatment, four cases had samples collected for laboratory confirmation. Of the four laboratory samples, three were positive for *Pseudomonas aeruginosa* and the fourth was identified as "mixed skin flora."

The mean age of cases was 20 years and 88% were female. Of the 11 individuals who were present at the cabin over the weekend of March 21-23, 2008, 73% spent time in the hot tub. The epidemiologic curve identifying the number of cases and timeline in which they reported illness is shown in Figure 1.



The water sample collected from the hot tub was identified as positive for *Pseudomonas aeruginosa* by Lab Corp. On March 27, the Resort was asked to drain, thoroughly clean and sanitize all hot tubs. A follow-up inspection was made on April 1, 2008 to sample the hot tub after cleaning. Results of follow-up water sampling from April 1, were negative for *Psuedomonas aeruginosa* and *E. coli*, indicating that the hot tub was adequately cleaned and sanitized.

Discussion

Hot tub folliculitis has an incubation period of up to 48 hours after exposure to contaminated water. The rash usually clears on its own within 2-10 days, as it is a self-limiting infection. Usually no treatment is necessary for the infection, with the exception of the use of "anti-itch" medications while severe infections may be treated by ciprofloxacin. Laboratory testing usually isn't necessary; however, to rule out Staph infections and confirm a hot tub folliculitis outbreak by exposure to contaminated water, cultures were done. Morehead State Laboratory has the ability to perform specialized water testing. In order to submit specimens to the Morehead State Laboratory, (3) 120mL water samples should be taken and must arrive at the lab within 30 hours. It is important to note that the Morehead State Laboratory will charge $50 per organism tested. For more information, visit their website at http://www.morehead-st.edu/wtl/ . The State Public Health Laboratory does have the ability to test water for *Pseudomonas aeruginosa*, the most common cause of hot tub folliculitis. In order to submit water for testing for other organisms to the State Public Health Laboratory, (2) 100mL water samples must be collected from a hot tub/spa. For pool or beach samples, (1) 100 mL water sample is required. These samples must also arrive at the lab within 20 hours of collection.

The environmental investigation posed some unique challenges for the Environmentalists as well as the KDPH Division of Public Health Protection and Safety. Since this type of resort is not permitted by the health department as a regulated hotel or recreational water facility, new issues arose with regard to the handling the inspection and recommendations given to the facility. This is an area that the State has not yet addressed because ultimately these are private residences that are "rented."

An educational pamphlet for hot tub folliculitis describing the signs and symptoms, causes, and prevention methods, as well as recommendations for hot tub care and maintenance was created and made available to the Resort. The staff at the resort were educated on proper hot tub care and maintenance, and the cases were all educated on hot tub rash causes, symptoms, and prevention. The Centers for Disease Control and Prevention recommends maintaining a free chlorine or bromine concentration of 2 to 5 parts per million, pH of 7.2-7.8 and lists other important health and safety guidelines for public spas or hot tubs on their website.[3] Individuals are recommended to take precautions such as heeding hot tub safety rules, observing the hot tub and its surroundings and talking with staff and other hot tub users when choosing to enjoy a hot tub in the future[4].

Closing Notes

The outbreak investigation at the Resort in Lake Cumberland demonstrated the need for a coordinated effort between LHD environmentalists and epidemiologists during outbreak investigations. In addition, further guidelines may need to be developed for facilities available for public use that are privately owned and rented. The issue remains as to when this is a private agreement between parties or when this is a public place that should fall under health department regulation. This will have to be addressed at the state level and the policy/procedure passed down to the local level.

[3] http://www.cdc.gov/healthyswimming/pdf/spa_operation.pdf

[4] http://www.cdc.gov/healthyswimming/pdf/spa_user_tips.pdf

Example 4.2 Outbreak Report

E Coli O157:H7 Outbreak Associated with Spinach in Kentucky – September 2006

Kentucky Cabinet for Health and Family Services
Department for Public Health
Division of Epidemiology and Health Planning
Epidemiologic Notes & Reports
Volume 42 Number 1 January/February 2007

Summary
In September 2006, public health officials in Wisconsin and Oregon reported that an outbreak of *E. coli* O157:H7 associated with the consumption of raw spinach was occurring in their region. Officials in New Mexico reported seeing similar cases in their area later that same month. CDC created a one-page questionnaire to be administered to cases which focused on spinach consumption. On September 15, 2006, Kentucky Department for Public Health (KDPH) laboratorians and epidemiologists confirmed that their first case-patient's clinical specimen matched the national outbreak strain. Three additional outbreak cases in Kentucky residents were confirmed later that day. By the end of the month, the Kentucky outbreak included 8 cases, of which 4 required hospitalization, with 2 developing hemolytic-uremic syndrome. Nationwide, 199 cases were associated with the outbreak. The outbreak was eventually traced to four fields in California that were contaminated with pig and cattle feces.

Background
Escherichia coli O157:H7 is a gram negative bacterium that causes an average of 70,000 cases of disease, 20,000 hospitalizations, and 60 deaths yearly in the United States. It is also a frequent cause of hemolytic-uremic syndrome (HUS), a triad of renal insufficiency, anemia, and thrombocytopenia (lowered platelet count) that can lead to permanent need for dialysis and even death. It is one of several hundred types of *E. coli* bacteria and is found in the intestines of cattle, sheep, and goats. It is a common cause of foodborne illness, although the Centers for Disease Control and Prevention (CDC) reports that the incidence of *E. coli* O157:H7 is decreasing. On September 13, 2006, CDC was alerted to an *E. coli* O157:H7 outbreak likely caused by bagged spinach in Wisconsin and Oregon. On the same date, Kentucky epidemiologists were notified of several residents who were infected with *E. coli* O157:H7. This article describes the investigation and events related to this outbreak in Kentucky and the national investigation of this outbreak.

Investigation Methods
On September 8, 2006, Wisconsin officials reported to CDC that they had multiple cases of *E. coli* O157:H7 in their state. On September 12, CDC reported to Wisconsin that the pulsed-field gel electrophoresis (PFGE) patterns were matching in their cases. Public

health officials in Wisconsin and Oregon conducted a survey of patients' eating habits prior to illness which showed a strong association between disease and raw spinach consumption in patients infected with *E. coli*. State officials in Wisconsin and Oregon notified CDC of their findings on September 13th. New Mexico epidemiologists contacted Wisconsin and Oregon officials on the same date regarding an *E. coli* O157:H7 outbreak in their state which also appeared to be related to the consumption of fresh spinach. State officials and CDC determined that a multi-state outbreak of *E. coli* was in progress. CDC created a one-page questionnaire to be administered to cases which focused on spinach consumption. A case was defined as any person with a lab-confirmed *E. coli O157:H7* infection which matched the outbreak strain identified in Wisconsin and Oregon by PFGE pattern. On September 15, 2006, KDPH laboratorians and epidemiologists confirmed that their first *E. coli O157:H7* case-patient's clinical specimen matched the national outbreak strain. Three additional outbreak cases in Kentucky residents were confirmed later that day. Using the CDC spinach questionnaire, Kentucky case patients were questioned by local health department epidemiologists about timing of spinach consumption, location where the spinach was purchased, and if spinach packaging with universal product code (UPC) and lot numbers was available. Data regarding need for hospitalization and development of HUS were obtained on the questionnaire. This questionnaire was used both with Kentucky case patients as well as patients throughout the country during the outbreak. Across the U.S., a confirmed case was defined as a patient with an illness onset date of August 1, 2006-September 18, 2006 or if onset was unknown, a patient with an *E. coli* O157:H7 isolate from August 15, 2006-September 18, 2006 matching the outbreak strain of *E. coli* and from the U.S. By September 22, 2006, a total of eight Kentucky residents were ultimately identified as part of the outbreak.

Regional epidemiologists interviewed seven of the patients by phone or in person and completed the CDC spinach questionnaire. Several patients also completed the general foodborne illness questionnaire to identify other potential exposures. Epidemiologists and environmentalists worked with the state lab and CDC to obtain spinach samples in order to attempt to isolate *E. coli* in the spinach or packaging. Spinach specimens provided by case patients were tested in the state lab for the presence of *E. coli* O157:H7.

Results

National

Ultimately, 199 cases nationwide were confirmed positive for the *E. coli* outbreak strain associated with the outbreak. States reporting the greatest number of confirmed cases were Wisconsin (49), Ohio (25), and Utah (19). Ninety-five percent of patients reported spinach consumption prior to onset of illness. Ninety-eight people required hospitalization, and three people died. Thirty cases of HUS occurred nationally among those infected.

Kentucky

Six Kentucky *E. coli* O157 case patients (75%) were female. Two patients (25%) developed HUS. Four Kentucky patients (50%) required hospitalization. There were no Kentucky fatalities. Of the seven patients who completed interviews detailing their exposures, six (85.7%) recalled eating spinach in the appropriate time frame prior to illness. One patient could not recall whether spinach was consumed prior to illness onset. The ability of the regional epidemiologists and local environmentalists to work throughout the state to interview patients, ship samples to the state lab, and provide state epidemiologists with the spinach questionnaire responses played a critical role in Kentucky's response to the outbreak. State and regional epidemiologists worked in concert to inform the state lab when environmental and patient specimens would be arriving. Regional epidemiologists also quickly provided state epidemiologists with completed questionnaires, thereby enabling state epidemiologists to share information with CDC and the U.S. Food and Drug Administration (FDA). The Public Health Protection and Safety team also was crucial to the success of the state investigation. The local environmentalists collected spinach samples from individuals involved in the outbreak, and worked with epidemiologists at the state level to coordinate testing at the state laboratory. They fielded questions from Kentucky residents about spinach safety. State food safety experts also worked with the laboratory and epidemiologists to arrange for local environmentalist services, and updated local health departments on FDA updates and the number of state residents who were part of the outbreak. The CDC and the FDA used information including lot numbers, lab testing, and spinach brands provided by Kentucky and other involved states to trace the outbreak to four fields in California. Testing performed at these fields revealed that the fields contained pig and cattle feces contaminated with *E. coli* O157:H7 matching the outbreak strain. Investigators also found evidence that wild pigs had been present in the implicated farms.

Discussion

E. coli O157:H7 is a virulent strain of *E. coli* that produces Shiga toxin. It may cause acute watery or bloody diarrhea due to its ability to invade the intestinal wall. It is diagnosed by a clinical stool specimen taken from the patient. The incubation period ranges from 1-8 days following ingestion, but most commonly symptoms begin 3-4 days after ingestion. *E. coli* O157:H7 is transmitted by ingestion of food or liquid contaminated with feces of an infected or asymptomatic carrier. Foods previously implicated in transmission of *E. coli* O157:H7 include raw milk, unpasteurized apple juice, ground beef, uncooked fruits, and vegetables. Petting zoos have also been the source of previous outbreaks. According to the FDA, 18 previous outbreaks have been caused by spinach in the last 10 years, including an outbreak in 2005 in which spinach was implicated. Lettuce or spinach may become contaminated via multiple mechanisms from the farm to consumption (by manure from an infected animal such as a cow; from contaminated irrigation water; from contamination during packaging and processing; or through individual contamination at restaurants or grocery stores). Infection may also result in HUS, or renal insufficiency, anemia, and thrombocytopenia. Children aged

younger than five years are most likely to contract HUS, which most commonly occurs around two weeks after infection with *E. coli* O157; approximately 8% of children infected with *E. coli* O157:H7 subsequently develop HUS. Half of the children diagnosed with HUS ultimately require short- or long-term dialysis, and approximately 4% die. Antibiotics have not proven beneficial in the prevention of HUS.

Normally, transmission of *E. coli* infection is prevented by cooking ground beef until no longer pink, avoiding raw milk and unpasteurized products, and good hand hygiene. In this outbreak, the FDA also stated that cooking spinach for 15 seconds at a temperature of 160 degrees Fahrenheit would kill any *E. coli* present, therefore making the spinach safe to eat. It should be noted that meticulous attention to food preparation helps to prevent any foodborne illness. Cooks should be careful to avoid contamination of raw fruits and vegetables with items which have touched uncooked meat. In addition, refrigerating spinach will also prevent the growth of *E. coli* and other types of bacteria. In the present outbreak, however, the product was advertised as “pre-washed”. Bagged raw spinach is usually used for salad and is therefore not cooked. The FDA did not recommend rewashing pre-washed spinach, as the *E. coli* often is incorporated into the interior of the spinach leaf and therefore can’t be removed by washing at home. Thus, prevention strategies for this type of transmission rely primarily on identification of sources of contamination prior to distribution and prevention of subsequent outbreaks via the same or similar mechanism.

Closing Notes

Ultimately, the outbreak strain was not isolated from spinach supplied by Kentucky patients to the state lab. However, the implicated strain of *E. coli* was isolated from several spinach bags provided by ill patients in other states (New Mexico, Pennsylvania, Utah, and Nebraska). The FDA traced the infection to a spinach processing company by combining the epidemiologic information obtained from the spinach questionnaire with the laboratory testing performed on the implicated bags of spinach. The outbreak was halted by recalls of spinach and spinach products from the implicated companies and FDA advice to consumers to avoid eating raw spinach until the source of the outbreak could be determined. Future plans include development of an industry-wide plan with steps to prevent contamination, thereby reducing the risk of another outbreak.

References

Bryan, F. *Guide for Investigating Foodborne Disease Outbreaks and Surveillance Data,* U.S. Department of Health and Human Services, CDC. Atlanta, Georgia, 1981.

Holland, W. et al. *Oxford Textbook of Public Health*, Oxford University Press, 1985; 3:284-289.

Example 4.3 Outbreak After Action Report

Kentucky Public Health

Prevent. Promote. Protect.

EVENT NAME

After-Action Report/Improvement Plan

[Date]

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EXECUTIVE SUMMARY

[When writing the Executive Summary, keep in mind that this section may be the only part of the AAR/IP that some people will read. Introduce this section by stating the full name of the event and providing a brief overview. This brief overview should discuss what occurred and the capabilities that were address i.e., Core Capabilities, HPP Capabilities, and/or PHEP Capabilities and the purpose of the exercise/event. In addition, the Executive Summary may be used to summarize any high-level observations that cut across multiple capabilities.]

Purpose

The purpose of this exercise was to ……

This report will analyze the results of the exercise and identify strengths and potential areas for further improvement to support the development of improvement plans and associated corrective actions for the [Your Agency].

Major Strengths

The major strengths identified by [Your Agency] during the [Name of Exercise] are as follows:

- [List Strength - Use complete sentences to describe each major strength.]
- [List Strength - Use complete sentences to describe each major strength.]
- [List Strength - Use complete sentences to describe each major strength.]

Primary Areas for Improvement

Throughout the response to the [Name of Exercise], several opportunities for improvement in the [Your Agency] ability to respond were identified. The primary areas for improvement are listed below. These areas for improvement, along with recommendations and corrective actions, are listed in the Improvement Plan; Appendix A.

- [List Area for Improvement - Use complete sentences to state each primary area for improvement.]
- List Area for Improvement - Use complete sentences to state each primary area for improvement.]
- List Area for Improvement - Use complete sentences to state each primary area for improvement.]

Conclusion *[End this section by describing the overall response as successful or unsuccessful, and briefly state the areas in which organizations should focus on (exercise, training, equipment, etc.) to prepare for future responses.]*

EVENT OVERVIEW

Event Name	[Insert the formal name of exercise, which should match the name in the document header]
Event Dates	[Indicate the start and end dates of the exercise]
Scope	This exercise was a [exercise type], planned for [exercise duration] at [exercise location]. Exercise play was limited to [exercise parameters].
Mission Area(s)	[Prevention, Protection, Mitigation, Response, and/or Recovery]
Core Capabilities	[List the core capabilities being exercised]
HPP/PHEP Capabilities	[List the HPP/PHEP capabilities being exercised]
Objectives	[List exercise objectives]
Threat or Hazard	[List the threat or hazard (e.g. natural/hurricane, i.e., technological/ radiological release)]
Scenario	[Insert a brief overview of the exercise scenario, including scenario impacts (2-3 sentences)]
Sponsor	[Insert the name of the sponsor organization, as well as any grant programs being utilized, if applicable]
Participating Organizations	[Insert a brief summary of the total number of participants and agency level (i.e., federal, state, local, private). List the participating agencies in Appendix B. List the exercise participants in Appendix C (Optional)]
Point of Contact	[Insert the name, title, agency, address, phone number, and email address of the primary exercise POC (e.g., exercise director or exercise sponsor)]

ANALYSIS OF CAPABILITIES

Aligning exercise objectives and core capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned core capabilities, and performance ratings for each core capability as observed during the exercise and determined by the evaluation team.

Objective	Core Capability	HPP/PHEP Capabilities	Gaps Addressed	Rating
[Objective 1]	Choose from dropdown.	Choose from dropdown.		Choose from dropdown.
[Objective 2]	Choose from dropdown.	Choose from dropdown.		Choose from dropdown.
[Objective 3]	Choose from dropdown.	Choose from dropdown.		Choose from dropdown.
[Objective 4]	Choose from dropdown.	Choose from dropdown.		Choose from dropdown.

Ratings Definitions:

- Performed without Challenges (P): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Performed with Some Challenges (S): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s) and did not negatively impact the performance of other activities. Performance of this activity did not contribute to additional health and/or safety risks for the public or for emergency workers, and it was conducted in accordance with applicable plans, policies, procedures, regulations, and laws. However, opportunities to enhance effectiveness and/or efficiency were identified.
- Performed with Major Challenges (M): The targets and critical tasks associated with the core capability were completed in a manner that achieved the objective(s), but some or all of the following were observed: demonstrated performance had a negative impact on the performance of other activities; contributed to additional health and/or safety risks for the public or for emergency workers; and/or was not conducted in accordance with applicable plans, policies, procedures, regulations, and laws.
- Unable to be Performed (U): The targets and critical tasks associated with the core capability were not performed in a manner that achieved the objective(s).

The following sections provide an overview of the performance related to each exercise objective and associated core capability, highlighting strengths and areas for improvement.

[Objective 1]

[Core Capability 1]

Strengths

- **Strength 1:** [Observation statement]
- **Strength 2:** [Observation statement]
- **Strength 3:** [Observation statement]

Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 1.1: [Observation statement. This should clearly state the problem or gap; it should not include a recommendation or corrective action, as those will be documented in the Improvement Plan.]

- **References:** [List any relevant plans, policies, procedures, regulations, or laws.]
- **Analysis:** [Provide a root cause analysis or summary of why the full capability level was not achieved.]

Area for Improvement 1.2: [Observation statement]

- **References:** [List any relevant plans, policies, procedures, regulations, or laws.]
- **Analysis:** [Provide a root cause analysis or summary of why the full capability level was not achieved.]

[Objective 2]

[Core Capability 2]

Strengths

- **Strength 1:** [Observation statement]
- **Strength 2:** [Observation statement]
- **Strength 3:** [Observation statement]

Areas for Improvement

The following areas require improvement to achieve the full capability level:

Area for Improvement 2.1: [Observation statement. This should clearly state the problem or gap; it should not include a recommendation or corrective action, as those will be documented in the Improvement Plan.]

- **References:** [List any relevant plans, policies, procedures, regulations, or laws.]
- **Analysis:** [Provide a root cause analysis or summary of why the full capability level was not achieved.]

Area for Improvement 2.2: [Observation statement. This should clearly state the problem or gap; it should not include a recommendation or corrective action, as those will be documented in the Improvement Plan.]

- **References:** [List any relevant plans, policies, procedures, regulations, or laws.]
- **Analysis:** [Provide a root cause analysis or summary of why the full capability level was not achieved.]

APPENDIX A: IMPROVEMENT PLAN

This Improvement Plan P has been developed specifically for [Organization or Jurisdiction]as a result of [Exercise Name] conducted on [date of exercise.]

Core Capability	HPP/PHEP Capability	Issue/Area for Improvement	Corrective Action Description	Capability Element	Primary Responsible Organization	Organization POC	Start Date	Completion Date
Core Capability 1: Choose from dropdown.	Capability 1: Choose from dropdown.	1. [Area for Improvement]		Choose from dropdown				
				Choose from dropdown				
				Choose from dropdown				
		2. [Area for Improvement]		Choose from dropdown				
				Choose from dropdown				
Core Capability 2: Choose from dropdown.	Capability 2: Choose from dropdown.	1. [Area for Improvement]		Choose from dropdown				
				Choose from dropdown				
				Choose from dropdown				
		2. [Area for Improvement]		Choose from dropdown				
				Choose from dropdown				

APPENDIX B: PARTICIPATING AGENCIES

Name of Organization	Type of Organization	Agency Level (Federal, State, Local, Private)	Level of Involvement
	Choose from dropdown.	Choose from dropdown.	Choose from dropdown.
	Choose from dropdown.	Choose from dropdown.	Choose from dropdown.
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	Choose from dropdown.	Choose from dropdown.	Choose from dropdown.
	Choose from dropdown.	Choose from dropdown.	Choose from dropdown.

APPENDIX C: EVENT PARTICIPANT (OPTIONAL)

First Name	Last Name	Agency	Phone Number	Email

APPENDIX D: ACRONYMS

Acronym	Title

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Appendix A. Contact Agencies and Personnel

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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
http://www.chfs.ky.gov/dph/epi/default.htm

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

Name	Title	Telephone Number	E-mail Address
Dr. Kraig Humbaugh	State Epidemiologist	502-564-3418	Kraig.Humbaugh@ky.gov
Dr. Robert Brawley	Chief of Infectious Disease Branch	502-564-3261 ext. 4235	Robert.Brawley@ky.gov
Dr. John Poe	State Public Health Veterinarian	502-564-3418 ext. 4313	John.Poe@ky.gov
Dr. Doug Thoroughman	Career Epidemiology Field Officer (CDC)	502-564-3418 ext. 4315	Douglas.Thoroughman@ky.gov
Liz Russell	EIS Officer	502-564-3418 ext. 4316	Elizabeth.Russell@ky.gov
Matt Groenewold	CDC Field Officer	502-564-7243 ext. 4028	Matthew.Groenewold@ky.gov
Sandy Kelly	Infectious Disease Branch: Reportable Disease Branch-Section Supervisor	502-564-3261 ext. 3235	SandyE.Kelly@ky.gov
Stacy Davidson	Infectious Disease Branch-Nurse Consultant	502-564-3261 ext. 4238	Stacy.Davidson@ky.gov
Jim Britton	Infectious Disease Branch-Nurse Consultant	502-564-3261 ext. 3571	James.Britton@ky.gov
Tracy Vaughn	Infectious Disease Branch-Nurse Consultant	502-564-3261 ext. 3583	TracyL.Vaughn@ky.gov
T.J. Sugg	Infectious Disease Branch-Epidemiologist	502-564-3261 ext. 4244	Tennis.Sugg@ky.gov
Jasie Logsdon	Infectious Disease Branch-Foodborne and Waterborne Epidemiologist	502-564-3261 Ext. 4240	Jasie.Logsdon@ky.gov

ESF-8/Public Health Preparedness

Name	Title	Telephone Number	E-mail Address
Rebecca Gillis	Public Health Preparedness Branch Manager	502-564-7243 ext. 4032	RebeccaL.Gillis@ky.gov
Michael Johnson	Operations Section Supervisor	502-564-7243 ext. 4036	MichaelL.Johnson@ky.gov
Jim House	ESF-8 Planning Coordinator	502-564-7243 ext. 4034	JamesR.House@ky.gov

KDPH Division of Public Health Protection and Safety

275 East Main St.
Frankfort KY 40621
502-564-7181
http://www.chfs.ky.gov/dph/info/phps/

Name	Title	Telephone Number	E-mail Address
Kathy Fowler, Interim Director	Public Health Protection & Safety-Division Director	502-564-7181	KathyL.Fowler@ky.gov

Environmental Health Management- Waterborne Illness

Name	Title	Telephone Number	E-mail Address
Vonia Grabeel	Environmental Health- Facilities Sections Supervisor	502-564-4856 ext. 4195	Vonia.Grabeel@ky.gov
Angela Billings	Environmental Health-Community Sections Program Administrator	502-564-4856 ext. 4192	Angela.Billings@ky.gov

Food Safety

Name	Title	Telephone Number	E-mail Address
Mark Reed	Manager-Food Safety Branch	502-564-7181 ext. 4203	Mark.Reed@ky.gov
Pamela Hendren	Environmental Health-Retail Food Section Supervisor	502-564-7181 ext. 3715	PamelaM.Hendren@ky.gov
Shadrick Adams	Environmental Health-Food Manufacturing Section Supervisor	502-564-7181 ext. 4204	Shadrick.Adams@ky.gov
Leslie Cobb	Environmental Health Inspector/ Program Evaluator	502-564-7181 ext. 4267	Leslie.Cobb@ky.gov

KDPH Division of Laboratory Services

100 Sower Bvld.
Frankfort, KY 40621
502-564-4446
http://www.chfs.ky.gov/dph/info/lab/

Name	Title	Telephone Number	E-mail Address
Dr. Paul Bachner	Division of Laboratory Services-Director	502-564-4400 ext. 4400	Paul.Bachner@ky.gov
Dr. Julie Ribes	Division of Laboratory Services- Director	502-564-4446 ext. 4400	JulieA.Ribes@ky.gov
Dr. Darrell Jennings	Division of Laboratory Services- Director	502-564-4446	ChesterD.Jennings@ky.gov
Karim George	Division of Laboratory Services – Assistant Director	502-564-4446	Karim.George@ky.gov
William Baker	Division of Laboratory Services – Assistant Director	502-564-4446 x.4417	WilliamH.Baker@ky.gov
Robin Cotten	Division of Laboratory Services- Bacteriology Supervisor	502-564-4446 ext. 4431	Robin.Cotten@ky.gov

