



Shigellosis Investigation Guideline

Contents

CASE DEFINITION	1
LABORATORY ANALYSIS	2
EPIDEMIOLOGY	3
DISEASE OVERVIEW	3
NOTIFICATION TO PUBLIC HEALTH	4
INVESTIGATOR RESPONSIBILITIES	4
STANDARD CASE INVESTIGATION	6
Case Investigation.....	6
Contact Investigation	7
Isolation, Work and Daycare Restrictions.....	8
Case Management.....	12
Contact Management	12
Environmental.....	13
Education	13
MANAGING SPECIAL SITUATIONS	14
A. Outbreak Investigation.....	14
B. Public Gathering Implicated	14
C. Case Is a Food handler or Food Establishment Is Implicated	15
D. Daycare Worker or Attendee	16
E. Community Water Source or Commercial Dairy is Implicated	14
F. Health Care Setting Associated	18
G. Residential Facility or Institutional Outbreak	18
H. Intentional Contamination	18
DATA MANAGEMENT AND REPORTING	19
ATTACHMENTS	20
• Fact Sheet	
• KDHE Exclusion Guidance (vs. 10/2019)	
• Sample Letter, Shigella to Case	
• Sample Letter, To Parent for Daycare Outbreak	
• Sample Letter to worker (vs. 10/2019)	
• Sample Letter to worker's manager (vs. 10/2019)	

Attachments can be accessed through the Adobe Reader's navigation panel for attachments. Throughout this document attachment links are indicated by this symbol ; when the link is activated in Adobe Reader it will open the attachments navigation panel. The link may not work when using PDF readers other than Adobe.

Revision History:

Date	Replaced	Comments
10/2019	05/2018	Updated laboratory analysis and case management to provide clarification on exclusion testing. Updated case investigation to consider additional fields on Shigella Investigation Form. Updated guidance for exclusions and managing food handlers. Minor edits and formatting throughout. Added sample letters.
05/2018	08/2014	Updated case definition (CDC 2017). Notification Section and restriction section modified with requirements of new reporting regulations. Restriction section modified to bring in agreement with Kansas Food Code 2012. Daycare section modified.
08/2014	05/2012	Added table of contents. Updated laboratory analysis, Notification to Public Health, Isolation, Work and Daycare Restrictions, Data Management, and Management of Special Situations. More details added to Investigators Responsibilities. Reformatted Standard Case Investigation section to assist with EpiTrax system data entry. Revised Enteric Letter to a Case to apply specifically to Shigella. Reformatted Fact Sheet.
05/2012	02/2012	Updated investigation sections to agree with new surveillance system and added reporting form. Updated fact sheet and sample letters.
02/2012	05/2011	Removed references to KS-EDSS. Updated CDC case definition to 2012 version.
05/2011	03/2009	Minor formatting of investigation guideline. Incorporated specific agent recommendations from Enteric Outbreak in Daycares Manual into this investigation guideline. Note: Childcare guidance was modified to agree with current regulations with stricter control measures retained for the control of outbreaks. BEPHI replaced BSE throughout.

Shigellosis

Disease Management and Investigation Guidelines

CASE DEFINITION (CDC 2017)

Clinical Description for Public Health Surveillance:

An illness of variable severity characterized by diarrhea, fever, nausea, cramps, and tenesmus. Asymptomatic infections may occur.

Laboratory Criteria for Case Classification:

Supportive laboratory evidence: Detection of *Shigella* spp. or *Shigella*/Enteroinvasive *E. coli* (EIEC) in a clinical specimen using a culture-independent diagnostic testing (CIDT).

Confirmatory laboratory evidence: Isolation of *Shigella* spp. from a clinical specimen.

Epidemiologic Linkage:

A clinically compatible case that is epidemiologically linked to a case that meets the supportive or confirmatory laboratory criteria for diagnosis.

Criteria to Distinguish New Case from an Existing Case:

A case should not be counted as a new case if laboratory results were reported within 90 days of a previously reported infection in the same individual.

When two or more different serotypes are identified in one or more specimens from the same individual, each should be reported as a separate case

Case Classification:

Probable:

- A case that meets the supportive laboratory criteria for diagnosis; **OR**
- A clinically compatible case that is epidemiologically linked to a case that meets the supportive or confirmatory laboratory criteria for diagnosis.

Confirmed:

- A case that meets the confirmed laboratory criteria for diagnosis.

Comment: *Both asymptomatic infections and infections at sites other than the gastrointestinal tract, if laboratory confirmed, are considered confirmed cases that should be reported.*

LABORATORY ANALYSIS

Services available from the Kansas Health and Environmental Laboratories (KHEL):

- 1) Laboratory isolate submission: STEC isolate submission to KHEL is required by law. KHEL stores and analyzes these isolates for public health. Ship isolates using the KHEL [infectious disease mailers](#).
- 2) Outbreak investigations: Testing of stool specimens from suspected cases using molecular GI Screens. **Preapproval** is required through KDHE Epidemiology at 877-427-7317.
- 3) Removal of work / daycare restrictions with culture of stool specimens.
 - o The health department with jurisdiction over the case is responsible for the collection and shipment of stool specimens needed for the removal of exclusions.
 - o Specimen type: Feces; marble size amount in Cary-Blair
 - o Collection materials: [Enteric kit](#) (bottle with Cary-Blair medium (0.16%))
 - o Timing of specimen collection, [to remove work/daycare restrictions](#):
 - Collect the specimen >48 hours after the discontinuation of antibiotics and at least 24 hours after diarrhea has stopped.
 - Continue collecting specimens ≥ 24 hours apart until obtaining a negative stool.
 - Specimen must be received by KHEL within 7 days of collection.
 - o Each clinical specimen should be:
 - Packaged with a unique KDHE Universal Laboratory Submission Form that requests "Epidemiology Exclusion Testing", **and**
 - Labeled with a unique barcode from the KDHE Universal Form, patient full name (last, first), and date of birth (MM/DD/YYYY).
 - o Refrigerate clinical specimens until shipment.
 - o Ship specimens in the enteric mailer as soon as possible after collection using a courier or rapid shipping method, such as UPS or FedEx.
 - o Specimens must be received by KHEL within 7 days of collection.
 - o Notify KDHE Epidemiology (877-427-7317) when a specimen is shipped.
- 4) County Health Departments should keep at least five universal forms and unexpired enteric kits in stock for immediate use.
 - o Order supplies using following order form: www.kdheks.gov/labs/cust_serv/download/specimen_kit_request_form.pdf
 - Under "Health Specimen Submission Forms, select "Universal Laboratory Specimen Submission".
 - Under "Health Specimen Kits", select "Enteric with Cary Blair (Category B) ambient".