Name	Title	Telephone Number	E-mail Address
Isabelle Berberian	Division of Laboratory Services- Branch Manager	502-564-4446 ext. 4439	Isabelle.Berberian@ky.gov
Leigh Ann Bates	Division of Laboratory Services-Preparedness Supervisor	502-564-4446 ext. 4490	LeighAnn.Bates@ky.gov
Lea Mott	Division of Laboratory Services – Branch Manager Molecular Branch	502-564-4446 ext. 4456	Lea.Mott@ky.gov
Darrin Sevier	Division of Laboratory Services, Molecular Branch, PFGE lab supervisor	502-564-4446 ext. 4419	Darrin.Sevier@ky.gov
Matthew Johnson	Division for Laboratory Services-Virology Supervisor	502-564-4446 ext. 4483	Matthew.Johnson@ky.gov
Carrell Rush	Division for Laboratory Services-Epidemiologist	502-564-4446 ext. 4454	Carrell.Rush@ky.gov
	Laboratory Triage Phone Number	502-330-6235	

Contacts for Outbreak Investigations
Local Health Departments (LHDs)

County or District		Name	Telephone	Fax	E-mail
Allen					
	Director of Local Health Department	Donnie R. Fitzpatrick	270-237-4423 ext 106	270-237-4777	Donnie.R.Fitzpatrick@ky.gov
	Environmental Health Director	Margaret Ann Vick	270-237-4423 ext 112	270-237-4777	MargaretA.Vick@ky.gov
	Regional Epidemiologist	Srihari Seshadri	270-781-8039 ext. 164	270-796-8946	Srihari.Seshadri@barrenriverhealth.org
	Local Health Department Nurse Leader	Carolyn Richey	270-237-4423 ext 109	270-237-4777	CarolynS.Richey@ky.gov
	Local Surveillance Nurse Contact	Laura Jones	270-237-4423	270-237-4777	LauraL.Jones@ky.gov
		Carolyn Richey	270-237-4423	270-237-4777	CarolynS.Richey@ky.gov
		Lisa Carter	270-237-4423	270-237-4777	lisag.carter@ky.gov
	Regional Preparedness Coordinators	Jerrod Wright	270-487-6782 ext.236	270-487-5457	Jerrod.Wright@ky.gov
	Emergency/24 hour contact number		270-622-1740		
Anderson					
	Director of Local Health Department	Tim Wright	502-839-4551	502-839-8099	TimothyE.Wright@ky.gov
	Health Environmentalist II	Brenda Haydon	502-839-4551	502-839-8099	Brenda.Haydon@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Renee Durr	502-680-6113	502-839-8099	JacquelineR.Durr@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinator	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		859-753-0314 or 859-873-0109		
Ashland-Boyd					
	Director of Local Health Department	Maria Hardy	606-329-9444 ext. 2229	606-324-1023	MariaC.Hardy@ky.gov
	Environmental Health Program Manager	Steve Rudd	606-324-7141 ext 2295	606-324-7213	StephenD.Rudd@ky.gov
	Regional Epidemiologist	Kristy Bolen	606-329-9444 ext.2232	606-324-1023	KristyM.Bolen@ky.gov
	Local Health Department Nurse Leader	Jennifer Burchett	606-324-7181 ext 2263	606-329-2434	JenniferM.Burchett@ky.gov
	Local Surveillance Nurse Contact	Erin Crace	606-324-7181 ext 2262	606-324-1023	ErinE.Crace@ky.gov
	Regional Preparedness Coordinators	John Hunt	606-638-4389	606-638-3008	JohnM.Hunt@ky.gov
	Emergency/24 hour contact number		606-329-2191 or 606-329-9444		
Barren River (Barren, Butler, Edmonson, Hart, Logan, Metcalfe, Simpson, Warren)					
	Director of District Health Department	Dennis R. Chaney	270-781-8039 ext. 131	270-796-8946	Dennis.Chaney@BarrenRiverHealth.Org
	Environmental Health Director	David Burton	270-781-8039 ext. 116	270-796-8946	david.burton@barrenriverhealth.org
		Tom Buchanan	270-651-8321 ext. 121	270-659-0062	thomas.buchanan@barrenriverhealth.org
	Regional Epidemiologist	Srihari Seshadri	270-781-8039 ext. 164	270-796-8946	Srihari.Seshadri@barrenriverhealth.org
	Local Health Department Nurse Leader	Julia M. Davidson	270-781-8039 ext. 184	270-796-8946	Julia.Davidson@barrenriverhealth.org
	Local Surveillance Nurse Contact	Teresa Casey	270-781-8039 ext. 126	270-796-8946	Teresa.Casey@BarrenRiverHealth.org
		Sharon Ray	270-781-8039 ext. 183	270-796-8946	Sharon.Ray@BarrenRiverHealth.org
		Tina Loy	270-781-8039 ext. 196	270-796-8946	Tina.Loy@BarrenRiverHealth.org
		Carolyn Lyons	270-781-8039 ext. 190	270-796-8946	Carolyn.Lyons@BarrenRiverHealth.org
	Regional Preparedness Coordinators	Jerrod Wright	270-487-6782 ext.236	270-487-5457	Jerrod.Wright@ky.gov
	Emergency/24 hour contact number		270-202-5785		

APPENDIX A

County or District		Name	Telephone	Fax	E-mail
Bell Co.					
	Director of Local Health Department	Teresa Hunter	606-337-7046	606-337-8321	TeresaL.Hunter@ky.gov
	Health Environmentalist II	William Faulkner	606-337-9595	606-337-9424	WilliamC.Faulkner@ky.gov
		Charles Henson			charlesd.henson@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-8295	marionr.pennington@ky.gov
	Local Health Department Nurse Leader	Judy LeFevers	606-337-7046 ext. 222	606-337-8321	judy.lefevers@ky.gov
	Local Surveillance Nurse Contact	Kelly Swanner	606-337-7046	606-337-8321	KellyR.Swanner@ky.gov
		Donna Jenkins	606-337-7046	606-337-8321	DonnaF.Jenkins@ky.gov
	Regional Preparedness Coodinator	Rebecca Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-337-6174		
Bourbon					
	Director of Local Health Department	Andrew Beckett	859-987-1915 ext 112	859-987-3230	andrewb.beckett@ky.gov
	Health Environmentalist II	William Caldwell	859-987-1915	859-987-3230	WilliamR.Caldwell@ky.gov
		Larry Trussell	859-987-1915	859-987-3230	Larry.Trussell@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Joan B. Boardman	859-987-1915 ext 107	859-987-3230	JoanB.Boardman@ky.gov
	Local Surveillance Nurse Contact	Teresa Marsh	859-987-1915 ext 105	859-987-3230	TeresaF.Marsh@ky.gov
		Joan B. Boardman	859-987-1915 ext 1029	859-987-3230	JoanB.Boardman@ky.gov
	Regional Preparedness Coordinators	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		859-707-8002 or 859-987-1915		
Boyle					
	Director of Local Health Department	Brent Blevins	859-236-2053	859-236-2863	Brent.Blevins@ky.gov
	Health Environmentalist II	Dan Troutman	859-236-2053	859-236-2863	DanielT.Troutman@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurses	Vikki Ratliff	859-236-2053	859-236-2863	VickiL.Ratliff@ky.gov
		Amy Gammon			AmeliaD.Gammon@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-2863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-236-2053		
Bracken					
	Director of Local Health Department	Tony Cox	606-735-2157 ext. 231	606-735-2747	Tony.Cox@ky.gov
	Health Environmentalist III	John Dells	606-735-2157 ext. 224	606-735-2159	JohnT.Dells@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@Ky.gov
	Local Health Department Nurse Leader	Amy A. Mains	606-735-2157 ext. 226	606-735-2159	AmyA.Mains@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		606-735-2157		
Breathitt					
	Director of Local Health Department	Sheila Sharpe, Ed.D	606-666-5274	606-666-4601	SheilaG.Sharpe@ky.gov
	Health Environmentalist II	William Sizemore	606-666-7755	606-666-4601	williamg.sizemore@ky.gov
	Regional Epidemiologist	Rudrani Ghosh	606-439-2361	606-439-0870	rudrani.ghosh@ky.gov
	Local Health Department Nurse Leader	Angie Reynolds	606-666-5274	606-666-4601	Angelena.reynolds@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Jarrod Crase	606-666-7732	606-633-2945	jarrod.crase@ky.gov
	Emergency/24 hour contact number		606-666-5274		

County or District		Name	Telephone	Fax	E-mail
Breckinridge					
	Director of Local Health Department	Scott Shrewsberry	270-756-5121	270-756-9090	JosephS.Shrewsberry@ky.gov
	Health Environmentalist III	Jeremy Hinton	270-759-5121		JeremyC.Hinton@ky.gov
		Joseph Shrewsberry	270-759-5121	270-756-9090	JosephS.Shrewsberry@ky.gov
	Regional Epidemiologist	David Day	270-769-1601	270-765-7274	davidl.day@ky.gov
	Local Health Department Nurse Leader	Mary A. Basham	270-756-5121	270-756-9090	MaryA.Basham@ky.gov
	Local Surveillance Nurse Contact	Kim Flood	270-756-5121	270-756-9090	Kimberlin.Flood@ky.gov
	Regional Preparedness Coordinators	Mike Harmon	270-769-1601 ext. 1010	270-765-7274	michaela.harmon@ky.gov
	Emergency/24 hour contact number		270-756-5121		
Buffalo Trace (Mason and Robertson)					
	Director of Local Health Department	Allison Adams	606-564-9447 ext. 131	606-564-7696	AllisonA.Adams@ky.gov
	Health Environmentalist III	Doug Waldren	606-564-9447 ext. 125	606-564-7696	Doug.Waldren@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@ky.gov
	Local Health Department Nurse Leader	Vicki D. Morgan	606-564-9447 ext. 109	606-564-7696	VickiD.Morgan@ky.gov
	Local Surveillance Nurse Contact				
	Mason	Vicki Morgan	606-564-9447 ext. 109	606-564-4483	VickiD.Morgan@ky.gov
	Robertson	Allison Alexander	606-724-5222	606-724-5527	AllisonL.Alexander@ky.gov
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		606-564-9447		
Bullitt					
	Director of Local Health Department	Andrea Renfrow	502-955-7837	502-543-2998	andrea.renfrow@ky.gov
	Environmental Health Program Manager	Mary Ann Blanton	502-955-7837	502-543-2449	marya.blanton@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Marcie Flechler	502-955-7837 ext. 2127	502-543-2998	Marciaa.flecler@ky.gov
	Local Surveillance Nurse Contact	Vickie Trevino	502-955-7837 ext 2124	502-543-2998	VickieM.Trevino@ky.gov
	Regional Preparedness Coordinators	Joey Riddle	502-955-7837 ext.2165	502-543-2998	joey.riddle@ky.gov
	Emergency/24 hour contact number		502-955-7837		
Calloway					
	Director of Local Health Department	Linda Cavitt	270-753-3381	270-753-8455	LindaR.Cavitt@ky.gov
	Health Environmentalist III	Landon Barrow	270-753-3381	270-753-8455	LandonO.Barrow@ky.gov
		Chadwick Burch	270-753-3381	270-753-8455	Chad.Burch@ky.gov
	Regional Epidemiologist	Brandi Day	270-444-9625	270-443-8229	Brandil.day@ky.gov
	Local Health Department Nurse Leader	Linda Cavitt	270-753-3381	270-365-3145	LindaR.Cavitt@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Tina Massengill	270-252-2710	270-527-5321	Tina.Massengill@ky.gov
	Emergency/24 hour contact number		270-293-9334/270-293-5892		
Christian					
	Director of Local Health Department	Mark Pyle	270-887-4160	270-887-4165	Mark.Pyle@ky.gov
	Health Environmentalist II	Matthew Futrell	270-887-4160	270-886-6192	MatthewL.Futrell@ky.gov
		Jill Harton	270-887-4160	270-886-6192	JillT.Harton@ky.gov
		Kristi Wyatt	270-887-4160	270-886-6192	KristiR.Wyatt@ky.gov
	Regional Epidemiologist		270-388-9763 ext. 6		
	Local Health Department Nurse Leader	Amy Maternowski	270-887-4160	270-887-4165	Amy.Maternowski@ky.gov
	Local Surveillance Nurse Contact	Bath Campbell	270-887-4160 ext. 132	270-890-0110	beth.campbell@ky.gov
	Regional Preparedness Coordinators	John Rudolph	270-388-9763 ext. 7	270-388-5941	John.Rudolph@ky.gov
	Emergency/24 hour contact number		270-887-4160		

County or District		Name	Telephone	Fax	E-mail
Clark					
	Director of Local Health Department	Anthony Scott Lockard	859-744-4482	859-744-0338	AnthonyS.Lockard@ky.gov
	Environmental Health Program Manager	Allie Carlene Whitt	859-744-4482	859-737-2426	AllieC.Whitt@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurse	Anne Hatton	859-744-4482	859-737-2426	Anne.Hatton@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-595-1510		
Cumberland Valley (Clay, Jackson, Rockcastle)					
	Director of Local Health Department	Lynnett Renner	606-598-5564	606-598-6615	Lynnett.Renner@ky.gov
	Environmental Health Director	Danny Davis	606-248-7228	606-242-2613	dannya.davis@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-5187	marionr.pennington@ky.gov
	Local Health Department Nurse Leader				
	Clay	Carol Prewitt	606-598-2425	606-598-4448	Carola.prewitt@ky.gov
	Jackson	Sandy Thomas	606-287-8421	606-287-4199	Sandra.thomas@ky.gov
	Rockcastle	Angela Thacker	606-256-2242	606-256-5482	Angelar.thacker@ky.gov
	Local Surveillance Nurse Contact				
	Clay	Carol Prewitt	606-598-2425		Carola.prewitt@ky.gov
		Natasha Roberts	606-598-5564		NatashaL.Roberts@ky.gov
	Jackson	Sandra Thomas	606-287-8421 ext. 1016	606-287-4199	Sandra.thomas@ky.gov
		Cynthia Bingham	606-278-8421		CynthiaE.Bingham@ky.gov
	Rockcastle	Angela Thacker	606-256-2242 ext. 126	606-256-5482	Anglear.Thacker@ky.gov
	Regional Preparedness Coordinators	Becki Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-224-1744 or 606-269-2002		
Estill					
	Director of Local Health Department	Harold "Tim" Gould	606-723-5181	606-723-5254	HaroldT.Gould@ky.gov
	Environmentalists	Kenny Cole	606-723-5181	606-723-5254	KennyW.Cole@ky.gov
		Candie McMaine	606-723-5181	606-723-5254	CandieL.McMaine@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurses	Eshia D. Johnson	606-723-5181	606723-5254	EshiaD.Johnson@ky.gov
		Paula Watson	606-723-5181	606-723-5254	Paula.Watson@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		606-723-5181		
Fayette					
	Director of Local Health Department	Rice Leach, MD	859-288-2300	859-288-2359	RiceC.Leach@ky.gov
	Environmental Health Director	Jessica Cobb	859-494-8950	859-231-9459	JessicaE.Cobb@ky.gov
	Regional Epidemiologist	Katie Myatt	859-899-4238	859-288-7512	AndrewD.Waters@ky.gov
	Local Health Department Nurse Leader	Lois A. Davis	859-288-2323	859-288-2359	LoisA.Davis@ky.gov
	Local Surveillance Nurse Content				
	Regional Preparedness Coordinators	Jason Dotson	859-885-4149 ext 1029	859-887-3683	Jason.Dotson@ky.gov
	Emergency/24 hour contact number		859-335-7071		
Fleming					
	Director of Local Health Department	Stephanie Fryman	606-845-6511	606-845-0879	StephanieO.Fryman@ky.gov
	Health Environmentalist III	Gene McElfresh	606-845-0491	606-845-0879	GeneO.McElfresh@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@ky.gov
	Local Health Department Nurse Leader	Marcy M. Faris	606-845-6511	606-845-0879	MarcyM.Faris@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		606-845-6511		

County or District		Name	Telephone	Fax	E-mail
Floyd					
	Director of Local Health Department	Thursa Sloan	606-886-2788	606-886-9318	ThursaC.Sloan@ky.gov
	Health Environmentalist III	Scott Young	606-886-2788		christophers.young@ky.gov
	Regional Epidemiologist	Nikita Thornsberry	606-886-2788 ext243	606-886-7989	NikitaL.Thornsberry@ky.gov
	Local Health Department Nurse Leader	Martha N. Ellis	606-886-2788 ext.211	606-886-7989	MarthaN.Ellis@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Kim Hall	606-886-2788	502-564-7243	kimberly.hall@ky.gov
	Emergency/24 hour contact number		606-886-2788		
Franklin					
	Director of Local Health Department	Paula Alexander	502-564-4269	502-564-9586	Paula.Alexander@ky.gov
	Environmental Health Director	Kendra Palmer	502-564-7382	502-564-5672	kendrag.palmer@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Tammie J. Bertram	502-564-4269	502-564-7647	TammieJ.Bertram@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		502-564-4269		
Garrard					
	Director of Local Health Department	Marcia Hodge	859-792-2153	859-792-7419	MarciaA.Hodge@ky.gov
	Environmental Health Program Manager	David Heath Stone	606-792-2153	859-792-4719	DavidH.Stone@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurses	Doris Renee Davis	859-792-2153	859-792-4719	Doris.Davis1@ky.gov
		Cathy Stapleton	859-792-2153 ext. 113	859-792-4719	CathyJ.Stapleton@ky.gov
		Keri Noe	859-792-2153	859-792-4719	keril.noe@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-792-2153		
Gateway (Bath, Menifee, Morgan, Rowan)					
	Environmental Health Program Manager	Robin Little	606-768-2151	606-768-2153	RobinL.Little@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@ky.gov
	Director of Local Health Department	James R. Ratliff, Jr.	606-674-6396	606-674-3071	jamesr.ratliff@ky.gov
	Local Health Department Nurse Leader	Jahnna L. Lane	606-674-6396	606-674-3071	JahnnaL.Lane@ky.gov
	Bath	Sherry Ingram	606-674-2731	606-674-6946	SherryL.Ingram@ky.gov
	Menifee	Kim Smallwood	606-768-2151	606-768-2153	TeresaK.Smallwood@Ky.gov
	Morgan	Tamra Burke	606-743-3744	606-743-3750	Tamrap.Burke@ky.gov
	Rowan	Emily Morgan	606-784-8954	606-783-1443	Emily.Morgan@ky.gov
		Laura Harney			LauraJ.Harney@ky.gov
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		606-576-2481 or 606-336-1098		
Graves					
	Director of Local Health Department	Noel Coplen	270-247-3533	270-247-0391	NoelT.Coplen@ky.gov
	Environmental Health Director	Steven Brown	270-247-3533	270-247-0391	StevenL.Brown@ky.gov
		Amber Rodgers	270-247-3533	270-247-0391	AmberM.Rogers@ky.gov
	Regional Epidemiologist	Brandi Day	270-444-9625	270-443-8229	brandil.day@ky.gov
	Local Health Department Nurse Leader	Jimmye Saunders	270-247-3533	270-247-0391	JimmyeL.Saunders@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Tina Massengill	270-252-2710	270-527-5321	tina.massengill@ky.gov
	Emergency/24 hour contact number		270-559-5852		

County or District		Name	Telephone	Fax	E-mail
Grayson					
	Director of Local Health Department	Gigi Meredith	270-259-3141		gigim.meredith@ky.gov
	Enivornmental Health Director	Jerry Brackett	270-259-6844		jerryj.brackett@ky.gov
	Regional Epidemiologist	David Day	270-769-1601 ext. 1011		davidl.day@ky.gov
	Local Health Department Nurse Leader	Sandy Clark	270-259-3141		sandyk.clark@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Michael Harmon	270-769-1601 ext. 1010		Michawla.harmon@ky.gov
	Emergency/24 hour contact number		270-259-6866		
Green River (Daviess, Hancock, Henderson, McLean, Ohio, Union, Webster)					
	Director of Local Health Department	Deborah Fillman	270-686-7747	270-926-9862	Deborah.Fillman@ky.gov
	Environmental Health Director	Clay Horton	270-925-3790	270-926-9862	clayton.horton@grdhd.org
	Regional Epidemiologist	Jessica Austin	270-852-2938	270-926-9862	jessica.austin@grdhd.org
	Director of Nursing	Connie Nalley	270-852-5584	270-926-9862	Connie.Nalley@grdhd.org
	Local Surveillance Nurse Contact				
	Daviess	Judy Payne	270-686-7744	270-926-8677	Judy.Payne@grdhd.org
		Peggy O'Neal	270-686-7744		Peggy.Oneal@grdhd.org
	Hancock	Mary Crowe	270-927-8803	270-927-9467	Mary.Crowe@grdhd.org
	Henderson	Donna DeMar	270-826-3951	270-827-5527	donna.demar@grdhd.org
		Teresa Conrad			teresa.conrad@grdhd.org
	McLean	Laura Brown	270-273-3062	270-273-9983	Laura.Brown@grdhd.org
		Joanie Patterson			Joanie.Patterson@grdhd.org
	Ohio	Laura Brown	270-298-3663	270-298-4777	Laura.Brown@grdhd.org
		Christen Renfrow			christen.renfrow@grdhd.org
	Union	Jennifer Hagan	270-389-1230	270-389-9031	Jennifer.Hagan@grdhd.org
	Webster	Tiffany Nalley	270-639-9315	270-639-7866	Tiffany.nalley@grdhd.org
	Regional Preparedness Coordinators	Margaret Hibbs	270-686-7747 ext.3005	270-926-9862	margaret.hibbs@ky.gov
	Emergency/24 hour contact number		270-215-1750		
Greenup					
	Director of Local Health Department	Chris Crum	606-473-9838	606-473-6405	ChrisG.Crum@ky.gov
	Health Environmentalist II	Erin Fannin	606-473-9838	606-473-6405	ErinE.Fannin@ky.gov
		Wayne Floyd	606-473-9838	606-473-6405	DavidW.Floyd@ky.gov
	Regional Epidemiologist	Kristy Bolen	606-329-9444 ext.237	606-324-1023	KristyM.Bolen@ky.gov
	Local Health Department Nurse Leader	Connie Wilburn	606-473-9838	606-473-6405	ConnieD.Wilburn@ky.gov
	Local Surveillance Nurse Contact	Eve Green	606-473-9838	606-473-6405	EveM.Greene@ky.gov
		Cassie Mace	606-473-9838	606-473-6405	CassieA.Mace@ky.gov
	Regional Preparedness Coordinators	John Hunt	606-638-4389	606-638-3008	JohnM.Hunt@ky.gov
	Emergency/24 hour contact number		606-473-1411 or 606-473-9838		
Harlan					
	Director of Local Health Department	Bobbi Crider	606-573-4820	606-573-6128	BobbiV.Crider@ky.gov
	Health Environmentalist II	Frank Davis	606-573-3219	606-573-9272	FrankB.Davis@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-8295	marionr.pennington@ky.gov
	Local Health Department Nurse Leader	Elena Creech	606-573-4820	606-573-6128	ElenaS.Creech@ky.gov
	Local Surveillance Nurse Contact	Kim Miller	606-573-4820	606-573-6128	KimberlyM.Miller@ky.gov
	Regional Preparedness Coordinators	Becki Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-573-4820		

County or District		Name	Telephone	Fax	E-mail
Hopkins					
	Director of Local Health Department	Denise Beach	270-821-5242	270-825-0138	DeniseL.Baldwin@ky.gov
	Environmental Health Program Manager	Barry Franklin	270-821-5242 ext. 236		Barryl.franklin@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Sophie French	270-821-5242	270-825-0138	SophieM.French@ky.gov
	Local Surveillance Nurse Contact	Jackie Henderson	270-821-5242	270-825-0138	Jackie.Henderson@ky.gov
	Regional Preparedness Coordinators	John Rudolph	270-388-9763 ext. 7	270-388-5941	john.rudolph@ky.gov
	Emergency/24 hour contact number		270-821-5242		
Jessamine					
	Director of Local Health Department	Randy Gooch	859-885-4149 ext. 1011	859-885-1863	Randy.Gooch@ky.gov
	Environmental Health Program Manager	Lisa Bolton	859-885-4149 ext 1015	859-887-3683	lisam.bolton@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Carolyn J. Beaty	859-885-4149	859-885-1863	CarolynJ.Beaty@ky.gov
	Local Surveillance Nurse Contact	Norma Lovins	859-885-4149 ext. 1003	859-885-1863	NormaJ.Lovins@ky.gov
	Regional Preparedness Coordinators	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		859-885-4149 ext. 1090		
Johnson					
	Director of Local Health Department	Russell Briggs	606-789-2590	606-789-8888	RussellW.Briggs@ky.gov
	Environmental Health Program Manager	David Sellards	502-595-4463	606-789-8888	DavidT.Sellards@ky.gov
	Regional Epidemiologist	Nikita Thornsberry	606-438-2758	606-438-2758	NikitaL.Thornsberry@ky.gov
	Local Health Department Nurse Leader	Geneva Childers	606-789-2590	606-789-8888	Geneva.Childers@ky.gov
	Local Surveillance Nurse Contact	Teresa Lawson	606-789-2590	606-789-8237	TeresaA.Lawson@ky.gov
	Regional Preparedness Coordinators	Kim Hall	606-886-2788	502-564-7243	kimberly.hall@ky.gov
	Emergency/24 hour contact number		606-789-2590		
Kentucky River (Knott, Lee, Leslie, Letcher, Owsley, Perry, Wolfe)					
	Director of Local Health Department	Karen Cooper	606-439-2361	606-439-0870	KarenD.Cooper@ky.gov
	Environmental Health Director	Jeffrey Cornett	606-439-2361	606-436-0870	jeffreyd.cornett@ky.gov
	Regional Epidemiologist	Rudrani Ghosh	606-439-2361	606-439-0870	rudrani.ghosh@ky.gov
	Local Health Department Nurse Leader	Sharon Dunaway	606-439-2361	606-439-0870	SharonC.Dunaway@ky.gov
	Local Surveillance Nurse Contact				
	Knott	Kathy Hall	606-785-3144 ext.112	606-785-5512	Kathy.Hall@ky.gov
	Lee	Irsha Wilder	606-464-2492	606-464-5050	Irsha.Wilder@ky.gov
	Leslie	Jean Hoskins	606-672-2393	606-672-5006	Jean.Hoskins@ky.gov
		Lisa Lawson			LisaL.Lawson@ky.gov
	Letcher	Tina Caudill	606-633-2068	606-633-0381	TinaR.Caudill@ky.gov
		Tina Ross			
	Owsley	Thelma Spencer	606-5935181	606-593-7438	ThelmaM.Spencer@ky.gov
	Perry	Libby Turner	606-436-2196	606-439-1813	ElizabethH.Turner@ky.gov
	Wolfe	Melanie Linkous	606-668-3185	606-668-6076	Melanie.Linkous@ky.gov
	Regional Preparedness Coordinators	Jarrod Crase	606-666-7732	606-633-2945	jarrod.crase@ky.gov
	Emergency/24 hour contact number		606-439-2361		

County or District		Name	Telephone	Fax	E-mail
Knox					
	Director of Local Health Department	Susan Liford	606-546-3486	606-277-2125	Susan.Liford@ky.gov
	Health Environmentalist II	John Dye	606-546-3486		JohnR.Dye@ky.gov
		Ricky Hammons	606-546-3486		RickyL.Hammons@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-5187	marionr.pennington@ky.gov
	Local Health Department Nurse Leader	Jerrie Campbell	606-546-3486	606-546-2168	JerriL.Campbell@ky.gov
	Local Surveillance Nurse Contact	Rebecca Davidson			RebeccaL.Davidson@ky.gov
	Regional Preparedness Coordinators	Becki Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-546-5919		
Lake Cumberland (Adair, Casey, Clinton, Cumberland, Green, McCready, Pulaski, Russell, Taylor, Wayne)					
	Director of Local Health Department	Shawn Crabtree	606-678-4761 ext. 1138	606-678-2708	ShawnD.Crabtree@lcdhd.org
	Environmental Health Director	Stuart Spillman	606-678-4761 ext. 2231	606-679-4419	Stuart.Spillman@lcdhd.org
	Regional Epidemiologist	Amanda England	270-864-2206 ext. 2640	270-864-1232	AmandaJ.England@lcdhd.org
	Local Health Department Nurse Leader	Peggy A. Tiller	606-678-4761 ext. 1173	606-678-2708	PeggyA.Tiller@lcdhd.org
	Local Surveillance Nurse Contact				
	Adair	Rhonda Akin	270-384-2268	270-384-4800	RhondaG.Akin@lcdhd.org
		Crystal Dillingham			CrystalG.Hayes@lcdhd.org
	Casey	Natasha Bowmer	606-787-6911	606-787-2507	NatashaL.Bowmer@lcdhd.org
	Clinton	Donna Parrish	606-387-5711	606-387-7212	DonnaJ.Parrish@lcd.hd.org
	Cumberland	Sherri Gibson	270-864-2206	270-864-1232	Sherril.gibson@lcdhd.org
		Heather Capps			
	Green	Kaylene Bush	270-932-4341	270-932-6016	KayleneW.Busg@lcddh.org
	McCreary	Mary Beth Miller	606-376-2412	606-376-3815	Marye.Miller@lcdhd.org
		Jeanne Gaskin			Jeannef.Gaskin@lchd.org
	Pulaski	Peggy Dancy	606-679-4416	606-679-4419	Peggie.i.Dancy@lcdhd.org
		Norma Trull			NormaJ.Trull@lcdhd.org
	Russell	Sonya Whitis	270-343-2181	270-343-2183	Sonyal.whitis@lcdhd.org
	Taylor	Megan Harrison	270-465-4191	270-789-3873	Megan.Harrison@lcdhd.org
	Wayne	Fay Delcamp	606-348-9349	606-348-7464	Fay.Delcamp@lcdhd.org
		Lori Turner			Loric.Turner@lcdhd.org
	Regional Preparedness Coordinators	Jessica Gover	606-678-4761 ext.1295	606-676-9691	Jessica.Gover@ky.gov
	Emergency/24 hour contact number		1-800-295-8253		
Laurel					
	Director of Local Health Department	Mark Hensley	606-878-7754	606-864-8295	MarkA.Hensley@ky.gov
	Environmental Health Program Manager	Timothy Vorbeck	606-864-5187	606-864-8295	TimothyD.Vorbeck@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-8295	marionr.pennington@ky.gov
	Local Health Department Nurse Leader	Rinda A. Vanderhoof	606-864-5187	606-864-8295	RindaA.Vanderhoof@ky.gov
	Local Surveillance Nurse Contact	Carolee B. Epperson			CaroleeB.Epperson@ky.gov
	Regional Preparedness Coordinators	Becki Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-224-1744 or 606-682-1516		
Lawrence					
	Director of Local Health Department	Cindy Maynard	606-638-4389	606-638-3008	CindyL.Maynard@ky.gov
	Health Environmental II	Tanya Horn	606-638-4389	606-638-3008	tanya.marcum@ky.gov
	Regional Epidemiologist	Kristy Bolen	606-329-9444 ext.237	606-324-1023	kristym.bolen@ky.gov
	Local Health Department Nurse Leader	Shirley A. Delong	606-638-4389	606-638-3008	ShirleyA.Delong@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	John Hunt	606-638-4389	606-638-3008	johnm.hunt@ky.gov
	Emergency/24 hour contact number	Cindy Maynard	606-638-4851 or 606-638-4389		

County or District		Name	Telephone	Fax	E-mail
Lewis					
	Director of Local Health Department	Anita J. Bertram	606-796-2632	606-796-9285	AnitaJ.Bertram@ky.gov
	Health Environmentalist III	Travis Patton	606-796-2632		Travis.Patton@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@ky.gov
	Local Health Department Nurse Leader	Allyson Brannon	606-796-2632	606-796-9285	AllysonK.Brannon@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		606-584-1538 or 606-584-1538		
Lincoln					
	Director of Local Health Department	Diane Miller	606-365-3106	606-365-1640	Diane.Miller@ky.gov
	Health Environmentalist II	Teresa Baldwin	606-365-3106	606-365-1640	Teresa.Baldwin@ky.gov
		Jack Metcalfe	606-365-3106	606-365-1640	JackL.Metcalfe@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	Judy.Collins@ky.gov
	Reportable Disease Nurse	Jackie McMurtry	606-365-3106	606-365-1640	JackieG.McMurtry@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-583-0698		
Lincoln Trail (Hardin, Larue, Marion, Meade, Nelson, Washington)					
	Director of Local Health Department	Sara Best	270-769-1601	270-765-7274	SaraJ.Best@ky.gov
	Environmental Health Director	Pablo Munzo	270-769-1604 ext. 1014	270-765-7274	pablod.munoz@ky.gov
	Regional Epidemiologist	David Day	270-769-1601	270-765-7274	DavidL.Day@ky.gov
	Local Health Department Nurse Leader	Glenda Bastin	270-769-1601	270-765-7274	Glenda.Bastin@ky.gov
	Local Surveillance Nurse Contact				
	Hardin	Angee McCreery	270-765-6196	270-763-0397	AngeeM.McCreery@ky.gov
	Larue	Lisa Cox	270-358-3844	270-358-5816	LisaR.Cox@ky.gov
	Marion	Paula Mattingly	270-692-3393	270-692-0045	Paula.Mattingly@ky.gov
	Meade	Beverly Ambry	270-422-3988	270-422-5699	Beverly.embry@ky.gov
	Nelson	Tammi Moore	502-348-3222	502-349-1557	Tammi.Moore@ky.gov
	Washington	Paula Mattingly	859-336-3980	859-336-9162	Paula.Mattingly@ky.gov
	Regional Preparedness Coordinators	Mike Harmon	270-769-1601 ext. 1010	270-765-7274	MichaelA.Harmon@ky.gov
	Emergency/24 hour contact number		1-866-287-8908		
Little Sandy					
	Director of Local Health Department	Vacant (as of July 31st 2013)			
	Health Environmentalist II	Henry Sturgill	606-474-4115	606-474-0256	HenryO.Sturgill@ky.gov
		Jeffery Barker	606-474-4115	606-474-0256	jefferyd.barker@ky.gov
	Regional Epidemiologist	Kristy Bolen	606-329-9444 ext.237	606-324-1023	kristym.bolen@ky.gov
	Local Health Department Nurse Leader	Trena Greene	606-474-4115	606-474-0256	TrenaR.Greene@ky.gov
	Regional Preparedness Coordinators	John Hunt	502-474-5753	606-638-3008	johnm.hunt@ky.gov
	Emergency/24 hour contact number		606-474-4115 or 606-474-5753		
Louisville Metro					
	Director of Local Health Department	LaQuandra Nesbitt	502-574-6530	502-574-6588	LaQuandra.Nesbitt@louisvilleky.gov
	Environmental Health Director	Matt Rhodes	502-574-6633	502-574-6657	matt.rhodes@louisvilleky.gov
	Regional Epidemiologist	Ma'isah Burks	502-574-5292	502-574-5865	Maisah.Burks@louisvilleky.gov
	Local Health Department Nurse Leader	LaVonne White	502-574-6759	502-574-5650	LaVonne.White@louisvilleky.gov
	Local Surveillance Nurse Contact	Mary Powell	502-574-6570	502-574-5865	Mary.Powell@louisvilleky.gov
		Sandy Melendez	502-574-6570		Sandra.Melendez@louisvilleky.gov
		Carolyn Blair	502-574-6570		Carolyn.Blair@louisvilleky.gov
	Regional Preparedness Coordinators	Joey Riddle	502-955-7837 ext.2165	502-543-2998	joey.riddle@ky.gov
	Emergency/24 hour contact number		502-574-8200		

County or District		Name	Telephone	Fax	E-mail
Madison					
	Director of Local Health Department	Nancy Crewe	859-626-4241	859-623-5910	Nancy.Crewe@ky.gov
	Environmental Health Program Manager	Gene Woody Arvin	859-626-4232	859-626-4277	GeneW.Arvin@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurses	Karen King	859-626-4280	859-624-0104	KarenB.King@ky.gov
		Ava Wright	859-626-4227	859-624-0104	avam.wright@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-623-7312 option 8		
Magoffin					
	Director of Local Health Department	Dr. James M. Shepherd	606-349-6212	606-349-6216	JamesM.Shepherd@ky.gov
	Health Environmentalist II	Patrick Boyd	606-349-6212	606-349-6518	patricko.boyd@ky.gov
	Regional Epidemiologist	Nikita Thornsberry	606-886-2788	606-886-7989	NikitaLThornsberry@ky.gov
	Local Health Department Nurse Leader	Marlene Robertson	606-349-6212	606-349-6518	Marlene.Robertson@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Kim Hall	606-886-2788	502-564-7243	kimberly.hall@ky.gov
	Emergency/24 hour contact number		606-349-6212		
Marshall					
	Director of Local Health Department	Tina McCormick	270-527-1496	270-527-5321	TinaB.McCormick@ky.gov
	Environmental Health Director	Juli Conner	270-703-0395	270-252-2698	julib.conner@ky.gov
	Regional Epidemiologist	Brandi Day	270-444-9625	270-443-8229	brandil.day@ky.gov
	Local Health Department Nurse Leader	Billie J. Weathers	270-527-1496	270-527-5321	BillieJ.Weathers@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Tina Massengill	270-252-2710	270-527-5321	tina.massengill@ky.gov
	Emergency/24 hour contact number		270-527-1333		
Martin					
	Director of Local Health Department	Stephen Ward	606-298-7752	606-298-0412	stephen.ward@ky.gov
	Health Environmentalist II	Richard Helton	606-298-7752	606-298-0413	richardl.helton@ky.gov
	Regional Epidemiologist	Nikita Thornsberry	606-886-2788	606-866-7898	NikitaLThornsberry@ky.gov
	Local Health Department Nurse Leader	Penny Dye	606-298-7752	606-298-0413	pennyj.dye@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Kim Hall	606-886-2788	502-564-7243	kimberly.hall@ky.gov
	Emergency/24 hour contact number		606-298-7752		
Mercer					
	Director of Local Health Department	Kathy Crown-Weber	859-734-4522	859-734-0568	Kathlyn.Crown-Weber@ky.gov
	Environmental Health Director	Tony White	606-734-4522	859-734-0568	tonyd.white@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurses	Becky Horn	859-734-4522	859-734-0568	RebeccaS.Horn@ky.gov
		Rita Ballard	859-734-4522	859-734-0568	ritaa.ballard@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		859-583-8189		
Monroe					
	Director of Local Health Department	Jill Ford	270-487-6782	270-487-5457	JillA.Ford@ky.gov
	Environmental Health Director	Jason Holland	270-487-6782	270-487-5457	jasonj.holland@ky.gov
	Regional Epidemiologist	Srihari Seshadri	270-781-8039 ext. 164	270-796-8946	Srihari.Seshadri@barrenriverhealth.org
	Local Health Department Nurse Leader	Jill Ford	270-487-6782	270-487-5457	JillA.Ford@ky.gov
	Local Surveillance Nurse Contact	Betty Ford	270-487-6782	270-487-5457	BettyC.Ford@ky.gov
		Amy Comer			AmyL.Comer@ky.gov
	Regional Preparedness Coordinators	Jerrod Wright	270-487-6782 ext.236	270-487-5457	jerrod.wright@ky.gov
	Emergency/24 hour contact number		270-487-8083		

County or District		Name	Telephone	Fax	E-mail
Montgomery					
	Director of Local Health Department	Jan Chamness	859-498-3808 ext. 2422	859-498-9082	JanM.Chamness@ky.gov
	Environmental Health Director	Cassie Hudson	859-498-3808 ext. 2428	859-498-9082	CassieL.Hudson@ky.gov
	Regional Epidemiologist	Molly Jernigan	606-564-9447 ext.135	606-564-7696	molly.jernigan@ky.gov
	Local Health Department Nurse Leader	Elicia Combs	859-498-3808 ext . 2416	859-498-9082	Elicia.Combs@ky.gov
	Local Surveillance Nurse Contact	Bernetta Copher/Elicia Combs	859-498-3808	859-498-9082	Bernetta.Copher@ky.gov
	Regional Preparedness Coordinators	David Fifer			David.Fifer@ky.gov
	Emergency/24 hour contact number		859-585-5812		
Muhlenberg					
	Director of Local Health Department	Rebecca Keith	270-754-3200	270-754-5149	RebeccaH.Keith@ky.gov
	Health Environmentalist II	Sarah Wells	270-754-5741	606-743-3750	SarahA.Wells@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Betty Hendrix	270-754-3200	270-543-3159	BettyC.Hendrix@ky.gov
	Local Surveillance Nurse Contact	Sandra Grider	270-754-3200	606-743-3750	Sandraj.grider@ky.gov
	Regional Preparedness Coordinators	John Rudolph	270-388-9763 ext. 7	270-388-5941	john.rudolph@ky.gov
	Emergency/24 hour contact number		270-931-0543		
North Central (Henry, Shelby, Spencer, Trimble)					
	Director of Local Health Department	Renee Blair-Stump	502-633-1243	502-633-7658	Renee.Blair@ky.gov
	Environmental Health Program Manager	David Cammack	502-633-1243	502-633-7658	DavidM.Cammack@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Beverly Aldridge	502-633-1243	502-633-7658	Beverly.Aldridge@ky.gov
	Local Surveillance Nurse Contact				
	Henry,	Kim Cravens	502-845-2882	502-845-7995	Kimj.cravens@ky.gov
	Shelby	Adriana Cash	502-633-1231	502-633-7814	AdrianaC.Cash@ky.gov
	Spencer	Debbie Long	502-477-8146	502-477-5624	DebbieT.Long@ky.gov
	Trimble	Sandy Evans	502-255-7701	502-255-3760	SandraA.Evans@ky.gov
	Regional Preparedness Coordinators	Joey Riddle	502-955-7837 ext.2165	502-543-2998	joey.riddle@ky.gov
	Emergency/24 hour contact number		502-633-1243		
Northern KY (Boone, Campbell, Grant, Kenton)					
	Director of Local Health Department	Dr. Lynne Saddler	859-341-4264	859-578-3689	Lynne.Saddler@nkyhealth.org
	Environmental Health Director	Steve Divine	502-363-2023	859-578-3689	steve.divine@nkyhealth.org
	Regional Epidemiologist	Joyce Rice	859-363-2073	859-578-3689	joyce.rice@nkyhealth.org
	Local Health Department Nurse Leader	Jennifer Hunter	859-341-4264	859-578-3689	Jennifer.hunter@nkyhealth.org
	Local Surveillance Nurse Contact	Kelly Giesbrecht	859-363-2065	859-578-3689	kelly.giesbrecht@nkyhealth.org
		Jessica Scultz	859-363-2072	859-578-3689	jessica.schultz@nkyhealth.org
	Regional Preparedness Coordinators	Barbara Yates	502-352-8149	502-682-0294	barbara.yates@ky.gov
	Emergency/24 hour contact number		859-341-4264 or 859-391-5357		
Oldham					
	Director of Local Health Department	Teresa Gamsky	502-222-3516	502-222-0816	TeresaD.Gamsky@ky.gov
	Environmental Health Director	Todd Lafollette	502-222-3519 ext. 131	502-222-8723	toddg.lafollette@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Ellen Clements	502-222-3516	502-222-0816	JanetL.Cox@ky.gov
	Local Surveillance Nurse Contact	Dori Livy	502-222-3516 ext. 135	502-222-0816	DoriD.Livy@ky.gov
	Regional Preparedness Coordinators	Joey Riddle	502-955-7837 ext.2165	502-543-2998	joey.riddle@ky.gov
	Emergency/24 hour contact number	Teresa Gamsky	502-417-0427		

County or District		Name	Telephone	Fax	E-mail
Pennyrile					
	Director of Local Health Department	Allison Beshear	270-388-9747	270-388-7749	AllisonL.Beshear@ky.gov
	Environmental Health Program Manager	Elisha Kite	270-388-9763	270-388-5941	elishaa.kite@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Angela K. Dooms	270-965-5215	270-965-9078	AngelaK.Dooms@ky.gov
	Regional Preparedness Coordinators	John Rudolph	270-388-9763 ext. 7	270-388-5941	john.rudolph@ky.gov
	Emergency/24 hour contact number		270-388-0911		
Pike					
	Director of Local Health Department	Cynthia Hamilton	606-437-5500	606-437-0873	CynthiaM.Hamilton@ky.gov
	Environmental Health Director	Jackie Cole	606-437-5500	606-437-0873	RaymondJ.Cole@Ky.gov
	Regional Epidemiologist	Nikita Thornsberry	606-886-2788	606-886-7989	NikitaLThornsberry@ky.gov
	Local Health Department Nurse Leader	Stephanie Bentley	606-437-5500 ext. 353	606-437-5512	StephanieRBentley@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Kim Hall	606-886-2788	502-564-7243	kimberly.hall@ky.gov
	Emergency/24 hour contact number		606-437-5500		
Powell					
	Director of Local Health Department	Kathy Neal	606-663-4360	606-663-9790	Kathy.Neal@ky.gov
	Health Environmentalist II	Rusty Griffith	606-663-4360 ext. 2	606-663-9790	Rusty.Griffith@ky.gov
	Regional Epidemiologist	Judy Collins	270-993-9350	859-624-0104	judy.collins@ky.gov
	Reportable Disease Nurse	Joanne H. Campbell	606-663-4360	606-663-9790	JoanneH.Campbell@ky.gov
	Regional Preparedness Coordinators	Rebecca Hardin	859-236-2053	859-236-4863	rebeccal.hardin@ky.gov
	Emergency/24 hour contact number		606-481-1340		
Purchase (Ballard, Carlisle, Fulton, Hickman, McCracken)					
	Director of Local Health Department	Kent Koster	270-444-9625 ext. 111	270-575-5458	Kent.Koster@ky.gov
	Health Environmentalist III	Kevin Alderdice	270-653-6110	270-653-6523	KevinL.Alderdice@ky.gov
		Joel Barrett	270-444-9625	270-442-8769	JoelK.Barrett@ky.gov
		Todd Bogle	270-665-5432	270-665-9166	ToddA.Bogle@ky.gov
		Crystal Stevenson	270-444-9631	270-442-8769	CrystalG.Stevenson@ky.gov
	Regional Epidemiologist	Brandi Day	270-444-9625 ext. 147	270-443-8229	BrandiL.Day@ky.gov
	Local Health Department Nurse Leader	Dorthy Altrogge	270-444-9625 ext. 162	270-575-5458	DorothyL.Altrogge@ky.gov
	Local Surveillance Nurse Contact				
	Ballard, Carlisle, Fulton, Hickman	Pamela Klope	270-444-9625	270-443-8229	PamelaD.Klope@ky.gov
	McCracken	Brandi Earp	270-444-9625 ext. 147	270-443-8229	BrandiL.Earp@ky.gov
	Regional Preparedness Coordinators	Tina Massengill	270-252-2710	270-527-5321	Tina.Massengill@ky.gov
	Emergency/24 hour contact number		270-994-1880 or 731-676-9029		

County or District		Name	Telephone	Fax	E-mail
Three Rivers (Carroll, Gallatin, Owen, and Pendleton)					
	Director of Local Health Department	Georgia Heise	502-484-3412	502-484-0864	GeorgiaF.Heise@ky.gov
	Environmental Health Director	Justin Pittman	502-484-3412 ext.119	502-484-0864	justinl.pittman@ky.gov
	Regional Epidemiologist	Joyce Rice	859-363-2073	859-578-3689	joyce.rice@nkyhealth.org
	Local Health Department Nurse Leader	Susan D. Bingham	502-484-3412	502-484-0864	SusanD.Bingham@ky.gov
	Local Surveillance Nurse Contact				
	Carroll	Ruth Kingkade	502-732-6641	502-732-8681	ruth.kingkade@ky.gov
	Gallatin	Tammy McDonald	859-567-2844	859-567-2845	TammyM.McDonald@ky.gov
	Owen	Alicia Banta	502-484-5736	502-484-5737	AliciaM.Banta@ky.gov
	Pendleton	Rebecca Messmer	859-654-6985	859-654-6986	RebeccaM.Messmer@ky.gov
	Regional Preparedness Coordinators	Barbara Yates	502-352-8149	502-682-0294	barbara.yates@ky.gov
	Emergency/24 hour contact number		502-484-3412 or 502-682-0294		
Todd					
	Director of Local Health Department	Jennifer Harris	270-265-2362	270-265-0602	JenniferM.Harris@ky.gov
	Health Environmentalist III	Robert McLellan	270-265-2362	270-265-0602	RobertL.McLellan@ky.gov
	Regional Epidemiologist				
	Local Health Department Nurse Leader	Christie Baumann	270-265-2362	270-265-0602	Christiej.baumann@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	John Rudolph	270-388-9763 ext. 7	270-388-5941	john.rudolph@ky.gov
	Emergency/24 hour contact number		270-847-0374 or 270-604-7008		
Wedco District (Harrison, Nicholas and Scott)					
	Director of Local Health Department	Crystal Caudill	859-234-8750	859-234-0054	crystal.caudill@ky.gov
	Environmental Health Director	Gene Thomas	502-234-8750	859-234-0054	williame.thomas@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Carrie Johnson	502-542-9311	859-234-0054	carrie.johnson@ky.gov
	Local Surveillance Nurse Contact				
	Harrison	Debbie Bradford	859-234-2842	859-234-0393	DoborahM.Bradford@ky.gov
		Denna Moreland	859-234-8750	859-234-0054	Deena.Moreland-High@ky.gov
	Nicholas	Terry Sloat	859-289-2188	859-289-2203	Terry.Sloat@ky.gov
		Denna Moreland	859-234-8750	859-234-0054	Deena.Moreland-High@ky.gov
	Scott	Donna Long	502-863-3971	502-863-3986	Donna.Long@ky.gov
	Regional Preparedness Coordinators	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		859-234-8750		

County or District		Name	Telephone	Fax	E-mail
Whitley					
	Director of Local Health Department	Gail Timperio	606-549-3380	606-549-3362	CynthiaG.Timperio@ky.gov
	Health Environmentalist III	Paul Lawson	606-549-3380	606-521-1868	JerryP.Lawson@ky.gov
	Regional Epidemiologist	Marion Pennington	606-878-7754	606-864-5187	marionr.pennington@ky.gov
	Local Health Department Nurse Leader	Tamara A. Phelps	606-549-3380	606-549-8940	TamaraA.Phelps@ky.gov
	Local Surveillance Nurse Contact				
	Regional Preparedness Coordinators	Becki Patton	606-878-7754	606-864-8295	rebecca.patton@ky.gov
	Emergency/24 hour contact number		606-549-3380		
Woodford					
	Director of Local Health Department	Melissa Royce	859-873-4541	859-873-7238	Melissa.Royce@ky.gov
	Environmental Health Program Manager	J. Smith	859-873-4541	859-873-7238	jdwan.smith@ky.gov
	Regional Epidemiologist	Lesia Chaffins	859-885-4149 ext. 1020	606-424-2062	lesia.chaffins@ky.gov
	Local Health Department Nurse Leader	Teresa Catlett	859-873-4541	859-873-7238	Edie.Flora@ky.gov
	Local Surveillance Nurse Contact	Amanda Lancaster	859-873-4541	859-873-7238	Amanda.Lancaster@ky.gov
	Regional Preparedness Coordinator	Jason Dotson	859-885-4149 ext 1029	859-887-3683	jason.dotson@ky.gov
	Emergency/24 hour contact number		859-873-4541		