KDHE Universal Laboratory Specimen Submission Form (Health)
 6810 SE Dwight Street, Topeka, KS 66620 | Fax: (785) 296-1641 | Phone: (785) 296-1620 | CLIA 17D

Health Dept. ID# supplied by KHEL
 Health Dept. Name
 Health Dept. Address

PATIENT INFORMATION (Required)
 Last Name, First Name: Patient Last, First Name
 DOB: mm/dd/yyyy Sex: Male Female Unknown
 Race: White Asian AI, AN Black HN, PI
 Ethnicity: Hispanic or Latino Non-Hispanic or Non-Latino
 Address: Patient Address
 City: Patient City Patient State Patient Zip
 MRN: Medication #
 Collection (Date/Time): mm/dd/yyyy hh:mm Collector
 Physician's Full Name: Health Dept. Medical Consultant

MICROBIOLOGY
 Tuberculosis
 Clinical Isolate
 QuantIFERON: Incubation (Date/Time Required)
 IN: / OUT: / Not Incubated
 QuantIFERON Test Program:
 College Contract Contact Investigation
 Correctional Facility Screening Contract
 Other

Parasitology
 Fecal Oval/Parasite (Add) Crypt. Cyclospora
 Worm Arthropod

Enteric Bacteriology
 Confirmation*
 Epidemiology Exclusion Testing*
 Isolate*
 E. coli O157 STEC Salm. Shigella Other

SPECIMEN SOURCE/MATRIX
 Blood Serum
 Bronchial Wash Sputum
 CSF Stool
 Endocervical Urethral
 Genital Urine
 Nasopharyngeal Vaginal
 Plasma Wound
 Other

TOXICOLOGY
 Blood Metals: Lead, Mercury, Cadmium
 Capillary Venous

SEROLOGY/VIROLOGY
 Chlamydia/Gonorrhea Hepatitis
 HIV Hepatitis
 Syphilis Rubella
 Herpes (PCR) Influenza

Special Notes:
EPIDEMIOLOGY APPROVAL (877) 427-7317
 Epidemiologist
 Hepatitis A (IgM) Norovirus
 Perinatal-PVST Pertussis
 Arboviral Encephalitis Varicella
 Molecular GI Screen CRE/CR
 Menses: PCR IgG IgM
 Mumps: PCR IgG IgM
 Date of Onset:
 Other (Specify):
POST EXPOSURE BIOLOGICAL TESTS
 Food Source Environmental Source

For additional information concerning collection, transport, or facility identification numbers, call KHEL at (785) 296-1620.

EPIDEMIOLOGY

Shigellosis has a worldwide distribution with an estimated 600,000 deaths occurring annually throughout the world. Secondary attack rates can be as high as 40% in households and among close contacts. Outbreaks can result from person-to-person transmission and/or contaminated food and water. There is an increased risk in certain populations, including homosexual men or in conditions of crowding where personal hygiene may be poor; such as prisons, institutions for children, mental hospitals and refugee camps.

DISEASE OVERVIEW

A. Agent:

Shigella is a gram-negative rod divided into 4 groups, including: *S. dysenteriae* (Group A), *S. flexneri* (Group B), *S. boydji* (Group C) and *S. sonnei* (Group D). Group A infections are serious with high fatality rates but are rare in the United States. Group B infections are often associated with travel to/from developing countries. Over 75% of all *Shigella* infections in the U.S. are Group D.

B. Clinical Description:

Acute gastroenteritis with diarrhea, fever, nausea, vomiting, cramps and/or tenesmus (difficulty passing stool). When severe, stools contain blood, mucus and pus. While usually self-limiting to 4-7 days, severe dehydration can occur; especially with infants and the elderly. Asymptomatic infections can occur.

C. Reservoirs: Humans.

D. Mode(s) of Transmission:

Fecal-oral transmission with low infectious dose (10-200 organisms). Direct transmission is associated to poor hand washing and with certain sexual behaviors (e.g., oral-anal). Indirect transmission occurs via contaminated food, milk, water, inanimate objects (fomites) and houseflies (vectors).

E. Incubation Period:

Usually 1-3 days, range from 12 to 96 hours. Up to 1 week for *S. dysenteriae*.

F. Period of Communicability:

Variable, usually \leq 4 weeks after onset. Asymptomatic carriers may transmit infection; rarely, a carrier-state persists for months. Antimicrobial treatment may decrease the shedding to a few days.

G. Susceptibility and Resistance:

Susceptibility is general. The elderly, debilitated, and malnourished are more at risk for severe disease and death. Breastfeeding is protective for infants. There is evidence of serotype specific immunity but only for short durations.

H. Treatment:

Antibiotics have been shown to shorten the duration of illness and bacterial shedding. Usage should be based on the clinical status of patient and sensitivity of organism. High levels of resistance to Ampicillin and TMP/SMX have been found in the United States. Fluid and electrolyte replacement may be necessary in severe cases. The use of antimotility agents is contraindicated.

NOTIFICATION TO PUBLIC HEALTH AUTHORITIES

Suspected cases of shigellosis shall be reported within 24 hours, except if the reporting period ends on a weekend or state-approved holiday, the report shall be made by 5:00 p.m. on the next business day after the 24-hour period:

1. Health care providers and hospitals: report to the local public health jurisdiction
2. Local public health jurisdiction: report to KDHE-BEPHI (see below)
3. Laboratories: report to KDHE-BEPHI (see below)

**Kansas Department of Health and Environment (KDHE)
Bureau of Epidemiology and Public Health Informatics (BEPHI)**

Phone: 1-877-427-7317

Fax: 1-877-427-7318

Further responsibilities of state and local health departments to the CDC:

As a nationally notifiable condition, shigellosis cases require a ROUTINELY NOTIFIABLE report to the Center of Disease Control and Prevention (CDC).

1. ROUTINE reporting requires KDHE-BEPHI to file an electronic report for cases within the next reporting cycle.
 - KDHE-BEPHI will file electronic reports weekly with CDC.
2. The **Local public health jurisdiction** will:
 - Start the investigation **within 3 days** of receiving a notification, and
 - Will report the information requested in the Kansas EpiTrax system, as soon as possible, ensuring that the electronic form is completed within 5 days of receiving a notification of a report.

Additional notification that occur for work or daycare restrictions:

1. KDHE will notify the county health department with jurisdiction over a case-patient, as soon as it is identified that the patient must be excluded from work or school.
2. The county health department with jurisdiction will immediately notify the case-patient of the need to collect stool samples, arrange for specimen collection, and will notify the employer or daycare of the case-patient, if necessary, using the provided templates.
3. The county health department will notify KDHE Epidemiology as soon as a specimen is shipped for testing at KHEL.
4. KDHE will notify KHEL that the specimen is being shipped and will notify the county health department by phone as soon as preliminary or final results are available.
5. Additional guidance can be found in the [KDHE Exclusion Guidance for LHD's](#).

INVESTIGATOR RESPONSIBILITIES

- 1) [Report](#) all confirmed, probable and suspect cases to the KDHE-BEPHI.
 - Initiate the case investigation within 3 days of notification of a report.
 - Complete the investigation within 5 days of the notification.
- 2) Contact medical provider to collect additional information and confirm diagnosis using current [case definition](#).
 - If *Shigella* was isolated, ensure a bacterial isolate is sent to KHEL.
 - Collect all information requested in [Step 1\)](#) of case investigation.
 - Ensure that case is aware of his/her diagnosis.
- 3) Continue the [case investigation](#) starting within 3 days of receiving a report and completing the case investigation within 5 days of receiving the report.
 - Complete an interview with the case to collect information requested on the [Shigella Investigation Form](#).
- 4) Conduct [contact investigation](#) to locate additional cases and/or contacts.
 - Only contacts at high risk of acquiring infection require follow-up.
- 5) Identify whether the source of infection is major public health concern,
 - Identification of Shigella from a clinical specimen: ensure isolate or clinical specimen is sent to KHEL.
 - Involvement of a foodhandler, a daycare, or direct patient care provider.
 - Suspected outbreak.
 - Public water supply involvement.
- 6) Initiate control and prevention measures to prevent spread of disease.
 - Initiate needed measures to prevent case-patient from returning to work or school as required by [K.A.R 28-1-6](#).
 - Arrange the collection and shipment of stool specimens to the KHEL to allow the removal of restrictions and exclusions from work or daycare.
 - Additional guidance can be found in the [KDHE Exclusion Guidance](#).
- 7) [Record](#) data, collected during the investigation, in the KS EpiTrax system under the data's associated [\[tab\]](#) in the case morbidity report (CMR).
- 8) As appropriate, use the notification letter(s)  and the disease [fact sheet](#)  to notify the case, contacts and other individuals or groups.

STANDARD CASE INVESTIGATION AND CONTROL METHODS

Case Investigation

- 1) Contact the medical provider who ordered testing or is attending to the case and obtain the following. (This may require a request for medical records.)
 - Obtain clinical information on symptoms [Investigation-Symptoms], onset date and time and, if available, recovery date and time. [Clinical]
 - Note any underlying immunodeficiency. [Investigation-Symptoms]
 - Record any significant medical history and recent medications. [Investigation-Medical History & Recent Medications]
 - Examine laboratory testing. [Laboratory]
 - If *Shigella* was isolated, ensure bacterial isolate was sent to KHEL.
 - Mark yes/ no to: “Specimen Sent to State Lab?” in EpiTrax. [Laboratory]
 - Determine if further laboratory testing is needed.
 - If CIDT probable cases are increasing in number in your jurisdiction, it may be necessary to collect stool specimens for testing at KHEL.
 - Collect case’s demographics and contacting information (address, birth date, gender, race/ethnicity, primary language, and phone number(s)). [Demographic]
 - Record hospitalizations: location and duration of stay. [Clinical]
 - Record outcomes: survived or date of death. [Clinical]
- 2) Interview the case to determine source, risk factors and transmission settings:
 - At least 3 phone attempts at different times of day should be made before using the [Shigella Letter to Case](#) and closing the case as lost to follow-up.
 - Collect epidemiological information that helps to establish risks of acquiring and transmitting infection: [Investigation]
 - Case’s occupation: food handler, healthcare worker, daycare attendee or worker, school attendee or worker, lab employee or student; indicate if the case volunteers at any of these occupations.
 - Note any group living arrangements.
 - If the employee worked at or attended any facilities while ill: record the facility name, address, and phone number
 - Even if they did not work while ill record places of potential exposure (where they could have acquired or transmitted illness) this includes daycare, school, restaurants, recreational source, and group living.
 - For the period **7 days** prior to symptoms onset, examine:
 - In-state and out-of-state travel. [Investigation – Travel History]
 - o Obtain dates and location(s).
 - o Include hiking, camping or hunting trips.
 - Attendance at large gathering(s); record description, location and date(s). [Investigation – Travel History]
 - Ate food that was brought from another country. [Investigation – Travel History]
 - Contact with others with diarrhea. [Investigation –Contacts]
 - o Obtain contact’s onset date and exposure date(s) to case, relationship to case and contact’s occupation.
 - Contact with anyone who traveled outside of U.S. [Investigation –Contacts]
 - Recreational water exposure (pools, spas, water features, sprinklers, natural water); record, location and exposure dates. [Investigation-Water]