Updated: March 2014

Contacts for Outbreak Investigations
Additional Contacts

Kentucky Emergency Operations Center
100 Minuteman Parkway
Frankfort, KY 40601
Duty Officer 24/7: (800) 255-2587
Phone: 502-607-1630

Kentucky Department of Agriculture
107 Corporate Drive
Frankfort, KY 40601
Phone: 502-564-4696
Fax: 502-573-0303
http://www.kyagr.com/

Kentucky Energy and Environment Cabinet
Department for Environmental Protection
300 Fair Oaks Lane
Frankfort, KY 40601
Phone: 502-564-0323
Fax: 502-564-4245
http://www.dep.ky.gov/

Kentucky Department of Fish and Wildlife Resources
1 Sportsman's Lane
Frankfort, KY 40601
Phone: 1-800-858-1549
http://www.kdfwr.state.ky.us/default.aspx

Kentucky Emergency Management
(See Kentucky Emergency Operations Center above)

Centers for Disease Control & Prevention- www.cdc.gov

U.S. Food & Drug Administration- www.fda.gov

U.S. Department of Agriculture- www.usda.gov

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Appendix B: Kentucky Timeline for Disease Reporting

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902 KAR 2:020 requires health professionals to report the following diseases to the local health departments serving the jurisdiction in which the patient resides or to the Kentucky Department for Public Health (KDPH).
(Copies of 902 KAR 2:020 available upon request)

REPORT IMMEDIATELY by TELEPHONE to the Local Health Department or the KY Department for Public Health:

- **Unexpected pattern of cases, suspected cases or deaths which may indicate a newly recognized infectious agent**
- **An outbreak, epidemic, related public health hazard or act of bioterrorism, such as SMALLPOX**

Kentucky Department for Public Health in Frankfort
Telephone 502-564-3418 or 1-888-9REPORT (973-7678)
SECURED FAX 502-696-3803

REPORT WITHIN 24 HOURS

Anthrax
Arboviral Disease*
- **Neuroinvasive**
- **Non-Neuroinvasive**

Botulism
Brucellosis
Campylobacteriosis
Cholera
Cryptosporidiosis
Diphtheria
***E. coli* shiga toxin positive (STEC)**
***Haemophilus influenzae* invasive disease**
Hansen's disease
Hantavirus infection
Hepatitis A
Listeriosis
Measles
Meningococcal infections
Pertussis
Plague
Poliomyelitis
Psittacosis
Q Fever
Rabies, animal
Rabies, human
Rubella
Rubella syndrome, congenital
Salmonellosis
Shigellosis
Syphilis, primary, secondary, early latent or congenital
Tetanus
Tularemia
Typhoid Fever
Vibrio parahaemolyticus
Vibrio vulnificus
Yellow Fever

REPORT WITHIN ONE (1) BUSINESS DAY

Foodborne outbreak
Hepatitis B infection in a pregnant woman or child born in or after 1992
Hepatitis B, acute
Mumps
Streptococcal disease invasive, Group A
Toxic Shock Syndrome
Tuberculosis
Waterborne outbreak

REPORT WITHIN FIVE (5) BUSINESS DAYS

AIDS
Chancroid
***Chlamydia trachomatis* infection**
Ehrlichiosis
Gonorrhea
Granuloma inguinale
Hepatitis C, acute
Histoplasmosis
HIV infection
Lead poisoning
Legionellosis
Lyme disease
Lymphogranuloma venereum
Malaria
Rabies, post exposure prophylaxis
Rocky Mountain spotted fever
***Streptococcus pneumoniae*, drug-resistant invasive disease**
Syphilis, other than primary, secondary, early latent or congenital
Toxoplasmosis

* Includes Eastern Equine, Western Equine, California group, St. Louis, Venezuelan and West Nile Viruses
Influenza virus isolates are to be reported weekly by laboratories.
902 KAR 02:065 requires long term care facilities to report an outbreak (2 or more cases) of influenza-like illnesses (ILI) within 24 hours to the local health department or the KDPH.

All cases of HIV infections/AIDS are reportable to a separate surveillance system in accordance with KRS 211.180(1)b. To report a HIV/AIDS case call 866-510-0008.
DO NOT REPORT HIV/AIDS CASES ON THIS FORM.

Note: Animal bites shall be reported to local health departments within twelve (12) hours in accordance with KRS 258:065.

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Appendix C: Kentucky Field Guide for Foodborne and Waterborne Disease

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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]
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. 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. Form 219
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. 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

[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 http://www.cdc.gov/ncidod/dbmd/outbreak/guide_fd.htm 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 http://chfs.ky.gov/dph/info/lab/

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 January 2009

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]
						▪ Collect epidemiologically implicated fish
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 g feces, 10 ml sera in red stoppered tube[6] ▪ Sterile, leak-proof unbreakable container. 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 $>10^5$ *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 of culture isolates). ▪ 5-50 g stool ▪ Kit #10
Cryptosporidium parvum[7]	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	▪ Isolation of *C. parvum* oocysts from implicated food, **OR** Isolation 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. Form 219

[6] DLS staff must be contacted before any specimens for botulism will be tested.
[7] Additional waterborne agents will be added. These include *Cyclosporac ayetanensus, Entamoeba histolytica,* and *Giardia lamblia.*

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 January 2009

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]
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. Form 219
Escherichia coli enterotoxigenic (ETEC)[8]	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. 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
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

[8] 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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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]
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 ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219
Norwalk virus 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 or vomitus of ill person ▪ Sterile, leak-proof container without preservatives. Must be refrigerated. Form 275
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
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

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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. 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
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
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. 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 ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Form 219 ▪

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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 10^5/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
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
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 ▪
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. Form 219

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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 or vomitus of ill person. ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. 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 ▪ Feces, rectal swabs ▪ Enteric pathogens kit with buffered glycerol saline. Form 219
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 10^6 *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-

[1] *The KY Field Guide to Food-Borne 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 Food-borne 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. Food-Borne 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 food-borne 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 food-borne diseases at http://www.cdc.gov/ncidod/dbmd/outbreak/guide_fd.htm Chin, J, Ed. Control of Communicable Disease Manual. Washington, D.C.: American Public Health Association, 2000.

[3] CDC. Diagnosis and management of food-borne 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 food-borne 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. Food-Borne 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 http://chfs.ky.gov/dph/info/lab/

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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]
						Blair preservative. Must be refrigerated. 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 >10^5 *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 of culture isolates). ▪ 5-50 g stool ▪ Kit #10
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. Form 219
Escherichia coli Enteroinvasive (EIEC)	12-48 hours	Cramps and diarrhea, with fever, headache	5-10 days	Weeks to months	Unoooked 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. 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. Form 219

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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]
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. 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 10^5/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
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. Form 219
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 58% 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 ▪ Feces, rectal swabs ▪ Enteric pathogens kit with Cary-Blair preservative. Must be refrigerated. Form 219

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Agents typified by vomiting, diarrhea, myalgias, and headache without fever, within 24-48 hours of consuming.						
Norwalk virus 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 or vomitus of ill person ▪ Sterile, leak-proof container without preservatives. Must be refrigerated. Form 275
Agents typified by watery diarrhea and headache without fever, within 24-48 hours of consuming.						
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. 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. Form 219

[6] 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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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
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. Form 219
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 g feces, 10 ml sera in red stoppered tube[7] ▪ Sterile, leak-proof unbreakable container. Form 219

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

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Cryptosporidiosis						
Cryptosporidium parvum[6]	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	▪ Isolation of *C. parvum* oocysts from implicated food, **OR** Isolation 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. Form 219
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
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

[8] Additional waterborne agents will be added. These include *Cyclosporac ayetanensus, Entamoeba histolytica,,*and *Giardia lamblia.*

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						species of dinoflagellates in water from which epidemiologically implicated mollusks are gathered ▪ Collect any amount of epidemiologically implicated shellfish
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
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
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

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Appendix D: Collection and Submission of Clinical Samples

1) **Collection and Packaging of Enteric Pathogens**
2) **Collection and Packaging of Norovirus Specimens**
3) **Collection and Packaging of Intestinal Parasites**
4) **Lab Form 219**
5) **Lab Form 275**
6) **Request for Laboratory Kits and Supplies**

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Collection and Packaging of Enteric Pathogens

Collection and Packaging of Enteric Pathogens

Kentucky Public Health

Supplies Needed for Enteric Pathogens

Cary Blair Transport Media with Indicator
Zorb Sheet
Plastic Zippered Bag

Aluminum Can with
Biohazard label
*Ensure rubber gasket is in lid

Laboratory Form 219
or
Outreach Form

Outer Can with Lid

Collection of Specimen

DO NOT DISCARD LIQUID IN THE VIAL

1. Store Cary Blair media at room temperature.
2. Check expiration date of specimen vial.
3. Make sure two identifiers or lab label is on specimen vial.
4. Specimen should be sent to the laboratory as soon as possible. This medium is intended for use as a transport medium and should not be used as a storage or enrichment medium.

Stool Specimens
1. Collect stool specimen into clean container. DO NOT mix urine or water with sample.
2. Open vial carefully. Using the collection spoon attached to the cap, add enough specimen until the liquid reaches the arrow on the label. Approximately one gram.
3. Replace cap tightly and agitate vial.

Swab Specimens
1. Remove cap and immerse swab into medium.
2. Break swab shaft evenly with the lip of the vial.
3. Replace cap and tightly.

Packaging and Shipping

1. Place sample vial back into zippered bag with Zorb sheet.
2. Place zippered bag inside the aluminum can and tighten lid.
3. Wrap lab form around outside of aluminum can and place inside the outer can. Address label should be on the outside of the outer can. Specimen must be mailed to KY Public Health Lab on the day of collection.

KY Division of Laboratory Services (502)564-4446

10/2013

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Collection and Packaging of Norovirus Specimens

Collection and Packaging of Norovirus

Kentucky Public Health

Supplies Needed for Norovirus

Kit Components:

Cold Pack
95kPa Bag with absorbent
Vial in zip bag with Zorb Sheet
Lab Form 275

Collection of Specimen

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

Stool Specimens
1. Collect stool specimen into clean container. DO NOT mix urine or water with sample.
2. Open vial carefully. Using the collection spoon attached to the cap, fill vial with specimen until half full.
3. Replace cap tightly.

Swab Specimens
1. Remove cap and place into clean vial.
2. Break swab shaft evenly with the lip of the vial.
3. Replace cap and tightly.

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

Packaging and Shipping

Place sample vial into zip bag with Zorb sheet

Place sample/samples into 95kPa bag

Place sample bag on top of frozen freezer block and replace styrofoam lid

Place Outreach or Lab Form 275 on top of styrofoam lid

Close box and place appropriate label on top of box

KY Division of Laboratory Services (502)564-4446 10/2013

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Collection and Packaging of Intestinal Parasites

Collection and Packaging of Intestinal Parasites

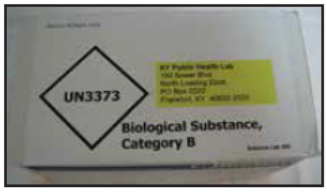
Kentucky Public Health

Supplies Needed for Intestinal Parasites

Zn-PVA Vial with
built-in collection spoon
and
10% Formalin Vial with
built-in collection spoon

95kPa bag
with Absorbent

Outreach Form
or
Lab Form 219



Multishipper box

Collection of Specimen

DO NOT DISCARD LIQUID IN THE VIAL

1. Store Formalin and Zn-PVA vials at room temperature.
2. Check expiration date of specimen vial.
3. Make sure two identifiers or lab label is on specimen vial.
4. For optimal identification collect both vials.
5. Three specimens spaced a few days apart should be sent for examination.

1. Collect stool specimen into clean container.
   DO NOT mix urine or water with sample.
2. Using the built-in spoon, add sufficient stool to each vial to bring the liquid up to the "Fill to Here" line. Tighten cap and shake firmly to ensure specimen is mixed.
3. Wash hands thoroughly.

The Formalin/Zn-PVA vial system assures the preservation of parasites if present in fecal material when there is a delay in transportation.

Packaging and Shipping

1. Place sample vials into 95kPa bag with Zorb sheet and seal.
2. Place 95kPa bag inside the multishipper box.
3. Set laboratory form inside box.
   Address label should be on the outside of the box.
   Specimen should be mailed to the KY Public Health Lab in a timely manner.

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Lab Form 219

Form 219
Revised 7/2012

"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., North Loading Dock,
P.O. Box 2020
Frankfort, Kentucky 40602-2020
Phone: 502/564-4446 Fax: 502/564-7019
Stephanie K. Mayfield Gibson, MD, FCAP, Director

Please complete a separate form for each specimen.

Special Microbiology

PATIENT INFORMATION:

Name (Last, First, MI)

Social Security # Sex Race Age DOB

Home Address

City State Zip Code County

Send Report To:

Submitter

Street Address (PO BOX)

City State Zip Code

Please Use "L" Label or Fill in Completely

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

☐ Intestinal Parasites

☐ Pinworm

☐ Other _____

Organism Suspected:

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

FOR LABORATORY USE ONLY:

Date Received:	Laboratory Number:

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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 7/2012)

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

Viral Isolation and Immunology

Stephanie K. Mayfield Gibson, MD, FCAP, Director

Patient Information:

(can use label here with complete info)

Name (Last, First, MI)

Social Security # Sex EO Age (dd-mmm-yyyy)

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

Viral Isolation:		Specimen Type / Date Collected
Influenza _____	☐	Throat Swab_____
Hospitalization	☐	NP Swab _____
Institutionalized	☐	Nasal Swab_____
Pregnant (____weeks)		Genital Swab_____
Herpes	☐	CSF _____
Enterovirus	☐	Other_____
Other _____		

Agent Detection:		Date Collected
Herpes virus	☐	FA Slide _____

Serology:		Date Collected Serum
Toxoplasmosis	☐	_____
CMV	☐	_____
Herpes	☐	_____
Measles (Rubeola)	☐	_____
Varicella zoster	☐	_____
Mumps	☐	_____
ARBOVIRUSES:	☐	
West Nile	☐	Serum _____
Other		CSF _____

PCR		Date Collected
NOROVIRUS	☐	Stool _____
		Other _____
Other, Specify:_____		Serum _____

CLINICAL DATA

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

Date of Onset:

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

Immunizations / Date	
None	☐
MMR_____	
Influenza_____	
Varicella_____	
Other_____	

Contacts / Recent Travel
Tick bite _____
Mosquito bite _____
Community _____
Other_____
Travel _____

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

Date Received	Laboratory #	Tech	Date Reported

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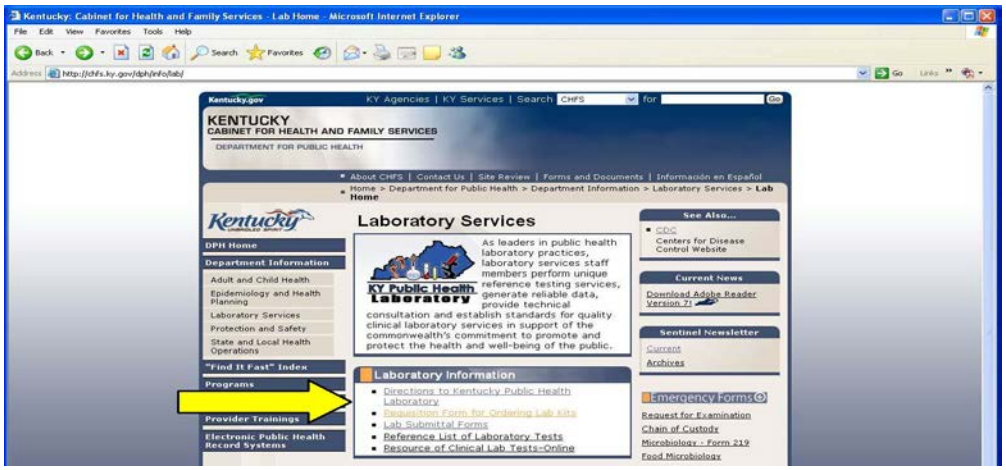
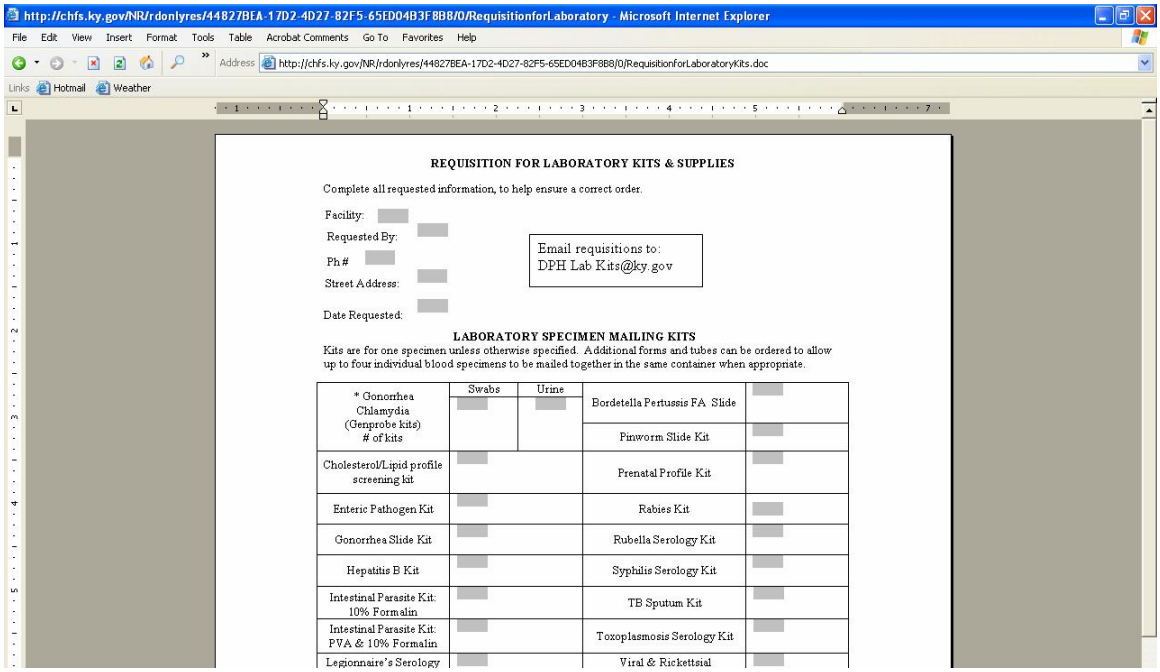
Request for Laboratory Kits and Supplies

1. Connect to http://chfs.ky.gov/dph/info/lab/ via Internet Explorer and click "REQUISITION FORM FOR ORDERING LAB KITS"

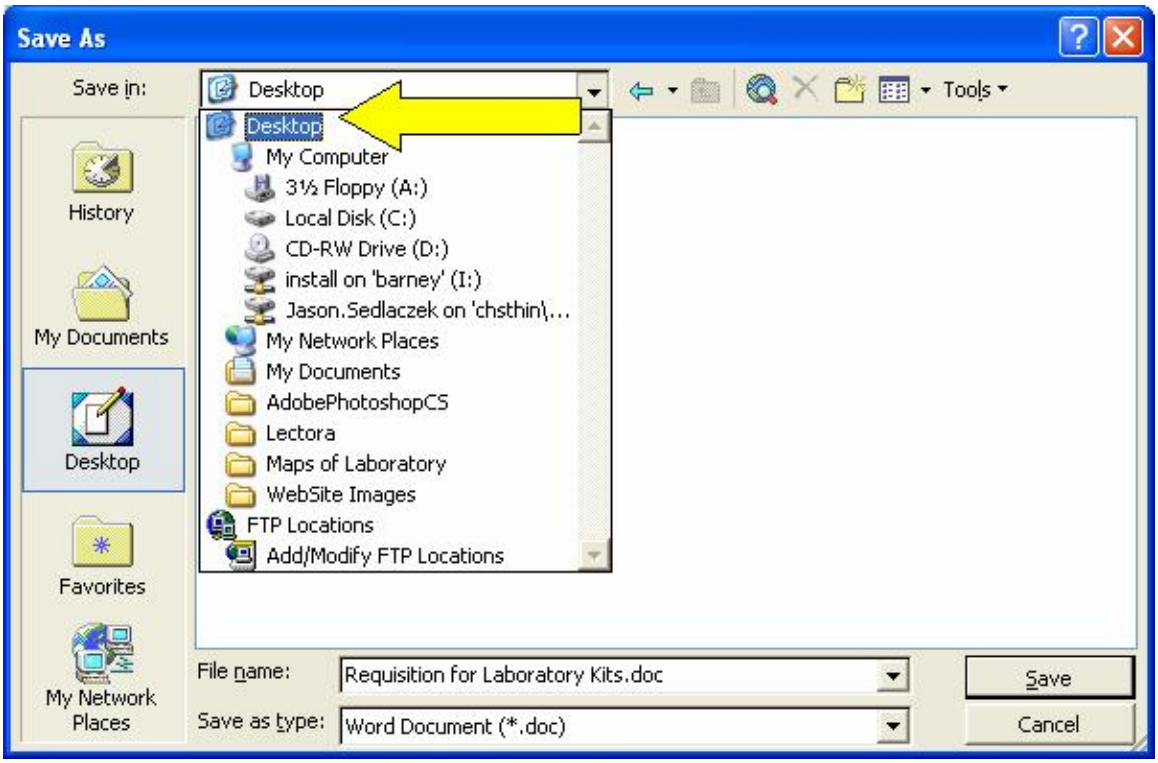


2. You will now see this window. It is best to save this form to your desktop now and then work with it.



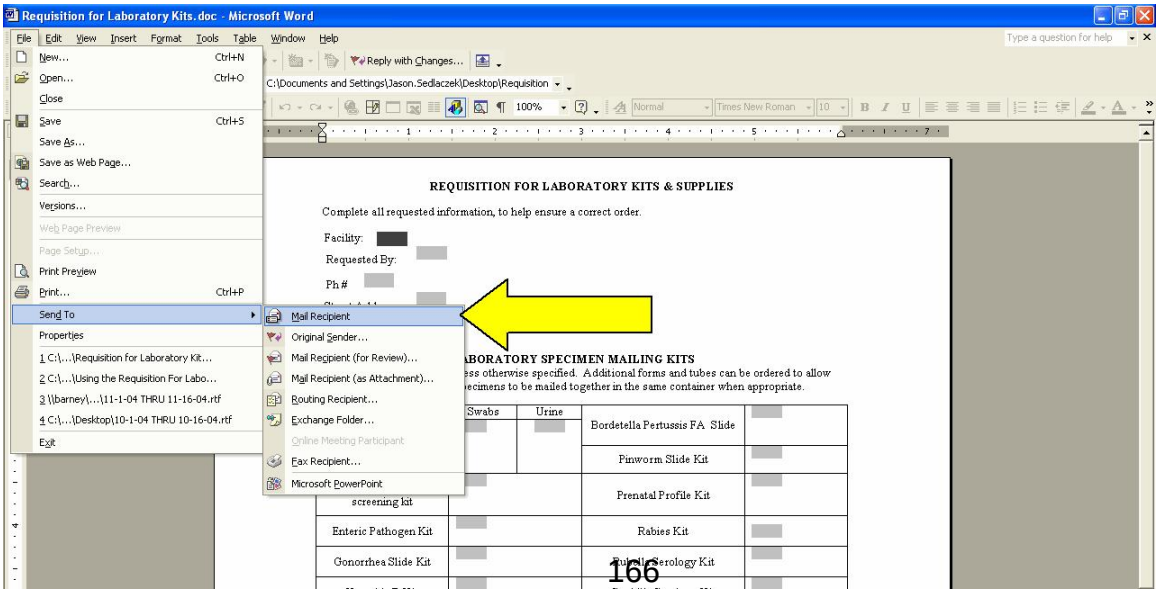
3. Go to FILE ⇨ SAVE AS

4. Older versions of Internet Explorer may look slightly different, but you need to save the document to the DESKTOP. The default file name is correct and the default file type should be .DOC. Click SAVE.

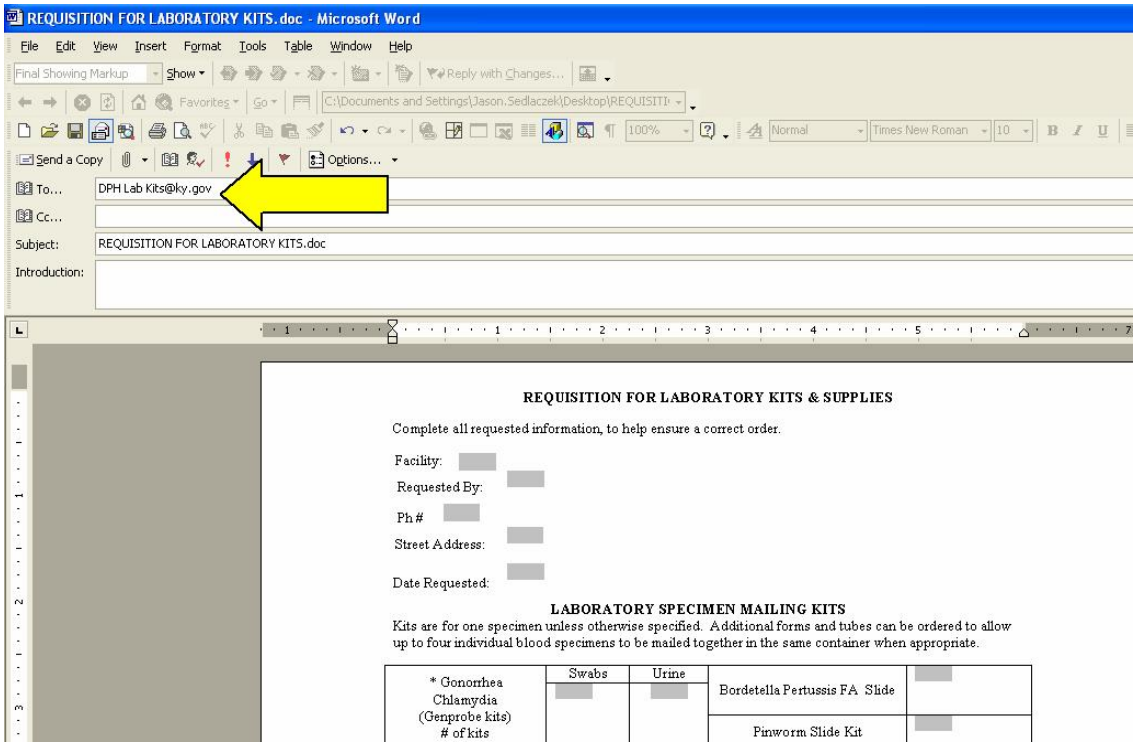


5. You can close the window and go to your desktop. You will have an icon on your desktop of the file. Double Click the icon.

6. Fill out the information in the form and go to FILE ⇨ SEND TO ⇨ MAIL RECIPIENT



7. You can now send the document to " DPH Lab Kits@ky.gov". You may wish to add information to the "Introduction" field. Click SEND A COPY when done.



8. When you close the file, it may be best to save it as a different file name if you want to retain the information for future use. If you do not save the changes, the document fields will be blank the next time you open it.

If you have problems connecting to the website (http://chfs.ky.gov/dph/info/lab) or downloading the forms, please contact Leigh Ann Bates at (502) 564-4446 ext. 4490

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Appendix E: Collection and Submission of Food Samples

1) **Collection and Submission of Food Sample for Bacteriological Examination**

2) **Lab Form 504**

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Collection and Submission of Food Sample for Bacteriological Examination

Collection and Submission of Food Sample for Bacteriological Examination

Kentucky Public Health

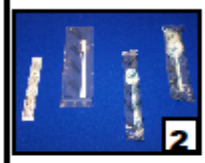
Supplies Needed for Food Sample Collection

1— Food Collection Kit

1—Submission Form LAB 504

1—State Seal

Collection



1. Select food to be sampled.
2. Obtain a minimum of 100 grams (3.5 oz) using the aseptic scoops, knife or tongue depressors provided in the food collection kit or, intact un opened containers.
3. If the sample is not in the original container, transfer to a sterile four ounce sampling bottle, whirl-pak bag or sample bag.
4. Identify sample source on sample form (LAB 504).
5. Seal with official seal. Pack in leak proof container, when in doubt refrigerate sample during transport. Use freezer packs or dry ice. Frozen samples should be kept frozen.
6. Fill out the submission form for each sample (LAB 504). Authorized Collector and Sanitarian ID, Date and Time of Collection, Owner/Occupant, County, and Submitter ID must be on the submission form.
7. Place sample and completed food sample form in styrofoam mailable cooler or other type of mailable package.
8. Remove backing from mailing label and affix to cooler or package.
9. 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 Section at (502) 564-3261 for authorization of all food samples before shipping.
10. Ship or transport food samples overnight/next day.

10/2013

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

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Lab Form 504

Lab form 504 (Rev. 01-2012)

Sample Collection Data and Analysis Report
Kentucky Cabinet for Health and Family Services, Department for Public Health
Division of Laboratory Services
100 Sower Blvd., North Loading Dock, P.O. Box 2020
Frankfort, Kentucky 40602-2020
Phone: 502/564-4446 Fax: 502/564-7019
Stephanie K. Mayfield Gibson, MD, FCAP, Director

Please complete a separate form for each sample submitted.

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

Collector/ Health Dept.: **(Name and Title)** **Sample Procured From:** **(Signature)**

Reason for Collection: **Establishment Number:**

Amount in Lot before Sampling:

Description of Sample (Code No. if any), **& Method of Collection:**

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

Manufacturer/ Health Dept.: **Address:** **Zip:**

Other (Name): **Address:** **Zip:**

Collector Remarks:

Collector Signature: **Delivery Method:** **Released Date:** **Time:**

Requested Laboratory Analysis: ☐Bacteriological ☐Chemical ☐ Other

☐ Aerobic Plate Count	☐ Staph aureus ☐ Count ☐ Toxin	☐ Salmonella species	☐ Pesticide Residue
☐ Coliform Count	☐ Bacillus cereus ☐ Count ☐ Toxin	☐ Shigella species	☐ Trace Metals (Water)
☐ Enterobacteriaceae Count	☐ Clostridium perfringens Count	☐ E. coli O157: H7	Specify Metal(s):
☐ E. coli Count	☐ Campylobacter species	☐ Non- O157 STEC	☐Other (Describe)
☐ Mold & Yeast Count	☐ Listeria species	Specify:	

Laboratory Receiving Record *(This block to be completed upon receipt in the laboratory)*

Lab Received: _____ (Date) _____ (Time) _____ (By: Initials) _____ (Lab ID No(s)) Delivered by:_____ (Method) From: _____ (Signature of Submitter if hand delivered)

State Seal Attached? ☐Yes ☐ No Sample Received: ☐Refrigerated ☐Frozen ☐Other (Describe)

Report of Laboratory Analysis:

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 217.650 to 217.710 KY Hazardous Substances Labeling Act; ☐ KRS 217C KY Milk and Milk Products Act; ☐ KRS 152.105 to 152.190 Regulates Use and Control of Radiation.

Sample Considered: ☐Adulterated ☐ Misbranded ☐ Other
Further Regulatory Action: ☐ Resample ☐Reinspect ☐ Official Action ☐ Other

Signature Title Agency Date

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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

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Important information to review prior to the collection of water samples

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

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 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.

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Collection and Submission of Water Sample for Bacteriological Examination

Collection and Submission of Water Sample for Bacteriological Examination

Kentucky Public Health

Supplies Needed for Water Sample Collection

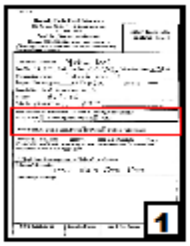
1—Sterile, clear plastic sample bottle containing Sodium Thiosulfate Tablet or Powder

1—Zip seal bag

1— Styrofoam mailer
1— Mailing label/seal

1—Submission Form LAB 507

Collection



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 2-5 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 provided with the water sample kit and seal.

7. Enter information from LAB 507 form into OUTREACH. Print electronic submission form to be submitted in Styrofoam mailer with sample. If OUTREACH can not be accessed and electronic form can not be printed and sent with sample, submit LAB 507 form with sample.
8. Place bag and copy of electronic water sample form in the Styrofoam mailer.

9. Remove backing from mailing label and seal Styrofoam mailer along the short axis.
10. Swimming pools and Beaches require **1 (one)** 100 mL sample. Testing that will include Pseudomonas, such as for Public spa, whirlpool, hot tub or other therapeutic pool requires **2 (two)** 100 mL samples. These can be sent along with the complete form in an appropriate size box to lessen the cost of postage.

11. Samples must arrive in the laboratory within **30 hours** of collection. Samples requiring chain of custody precautions are to be iced and taken to the nearest certified laboratory within **6 hours** of collection. Recommend sample collection on Monday, Tuesday, or Wednesday only and mail the same day.

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

10/2013

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Lab Form 507

LAB 507
REV. 7/2012

KY Division of Laboratory Services 100 Sower Blvd., North Loading Dock, PO Box 2020 Frankfort, Kentucky 40602-2020 Phone: 502/ 564-4446 Fax: 502/ 564-7019 Stephanie K. Mayfield Gibson, MD, FCAP, Director	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

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Appendix G: Chain of Custody

1) **Division of Laboratory Services Chain of Custody Form**
2) **Example of a Chain of Custody Form**

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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: (attach a copy of results)	

ITEM NUMBER	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	
		Signature	Signature	
		Print Name	Print Name	

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Chain of Custody Example

DIVISION OF LABORATORY SERVICES

CHAIN OF CUSTODY / PROPERTY FORM

LAB USE ONLY

LAB NUMBER: _____

EOC NUMBER: 20070000

NAME OF PERSON FROM WHOM RECEIVED: Civilian John Doe	
LOCATION WHERE SAMPLE WAS OBTAINED: John Doe's Mailbox	ADDRESS: 123 Maple St.
TIME OBTAINED: 11:43 a.m. DATE OBTAINED: 1/1/07	REASON OBTAINED: Suspicious white powder
SAMPLE SCREENED FOR: RADIOLOGICAL ( ) CHEMICAL ( ) EXPLOSIVE ( ) BIOLOGICAL ( ) RESULTS: (attach a copy of results)	

ITEM NUMBER	QUANTITY	DESCRIPTION OF ARTICLES
1	1	Envelope and letter with white powder in it

CHAIN OF CUSTODY

ITEM NO.	DATE/ TIME	RELEASED BY	RECEIVED BY	PURPOSE OF CHANGE
1	1/1/07 2:07 p.m.	Signature: Sign your name here Print Name: Print your name here	Signature Print Name	
		Signature Print Name	Signature Print Name	
		Signature Print Name	Signature Print Name	
		Signature Print Name	Signature Print Name	

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Appendix H: Record of Complaint and Investigation

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

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

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RECORD OF COMPLAINT AND INVESTIGATION

Form DFS-216

DFS-216(4-95)

CABINET FOR HUMAN RESOURCES
KENTUCKY DEPARTMENT FOR HEALTH SERVICES
Frankfort, KY 40621-0001

RECORD OF COMPLAINT AND INVESTIGATION

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

FORM OF COMPLAINT	❑ Telephone ❑ Letter ❑ Visit	**DATE OF COMPLAINT (Month/Day/Year)**	
SOURCE OF COMPLAINT	❑ Consumer ❑ Other Governmental Agency ❑ Trade/Industry		
COMPLAINT IDENTIFICATION	Name and Address (Include ZIP Code)		Telephone Number: ( )
COMPLAINT OR INJURY	Description of Complaint/Injury		
PRODUCT AND LABELING	Product Name	Name and Location of Store Where Purchased	Date Purchased
	Package Code	Product Used (If Yes, Enter Date) No ❑ Yes ❑	Amount Remaining
MANUFACTURER/ DISTRIBUTOR OF PRODUCT	Name and Address (Include ZIP Code)		
INJURY OR ILLNESS RESULTED NO _____ YES _____ [If YES, complete items (a) through (c)]	a. Type Symptoms - List by number first to last ____Nausea ____Prostration ____Vomiting ____Paralysis ____Diarrhea ____Other, ____Fever (_____ °F) (explain)	b. Attending Physician _____No _____Yes (If yes, give name/address/phone #)	c. Hospitalization Required _____ No _____ Yes (If yes, give name/ address/phone #)

How long after consuming the product did these symptoms occur? _____minutes/hours
List in detail all other products (food, drink, medicine) consumed during the 36 hour period before onset of illness:

_____

_____

_____

Was medical aid obtained concerning this illness? _____Yes _____ No; Date and time medical aid was obtained: _____
What was the attending physician's diagnosis? _____

_____

Other agency responsible: _____ Yes _____No; Referred to other agency _____ Yes _____ No
Name and Address of Agency _____

_____

_____

_____

Complaint investigation and action taken: _____

_____

_____

_____

_____

_____

_____

_____

Investigator (Name and Title) _____ Date _____

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Example of Record of Complaint and Investigation Form

DFS-216(4-95)

CABINET FOR HUMAN RESOURCES
KENTUCKY DEPARTMENT FOR HEALTH SERVICES
Frankfort, KY 40621-0001

RECORD OF COMPLAINT AND INVESTIGATION

5678911	ANYwhere	0-1000	03	ANYwhere
Est./Permit No.	Health Authority	Sanitarian Code	Action Code	County

FORM OF COMPLAINT	☒ Telephone ☐ Letter ☐ Visit	DATE OF COMPLAINT (Month/Day/Year) 2-27-06	
SOURCE OF COMPLAINT	☒ Consumer ☐ Other Governmental Agency ☐ Trade/Industry		
COMPLAINT IDENTIFICATION	Name and Address (Include ZIP Code) Larry Perry 24 South Ferry street Merry, KY 41234	Telephone Number: (653)247-9753	
COMPLAINT OR INJURY	Description of Complaint/Injury: Mold found in Smiths Yogurt		
PRODUCT AND LABELING	Product Name: Good Yogurt	Name and Location of Store Where Purchased: FOOD KING Grocery	Date Purchased: 2-26-06
	Package Code: Aug15_07L109/E	Product Used (If Yes, Enter Date) No ☒ Yes ☐	Amount Remaining: 8 oz
MANUFACTURER/ DISTRIBUTOR OF PRODUCT	Name and Address (Include ZIP Code) Good Yogurt 100 Creamy Lane St Louis, MO 61812		
INJURY OR ILLNESS RESULTED (NO) ✓ YES ____ [If YES, complete items (a) through (c)]	a. Type Symptoms - List by number first to last: ___ Nausea ___ Prostration ___ Vomiting ___ Paralysis ___ Diarrhea ___ Other, ___ Fever (___ °F) (explain)	b. Attending Physician ___ No ___ Yes (If yes, give name/address/phone #)	c. Hospitalization Required ___ No ___ Yes (If yes, give name/address/phone #)

How long after consuming the product did these symptoms occur? _____ minutes/hours
List in detail all other products (food, drink, medicine) consumed during the 36 hour period before onset of illness:

Was medical aid obtained concerning this illness? ___ Yes ___ (No); Date and time medical aid was obtained: _____
What was the attending physician's diagnosis? _____

Other agency responsible: ___ (Yes) ___ No; Referred to other agency ___ (Yes) ___ No
Name and Address of Agency FDA

Complaint investigation and action taken: Contacted KY Food Safety Branch for Follow up on 2/27/06. They recommended samples be collected and sent to the State Lab in Frankfort. An original sample and a control sample was collected and sent to the State Lab.

Investigator (Name and Title) [illegible] Heath Environmentalist Date 2-27-06

Kentucky

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Appendix I: KDPH Enteric Disease Investigation Form

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Reviewed 5/14/2013

Kentucky Department for Public Health
Division of Epidemiology and Health Planning

Enteric Disease Investigation Form

Circle one:
Campylobacter, *Cryptosporidium*, *Salmonella*, Shiga toxin-producing *E. coli* (STEC), *Shigella*

State Case # Patient Initials: _____ **Date of Interview:** ___/___/_____

Gender: ☐Male ☐ Female **Age**_____ **County of Residence**_____

Ethnicity:
☐Hispanic or Latino
Hispanic or Latino
☐ Unknown

Race:☐White
☐Black or African American ☐Not
☐Asian
☐ Native American/Pacific Islander
☐ American Indian/ Alaskan Native
☐Unknown

Occupation: _____
Employer: _____ **Job Description:** _____
Is the patient: ☐Daycare/school worker/attendee☐Healthcare worker☐Food service worker☐N/A
If so, name of daycare/school/health care facility/food service facility:
_____

SECTION 1: Clinical Information

1. **Date of illness onset:** ____/_____/_____ **2. Time of illness onset:** _____AM / PM

3. **Still ill at time of interview:** ☐Yes ☐No **If no, duration of illness:** ____ hours / days

4. **Symptoms:**

Unknown:	☐	Diarrhea:	☐ Yes ☐ No	Other:	_____
Fever:	☐ Yes ☐ No	Bloody Stool:	☐ Yes ☐ No		_____
Nausea:	☐ Yes ☐ No	Abdominal Cramps:	☐ Yes ☐ No		_____
Vomiting:	☐ Yes ☐ No	Headache:	☐ Yes ☐ No		_____

5. Admitted to hospital for illness:☐ Yes ☐ No When: ____/____/_____ Where: _____

6. Pertinent lab results: Was patient specimen sent for laboratory testing?: ☐Yes ☐No
Type of Test: _____ Specimen Source: _____
Collection Date: ____/_____/_____ Result: Positive Negative
Name of Organism isolated: _____ Serotype: _____
Isolate sent to the Division of Laboratory Services (State Lab):☐ Yes ☐ No

7. Antibiotic Therapy: ☐ Yes ☐ No
If yes, Name of Antibiotic: _____
Date initiated: ____/ _____/ _____ Duration of prescription: _____
Antibiotic resistance/susceptibility report available: ☐ Yes ☐ No
If yes, please send a copy to the Reportable Diseases Section with this form and the lab report.

8. Patient immunocompromised: ☐ Yes ☐ No

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SECTION 2: General Exposures

9. Family, friends, or co-workers with similar illness: ☐Yes ☐No ☐Unknown
Describe: _____

10. Usual sources of drinking water: ☐Tap water ☐Bottled water ☐Water from refrigerator

11. Usual sources of ice: ☐Tap water ☐Bottled water ☐Store-bought ☐ Ice from refrigerator

12. Type of water supply: ☐Public ☐Private ☐Unknown

13. Type of sewage: ☐Public ☐Private ☐Unknown

14. Recent (one month prior to onset) problems with water supply or sewage system:
☐Yes ☐No☐Unknown

15. Recent (one month prior to onset) recreational water activities (swimming, water-skiing, boating, WaterPark): ☐Yes ☐No ☐Unknown
If yes, What/Where: _____

16. Recent Construction / Soil Disturbance (Gardening, Farming etc.):☐Yes☐ No☐ Unknown

17. Animal Exposure Indoor: ☐Yes☐ No☐ Unknown

18. Animal Exposure Outdoor: ☐Yes☐ No☐ Unknown

19. Animal exposure in month preceding illness:

Dogs/Cats:	☐ Yes	☐ No	☐ Unknown	If yes,type: _____
Swine/Sheep:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Poultry:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Cattle:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Rodents:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Birds:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Reptiles:	☐ Yes	☐No	☐ Unknown	If yes,type: _____
Other animals:	☐ Yes	☐No	☐ Unknown	If yes,type: _____

20. Any Pets Ill? ☐Yes ☐No ☐Unknown

21. Farm/petting zoo in month preceding illness: ☐Yes☐ No ☐Unknown
Where: _____When: __/___/___ Type of animal(s) _____

22. Travel in month preceding illness: ☐Yes☐ No ☐Unknown
If yes:
Travel in the U.S: Where: _____ When: ____/_____/_____
Travel outside of the U.S: Where: _____ When: ____/_____/_____

Mode of Travel: ☐Airplane ☐Bus☐ Car ☐Cruise ☐Ship ☐Train ☐Other
Identifier, such as flight no. airline, etc. _____

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Reviewed 5/14/2013

23. Social events in seven days preceding illness (parties, weddings, etc):
☐Yes ☐No ☐Unknown When: ___/___/_____

What: _____ Where: _____

Others ill? _____

SECTION 3: Food and Beverage History (Refer to the five days preceding illness onset)

24. Grocery store(s) where food was purchased: _____
Address of Grocery Store: _____
_____

25. Restaurants/take out: ☐Yes☐ No ☐Unknown
Where: _____ When: ___/___/___ Foods Eaten: _____
Where: _____ When: ___/___/___ Foods Eaten: _____
Where: _____ When: ___/___/___ Foods Eaten: _____
Where: _____ When: ___/___/___ Foods Eaten: _____

26. Food and beverage history by day and meal:

Food and Beverage History by Day and Meal				
	Breakfast	Lunch	Dinner	Snacks/Other
Day of Onset				
One Day Prior to Onset				
Two Days Prior to Onset				
Three Days Prior to Onset				
Four Days Prior to Onset				
Five Days Prior to Onset				

☐ Limited Food Recall

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26. Did you drink any milk within the last 7 days, preceding your illness?:

☐Yes☐No ☐Unknown

When and where did you get the milk, you drank?

Date of Purchase: ___/____/____Where: _____

Was any of it unpasteurized or raw milk: ☐Yes ☐No ☐Unknown

Brand: _____ Type: _____

27. Did you eat any ground beef within the last 7 days, preceding your illness?:

☐Yes ☐No ☐Unknown

When and where did you purchase any ground beef you ate a week before your illness?

Date of Purchase: ___/____/____Where: _____

What type of ground beef was it?:_____Brand: _____ Package Size: _____

Percent Lean (e.g., 80/20): _____

28. Did you eat any chicken or turkey within the last 7 days, preceding your illness?:

☐Yes ☐No ☐Unknown

When and where did you purchase any other meat products that you ate a week before your illness

Date of Purchase: ___/____/____Where: _____

Brand_____What type is it (e.g., breast, ground, legs, thigh, whole):_____

29. Did you eat any other meat products within the last 7 days, preceding your illness?:

☐Yes ☐No ☐Unknown

When and where did you purchase any other meat products that you ate a week before your illness

Date of Purchase: ___/____/____Where: _____

Brand_____What type is it (e.g., pork, lamb, fish, etc):_____

30. Did you eat any home canned foods, within the last 7 days, before your illness?:

☐Yes ☐No ☐Unknown

Date of Consumption: ___/____/____ If yes, what was it: _____

Do you have any unused canned food available for testing: ☐Yes ☐No ☐Unknown

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Reviewed 5/14/2013

31. Did you eat any rice, 24 hours prior to your illness?: ☐Yes ☐No ☐Unknown

Date of Consumption: ___/____/____ Where was it eaten?: _____

Brand_____What type of rice was consumed?:_____

Was the food catered?: ☐Yes ☐No ☐Unknown If yes, who?:_____

32. Did you eat any potato salad, 24 hours prior to your illness?: ☐Yes ☐No ☐Unknown

Date of Consumption: ___/____/____ Where was it eaten?: _____

Brand_____Was the food catered?: ☐Yes ☐No ☐Unknown

If yes, who?:_____

33. Did you eat any cole slaw, 24 hours prior to your illness?: ☐Yes ☐No ☐Unknown

Date of Consumption: ___/____/____ Where was it eaten?: _____

Brand_____Was the food catered?: ☐Yes ☐No ☐Unknown

If yes, who?:_____

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34. Specific food and beverage items consumed:

Meat, Poultry, Fish, Egg, and Dairy	Yes	No	Unknown
Eggs	☐	☐	☐
Unpasteurized Milk	☐	☐	☐
Soy Milk	☐	☐	☐
Yogurt	☐	☐	☐
Cottage Cheese	☐	☐	☐
Ricotta	☐	☐	☐
Presliced Cheese	☐	☐	☐
Block Cheese	☐	☐	☐
Mexican Style Cheese (Queso Fresco, Queso Blanco)	☐	☐	☐
Beef (Not Ground)	☐	☐	☐
Ground Beef	☐	☐	☐
Chicken	☐	☐	☐
Turkey	☐	☐	☐
Ground Turkey/Chicken	☐	☐	☐
Pork/Ham	☐	☐	☐
Bacon	☐	☐	☐
Deli Meats	☐	☐	☐
Hot Dogs/Sausage	☐	☐	☐
Seafood	☐	☐	☐
Fish	☐	☐	☐
Juice/Fruit	**Yes**	**No**	**Unknown**
Unpasteurized Juice/Cider	☐	☐	☐
Orange Juice	☐	☐	☐
Apple Juice	☐	☐	☐
Other Juice	☐	☐	☐
Cantaloupe	☐	☐	☐
Watermelon	☐	☐	☐
Honeydew	☐	☐	☐
Raspberries	☐	☐	☐
Strawberries	☐	☐	☐
Bananas	☐	☐	☐
Apples	☐	☐	☐
Grapes	☐	☐	☐
Other Fresh Fruit	☐	☐	☐
Frozen Fruit	☐	☐	☐

Vegetables	Yes	No	Unknown
Tomatoes	☐	☐	☐
Carrots	☐	☐	☐
Lettuce in Salad	☐	☐	☐
Lettuce on Sandwich	☐	☐	☐
Spinach	☐	☐	☐
Sprouts	☐	☐	☐
Basil, Parsley, Cilantro	☐	☐	☐
Broccoli	☐	☐	☐
Cucumber/zucchini/squash	☐	☐	☐
Mushrooms	☐	☐	☐
Peppers (sweet peppers, jalapenos, etc)	☐	☐	☐
Potatoes	☐	☐	☐
Onion/ Garlic	☐	☐	☐
Other Fresh Vegetables	☐	☐	☐
Frozen Vegetables	☐	☐	☐
Premade/Processed Foods	**Yes**	**No**	**Unknown**
Store-bought potato/egg/pasta salad	☐	☐	☐
Tofu	☐	☐	☐
Cereal	☐	☐	☐
Baby Food	☐	☐	☐
Frozen Dinners	☐	☐	☐
Pre-made dinner requiring reheat	☐	☐	☐
Salsa	☐	☐	☐
Other	**Yes**	**No**	**Unknown**
Beans or Lentils	☐	☐	☐
Nuts (walnut, almonds, peanuts, etc)	☐	☐	☐
Dried Fruit	☐	☐	☐
Peanut Butter	☐	☐	☐

Reviewed 5/14/2013

Counseling (initial once completed):

_____Educate on pathogen and source (e.g. animal, human)
_____Mode of transmission/prevention/control
_____Proper hand washing and personal hygiene
_____Avoid sharing personal hygiene products
_____Washing all fruits and vegetables; proper food storage and thorough cooking of meats
_____Avoiding cross contamination (surfaces, cutting boards, utensils, stored food in refrigerator)
_____Avoid direct contact with reptiles (lizards, snakes, iguanas, turtles)
_____Risks associated with unpasteurized milk/juice
_____Avoid preparation of food for others
_____Disinfecting surfaces
_____Unrecognized foods (raw eggs in homemade ice cream, homemade salad dressings/sauces, raw cookie dough)
_____High risk circumstances for transmission identified.
_____Counseled to avoid activities that put others at risk of catching disease.
_____Mailed educational information to (address) _____

Environmentalist Notified: ☐Yes ☐No If yes, whom? Name: _____
Interviewer Name and Agency: _____

Enter completed questionnaire into NEDSS and retain a copy at the Local Health Department along with pertinent case information. Fax laboratory reports to the Reportable Disease Section secure fax 502-696-3803.