- Untreated/unfiltered water consumption: record source and date of exposure [\[Investigation-Water\]](#)
 - Association with childcare (including contact with attendees): daycare, preschool, elementary school, camp, or any other. [\[Investigation – General\]](#)
 - o Record childcare location and exposure dates [\[Epidemiological\]](#)
 - For case-patients ≥ 16 years of age, inquire about sexual exposures. [\[Investigation-Sexual Exposure\]](#)
 - For infants ≤ 3 months of age, if a source is not identified, consider:
 - Collecting detailed epidemiologic data and performing stool cultures on caretaker(s), even if asymptomatic.
 - Carefully review food-handling practices to determine whether cross-contamination of infant formula or food may be involved.
 - Collect information from case for the [Contact Investigation](#). (See below).
- 3) Investigate epi-links among cases (clusters, household, co-workers, etc).
- If the case had contact with person(s) who have/had *Shigella*, determine if the other “cases” have been reported to the state:
 - Search EpiTrax for the possible case.
 - If found, record the previously reported record number in the record of the case you are investigating [\[Notes\]](#)
 - Highly suspected cases, that have not previously been reported should be investigated as a potential case and [reported](#) to KDHE-BEPHI.
 - For suspected [Outbreaks](#) refer to Managing Special Situations section.

Contact Investigation

- 1) Review the case’s occupation and activities, collected during the case investigation, especially dates and activities during the period from illness onset till resolution.
- 2) Consider the following types of contacts during a contact investigation:
 - Household and intimate/sexual contacts of case.
 - Those who ate food that the case prepared or food that was implicated as the source of the case’s infection.
 - Daycare contacts, consider the following situations to determine contacts:
 - All direct caregivers and room/classmates of the case in a daycare with only children who are toilet trained or who are all over 2 years of age.
 - All employees and attendees of a daycare with non-toilet trained attendees, if one or more employee or child is infected or if household contacts of two or more separate attendees are infected.
 - All employees, attendees and household contacts of diapered attendees of a daycare in which outbreak recognition is delayed by ≥ 3 weeks.
 - Individuals who work the same shift in a daycare kitchen with an infectious food handler are also considered contacts.
 - School contacts: **Only** with epidemiologic evidence of transmission in a school setting should you investigate contacts. Consider those who share similar exposure activities with the cases (food/drink or recreational water).
 - Food service contacts: Patrons of the establishment of an infected food handler if (1) the food handler worked while infectious, (2) had poor personal hygiene, and (3) had the opportunity to have bare-hand contact with ready-to-eat food.

- Direct patient care provider contacts: Patients of an infected care provider if there is evidence that the provider was (1) symptomatic with poor personal hygiene and (2) had an opportunity for bare-hand contact with the patient's ready-to-eat foods, oral medications, or oral treatments.
 - Residential Facility / Institutional Contacts (Crowded Living Conditions):
 - Room or cellmates and those who share common bathroom facilities.
 - In conditions where personal hygiene is poor or with issues of fecal incontinence or toilet use, those who share common areas with cases.
- 3) After identifying potential contacts, evaluate whether a risk of transmission exists. ONLY if a risk of transmission exists, create a line listing of contacts at-risk of developing disease and make note of any high-risk contacts. [\[Contact\]](#)
- Risk of transmission is assumed to exist with the following exposures:
 - Household contacts and intimate/sexual contacts,
 - Those who consumed food prepared by an infectious case, or
 - Those who consumed food associated to an outbreak,
 - Risk of transmission (while not assumed) does increase if:
 - Case-patient exhibits lack of fecal continence (including diapered children) or has poor personal hygiene, especially after using the bathroom.
 - Contacts exhibit frequent hand-to-mouth activity (toddlers and infants) or have poor personal hygiene, especially after assisting someone in the bathroom, changing a diaper, or any other activity that may result in possible exposure to someone else's feces
 - High risk contacts are those who may develop a severe infection or who may expose those at high risk for developing a severe infection.
- 4) Follow-up with household and other contacts (especially high-risk contacts) as recommended under [Contact Management](#).
- 5) Institute control measures for school or day-care contacts as indicated under [Isolation, Work and Daycare Restrictions](#).

Isolation, Work and Daycare Restrictions

K.A.R 28-1-6 for Shigella Control of Cases

- Each person with a case shall be excluded working as a food employee, health care worker, and attending or working in a child care facility:
 - Until one negative stool culture or other laboratory test acceptable to the secretary is obtained at least 48 hours following completion of antimicrobial therapy.