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Appendix J: National Outbreak Reporting System (NORS) Forms

1) Foodborne Outbreak Form (CDC 52.13)
Instructions

2) Waterborne Outbreak Form (CDC 52.12)
Instructions

For additional information contact the KDPH Division of Epidemiology and Health Planning, Reportable Disease Section, (502) 564-3261

OR

CDC NORS website
http://www.cdc.gov/outbreaknet/nors/

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Foodborne Outbreak Form (CDC 52.13)

http://www.cdc.gov/outbreaknet/pdf/NORS_Guidance_5213_06232009(compliant).pdf

General

National Outbreak Reporting System

Foodborne Disease Transmission, Person-to-Person Disease Transmission, Animal Contact

This form is used to report enteric foodborne, person-to-person, and animal contact-related disease outbreak investigations. This form has 5 sections, General, Laboratory, Person to Person, Animal contact, and Food, as indicated by tabs at the top of each page. ***Complete the General and Laboratory tabs for all modes of transmission and complete additional sections as indicated by the mode of transmission.*** *Please complete as much of all sections as possible.*

CDC USE ONLY

CDC Report ID	State Report ID

Form Approved
OMB No. 0920-0004

General Section

Primary Mode of Transmission *(check one)*

- ☐ Food *(Complete General, Lab, and Food tabs)*
- ☐ Water *(Complete CDC 52.12)*
- ☐ Animal contact *(Complete General, Lab, and Animal Contact tabs)*
- ☐ Person-to-person *(Complete General, Lab, and Person-to-Person tabs)*
- ☐ Environmental contamination other than food/water *(Complete General and Lab tabs)*
- ☐ Indeterminate/Other/Unknown *(Complete General and Lab tabs)*

Investigation Methods *(check all that apply)*

- ☐ Interviews only of ill persons
- ☐ Case-control study
- ☐ Cohort study
- ☐ Food preparation review
- ☐ Water system assessment: Drinking water
- ☐ Water system assessment: Nonpotable water
- ☐ Treated or untreated recreational water venue assessment
- ☐ Investigation at factory/production/treatment plant
- ☐ Investigation at original source (e.g., farm, water source, etc.)
- ☐ Food product or bottled water traceback
- ☐ Environment/food/water sample testing
- ☐ Other

Comments

_____

_____

Dates (mm/dd/yyyy)

Date first case became ill *(required)* ____/_____/_____ Date last case became ill ____/_____/_____

Date of initial exposure ____/_____/_____ Date of last exposure ____/_____/_____

Date of report to CDC (other than this form) ____/_____/_____

Date of notification to State/Territory or Local/Tribal Health Authorities ____/_____/_____

Geographic Location

Reporting state: _____
- ☐Exposure occurred in multiple states
- ☐Exposure occurred in a single state, but cases resided in multiple states
- Other states: _____

Reporting county: _____
- ☐Exposure occurred in multiple counties in reporting state
- ☐Exposure occurred in a single county, but cases resided in multiple counties in reporting state
- Other counties: _____

City/Town/Place of exposure: _____

Do not include proprietary or private facility names

Primary Cases

Number of Primary Cases		Sex *(estimated percent of the primary cases)*	
# Lab-confirmed cases	(A)	Male	%
# Probable cases	(B)		
# Estimated total primary ill		Female	%

	# Cases	Total # of cases for whom info is available	Approximate percent of primary cases in each age group			
# Died			<1 year	%	20–49 years	%
# Hospitalized			1–4 years	%	50–74 years	%
# Visited Emergency Room			5–9 years	%	≥ 75 years	%
# Visited health care provider (excluding ER visits)			10–19 years	%	Unknown	%

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General

Incubation Period, Duration of Illness, Signs or Symptoms for Primary Cases only

Incubation Period *(circle appropriate units)*			**Duration of Illness** *(among recovered cases-circle appropriate units)*		
Shortest		Min, Hours, Days	Shortest		Min, Hours, Days
Median		Min, Hours, Days	Median		Min, Hours, Days
Longest		Min, Hours, Days	Longest		Min, Hours, Days
Total # of cases for whom info is available			Total # of cases for whom info is available		
☐ Unknown incubation period			☐ Unknown duration of illness		

Signs or Symptoms *(*refer to terms from appendix, if appropriate, to describe other common characteristics of cases)*

Feature	# Cases with signs or symptoms	Total # cases for whom info available
Vomiting		
Diarrhea		
Bloody stools		
Fever		
Abdominal cramps		
HUS		
Asymptomatic		
*		
*		
*		

Secondary Cases

Mode of Secondary Transmission *(check all that apply)*	**Number of Secondary Cases**	
☐ Food ☐ Water ☐ Animal contact ☐ Person-to-person ☐ Environmental contamination other than food/water ☐ Indeterminate/Other/Unknown	# Lab-confirmed secondary cases	(A)
	# Probable secondary cases	(B)
	Total # of secondary cases	
	Total # of cases (Primary + Secondary)	

Environmental Health Specialists Network *(if applicable)*

EHS-Net Evaluation ID: 1.) _____ 2.) _____ 3.) _____

Traceback *(for food and bottled water only, not public water)*

☐ Please check if traceback conducted

Source name *(if publicly available)*	Source type *(e.g. poultry farm, tomato processing plant, bottled water factory)*	Location of source		Comments
		State	Country	

Recall

☐ Please check if any food or bottled water product was recalled

Type of item recalled:

Comments:

Reporting Agency

Agency name: _____ E-mail: _____

Contact name: _____ Contact title: _____

Phone no.: _____ Fax no.: _____

Remarks *Briefly describe important aspects of the outbreak not covered above. Please indicate if any adverse outcomes occurred in special populations (e.g., pregnant women, immunocompromised persons)*

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Laboratory | Person-to-Person | Animal Contact

Laboratory Section

Etiology known? ☐ Yes ☐ No

If etiology is *unknown*, were patient specimens collected? ☐ Yes ☐ No ☐ Unknown

If *yes*, how many specimens collected? (provide numeric value) _____

What were they tested for? *(check all that apply)* ☐ Bacteria ☐ Chemicals/Toxins ☐ Viruses ☐ Parasites

Etiology *(Name the bacterium, chemical/toxin, virus, or parasite. If available, include the serotype and other characteristics such as phage type, virulence factors, and metabolic profile. Confirmation criteria available at http://www.cdc.gov/foodborneoutbreaks/guide_fd.htm or MMWR2000/Vol. 49/SS-1/App. B)*

Genus	Species	Serotype	Confirmed outbreak etiology	Other Characteristics	Detected in*	# Lab-confirmed cases
			☐ yes			
			☐ yes			
			☐ yes			
			☐ yes			

*Detected in *(choose all that apply)*: 1 - patient specimen 2 - food specimen 3 - environment specimen 4 - food worker specimen

Isolates *(For bacterial pathogens, provide a representative for each distinct pattern; provide lab ID for all specimens submitted for viral sequencing)*

State Lab ID	PulseNet Outbreak Code	CDC PulseNet Pattern Designation for Enzyme 1	CDC PulseNet Pattern Designation for Enzyme 2	Other Molecular Designation	Other Molecular Designation

Person to Person

Major setting of exposure *(choose one)*

☐ Camp ☐ Hotel ☐ Private setting (residential home) ☐ School
☐ Child day care ☐ Nursing home ☐ Religious facility ☐ Ship
☐ Community-wide ☐ Prison or detention facility ☐ Restaurant ☐ Workplace
☐ Hospital ☐ Other, please specify: _____

Attack rates for major settings of exposure

Group *(based on setting)*	Estimated exposed in major setting*	Estimated ill in major setting	Crude attack rate *[(estimated ill / estimated exposed) x 100]*
residents, guests, passengers, patients, etc.			
staff, crew, etc.			

*e.g., number of persons on ship, number of residents in nursing home or affected ward

Other settings of exposure *(choose all that apply)*

☐ Camp ☐ Hotel ☐ Private setting (residential home) ☐ School
☐ Child day care ☐ Nursing home ☐ Religious facility ☐ Ship
☐ Community-wide ☐ Prison or detention facility ☐ Restaurant ☐ Workplace
☐ Hospital ☐ Other, please specify: _____

Animals and their environment

Setting of exposure	Type of animal	Remarks

Food

Food-specific data

☐ Food vehicle undetermined Total # of cases exposed to implicated food _____

Food	1	2	3
Name of food *(excluding any preparation)*			
Ingredient(s) *(enter all that apply)*			
Contaminated ingredients *(enter all that apply)*			
Reason(s) suspected *(enter all that apply from list in appendix)*			
Method of processing *(enter all that apply from list in appendix)*			
Method of preparation *(select one from list in appendix)*			
Level of preparation *(select one from list in appendix)*			
Contaminated food imported to US?	☐ Yes, Country_____ ☐ Yes, Unknown ☐ No	☐ Yes, Country_____ ☐ Yes, Unknown ☐ No	☐ Yes, Country_____ ☐ Yes, Unknown ☐ No
Was product *both* produced under domestic regulatory oversight *and* sold?	☐ Yes ☐ No ☐ Unknown	☐ Yes ☐ No ☐ Unknown	☐ Yes ☐ No ☐ Unknown

Location where food was prepared *(Check all that apply)*		Location of exposure (where food was eaten) *(Check all that apply)*	
☐ **Restaurant – 'Fast-food'** *(drive up service or pay at counter)*	☐ **Nursing home, assisted living facility, home care**	☐ **Restaurant – 'Fast-food'** *(drive up service or pay at counter)*	☐ **Nursing home, assisted living facility, home care**
☐ **Restaurant – Sit-down dining**	☐ **Hospital**	☐ **Restaurant – Sit-down dining**	☐ **Hospital**
☐ **Restaurant – Other or unknown type**	☐ **Child day care center**	☐ **Restaurant – Other or unknown type**	☐ **Child day care center**
☐ **Private home**	☐ **School**	☐ **Private home**	☐ **School**
☐ **Banquet Facility** *(food prepared and served on-site)*	☐ **Prison, jail**	☐ **Banquet Facility** *(food prepared and served on-site)*	☐ **Prison, jail**
☐ **Carterer** *(food prepared off-site from where served)*	☐ **Church, temple, religious location**	☐ **Carterer** *(food prepared off-site from where served)*	☐ **Church, temple, religious location**
☐ **Fair, festival, other temporary or mobile services**	☐ **Camp**	☐ **Fair, festival, other temporary or mobile services**	☐ **Camp**
☐ **Grocery store**	☐ **Picnic**	☐ **Grocery store**	☐ **Picnic**
☐ **Workplace, not cafeteria**	☐ **Other** *(describe in Prepared/Remarks)*	☐ **Workplace, not cafeteria**	☐ **Other** *(describe in Eaten/Remarks)*
☐ **Workplace cafeteria**	☐ **Unknown**	☐ **Workplace cafeteria**	☐ **Unknown**
Remarks:		**Remarks:**	

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Food

Contributing Factors *(Check all that contributed to this outbreak)*

☐ Contributing factors unknown

Contamination Factor

☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5 ☐ C6 ☐ C7 ☐ C8 ☐ C9 ☐ C10 ☐ C11 ☐ C12 ☐ C13 ☐ C14 ☐ C15 ☐ C-N/A

Proliferation/Amplification Factor *(bacterial outbreaks only)*

☐ P1 ☐ P2 ☐ P3 ☐ P4 ☐ P5 ☐ P6 ☐ P7 ☐ P8 ☐ P9 ☐ P10 ☐ P11 ☐ P12 ☐ P-N/A

Survival Factor

☐ S1 ☐ S2 ☐ S3 ☐ S4 ☐ S5 ☐ S-N/A

The confirmed or suspected point of contamination *(Check one)*

☐ Before preparation ☐ Preparation

If 'before preparation': ☐ Pre-Harvest ☐ Processing ☐ Unknown

Reason suspected *(Check all that apply)*

☐ Environmental evidence	☐ Laboratory evidence
☐ Epidemiologic evidence	☐ Prior experience makes this a likely source

Was food-worker implicated as the source of contamination? ☐ Yes ☐ No

If yes, please check only one of the following

- ☐ Laboratory ***and*** epidemiologic evidence
- ☐ Epidemiologic evidence
- ☐ Laboratory evidence
- ☐ Prior experience makes this a likely source

School Questions

(Complete this section only if school is checked in either sections "Location where food was prepared" or "Location of exposure (where food eaten)")

1. Did the outbreak involve a single or multiple schools?

☐ Single

☐ Multiple (If *yes*, number of schools____)

2. School characteristics *(for all involved students in all involved schools)*

a. Total approximate enrollment

_____ (number of students)

☐ Unknown or undetermined

b. Grade level(s)

☐ Preschool

☐ Grade school *(grades K-12)*

Please check all grades affected: ☐ K ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th ☐ 6th ☐ 7th ☐ 8th ☐ 9th ☐ 10th ☐ 11th ☐ 12th

☐ College/university/technical school

☐ Unknown or Undetermined

c. Primary funding of involved schools

☐ Public

☐ Private

☐ Unknown

3. Describe the preparation of the implicated item: *(check all that apply)*

☐ Heat and serve *(Item mostly prepared or cooked off site, reheated on-site)*

☐ Served a-la-carte

☐ Serve only *(preheated or served cold)*

☐ Cooked on-site using primary ingredients

☐ Provided by a food service management company

☐ Provided by a fast-food vendor

☐ Provided by a pre-plate company

☐ Part of a club or fundraising event

☐ Made in the classroom

☐ Brought by a student/teacher/parent

☐ Other (*describe in General/Remarks*)

☐ Unknown or Undetermined

4. How many times has the state, county or local health department inspected this school cafeteria or kitchen in the 12 months before the outbreak?*

☐ Once

☐ Twice

☐ More than two times

☐ Not inspected

☐ Unknown or Undetermined

5. Does the school have a HACCP plan in place for the school feeding program?*

☐ Yes

☐ No

☐ Unknown or Undetermined

*If multiple schools are involved, please answer according to the most affected school

Food

6. Was implicated food item provided to the school through the National School Lunch/Breakfast Program?

☐ Yes
☐ No
☐ Unknown or Undetermined

If *yes*, was the implicated food item donated/purchased by:

☐ USDA through the Commodity Distribution Program
☐ The state/school authority
☐ Other (*describe in General/Remarks*)
☐ Unknown or Undetermined

Ground Beef

1. What percentage of ill persons (*for whom information is available*) ate ground beef raw or undercooked? _____ %

2. Was ground beef case-ready? ☐ Yes ☐ No ☐ Unknown
(Case-ready ground beef is meat that comes from a manufacturer packaged for sale that is not altered or repackaged by the retailer)

3. Was the beef ground or reground by the retailer?
☐ Yes ☐ No ☐ Unknown
If yes, was anything added to the beef during grinding (*such as shop trim or any product to alter the fat content*)?: _____

Additional *Salmonella* Questions
(Complete this section for Salmonella outbreaks)

1. Phage type(s) of patient isolates:

_____ *if RDNC* then include #* _____

_____ *if RDNC* then include #* _____

_____ *if RDNC* then include #* _____

_____ *if RDNC* then include #* _____

* Reacts, Does Not Conform

Eggs

1. Were eggs *(check all that apply)*

☐ in shell, unpasteurized?
☐ in shell, pasteurized?
☐ packaged liquid or dry?
☐ stored with inadequate refrigeration during or after sale?
☐ consumed raw?
☐ consumed undercooked?
☐ pooled?

2. Was Salmonella enteritidis found on the farm? ☐ Yes ☐ No ☐ Unknown

Comment *(e.g., eggs and patients isolates matched by phage type)*: _____

_____

Public reporting burden of this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC, Project Clearance Officer, 1600 Clifton Road, MS D-24, Atlanta, GA, 30333, ATTN: PRA (0920-0004) <--DO NOT MAIL CASE REPORTS TO THIS ADDRESS-

Waterborne Outbreak Form (CDC 52.12)

http://www.cdc.gov/healthywater/pdf/statistics/wbdoss/nors/CDC_5212_guidance.pdf

General

National Outbreak Reporting System

Waterborne Disease Transmission

This form is used to report waterborne disease outbreak investigations. This form has 6 parts, indicated by tabs at the top of each page. Part 1 asks for the minimum or basic information about the outbreak investigation. Part 2 asks for epidemiological data and clinical specimen test results. Parts 3, 4, 5 and 6 collect information about types of water exposure (treated recreational water, untreated recreational water, drinking water, and water not intended for drinking/unknown intent). Only 1 of these 4 water exposure parts should be completed for an outbreak investigation report.

CDC USE ONLY

CDC Report ID	State Report ID

Form Approved
OMB No. 0920-0004

General Section

Primary Mode of Transmission *(check one)*

- ☐ Food *(Complete CDC 52.13)*
- ☐ Water *(Complete tabs for General, Water-General and type of water exposure)*
- ☐ Animal contact *(Complete CDC 52.13)*
- ☐ Person-to-person *(Complete CDC 52.13)*
- ☐ Environmental contamination other than food/water *(Complete CDC 52.13)*
- ☐ Indeterminate/Other/Unknown *(Complete CDC 52.13)*

Investigation Methods *(check all that apply)*

- ☐ Interviews only of ill persons
- ☐ Case-control study
- ☐ Cohort study
- ☐ Food preparation review
- ☐ Water system assessment: Drinking water
- ☐ Water system assessment: Nonpotable water
- ☐ Treated or untreated recreational water venue assessment
- ☐ Investigation at factory/production/treatment plant
- ☐ Investigation at original source (e.g., farm, water source, etc.)
- ☐ Food product or bottled water traceback
- ☐ Environment/food/water sample testing
- ☐ Other

Comments

_____

_____

Dates (mm/dd/yyyy)

Date first case became ill *(required)* _____ Date last case became ill _____

Date of initial exposure _____ Date of last exposure _____

Date of report to CDC (other than this form) _____

Date of notification to State/Territory or Local/Tribal Health Authorities _____

Geographic Location

Reporting state: _____
- ☐ Exposure occurred in multiple states
- ☐ Exposure occurred in a single state but cases resided in multiple states

Other states: _____

Reporting county: _____
- ☐ Exposure occurred in multiple counties in reporting state
- ☐ Exposure occurred in a single county but cases resided in multiple counties in reporting state

Other counties: _____

City/Town/Place of exposure: _____

Do not include proprietary or private facility names

Primary Cases

Number of Primary Cases		**Sex** *(estimated percent of the primary cases)*	
# Lab-confirmed cases		Male	%
# Probable cases			
# Estimated total primary cases		Female	%

	# Cases	**Total # of cases for whom info is available**	**Approximate percent of primary cases in each age group**			
# Died			<1 year	%	20–49 years	%
# Hospitalized			1–4 years	%	50–74 years	%
# Visited Emergency Room			5–9 years	%	≥ 75 years	%
# Visited health care provider (excluding ER visits)			10–19 years	%	Unknown	%

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General

Incubation Period, Duration of Illness, Signs or Symptoms for Primary Cases only

Incubation Period *(select appropriate units)*			**Duration of Illness** *(among recovered cases-select appropriate units)*		
Shortest		**Min, Hours, Days**	Shortest		**Min, Hours, Days**
Median		**Min, Hours, Days**	Median		**Min, Hours, Days**
Longest		**Min, Hours, Days**	Longest		**Min, Hours, Days**
Total # of cases for whom info is available			Total # of cases for whom info is available		
☐ Unknown incubation period			☐ Unknown duration of illness		

Signs or Symptoms

Feature	**# Cases with signs or symptoms**	**Total # cases for whom info available**
Vomiting		
Diarrhea		
Bloody stools		
Fever		
Abdominal cramps		
HUS		
Asymptomatic		

Secondary Cases

Mode of Secondary Transmission *(check one)*	**Number of Secondary Cases**	
☐ Food ☐ Water ☐ Animal contact ☐ Person-to-person ☐ Environmental contamination other than food/water ☐ Indeterminate/Other/Unknown	# Lab-confirmed secondary cases	
	# Probable secondary cases	
	Estimated total secondary ill	
	Total # of cases (Primary + Secondary)	

Environmental Health Specialists Network ***(if applicable)***

EHS-Net Evaluation ID: 1.) _____ 2.) _____ 3.) _____

Traceback ***(for food and bottled water only, not public water)***

☐ Please check if traceback conducted

Source name *(If publicly available)*	**Source type** *(e.g. poultry farm, tomato processing plant, bottled water factory)*	**Location of source**		**Comments**
		State	Country	

Recall

☐ Please check if any food or bottled water product was recalled

Type of item recalled:

Comments:

Reporting Agency

Agency name: _____ E-mail: _____

Contact name: _____ Contact title: _____

Phone no.: _____ Fax no.: _____

Remarks ***Briefly describe important aspects of the outbreak not covered above. Please indicate if any adverse outcomes occurred in special populations (e.g., pregnant women, immunocompromised persons)***

Water-General

Waterborne Disease and Outbreaks - General

Type of Water Exposure *(check ONE box)*

- ☐ Water intended for recreational purposes – treated venue (e.g., pool, spa/whirlpool/hot tub, spray pad)
- ☐ Water intended for recreational purposes – untreated venue (e.g., freshwater lake, hot spring, marine beach)
- ☐ Water intended for drinking (includes water used for bathing/showering)
- ☐ Water not intended for drinking or water of unknown intent (e.g., cooling/industrial, occupational, decorative/display)

Geographic Location

Percent of primary cases living in reporting state : _____%

Associated Events

Was exposure associated with a specific event or gathering?

☐ Yes ☐ No ☐ Unknown

If **Yes**, what type of event or gathering was involved?

_____

If outbreak occurred during a defined event, dates of event:

Start date: _____ (mm/dd/yyyy) End date: _____ (mm/dd/yyyy)

Symptoms

For each category, indicate # of persons with:

- Gastrointestinal symptoms/ conditions _____
- Respiratory symptoms/ conditions _____
- Skin symptoms/conditions _____
- Ear symptoms/conditions _____
- Eye symptoms/conditions _____
- Neurologic symptoms/ conditions _____
- Wound infections _____
- Other, specify (e.g., hepatitis A, leptospirosis): _____

_____

Route of Entry

- ☐ Ingestion
- ☐ Contact
- ☐ Inhalation
- ☐ Other, specify: _____
- ☐ Unknown

Epidemiologic Data

1. Estimated total number of persons with primary exposure: _____
2. Were data collected from comparison groups to estimate risk? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

   If ***No*** or ***Unknown***, was water the only common source shared by persons who were ill? ☐ Yes ☐ No ☐ Unknown

Exposure (Vehicle/Setting) *(e.g., pool—waterpark; hot spring; well water)*	**Total # Exposed (A)**	**# Ill Exposed (B)**	**Total # Not Exposed**	**# Ill Not Exposed**	**Attack Rate (%) (B/A)**	**Odds Ratio**	**Relative Risk**	**p-Value** *(provide exact value)*	**95% Confidence Interval**

Attack rate for residents of reporting state: _____% **Attack rate for non-residents of reporting state: _____%**

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Water-General

Clinical Specimens - Laboratory Results *(refer to the laboratory findings from the outbreak investigation)*

1. Were clinical diagnostic specimens taken from persons? ☐ Yes ☐ No *(go to next tab)* ☐ Unknown *(go to next tab)*

If **Yes**, from how many persons were specimens taken? _____

Specimen Type*	Specimen Subtype**	Tested for § *(list all that apply)*

* Specimen Type: 1- Autopsy Specimen (specify subtype), 2-Biopsy (specify), 3-Blood, 4-Bronchial Alveolar Lavage (BAL), 5-Cerebrospinal Fluid (CSF), 6-Conjunctiva/Eye Swab, 7-Ear Swab, 8-Endotracheal Aspirate, 9-Saliva, 10-Serum, 11-Skin Swab, 12-Sputum, 13-Stool, 14-Urine, 15-Vomitus, 16-Wound Swab, 17-Unknown

** Specimen Subtype: 1-Bladder, 2-Brain, 3-Dura, 4-Hair, 5-Intestine, 6-Kidney, 7-Liver, 8-Lung, 9-Nails, 10-Skin, 11-Stomach, 12-Wound, 13-Other, 14-Unknown

§ Tested for: 1-Bacteria, 2-Chemicals/Toxins, 3-Fungi, 4-Parasites, 5-Viruses

Report the confirmed and/or suspected etiological agent(s) in the table below..