In addition to the K.A.R. 28-1-6 requirements, food handlers are subject to the [2012 Kansas Food Code](#), which restricts or excludes those diagnosed with Shigella, depending on the type of population the person serves:

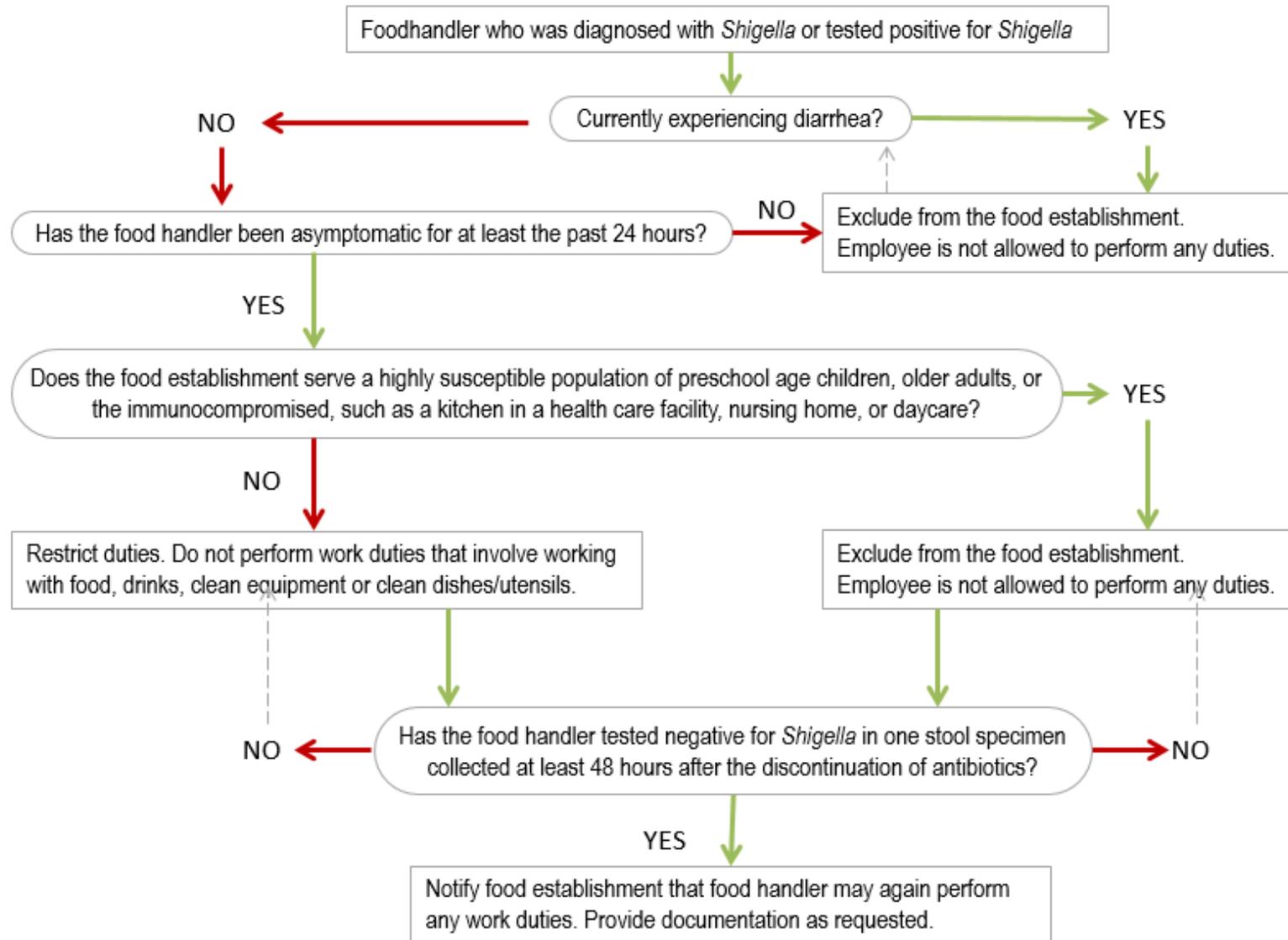
Kansas Food Code 2012:

- Food handlers diagnosed with *Shigella* must be **excluded** from food establishments until symptoms have resolved for at least 24 hours. After symptoms have resolved for at least 24 hours, the worker is **restricted**. Food handlers must be **excluded** from work if they serve a **highly susceptible population**, even after symptoms have resolved.
- Food handlers exposed (1) by consuming or preparing food that is suspected source of a confirmed *Shigella* outbreak, (2) by working or attending a setting of a confirmed *Shigella* outbreak, or (3) by living with someone diagnosed with *Shigella* or who worked in a setting of a confirmed *Shigella* outbreak shall be **restricted** when working in a food establishment serving a **highly susceptible population** until:
 - More than 3 calendar days have passed since last day of potential exposure, or
 - More than 3 calendar days have passed since the last the employee's household contact became asymptomatic.
- ***Restriction*** means to limit the activities of a food employee so that there is no risk of transmitting a disease that is transmissible through food and the food employee does not work with exposed food, clean equipment, utensils [including tableware such as dishes and glasses], linens, or unwrapped single-service or single-use articles
- ***Exclusion*** means to prevent a person from working as an employee in a food establishment or entering a food establishment as an employee.
- ***Highly susceptible population*** means persons who are more likely than other people in the general population to experience foodborne disease because they are:
 - (1) Immunocompromised; preschool age children, or older adults; and
 - (2) Obtaining food at a facility that provides services such as custodial care, health care, or assisted living, such as a child or adult day care center, kidney dialysis center, hospital or nursing home, or nutritional or socialization services such as a senior center.

School-aged children: With an understanding of and ability to practice good hygiene, children usually do not represent a risk of spreading this pathogen via the fecal-oral route. Children are a risk only if the infected child is unable to or fails to maintain good hygiene, including hand hygiene after toilet use. Children in diapers at any age constitute a far greater risk of spreading *Shigella*. In school settings:

1. Exclude children with diarrhea, vomiting, and fever until symptoms resolve.
2. Recommend the exclusion of infected school-aged students until at least 24 hours after symptoms have resolved.
3. During a school-based outbreak, stronger restriction and exclusion measures may be warranted and will be based on consultations with the KDHE-BEPHI.