Clinical Specimen Row Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype
1				
2				
3				
4				

Clinical Specimen Row Number	Confirmed as Etiology ?	Concentration *(numerical value)*	Unit	Specimen Type *	Specimen Subtype **
1	☐ Yes				
2	☐ Yes				
3	☐ Yes				
4	☐ Yes				

Clinical Specimen Row Number	Test Type §	Total # People Tested	Total # People Positive
1			
2			
3			
4			

* Specimen Type: 1- Autopsy Specimen (specify subtype), 2-Biopsy (specify), 3-Blood, 4-Bronchial Alveolar Lavage (BAL), 5-Cerebrospinal Fluid (CSF), 6-Conjunctiva/Eye Swab, 7-Ear Swab, 8-Endotracheal Aspirate, 9-Saliva, 10-Serum, 11-Skin Swab, 12-Sputum, 13-Stool, 14-Urine, 15-Vomitus, 16-Wound Swab, 17-Unknown

** Specimen Subtype: 1-Bladder, 2-Brain, 3-Dura, 4-Hair, 5-Intestine, 6-Kidney, 7-Liver, 8-Lung, 9-Nails, 10-Skin, 11-Stomach, 12-Wound, 13-Other, 14-Unknown

§ Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Isolates

State Lab Isolate ID	Specimen Profile 1 *(e.g., the PFGE, MLVA, or genotype sequence)*	Specimen Profile 2 *(e.g., the PFGE, MLVA, or genotyping method used)*

Rec Water-Treated

Recreational Water – Treated Venue

Recreational Water Vehicle Description

Water Vehicle Number	Water Type *(e.g., spa/whirlpool/hot tub; pool- swimming pool; pool- waterpark)*	Water Subtype *(select indoor, outdoor, or unknown)*	Setting of Exposure *(e.g., club, requiring membership; hotel/motel/lodge/inn; waterpark)*
1			
2			
3			

Water Vehicle Number *(reference the appropriate Water Vehicle Number)*	USUAL Water Treatment Provided at Venue *(e.g., no treatment; coagulation; disinfection; flocculation; filtration (pool); unknown)*	Venue Treatment Subtype *(disinfection or pool filtration: e.g., UV; chlorine dioxide; bag filter; cartridge filter; unknown)*	Chlorination Subtype *(chlorine disinfection only- e.g., gaseous; sodium hypochlorite; cyanurates /stabilized chlorine)*

Water Vehicle Number *(reference the appropriate Water Vehicle Number)*	Fill Water Type *(e.g., public water supply; sea water; untreated ground or surface water; unknown)*	IF PUBLIC WATER WAS USED TO FILL, USUAL Water Treatment Provided for Fill Water Before Coming to the Venue *(e.g., no treatment; disinfection; filtration (treatment plant); unknown)*	IF PUBLIC WATER WAS USED TO FILL, Fill Water Treatment Subtype *(disinfection or filtration: e.g., UV; chlorine dioxide; bag filter; cartridge filter; unknown)*

Recreational Water Quality

Did the venue meet state or local recreational water quality regulations? ☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **No**, explain: _____

Was there a pool operator on the payroll with state-approved training or certification? ☐ Yes ☐ No ☐ Unknown

Laboratory Section - Recreational Water Samples from Treated Venues

Was water from treated recreational water venues tested? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Results						
Sample		1	2	3	4	5
Source of Sample *(e.g., swimming pool, hot tub)*						
Additional Description *(e.g., time of day, backwash sample, etc.)*						
Date *(mm/dd/yyyy)*						
Volume Tested	Number					
	Unit					
Temperature	Number					
	Unit					
Residual/Free Disinfectant Level *(if total and combined disinfectant levels given, total - combined = free)*	Number					
	Unit					
Combined Disinfectant Level *(if total and free disinfectant levels given, total - free = combined)*	Number					
	Unit					
pH						

Rec Water-Treated

Microbiology or Chemical/Toxin Analysis *(refer to the laboratory findings from the outbreak investigation)*

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern

Sample Number	Test Results Positive?	Concentration *(numerical value)*	Unit	Test Type*	Test Method *(reference: National Environmental Methods Index: http://www.nemi.gov)*
	☐ Yes				
	☐ Yes				
	☐ Yes				

* Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Factors Contributing to Recreational Water Contamination and/or Increased Exposure in Treated Venues

	Factors *(check all that apply)***	Documented/ Observed***	Suspected***
	Exceeded maximum bather load	☐	☐
PEOPLE	Primary intended use of water is by diaper/toddler-aged children (e.g., kiddie pool)	☐	☐
PEOPLE	Heavy use by child care center groups	☐	☐
PEOPLE	Fecal/vomitus accident	☐	☐
PEOPLE	Patrons continued to swim when ill with diarrhea	☐	☐
	Operator error	☐	☐
	Intentional contamination (explain in remarks)	☐	☐
FACILITY DESIGN	Combined pool filtration/recirculation systems led to cross-contamination	☐	☐
FACILITY DESIGN	Hygiene facilities (e.g., toilets, diaper changing facilities) inadequate or distant	☐	☐
FACILITY DESIGN	Some spray feature water bypasses filtration/treatment system and returns to feature unfiltered/untreated	☐	☐
FACILITY DESIGN	No supplemental disinfection installed that would have inactivated pathogen (e.g., *Cryptosporidium*)	☐	☐
	Water temperature ≥30°C (≥86°F)	☐	☐
	Cross-connection with wastewater or non-potable water	☐	☐
	Disinfectant control system malfunctioning, inadequate, or lacking (e.g., hand feed chemicals)	☐	☐
	Incorrect settings on disinfectant control system	☐	☐
	pH control system malfunctioning, inadequate, or lacking (e.g., hand feed chemicals)	☐	☐
	Incorrect settings on pH control system	☐	☐
	Filtration system malfunctioning or inadequate (e.g., low flow rate)	☐	☐
	Supplemental disinfection system malfunctioning or inadequate (e.g., ultraviolet light, ozone)	☐	☐
MAINTENANCE	Insufficient system checks so breakdown detection delayed	☐	☐
MAINTENANCE	No preventive equipment maintenance programs to reduce breakdowns	☐	☐
MAINTENANCE	Ventilation insufficient for indoor aquatic facilities	☐	☐
MAINTENANCE	Chemical handling error (e.g., chemical hookup, improper mixing or application)	☐	☐
MAINTENANCE	Maintenance chemicals not flushed from system before opening to swimmers	☐	☐
MAINTENANCE	Recirculation pump off or restarted with swimmers in water	☐	☐
	Low or zero water flow combined with continuous feed of chemicals resulted in excess chemicals in water	☐	☐
	Extensive slime/biofilm formation	☐	☐
	Recent construction	☐	☐
	Cyanurate level excessive	☐	☐
	Lack of draining/cleaning	☐	☐
	Stagnant water in spa piping was aerosolized	☐	☐
	No aquatics operators on payroll who have completed state/local training	☐	☐
	Untrained/inadequately trained staff on duty	☐	☐
POLICY AND MANAGEMENT	Remote monitoring system replaces on-site water quality testing	☐	☐
POLICY AND MANAGEMENT	Unclear communication chain for reporting problems	☐	☐
POLICY AND MANAGEMENT	Inadequate water quality monitoring (e.g., inadequate test kit, inadequate testing frequency)	☐	☐
POLICY AND MANAGEMENT	Employee illness policies absent or not enforced	☐	☐
POLICY AND MANAGEMENT	No or inadequate policies on good chemical handling and storage practices	☐	☐
POLICY AND MANAGEMENT	No operator on duty at the time of incident	☐	☐
POLICY AND MANAGEMENT	Facility falls outside aquatic health code	☐	☐
	No shock/hyperchlorination policy	☐	☐
	Other, specify:	☐	☐
	Unknown	☐	☐

** Only check off what was found during investigation.
*** The release of sewage does not have to occur at the property/venue/setting where the people were exposed. The sewage may have occurred at a distant site but still affected the property/venue/setting in question.

Remarks

Rec Water-Untreated

Recreational Water – Untreated Venue

Recreational Water Vehicle Description

Water Type *(e.g., canal; lake; river/stream; ocean)*	IF SPRING OR HOT SPRING, Water Subtype *(select indoor, outdoor or unknown)*	Setting of Exposure *(e.g., beach-public; camp/cabin/recreational area)*

Recreational Water Quality

Did the venue meet state or local recreational water quality regulations? ☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **No**, explain: _____

Did the venue meet Environmental Protection Agency (EPA) recreational water quality standards?

☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **No**, explain: _____

Laboratory Section - Recreational Water Samples from Untreated Venues

Was water from untreated recreational water venues tested? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Results						
Sample		1	2	3	4	5
Source of Sample *(e.g., lake or stream)*						
Additional Description *(e.g., specific location, time of day, etc)*						
Date *(mm/dd/yyyy)*						
Volume Tested	Number					
	Unit					
Temperature	Number					
	Unit					

Water Quality Indicator

Sample Number	Type *(e.g., fecal coliforms)*	Concentration *(numerical value)*	Unit

Microbiology or Chemical/Toxin Analysis *(refer to the laboratory findings from the outbreak investigation)*

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern

Sample Number	Test Results Positive?	Concentration *(numerical value)*	Unit	Test Type*	Test Method *(reference: National Environmental Methods Index: http://www.nemi.gov)*
	☐ Yes				
	☐ Yes				
	☐ Yes				
	☐ Yes				

*Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Rec Water-Untreated

Factors Contributing to Recreational Water Contamination and/or Increased Exposure in Untreated Venues

	Factors *(check all that apply)**	Documented/ Observed**	Suspected**
	Exceeded maximum bather load	☐	☐
PEOPLE	Primary intended use of water is by diaper/toddler aged children (e.g., kiddie pool)	☐	☐
PEOPLE	Heavy use by child care center groups	☐	☐
PEOPLE	Fecal/vomitus accident	☐	☐
PEOPLE	Patrons continued to swim when ill with diarrhea	☐	☐
	Staff error	☐	☐
	Intentional contamination (explain in remarks)	☐	☐
SWIM AREA DESIGN	Hygiene facilities (e.g., toilets, diaper changing facilities) inadequate or distant	☐	☐
SWIM AREA DESIGN	Malfunctioning or inadequate on-site wastewater treatment system *** ≠	☐	☐
SWIM AREA DESIGN	Poor siting/design of on-site wastewater treatment system *** ≠	☐	☐
SWIM AREA DESIGN	Stagnant or poorly circulating water in swim area	☐	☐
	Heavy rainfall and runoff	☐	☐
	Sanitary sewer overflow (SSO) impact ***	☐	☐
	Combined sewer overflow (CSO) impact ***	☐	☐
	Domestic animal contamination (e.g., livestock, pets)	☐	☐
WATER QUALITY	Wildlife contamination - Birds	☐	☐
WATER QUALITY	Wildlife contamination - Mammals	☐	☐
WATER QUALITY	Wildlife contamination - Fish kill	☐	☐
WATER QUALITY	Wastewater treatment plant effluent flows past swim area	☐	☐
WATER QUALITY	Wastewater treatment plant malfunction ***	☐	☐
WATER QUALITY	Sewer line break ***	☐	☐
	Nearby biosolid/land application site (e.g., human or animal waste application)	☐	☐
	Contamination from agricultural chemical application (e.g., fertilizer, pesticides)	☐	☐
	Contamination from chemical pollution not related to agricultural application	☐	☐
	Water temperature ≥30°C (≥86°F)	☐	☐
	Seasonal variation in water quality (e.g., lake/reservoir turnover events)	☐	☐
	Inappropriate dumping of sewage into water body (e.g., from boat, RV)	☐	☐
	Algal bloom	☐	☐
	Dumping of ballast water	☐	☐
	Tidal wash (i.e., tide exchange or influence by inland water)	☐	☐
POLICY AND MANAGEMENT	No or inadequate monitoring of water quality	☐	☐
POLICY AND MANAGEMENT	No managers have completed state/local required training	☐	☐
POLICY AND MANAGEMENT	Untrained/inadequately trained staff on duty	☐	☐
POLICY AND MANAGEMENT	Unclear communication chain for reporting problems	☐	☐
POLICY AND MANAGEMENT	Employee illness policies absent or not enforced	☐	☐
	Other, specify:	☐	☐
	Unknown	☐	☐

* Only check off what was found during investigation.

** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.

*** The release of sewage does not have to occur at the property/venue/setting where the people were exposed. The sewage may have occurred at a distant site but still affected the property/venue/setting in question.

≠ "On-site wastewater treatment system" refers to a system designed to treat and dispose of wastewater at the point of generation, generally on the property where the wastewater is generated (e.g., septic systems or other advanced on-lte systems). However, contamination that originates from these systems can still occur off the property where treatment and disposal takes place due to migration of contaminants from malfunctioning systems or poor siting and design.

Remarks

Drinking Water

Drinking Water Vehicle Description

Drinking Water Vehicle Description

Water Type* *(e.g., commercially-bottled water, community water system, individual water system)*	**Public Water System EPA ID Number****	**Water Source** *(select ground water, surface water or unknown)*	**Water Source Description** *(e.g., spring; well; lake)*	**Setting of Exposure** *(e.g., airport, mobile home park)*	**USUAL Water Treatment Provided** *(e.g., no treatment, disinfection, home filtration)*	**Water Treatment Subtype** *(disinfection or filtration: e.g., boiling; chlorine; rapid sand filter; reverse osmosis)*

*Water system definitions: Community and noncommunity water systems are public water systems that have ≥ 15 service connections or serve an average of ≥ 25 residents for ≥ 60 days/year. A community water system serves year-round residents of a community, subdivision, or mobile home park. A noncommunity water system serves an institution, industry, camp, park, hotel, or business and can be nontransient or transient. Nontransient systems serve ≥ 25 of the same persons for > 6 months of the year but not year-round (e.g., factories and schools), whereas transient systems provide water to places in which persons do not remain for long periods (e.g., restaurants, highway rest stations, and parks). Individual water systems are small systems not owned or operated by a water utility that have < 15 connections or serve < 25 persons.

** Number used for EPA reporting that uniquely identifies the water system within a specific state. The water system ID number can be found at http://www.epa.gov/safewater/dwinfo/index.html by first selecting a state and then selecting a county.

Drinking Water Quality

Did the drinking water system have any monitoring violations in the 1 month prior to the outbreak?

☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **Yes**, explain: _____

Did the drinking water system have any maximum contaminant level (MCL) violations in the 1 month prior to the outbreak?

☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **Yes**, explain: _____

Did the drinking water system have any violations in the 12 months prior to the outbreak?***

☐ Yes ☐ No ☐ Unknown ☐ Not applicable

If **Yes**, explain: _____

*****Sources of information about past violations can be obtained from utility records, consumer confidence reports (water quality reports), or violation records from state or local health departments**

Laboratory Section - Drinking Water

Was drinking water tested? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Results						
Sample		1	2	3	4	5
Source of Sample						
Additional Description *(e.g., kitchen faucet, well, reservoir)*						
Date *(mm/dd/yyyy)*						
Volume Tested	**Number**					
	Unit					
Temperature	**Number**					
	Unit					
Residual/Free Disinfectant Level *(if total and combined disinfectant levels given, total - combined = free)*	**Number**					
	Unit					
pH						
Turbidity (NTU)						

Drinking Water

Water Quality Indicator

Sample Number	Type *(e.g., fecal coliforms)*	Concentration *(numerical value)*	Unit

Microbiology or Chemical/Toxin Analysis *(refer to the laboratory findings from the outbreak investigation)*

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern

Sample Number	Test Results Positive?	Concentration *(numerical value)*	Unit	Test Type*	Test Method *(reference: National Environmental Methods Index: http://www.nemi.gov)*
	☐ Yes				
	☐ Yes				
	☐ Yes				

* Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay

Factors Contributing to Drinking Water Contamination and/or Increased Exposure to Contaminated Drinking Water

Did a problem with the source water (i.e., ground water or surface water) contribute to the disease or outbreak?

☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Source Water Factors *(check all that apply)***	Documented/ Observed***	Suspected***
Sanitary sewer overflow (SSO) ****	☐	☐
Combined sewer overflow (CSO) ****	☐	☐
Malfunctioning on-site wastewater treatment system **** ≠	☐	☐
Sewage treatment plant malfunction ***	☐	☐
Sewer line break ***	☐	☐
Poor siting/design of on-site wastewater treatment system **** ≠	☐	☐
Nearby biosolid/land application site (e.g., human or animal waste application)	☐	☐
Contamination from agricultural chemical application (e.g., fertilizer, pesticides)	☐	☐
Contamination from chemical pollution not related to agricultural application	☐	☐
Contamination by a chemical that the current treatment methods were not designed to remove	☐	☐
Domestic animal contamination (e.g., livestock, concentrated feeding operations, pets)	☐	☐
Wildlife contamination - Birds	☐	☐
Wildlife contamination - Mammals	☐	☐
Wildlife contamination - Fish kill	☐	☐
Flooding/heavy rains	☐	☐
Algal bloom	☐	☐
Seasonal variation in water quality (e.g., lake/reservoir turnover events, resort community with seasonal loading)	☐	☐
Low water table (e.g., drought, over-pumping)	☐	☐
Ground water under direct influence of surface water (e.g., shallow well)≠ ≠	☐	☐
Contamination through limestone or fissured rock (e.g., karst)	☐	☐
Contaminated recharge water	☐	☐
Use of an alternate source of water by a water utility	☐	☐
Mixing of raw water from different sources	☐	☐
Improper construction or location of a well or spring	☐	☐
Water system intake failure (e.g., cracked well casing, cracked intake pipe)	☐	☐
Intentional contamination (explain in remarks)	☐	☐
Other, specify:	☐	☐
Unknown	☐	☐

** Only check off what was found during investigation.

*** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.

**** The release of sewage does not have to occur on the property in which persons have become ill. The sewage release may have occurred at a distant site but still affected the property in question.

≠ "On-site wastewater treatment system" refers to a system designed to treat and dispose of wastewater at the point of generation, generally on the property where the wastewater is generated (e.g., septic systems or other advanced on-site systems). However, contamination that originates from these systems can still occur off the property where treatment and disposal takes place due to migration of contaminants from malfunctioning systems or poor siting and design.

≠ ≠ Any water beneath the surface of the ground with substantial occurrence of insects or other macroorganisms, algae, or large-diameter pathogens (e.g., *Giardia intestinalis* or *Cryptosporidium*), or substantial and relatively rapid shifts in water characteristics (e.g., turbidity, temperature, conductivity, or pH) that closely correlate with climatologic or surface water conditions. Direct influence must be determined for individual sources in accordance with criteria established by the state.

Drinking Water

Factors Contributing to Drinking Water Contamination and/or Increased Exposure to Contaminated Drinking Water

Did a problem with the water treatment prior to entry into a house or building contribute to the disease or outbreak?

☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Treatment Factors *(check all that apply)**	**Documented/ Observed****	**Suspected****
Change in treatment process (explain in remarks)	☐	☐
No disinfection	☐	☐
Temporary interruption of disinfection	☐	☐
Chronically inadequate disinfection	☐	☐
No filtration	☐	☐
Inadequate filtration	☐	☐
Deficiencies in other treatment processes	☐	☐
Corrosion in or leaching from pipes or storage tanks	☐	☐
Pipe/component failure or break (e.g., pipes, tanks, valves)	☐	☐
Contamination during construction or repair of pipes/components	☐	☐
Construction or repair of pipes/components without evidence of contamination	☐	☐
Operator error	☐	☐
Other, specify:	☐	☐
Unknown	☐	☐

Did a problem with the distribution system contribute to the disease or outbreak? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

(NOTE: For a community water system, the distribution system refers to the pipes and storage infrastructure under the jurisdiction of the water utility prior to the water meter (or property line if the system is not metered). For noncommunity and nonpublic water systems, the distribution system refers to the pipes and storage infrastructure prior to entry into a building or house)

Distribution and Storage Factors *(check all that apply)**	**Documented/ Observed****	**Suspected****
Cross-connection of potable and nonpotable water pipes resulting in backflow	☐	☐
Low pressure or change in water pressure in the distribution system	☐	☐
Change in water flow direction in the distribution system	☐	☐
Mixing of treated water from different sources	☐	☐
Pipe/component failure or break (e.g., pipes, tanks, valves)	☐	☐
Corrosion in or leaching from pipes or storage tanks	☐	☐
Contamination of mains during construction or repair	☐	☐
Construction or repair of mains without evidence of contamination	☐	☐
Scheduled flushing of the distribution system	☐	☐
Contamination of storage facility	☐	☐
Aging water distribution components (e.g., pipes, tanks, valves)	☐	☐
Water temperature ≥30°C (≥86°F)	☐	☐
Intentional contamination (explain in remarks)	☐	☐
Other, specify:	☐	☐
Unknown	☐	☐

Did a problem occur after the water meter or outside the jurisdiction of a water utility that contributed to the disease or outbreak? (e.g., in a service line leading to a house/building, in the plumbing inside a house/building, during shipping/hauling, during storage other than in the distribution system, at the point of use, involving commercially-bottled water)

☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Factors Not Under the Jurisdiction of a Water Utility or Factors at the Point of Use *(check all that apply)**	**Documented/ Observed****	**Suspected****
Legionella species in water system	☐	☐
Cross-connection of potable and nonpotable water pipes resulting in backflow	☐	☐
Lack of backflow prevention in plumbing	☐	☐
Low pressure or change in water pressure in the plumbing	☐	☐
Change in water flow direction in the plumbing	☐	☐
Corrosion in or leaching from pipes or storage tanks	☐	☐
Pipe/component failure or break (e.g., pipes, tanks, valves)	☐	☐
Aging plumbing components (e.g., pipes, tanks, valves)	☐	☐
Contamination of plumbing during construction or repair	☐	☐
Construction or repair of plumbing without evidence of contamination	☐	☐
Deficiency in building/home-specific water treatment after the water meter or property line	☐	☐
Deficiency or contamination of equipment/devices using or distributing water	☐	☐
Contamination during commercial bottling	☐	☐
Contamination during shipping, hauling, or storage	☐	☐
Contamination at point of use – Tap	☐	☐
Contamination at point of use – Hose	☐	☐
Contamination at point of use – Commercially-bottled water	☐	☐
Contamination at point of use – Container, bottle, or pitcher	☐	☐
Contamination at point of use – Unknown	☐	☐
Water temperature ≥30°C (≥86°F)	☐	☐
Intentional contamination (explain in remarks)	☐	☐
Other, specify:	☐	☐
Unknown	☐	☐

*** Only check off what was found during investigation.**

**** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.**

WNID/WUI

Water Not Intended for Drinking or Water of Unknown Intent (WNID/WUI)

Intent for Use

What was the intended use for the implicated water? *(check all that apply)*

- ☐ Cooling/Air Conditioning (e.g., cooling tower, swamp cooler)
- ☐ Mister (e.g., produce in grocery store, public cooling system)
- ☐ Ornamental (e.g., a decorative non-interactive fountain intended for public display and not designed for swimming or recreational use)
- ☐ Industrial/Occupational (e.g., steam cleaner)
- ☐ Agricultural Irrigation
- ☐ Waste water
- ☐ Other (specify):_____
- ☐ Unknown

Water Description

Water Type *(e.g., cooling tower; drainage ditch; fountain- ornamental)*	**Setting of Exposure** *(e.g., airport; hospital/ health care facility, nursing home; park- state park)*	**USUAL Water Treatment Provided** *(e.g., no treatment; disinfection; settling/sedimentation)*	**Water Treatment Subtype** *(disinfection or filtration: e.g., boiling; chlorine; rapid sand filter; reverse osmosis)*

Laboratory Section - Water Not Intended for Drinking of Water of Unknown Intent

Was the implicated water tested? ☐ Yes *(specify in table below)* ☐ No ☐ Unknown

Results						
Sample		1	2	3	4	5
Source of Sample						
Additional Description *(e.g., time of day, specific location, etc.)*						
Date *(mm/dd/yyyy)*						
Volume Tested	**Number**					
	Unit					
Temperature	**Number**					
	Unit					
Residual/Free Disinfectant Level *(if total and combined disinfectant levels given, total - combined = free)*	**Number**					
	Unit					
Turbidity (NTU)						
pH						

Water Quality Indicator

Sample Number	**Type** *(e.g., fecal coliforms)*	**Concentration** *(numerical value)*	**Unit**

WNID/WUI

Microbiology or Chemical/Toxin Analysis *(refer to the laboratory findings from the outbreak investigation)*

Sample Number	Genus/ Chemical/ Toxin	Species	Serotype/ Serogroup/ Serovar	Genotype/ Subtype	PFGE Pattern

Sample Number	Test Results Positive?	Concentration *(numerical value)*	Unit	Test Type*	Test Method *(reference: National Environmental Methods Index: http://www.nemi.gov)*
	☐ Yes				
	☐ Yes				
	☐ Yes				
	☐ Yes				

*** Test Type: 1-Culture, 2-DNA or RNA Amplification/Detection (e.g., PCR, RT-PCR), 3-Microscopy (e.g., fluorescent, EM), 4-Serological/Immunological Test (e.g., EIA, ELISA), 5-Phage Typing, 6-Chemical Testing, 7-Tissue Culture Infectivity Assay**

Factors Contributing to Contamination and/or Increased Exposure to Contaminated Water

Factors *(check all that apply)**	Documented/ Observed**	Suspected**
Cooling tower/evaporative condenser – shutdown for >3 days without draining to waste	☐	☐
Cooling tower/evaporative condenser – lack of a maintenance program	☐	☐
Cooling tower/evaporative condenser – lack of a qualified water quality specialist	☐	☐
Cooling tower/evaporative condenser – presence of scale or corrosion	☐	☐
Cooling tower/evaporative condenser – presence of dirt, organic matter, or other debris in the cold water basin	☐	☐
Cooling tower/evaporative condenser – absence of drift eliminators	☐	☐
Cooling tower/evaporative condenser – presence of damaged drift eliminators	☐	☐
Cooling tower/evaporative condenser – history of recent repairs to the device	☐	☐
Cooling tower/evaporative condenser – siting of device near building air intakes	☐	☐
Cooling tower/evaporative condenser – siting of device near windows that can be opened	☐	☐
Cooling tower/evaporative condenser – siting of device in immediate area of kitchen exhaust fans, live plants, truck bays, or other sources of organic matter	☐	☐
Cooling tower/evaporative condenser – construction on the premises of the device within 6 months before the index case	☐	☐
Cooling tower/evaporative condenser – construction within 100 meters of the premises of the device within 6 months before the index case	☐	☐
Ornamental fountain – presence of submerged lighting	☐	☐
Ornamental fountain – lack of a written cleaning and maintenance program	☐	☐
Ornamental fountain – presence of dirt, organic matter, or other debris in the water basin	☐	☐
Broken/damaged sewer pipe	☐	☐
Recycling of water	☐	☐
Water temperature ≥30°C (≥86°F)	☐	☐
Other, specify:	☐	☐
Unknown	☐	☐

*** Only check off what was found during investigation.**

**** "Documented/Observed" refers to information gathered through document reviews, direct observations, and/or interviews. "Suspected" refers to factors that probably occurred but for which no documentation (as defined previously) is available.**

Remarks

Epidemic and laboratory assistance for the investigation of a waterborne disease outbreak is available upon request by the State Health Department to the Centers for Disease Control and Prevention. Please enter this report into the National Outbreak Reporting System (NORS). State/Local investigation reports and questionnaires can also be attached to the report in the electronic system. Communications and requests for epidemic and laboratory assistance may be directed to: Waterborne Disease and Outbreak Surveillance Coordinator, Division of Parasitic Diseases, National Center for Zoonotic, Vector-Borne, and Enteric Diseases, Coordinating Center for Infectious Diseases, CDC 4770 Buford Highway, NE, MS F-22, Atlanta, GA, 30341-3724 or (770) 488-7775

Public reporting burden of this collection of information is estimated to average 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to CDC, Project Clearance Officer, 1600 Clifton Road, MS D-24, Atlanta, GA, 30333, ATTN: PRA (0920-0004) <--DO NOT MAIL CASE REPORTS TO THIS ADDRESS-

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Appendix K: Acronyms and Agency Abbreviations

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Acronyms and Agency Abbreviations

AAR	After Action Report
AR	Attack Rate
ASPR	Assistant Secretary for Preparedness and Response
CAP	Corrective Action Program
CCDM	Control of Communicable Disease Manual
CDC	Center of Disease Control
CHFS	Cabinet for Health and Family Services
DLS	Division of Laboratory Services
DOC	Department Operation Center
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	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
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
RR	Relative Risk
TCL	Target Capabilities List
USDA	United States Department of Agriculture

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Appendix L: Definition of Terms

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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

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.