Figure 1: Management of a food handler with suspected *Shigella*



Case Management

- 1) Educate case on measures to avoid future illness and to prevent transmission.
- 2) Follow-up is needed to assure compliance with [restrictions or exclusions](#) if:
 - Case-patient cares for young children, the elderly or patients;
 - Case-patient or exposed contact handles food; or
 - Case-patient attends a daycare or family daycare home.
- 3) When the health department is carrying out restrictions or exclusions:
 - The patient's county of residence is responsible for providing stool enteric kits and instructions for specimen collection to the excluded patient.
 - Plan on having at least five kits and universal forms on hand.
 - Order supplies through KHEL (refer to [Laboratory Analysis](#)).
 - Inform the patient or guardian of the restrictions and exclusion and arrange for the pick-up and return of enteric kits from and to the health department.
 - Prolonged shedding may occur; the patient should be prepared to submit multiple specimens that are collected 24 hours apart.
 - Specimens should be collected at least 48 hours after discontinuation of antibiotics and at least 24 hours after diarrhea has stopped.
 - A doctor's note releasing a patient from restrictions or exclusions does not supersede the state regulation requiring negative stool cultures.
 - Inform the patient's supervisor or daycare of the restriction or exclusion.
 - Sample letters are available that can be adapted for use.
 - After shipping the specimen to KHEL, contact KDHE-BEPHI that a specimen was collected and is being shipped.
 - Continue collecting specimens until restrictions or exclusions can be lifted.
- 4) Document negatives in EpiTrax and the date the exclusion was lifted.
- 5) Report changes in patient status, complications, hospitalizations, or death. [Clinical]

Contact Management

- 1) If a contact listing was created because of the high possibility of disease transmission, follow-up with the listed contacts to determine if transmission occurred and to identify any high-risk situations. [Contact]
 - Collect information on each contact's health status, noting any symptoms
 - Collect information on each contact's occupation.
 - A contact that is a food-handler should be restricted from facilities that serve highly susceptible populations. Consult [restrictions or exclusions](#).
 - Note any other high-risk contacts or situations and handle appropriately.
- 2) As needed, provide education on avoiding further exposures and to ensure proper medical care is obtained and precautions taken if symptoms develop.
- 3) A symptomatic contact is considered a probable case requiring investigation and [reporting](#) to KDHE-BEPHI [Contact]
 - Initiate any [Restrictions](#) or exclusions needed for the probable case (symptomatic contact) and encourage medical evaluation.
- 4) In outbreak situations, cultures to confirm epi-linked cases may be warranted.

Environmental

Environmental Investigation: If a [commercial food service](#), [daycare center](#), [public water supply](#) or [commercial raw milk dairy](#) is implicated in transmission, coordinate with the proper regulatory agency to accomplish the following:

- 1) Inspecting the facility.
- 2) Collecting food, drink or water samples

Environmental control measures:

- 1) Proper chlorination or boiling of water prevents illness transmission.
- 2) Clean and sanitize contaminated surfaces with 1% bleach or proper germicides.

Education

1. Instruct on the necessary [restrictions or exclusions](#).
2. Counsel contacts to watch for signs or symptoms that may develop within 1 week of exposure and to seek medical attention if needed.
3. Provide [education](#) on preventing the spread of disease:
 - Stress that case-patient should wash hands thoroughly with soap and water before eating/handling food or after using the toilet.
 - Education should emphasize cleaning fingernails and personal hygiene.
 - Symptomatic individuals should not prepare food and drinks for others.
 - Remind contacts that when taking care of someone with diarrhea scrub hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes or sheets.
 - Remind infected individuals not to use recreational water venues until symptoms resolve for 2 weeks.
4. Provide [education](#) on preventing future illness:
 - Hand washing: wash hands thoroughly with soap and water before eating/handling food or after handling raw food, using the toilet, changing diapers and handling pets, fowl, or other animals and/or feces.
 - Refer to the [KDA Handwashing Fact Sheet](#) for food handlers.
 - Wash fresh produce before cutting or consuming.
 - Avoid drinking or swallowing untreated surface water.

MANAGING SPECIAL SITUATIONS

A. Outbreak Investigation:

Outbreak definition: (1) An unexpected, unexplained increase in cases clustered by time, place, or person; or (2) two or more cases in different households with the same strain or pulsed-field gel electrophoresis (PFGE) pattern clustered by person, place or time (within the incubation period).

- Notify KDHE-BEPHI immediately, 1-877-427-7317.
- Organize and maintain all data related to outbreak:
 - Construct and maintain case listing which includes:
 - Record number, name, DOB (or age) and other demographics,
 - Symptoms; onset date and time; recovery date and time
 - Source of exposure (i.e., case ID, setting, classroom),
 - Specimen collection date and lab results,
 - Case status (i.e., confirmed, probable, suspect)
 - All epidemiologic data will be reported and managed with EpiTrax.
- Identify population(s) at risk of infection based on the scope and spread of the outbreak; use the information collected in case investigations to define:
 - Person: who is becoming ill (i.e., age, gender, occupations)
 - Place: where are the cases (i.e. classrooms, address) and to what settings or activities are they associated
 - Time: when did it start and is it still going on
- Enhance surveillance and perform active case finding using active surveillance with medical providers and others serving the affected community for 1 week (two incubation periods) from last confirmed case.
- Outbreak control:
 - Target efforts on those population(s) identified as at risk.
 - Evaluate the effectiveness of and consider amendments to the restrictions or exclusions discussed in [Isolation, Work and Daycare Restrictions](#).
 - Establish protocols for control measures necessary to slow or prevent the transmission of disease in affected settings.

B. Community Water Source or Commercial Dairy is Implicated:

Consult with the State epidemiology staff when the investigation implicates that a community drinking water system.

C. Public Gathering Implicated:

- 1) Determine if anyone who prepared food for the gathering had diarrhea during the week prior to food preparation.
- 2) Conduct active case finding; determine if any other food preparers or attendees developed diarrhea within 4 days after the gathering.
- 3) Collect stool specimens for culture from any symptomatic food handler.
 - If it is <72 hours since exposure, contacts who are food handlers are managed according to [Isolation, Work and Daycare Restrictions](#).
- 4) If a food establishment or distributor is implicated as the source of infection refer to "[Case Is a Food Handler or Food Establishment Is Implicated](#)."

D. Case Is a Food handler or Food Establishment Is Implicated:

- 1) Instruct cases on the necessary [work or daycare restrictions or exclusions](#), and that you will be contacting their manager.
 - Obtain manager name and contact information from the case.
- 2) Coordinate stool specimen collection, shipping, and testing through the KDHE Laboratory. One stool specimens should be 48 hours after discontinuance of antibiotics or 24 hours after diarrhea has stopped.
- 3) Contact the case's manager at the food service establishment.
 - Explain the case is restricted or excluded until one stool specimen is negative. Because the Kansas Food Code requires food employees to report an Shigella diagnosis to their manager, you can share both the name the case and the Shigella diagnosis with the manager.
 - If requested, send letter explaining restriction or exclusion (see attachments, "[Shigella food handler template letter](#)" and "[Shigella food handler manager template letter](#)")
 - If the manager has questions about work duties a restricted case can perform, provide the Kansas Department of Agriculture (KDA) Division of Food Safety and Lodging phone number: (785) 296-5600.
 - Ask about diarrheal illness among staff or patrons within past week.
 - Staff that were symptomatic should be considered as probable cases of Shigella, and restricted or excluded from food handling.
 - Collect stool specimens from any staff or patron with history of diarrheal illness within the past week.
 - Ship specimens to the KDHE Laboratory (KHEL) for Shigella testing.
 - A negative stool specimen, collected >48 hours after antibiotics were last used, allows the staff person to return food handling.
 - Instruct the facility operator to call the health department if new cases of diarrhea occur in staff members within the next week.
 - Newly symptomatic staff should be considered as probable cases of Shigella, and restricted or excluded from food handling.
 - Coordinate stool specimen collection and shipping to KHEL for symptomatic staff.
- 4) Notify KDHE. KDHE will contact the Kansas Department of Agriculture (KDA) Division of Food Safety and Lodging at (785) 296-5600 so they are aware of the food handler restriction or exclusion.
- 5) Document the restriction or exclusion in EpiTrax in the Epidemiological tab of the case record. [\[Epidemiological\]](#)
- 6) After a stool specimen tests negative, contact case and manager to remove restriction or exclusion.

If >1 case from separate households are associated to the facility:

- 1) The local health department will initiate an [outbreak investigation](#).
- 2) KDHE will notify KDA, and a KDA inspector will also perform the following:
 - A thorough inspection of the establishment.
 - Sample collection of any suspected foods.

D. Daycare Worker or Attendee:

For the one case identified at a daycare perform the following actions:

- 1) Interview the operator and request review of attendance records to identify other possible cases among staff or attendees in the past week.
- 2) Coordinate the [collection](#) stool specimens or rectal swabs from any other attendees or staff with a history of diarrheal illness within the past week.
- 3) Reinforce the need to exclude:
 - All symptomatic children and adults with diarrhea, vomiting, and fever.
 - All culture positive attendees and workers involved in child care or food handling until after the submission of negative stool samples taken from the excluded person 48 hours after the discontinuation of any antibiotic treatment.
- 4) Instruct the facility operator
 - To call immediately if new cases of diarrhea occur.
 - On how to prevent disease transmission at center and at home.
- 5) Call or visit one week after the last case's onset to verify no further cases and that appropriate hygienic measures are being carried out.

Continue to investigate if greater than one case is identified at a daycare.

- 1) Contact KDHE-BEPHI and initiate an [outbreak investigation](#).
- 2) Contact the KDHE Child-Care Licensing Program at (785) 296-1270, and/or the local daycare inspector to coordinate the following:
 - Performance of a thorough inspection of the facility.
 - Investigate hand washing, diapering and disinfection procedures.
 - Investigate for possible source of infection during last 7 days:
 - Possible index cases
 - Water-play areas
 - For suspected point source outbreaks, collect menus of food and drinks served during the last 4 days from the first date of onset.
 - Conduct of a review of findings with the operator and implementation of control measures.
- 3) Request stool samples from all symptomatic children, food handlers/ childcare givers, and household/close contacts.
- 4) Consider the collection of stool samples from the following if there appears to be ongoing, continued transmission (consult with KDHE epidemiology):
 - Asymptomatic children in the “class or room” of the sick children if the group includes non-toilet trained children.
 - Asymptomatic food handlers and childcare givers.
 - Asymptomatic household/close contacts who are engaged in sensitive occupations such as food handling or direct patient care.

- 5) Exclusion and readmission:
 - Continue to exclude culture positive workers and attendees until two negative stools are collected as required.
 - In addition, exclude all children and adults with diarrhea, vomiting, or fever until after symptoms has ceased for 24 hours. (Requiring one “formed” stool before readmitting is an effective control measure.)
- 6) Antibiotic resistance and treatment:
 - Due to an increase in antibiotic resistance among strains of *Shigella spp.*, an antibiogram should be obtained early in the outbreak.
 - Provide the antibiogram to the physicians of sick individuals.
 - Do not assume that simultaneous outbreaks at different day cares share the same antibiogram. Obtain an antibiogram for each center.
 - Recommend all lab-confirmed children and adults (symptomatic and asymptomatic) seek medical evaluation for treatment.
 - Treatment cannot be mandated, but public health measures can still include restriction or exclusions of the activities of stool positive individuals.
 - Encourage any symptomatic individual to submit a stool specimen for culturing to confirm diagnosis prior to any antibiotic treatment.
- 7) Closing of daycares:
 - Close to new admissions when there is evidence of noncompliance with control measures or if there is continued transmission within the center.
 - Do not close to readmission or enforce a temporary closure, as this may result in the spread of infection to other daycares.
 - Permanent closure/revocation of license may occur only if deemed necessary by the Child Care Licensing Program.
- 8) Notification: use the [Sample Parent Letter](#).