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 standard PFGE 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.

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.

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.

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

Appendix M: 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) HIPPA – Disclosures for Public Health Activities

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902 KAR 2:020. Disease Surveillance.

RELATES TO: KRS 211.180(1), 214.010, 214.645, 333.130
STATUTORY AUTHORITY: KRS 194A.050, 211.090(3), EO 2004-726
NECESSITY, FUNCTION, AND CONFORMITY: EO 2004-726, effective July 9, 2004, reorganized the Cabinet for Health and Family Services and placed the Department for Public Health under the Cabinet for Health and Family Services. KRS 211.180 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 which are transmissible to man, and other diseases and health hazards that may be controlled. KRS 214.010 requires every physician and every head of family to notify the local health department of the existence of diseases and conditions of public health importance, known to him or her. This administrative regulation establishes notification standards and specifies the diseases requiring urgent, priority, or routine 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. Notification Standards. (1) A health professional licensed under KRS Chapters 311 through 314, and a health facility licensed under KRS Chapter 216B, shall give notification pursuant to subsection (3) of this section, if:
(a) The health professional makes a probable diagnosis of a disease specified in Section 2, 3, or 4 of this administrative regulation; and
(b) The diagnosis is supported by:
1. "Case Definitions for Infectious Conditions under Public Health Surveillance"; or
2. A reasonable belief that the disease is present.
(2)(a) A single report by a hospital of a condition diagnosed by a test result from the hospital laboratory shall constitute notification on behalf of the hospital and its laboratory.
(b) A hospital may designate an individual to report on behalf of the hospital's laboratory and the hospital's clinical facilities.
(3) The notification shall be given to the:
(a) Local health department serving the jurisdiction in which the patient resides; or
(b) Department for Public Health.
(4) The reporting professional shall furnish the:
(a) Name, birthdate, address, county of residence, and telephone number of the patient; and
(b) Clinical, epidemiologic, and laboratory information pertinent to the disease.
(5) Upon the confirmation of a laboratory test result which indicates infection with an agent associated with one (1) or more of the diseases or conditions specified in Section 2, 3, or 4 of this administrative regulation, the director of a clinical laboratory licensed under KRS Chapter 333 shall:
(a) Report the result to the:
1. Local health department serving the jurisdiction in which the patient resides; or
2. Department for Public Health; and
(b) Report the patient's name, birthdate, address, and county of residence; and

Section 2. Diseases Requiring Urgent Notification. (1) Notification pursuant to Section 1(3) of this administrative regulation of the following diseases shall be made within twenty-four (24) hours:
(a) Anthrax;
(b) Botulism;
(c) Brucellosis;
(d) Campylobacteriosis;
(e) Cryptosporidiosis;
(f) Cholera;
(g) Diphtheria;

(h) Escherichia coli O157:H7;
(i) Escherichia coli, shiga toxin positive;
(j) Encephalitis, California group;
(k) Encephalitis, Eastern equine;
(l) Encephalitis, St. Louis;
(m) Encephalitis, Venezuelan equine;
(n) Encephalitis, Western;
(o) Encephalitis, West Nile Virus;
(p) Hansen's Disease;
(q) Hantavirus infection;
(r) Hemophilus influenzae invasive disease;
(s) Hepatitis A;
(t) Listeriosis;
(u) Measles;
(v) Meningococcal infections;
(w) Pertussis;
(x) Plague;
(y) Poliomyelitis;
(z) Psittacosis;
(aa) Q fever;
(bb) Rabies, animal;
(cc) Rabies, human;
(dd) Rubella;
(ee) Rubella syndrome, congenital;
(ff) Salmonellosis;
(gg) Shigellosis;
(hh) Syphilis, primary, secondary, early latent or congenital;
(ii) Tetanus;
(jj) Tularemia;
(kk) Typhoid fever;
(ll) Vibrio parahaemolyticus;
(mm) Vibrio vulnificus;
(nn) Yellow fever.

(2) Weekend or evening urgent notification.

(a) If health department personnel cannot be contacted directly, notification shall be made by electronic submission or by telephone to an emergency number provided by the local health department or the Department for Public Health.

(b) For the protection of patient confidentiality, this notification 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 professional.

(3) Upon receipt of a report for a disease specified in subsection (1) of this section, the local health department shall:

(a) Immediately notify the Department for Public Health; and
(b) Assist the department in carrying out a public health response as instructed.

Section 3. Diseases Requiring Priority Notification. (1) Notification pursuant to Section 1(3) of this administrative regulation of the following diseases shall be made within one (1) business day:

(a) Group A streptococcal infection, invasive;
(b) Hepatitis B, acute;
(c) Hepatitis B infection in a pregnant woman or a child born in or after 1992;
(d) Mumps;
(e) Toxic shock syndrome;
(f) Tuberculosis.

(2) Upon receipt of a report for a disease or condition specified in subsection (1) of this section, a local health department:

(a) Shall investigate the report and carry out public health measures appropriate to the disease or condition;

(b) Shall notify the Department for Public Health of the case, in writing, within five (5) business days; and

(c) May seek assistance from the Department for Public Health.

Section 4. Diseases Requiring Routine Notification. (1) Notification pursuant to Section 1(3) of this administrative regulation of the following diseases shall be made within five (5) business days:

(a) Chancroid;

(b) Chlamydia trachomatis infection;

(c) Ehrlichiosis;

(d) Gonorrhea;

(e) Granuloma inguinale;

(f) Hepatitis C, acute;

(g) Histoplasmosis;

(h) Lead poisoning;

(i) Legionellosis;

(j) Lyme Disease;

(k) Lymphogranuloma venereum;

(l) Malaria;

(m) Rabies postexposure prophylaxis;

(n) Rocky Mountain Spotted Fever;

(o) Streptococcus pneumoniae, drug-resistant invasive disease;

(p) Syphilis, other than primary, secondary, early latent or congenital; and

(q) Toxoplasmosis.

(2) Upon receipt of a report for a disease or condition specified in subsection (1) of this section, a local health department shall:

(a) Make a record of the report;

(b) Answer inquiries or render assistance regarding the report if requested by the reporting entity; and

(c) Forward the report to the Department for Public Health within three (3) business days.

Section 5. Outbreaks or Unusual Public Health Occurrences. (1) If, in the judgment of a health professional licensed under KRS Chapters 311 through 314, or a health facility licensed under KRS Chapter 216B, an unexpected pattern of cases, suspected cases, or deaths which may indicate a newly-recognized infectious agent, an outbreak, epidemic, related public health hazard or an act of bioterrorism, such as smallpox, appears, a report shall be made immediately by telephone to the:

(a) Local health department where the professional is practicing or where the facility is located; or

(b) Department for Public Health.

(2) An instance of suspected staphylococcal or other foodborne intoxication or an instance of salmonellosis or other foodborne or waterborne infection shall be reported within one (1) business day, and shall include all known information about the persons affected.

(3) The local health department:

(a) Shall investigate the outbreak or occurrence;

(b) Shall carry out public health measures appropriate to the disease or condition involved;

(c) Shall make medical and environmental recommendations appropriate to prevent future similar outbreaks or occurrences; and

(d) May seek assistance from the Department for Public Health.

Section 6. Laboratory Surveillance. (1)(a) In addition to the reports required by Sections 1 through 4 of this administrative regulation, laboratory results shall be reported weekly for influenza virus isolates.

(b) The report shall include the:

1. Name, birthdate, address, and county of residence of the person with the disease; and

2. Specific laboratory information pertinent to the result.

(c) The format of the report shall be an alphabetical listing of each person for whom a report is submitted.

(2) Upon request by the Department for Public Health, a clinical laboratory within a hospital licensed under KRS Chapter 216B, or a laboratory licensed under KRS Chapter 333, shall report:

(a) The numbers of isolates and information regarding the antimicrobial resistance patterns of the isolates;

(b) At intervals agreed upon between the laboratory and the department, not less frequently than three (3) months, for the following:

1. Staphylococcus aureus;

2. Enterococcus species; or

3. Other organism specified in a request that includes a justification of the public health importance of the organism.

Section 7. Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) Surveillance. (1) Physicians and Medical Laboratories shall report:

(a)1. A positive test result for HIV infection including a result from:

a. Elisa;

b. Western Blot;

c. PCR;

d. HIV antigen; or

e. HIV culture;

2. CD4+ assay including absolute CD4+ cell counts and CD4+%;

3. HIV detectable Viral Load Assay; and

4. A positive serologic test result for HIV infection; or

(b) A diagnosis of AIDS that meets the definition of AIDS established within the Centers for Disease Control and Prevention (CDC) guidelines and reported in the:

1. "Adult HIV/AIDS Confidential Case Report Form," or

2. "Pediatric HIV/AIDS Confidential Case Report Form."

(2) An HIV infection or AIDS diagnosis shall be reported within five (5) business days and, if possible, on the "Adult HIV/AIDS Confidential Case Report form" or the "Pediatric HIV/AIDS Confidential Case Report form."

(a) A report for a resident of Jefferson, Henry, Oldham, Bullitt, Shelby, Spencer, and Trimble Counties shall be submitted to the HIV/AIDS Surveillance Program of the Louisville-Metro Health Department.

(b) A report for a resident of the remaining Kentucky counties shall be submitted to the HIV/AIDS Surveillance Program of the Kentucky Department for Public Health, or as directed by the HIV/AIDS project coordinator.

(3) A report for a person with HIV infection without a diagnosis of AIDS shall include the following information:

(a) The patient's full name;

(b) Date of birth, using the format MMDDYY;

(c) Gender;

(d) Race;

(e) Risk factor, as identified by CDC;

(f) County of residence;

(g) Name of facility submitting report;

(h) Date and type of HIV test performed;

(i) Results of CD4+ cell counts and CD4+%;

(j) Results of viral load testing;
(k) PCR, HIV culture, HIV antigen, if performed;
(l) Results of TB testing, if available; and
(m) HIV status of the person's partner, spouse or children.
(4) Reports of AIDS cases shall include the information in subsections (1) through (3) of this section; and
(a) The patient's complete address;
(b) Opportunistic infections diagnosed; and
(c) Date of onset of illness.
(5) (a) Reports of AIDS shall be made whether or not the patient has been previously reported as having HIV infection.
(b) If the patient has not been previously reported as having HIV infection, the AIDS report shall also serve as the report of HIV infection.

Section 8. Reporting of Communicable Diseases in Animals. (1) Upon arriving at a probable diagnosis in an animal of a condition known to be communicable to humans, a veterinarian licensed under the provisions of KRS Chapter 321 shall report the occurrence within one (1) business day to:
(a) The local health department in which the animal is located; or
(b) If the local health department cannot be reached, the Department for Public Health.
(2) Upon the confirmation of a laboratory test result which indicates infection of an animal with an agent associated with a condition known to be communicable to humans, the director of a clinical laboratory licensed under KRS Chapter 333 shall, within one (1) business day, report the result to the:
(a) Local health department serving the jurisdiction in which the animal is located; or
(b) Department for Public Health.
(3) The local health department:
(a) Shall investigate the report and carry out public measures for the control of communicable diseases appropriate to the condition;
(b) Shall notify the Department for Public Health of the occurrence, in writing, within five (5) business days; and
(c) May seek assistance from the Department for Public Health.

Section 9. Asbestosis, Coal Worker's Pneumoconiosis, and Silicosis. (1) A reporting provider shall submit the following information relating to a person diagnosed with asbestosis, coal worker's pneumoconiosis, or silicosis:
(a) Name;
(b) Address;
(c) Birthdate; and
(d) County of residence.
(2) A reporting provider shall submit the required information to the department within three (3) months following the diagnosis.

Section 10. Incorporation by Reference. (1) The following material is incorporated by reference:
(a) "Case Definitions for Infectious Conditions under Public Health Surveillance, MMWR, May 2, 1997, Volume 46, Number RR-10", published by the Epidemiology Program Office, Centers for Disease Control and Prevention, Public Health Service, U.S. Department of Health and Human Services, Atlanta, Georgia;
(b) "Adult HIV/AIDS Confidential Case Report (CDC 50.42A, Revised January, 2003)"; and
(c) "Pediatric HIV/AIDS Confidential Case Report form (CDC 50.42B, Revised January, 2003)"; and
(d) "Control of Communicable Diseases Manual 17th Edition, An Official Report of the American Public Health Association, American Public Health Association, Washington, D.C., 2000".
(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, Monday through Friday, 8 a.m. to 4:30 p.m. (CDS-2; 1 Ky.R. 187; eff. 12-11-74; Am. 2 Ky.R. 464; eff. 4-14-76; 11 Ky.R. 1518;

1786; eff. 6-4-85; 16 Ky.R. 663; 1185; eff. 11-29-89; 21 Ky.R. 128; eff. 8-17-94; 23 Ky.R. 3119; 3597; 4131; eff. 6-16-97; 27 Ky.R. 1099; 1489; eff. 12-21-2000; 29 Ky.R. 812; 1273; eff. 10-16-02; 31 Ky.R. 873; eff. 1-4-05.)

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 programs relating to all matters of public 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 a minimum time period for reporting a sexually transmitted disease. In adopting the 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 to prohibit 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 equipment related to food-handling in food-handling establishments; the licensure of hospitals; and the control of such 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;

(f) The practice of midwifery, including the issuance of permits to and supervision of women who practice midwifery; and

(g) Protection and improvement of the health of the people through better nutrition.

(2) The secretary shall have authority to establish by regulation a schedule of reasonable fees, not to exceed twenty dollars ($20) per inspector hour plus travel costs 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 determining compliance with the provisions of this section and the regulations adopted by the secretary pursuant thereto. 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 the provisions of this section. The balance of the account shall lapse to the general fund 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: June 20, 2005
History: 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.

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.

214.990 Penalties

(1) Every head of a family who willfully fails or refuses and every physician who fails 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 owner or person having charge of any public or private conveyance, including watercraft, who refuses to obey the rules and regulations made by the Cabinet for Health and Family Services under KRS 214.020 shall be guilty of a Class B misdemeanor.
(3) Any physician or other person legally permitted to engage in attendance upon a pregnant woman during pregnancy or at delivery who fails to exercise due diligence 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 shall be 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 214.466 shall be guilty of a Class D felony. Each violation shall constitute a separate offense.
Effective: June 20, 2005
History: 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,

KRS 214.020 Cabinet to adopt regulations and take other action to prevent spread of disease.

When the Cabinet for Health and Family Services believes that there is a probability that any infectious or contagious disease will invade this state, it shall take such action and adopt and enforce such rules and regulation as it deems efficient in preventing the introduction or spread of such infectious or contagious disease or diseases within this state, and to accomplish these objects shall establish and strictly maintain quarantine and isolation at such places as it deems proper.

Effective: June 20, 2005

History: 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 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.

HIPPA – Disclosures for Public Health Activities

Downloaded from the Department for Health and Human Services Office for Civil Rights Website
http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/publichealth.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

a minimum necessary determination made by the public health authority in requesting the protected health information. See 45 CFR 164.514(d)(3)(iii)(A). For routine and recurring public health disclosures, covered entities may develop standard protocols, as part of their minimum necessary policies and procedures, that address the types and amount of protected health information that may be disclosed for such purposes. See 45 CFR 164.514(d)(3)(i).

Other Public Health Activities. The Privacy Rule recognizes the important role that persons or entities other than public health authorities play in certain essential public health activities. Accordingly, the Rule permits covered entities to disclose protected health information, without authorization, to such persons or entities for the public health activities discussed below.

- Child abuse or neglect. Covered entities may disclose protected health information to report known or suspected child abuse or neglect, if the report is made to a public health authority or other appropriate government authority that is authorized by law to receive such reports. For instance, the social services department of a local government might have legal authority to receive reports of child abuse or neglect, in which case, the Privacy Rule would permit a covered entity to report such cases to that authority without obtaining individual authorization. Likewise, a covered entity could report such cases to the police department when the police department is authorized by law to receive such reports. See 45 CFR 164.512(b)(1)(ii). See also 45 CFR 512(c) for information regarding disclosures about adult victims of abuse, neglect, or domestic violence.

- Quality, safety or effectiveness of a product or activity regulated by the FDA. Covered entities may disclose protected health information to a person subject to FDA jurisdiction, for public health purposes related to the quality, safety or effectiveness of an FDA-regulated product or activity for which that person has responsibility. Examples of purposes or activities for which such disclosures may be made include, but are not limited to:

  - Collecting or reporting adverse events (including similar reports regarding food and dietary supplements), product defects or problems (including problems regarding use or labeling), or biological product deviations;
  - Tracking FDA-regulated products;
  - Enabling product recalls, repairs, replacement or lookback (which includes locating and notifying individuals who received recalled or withdrawn products or products that are the subject of lookback); and
  - 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).

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.)

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Appendix N: References

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Reference Books and Journal Articles

- Heymann DL, ed. *Control of Communicable Diseases Manual*. 19th ed. Washington, DC: American Public Health Association, 2008.

- Pickering LK, ed. *Red Book: 2006 Report of the Committee on Infectious Diseases*. 27th ed. Elk Grove Village, IL. American Academy of Pediatrics; 2006.

- Kentucky Department for Public Health, *Kentucky Reportable Disease Desk Reference,* 2006. http://www.chfs.ky.gov/dph/diseases/

- Kentucky Department for Public Health, *Registered Sanitarian Field Handbook, 2004*. http://www.chfs.ky.gov/dph/sanitarians.htm

- Council to Improve Foodborne Outbreak Response (CIFOR). *Guidelines for Foodborne Disease Outbreak Response*. Atlanta: Council of State and Territorial Epidemiologists, 2009. http://www.cste.org/dnn/ProgramsandActivities/InfectiousDiseases/CIFORGuidelines/tabid/207/Default.aspx

- Gregg, MB, ed. *Field Epidemiology*. 2nd ed. New York, NY: Oxford University Press, 2002.

- 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, 2007. *MMWR* 2010;59(31):973-979.

- Bryan, F.L. et al., Procedures to Investigate Foodborne Illness, Fourth Edition. *Iowa: International Association of Milk, Food, and Environmental Sanitarians, (IAMFES) Iowa,* 1988.

- Food and Drug Administration (FDA). Employee Health and Personal Hygiene Handbook http://www.fda.gov/Food/FoodSafety/RetailFoodProtection/IndustryandRegulatoryAssistanceandTrainingResources/ucm113827.htm

- Surveillance for Waterborne Disease and Outbreaks Associated with Recreational Water Use and Other Aquatic Facility Associated Health Events. *MMWR* 2008;57(SS-9); 1-38.

- Surveillance for Waterborne Disease and Outbreaks Associated with Drinking Water and Water not Intended for Drinking. *MMWR* 2008; 57(SS-9); 39-69.

- Cryptosporidiosis Surveillance – United States, 2003-2005. *MMWR* 2007; 56(SS-7); 1-10.

- Giardiasis Surveillance – United States, 2003-2005. *MMWR* 2007; 56(SS-7);11-18.

Reference List of Infectious Disease Information on the Internet

Note: Care should be used when referencing materials from the Internet because of 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 as well as the Reportable Disease Desk Reference

  http://www.chfs.ky.gov/dph/diseases/

  Annual Reportable Disease Report

  http://www.chfs.ky.gov/dph/epi/reportablediseases.htm

- **KDPH Epidemiology Rapid Response Team**

  Information on Epi Rapid Response Team Membership and Training

  http://www.chfs.ky.gov/dph/epi/Epi

- **KDPH Division of Public Health Protection and Safety**

  Information on responding to a foodborne or waterborne outbreak and the Registered Sanitarians Handbook

  http://www.chfs.ky.gov/dph/sanitarians.htm

- **KDPH Division of Laboratory Services**

  Information on responding to a foodborne or waterborne outbreak and lab forms for download
  www.chfs.ky.gov/dph/info/lab

- **Centers for Disease Control and Prevention (CDC) – OutbreakNet Site**

  Information on responding to a foodborne or waterborne outbreak
  http://www.cdc.gov/foodborneoutbreaks/index.htm

- **National Outbreak Reporting System (NORS) Training**

  Training on how to enter data into the NORS system
  http://www.cdc.gov/healthywater/statistics/wbdoss/nors/training.html

- **Centers for Disease Control and Prevention (CDC) – Constructing an Epidemic Curve**

  Information from the Coordinating Office on Global Health on how to construct an epidemic curve
  http://www.cdc.gov/globalhealth/fetp/modules/MiniModules/Epidemic_Curve/page01.htm

- **University of North Carolina Center for Public Health Preparedness – *FOCUS on Field Epidemiology***

  Newsletters that include information on how to conduct an outbreak investigation
  http://cphp.sph.unc.edu/focus/issuelist.htm

  Instructions on **how to construct an epidemic curve in Excel**
  http://cphp.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_flash.pdf

- **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
  http://www.cifor.us/CIFORGuidelinesProjectMore.cfm

- **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://www.cifor.us/clearinghouse/keywordsearch.cfm

- **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.

  http://www.cifor.us/projind.cfm

- **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.

  http://www.mass.gov/?pageID=eohhs2modulechunk&L=4&L0=Home&L1=Provider&L2=Guidance+for+Businesses&L3=Food+Safety&sid=Eeohhs2&b=terminalcontent&f=dph_environmental_foodsafety_g_reference_manual&csid=Eeohhs2

- **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.

  http://www.dhs.wisconsin.gov/communicable/resources/pdffiles/FDWTRBorneMAN.pdf

- **Emerging Infectious Diseases Homepage**

  Current scientific articles on emerging diseases

  http://www.cdc.gov/ncidod/eid/index.htm

- **National Food Safety Website**

  Consumer information related to food safety including recalls

http://www.foodsafety.gov

- **U.S. Dept. of Agriculture (USDA)**

  Current topics related to food issues

  http://www.usda.gov/agency/fsis

- **U.S. Environmental Protection Agency (EPA) - Microbiology Homepage**

  Water-related issues, waterborne disease, regulations

  http://www.epa.gov/microbes

- **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

  http://water.epa.gov/drink/

- **U.S. Food & Drug Administration (FDA) - FDA News and Publications**

  Press releases, publications and issues related to current food issues

  http://www.fda.gov/opacom/hpnews.html

- **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 Epidemiology Summary Table Appendix for a summary table of pathogens by symptom description and incubation period.

  http://www.fda.gov/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/default.htm

- **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.

  http://www.fernlab.org/index.cfm

- **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.

http://www.fda.gov/Food/FoodSafety/RetailFoodProtection/IndustryandRegulatoryAssistanceandTrainingResources/ucm212661.htm

- **MEDLINE**

  Extensive collection of current published medical information, free Med-line searches

  http://www.nlm.nih.gov

Mapping Resources:

- Policy Map: www.policymap.com
- Batchgeo: http://batchgeo.com/
- USD Mapper: www.usdmapper.org
- Community Commons: www.communitycommons.org
- Arch GIS: http://www.esri.com/software/arcgis
- Open Street Mapping: http://www.openstreetmap.org/#map=5/51.500/-0.100

Public Health Data Resource Guide:

http://chfs.ky.gov/dph/DataResourceGuide.htm