Eight days after control measures started, if new cases are still occurring, the local health officer / administrator or designee may use the following:

- 1) Re-inspect to ensure control measures are being employed.
- 2) If not already done, consider closing the daycare to new admissions, but still not to readmission or temporary closure.
- 3) Consider expanding the testing to asymptomatic contacts and previously treated children that may not have been tested.
- 4) Examine current restriction or exclusion measures; modify, as needed.
- 5) For facilities with the capability, consider cohorting:
 - Asymptomatic, stool positive (or previously positive) children and staff may be placed in separate convalescent rooms away from healthy individuals, with the provision of separate restrooms when possible.
 - Individuals may be released after two consecutive stool samples are taken 24 hours apart and, if treated, 48 hours after the discontinuation of any antibiotic treatment.

E. Health Care Setting Associated:

- 1) Hospitals: *Shigella* has rarely been associated with nosocomial infections.
 - Nosocomial describes infections not present or incubating prior to the patient being admitted but acquired in hospitals and usually observed >48 hours after admission. As the incubation period will vary, each infection should be assessed individually. Nosocomial infections include those acquired in the hospital but not evident until after discharge.
 - Coordinate investigation efforts with hospital infection control.
- 2) Nursing home: Crowded communal living conditions and age-related risk factors including immune status and higher rates of antibiotic usage, dementia, and incontinence may allow transmission of enteric pathogens.
 - Coordinate investigation efforts through nursing home administrator.
 - Kansas Department of Aging and Disability Services should be notified if a nursing home, adult care, or long-term care facility is involved in an outbreak.

G. Residential Facility or Institutional Outbreaks:

- 1) Special measures may be required, including separate housing for cases and new admissions, vigorous program of supervised hand washing, and repeated cultures of patients and attendants.
- 2) Groups that include non-toilet trained or young children, those who are mentally deficient and those without an adequate water or hand washing facilities are the most difficult to control.
- 3) Coordinate efforts with institutional medical staff and appropriate regulatory agency. (For example, the Kansas Department of Corrections should be notified of outbreaks involving state prisons.)

H. Intentional Contamination

Shigella dysenteriae is a category B agent and food safety threat, it is moderately easy to disseminate, results in moderate morbidity but low mortality, and requires specific enhancements of CDC's diagnostic capacity and disease surveillance.

- 1) If suspected, notify local law enforcement and state public health officials.
 - Consider epidemiologic clues and law enforcement guidance.
 - Observations during environmental assessments may provide evidence.
- 2) Implement ["Chain of Custody"](#) procedures for all samples collected, as they will be considered evidence in a criminal investigation.

DATA MANAGEMENT AND REPORTING TO THE KDHE

- A.** Accept the case assigned to the LHD and record the date the LHD investigation was started on the [**Administrative**] tab.
- B.** Organize and collect data, using appropriate questionnaires, case listings (spreadsheets), and investigation forms, including:
- EpiTrax [Shigella Investigation Form](#) (This is a paper-based form allows investigators to collect required information without being in EpiTrax.)
 - Alternatively, investigators can collect and enter all required information directly into EpiTrax [**Investigation**], [**Clinical**], [**Demographics**], and [**Investigation**] tabs.
 - During outbreak investigations, refer to guidance from a KDHE epidemiologist for appropriate collection tools.
- C.** Report data collected during the investigation via EpiTrax.
- Verify that all data requested on the [Shigella Investigation Form](#) has been recorded on an appropriate EpiTrax [**tab**], or that actions are completed for a case lost to follow-up as outlined below.
 - Some data that cannot be reported on an EpiTrax [**tab**] may need to be recorded in [**Notes**] or scanned and attached to the record.
 - Paper report forms do not need to be sent to KDHE after the information is recorded in EpiTrax. The forms should be handled as directed by local administrative practices.
- D.** If a case is lost to follow-up and appropriate attempts have been made:
- Indicate 'lost to follow-up' on the [**Administration**] tab with the number of attempts to contact the case recorded.
 - Record at least the information that was collected from the medical records.
 - Record a reason for 'lost to follow-up' in [**Notes**].
- E.** After the requirements listed under [Case Investigation](#) have been completed, record the "Date LHD investigation completed" field located on the [**Administrative**] tab.
- Record the date even if the local investigator's [Case](#) or [Contact Management](#) for the contact is not "Complete".
- F.** Once the entire investigation is completed, the LHD investigator will click the "Complete" button on the [**Administrative**] tab. This will trigger an alert to the LHD Administrator, so they can review the case before sending to the state.
- The LHD Administrator will then "Approve" or "Reject" the CMR.
 - Once a case is "Approved" by the LHD Administrator, BEPHI staff will review the case to ensure completion before closing the case.

(Review the [EpiTrax User Guide, Case Routing](#) for further guidance.)

ADDITIONAL INFORMATION / REFERENCES

- A. **Treatment / Differential Diagnosis:** American Academy of Pediatrics. Red Book: Report of the Committee on Infectious Disease, 30th Edition. Illinois, Academy of Pediatrics, 2015.
- B. **Epidemiology, Investigation and Control:** Heymann. D., ed., Control of Communicable Diseases Manual, 20th Edition. Washington, DC, American Public Health Association, 2015.
- C. **Case Definitions:** CDC Division of Public Health Surveillance and Informatics, Available at: www.cdc.gov/nndss/
- D. **Kansas Regulations/Statutes Related to Infectious Disease:** www.kdheks.gov/epi/regulations.htm
- E. **Kansas Food Code 2012:** http://agriculture.ks.gov/docs/default-source/fsl--handouts/2012_kda_food_code_12_14_12.pdf?sfvrsn=6
- F. **Additional Information (CDC):** www.cdc.gov/health/default.htm

ATTACHMENTS

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