

Salmonella Paratyphi

BASIC EPIDEMIOLOGY

Infectious Agent

Salmonella enterica serovars Paratyphi A, B (tartrate negative), and C (*S. Typhi*) are the etiologic agents of *Salmonella* Paratyphi. *Salmonella* Paratyphi B (tartrate negative), previously known as *S. Java* is reported as *Salmonella*, non-Paratyphi/non-Typhi condition.

Transmission

Transmission primarily occurs through ingestion of food or water contaminated with the stool and sometimes urine of a typhoid fever case or an asymptomatic carrier of the organism. Most cases of paratyphoid fever are acquired during international travel. travel-related and involve an exposure that occurred in an endemic region (i.e., primarily Asia, Africa, and Latin America). Humans are the only known reservoir of *S. Typhi*.

Incubation Period

Typically, ranges from 1 to 10 days.

Communicability

This disease is communicable as long as paratyphoid bacilli are present in excreta. Some patients become permanent carriers of *S. paratyphi*.

Clinical Illness

Infections caused by *Salmonella enterica* serotypes Paratyphi A, B (tartrate negative), and C are often characterized by insidious onset of sustained fever, headache, malaise, anorexia, relative bradycardia, constipation or diarrhea, and non-productive cough. However, mild and atypical infections may occur. Carriage of *S. Paratyphi* A, B (tartrate negative), and C may be prolonged.

DEFINITIONS

Clinical Case Definition

An illness caused by *Salmonella* Paratyphi that is often characterized by insidious onset of sustained fever, headache, malaise, anorexia, relative bradycardia, constipation or diarrhea, and nonproductive cough. However, many mild and atypical infections occur. Carriage of *S. Paratyphi* can be prolonged.

Laboratory Confirmation

- Isolation of *S. Paratyphi* A, B (tartrate negative), or C from blood, stool, or other clinical specimen.

Case Classifications

- **Confirmed:** A clinically compatible case that is laboratory confirmed.
- **Probable:** A clinically compatible case with *S. Paratyphi* A, B (tartrate negative), or C detected by use of culture independent laboratory methods (non-culture based), **OR**
A clinically compatible case that is epidemiologically linked to a case that meets the probable or confirmed laboratory criteria for diagnosis

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

Carriage of *S. Paratyphi* A, B (tartrate negative), and C can be prolonged and a case should not be counted as a new case if laboratory results were reported within 365 days of a previously reported infection in the same individual, unless additional information is available indicating a separate infection, e.g., different serotype.

SURVEILLANCE AND CASE INVESTIGATION

Case Investigation

Local and regional health departments should promptly investigate all reports of *Salmonella* Paratyphi. Investigations should include an interview of the case or a surrogate to get a detailed exposure history. Please use the **CDC Typhoid and Paratyphoid Fever Surveillance Report** available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>.

Case Investigation Checklist

- Confirm laboratory results meet the case definition.
- Contact laboratory to determine if an isolate has been sent to the DSHS laboratory. If an isolate has not been sent, please request a specimen be submitted.
 - Note: The submission of *S. Paratyphi* isolates is not required by state law, but it is critical for the detection and investigation of outbreaks.
- Review medical records or speak to an infection preventionist or healthcare provider to verify case definition, identify possible risk factors and describe course of illness.
 - Use information from medical records to complete the CDC Typhoid and Paratyphoid Fever Surveillance Report.
 - Interview the case to get travel history and other risk factor information.
 - Make special note of the case's travel history. If the case-patient does not report travel outside of the U.S., ask again about travel. If the answer is still negative, inquire about any visitors from a country where typhoid fever is endemic, especially any who might have stayed in the case-patient's household, prepared food, cared for, or had close contact with the case-patient. Ask about prior cases of typhoid fever among members of the household, extended family, or friends. Ask about consumption of raw or undercooked shellfish or bivalves (oysters, scallops etc.) If no history of travel to an endemic country, exposure to an imported case or history of consumption of raw or undercooked seafood is identified, call an EAIDU epidemiologist immediately to discuss the case.
 - Make special note if the case is a food worker. Food workers who are diagnosed with typhoid fever are subject to work exclusion requirements. See Exclusions.
 - Use the **CDC Typhoid and Paratyphoid Fever Surveillance Report** to record information from the interview.
 - If the case is not available or is a child, conduct the interview with a surrogate who would have the most reliable information on the case, such as a parent or guardian.
 - Provide education to the case or his/her surrogate about effective hand washing and food safety practices. See Prevention and Control Measures.
- Fax completed forms to DSHS EAIDU at 512-776-7616 or email securely to an EAIDU epidemiologist.
 - An EAIDU foodborne epidemiologist will fax the form (de-identified) to the CDC.
 - Please note that the CDC measures the proportion of interviews reported to CDC within 7 days of interview date, so please send the form as soon as possible.
 - For lost to follow-up (LTF) cases, please complete as much information as possible obtained from medical/laboratory records (e.g., demographics, symptomology, onset date, etc.) on the investigation form and fax/email securely to DSHS EAIDU noting case is LTF.
- Hospitalized cases should be followed until discharge and patient's outcome recorded on the Typhoid and Paratyphoid ever Surveillance Report.
 - Initial reports can be sent to DSHS prior to discharge.
- In the event of a death, copies of the hospital discharge or death summary should also be faxed to DSHS EAIDU.
- If the case is part of an outbreak or cluster, see Managing Special Situations section.

- All confirmed case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Prevention and Control Measures

- For those traveling to an endemic region:
 - Only eat fresh raw fruit and vegetables that can be peeled, peel them yourself, don't eat the peels, and wash your hands before and after handling.
 - Avoid food and drinks sold from street vendors.
 - Avoid ice, frozen drinks, or other items made from an unknown water source.
 - Drink bottled water (or boil non-bottled water for >1min) and avoid swallowing tap water while showering and brushing teeth.
 - Carbonated water is safer to drink than non-carbonated water.
- Practice routine hand washing with soap and warm water, especially:
 - Before preparing or after handling or eating any food.
 - After going to the bathroom.
 - After changing a diaper.
 - After caring for someone with diarrhea.
 - After handling raw food.
- Avoid consuming raw or undercooked shellfish and bivalves (oysters, scallops, mussels etc.), especially in endemic countries.
- Avoid consuming raw milk, unpasteurized dairy products, and undercooked eggs.

Exclusions

School/child-care:

No exclusion specified for salmonellosis but the standard exclusion for diarrhea or fever applies:

- Children with diarrhea should be excluded from school/child-care until they are free from diarrhea for 24 hours without the use of diarrhea suppressing medications.
- Children with a fever from any infection should be excluded from school/child-care for at least 24 hours after fever has subsided without the use of fever suppressing medications.

Please see Guide to Excluding and Restricting Food Employees in Appendix A.

MANAGING SPECIAL SITUATIONS

Outbreaks

If a *Salmonella* Paratyphi outbreak is suspected, immediately notify the appropriate regional DSHS office or DSHS EAIDU at **(800) 252-8239** or **(512) 776-7676**.

The local/regional health department should:

- Interview all cases suspected as being part of the outbreak or cluster.
- Request medical records for any case in your jurisdiction that died, was too ill to be interviewed, or for whom there are no appropriate surrogates to interview.
- Prepare a line list of cases in your jurisdiction. Minimal information needed for the line list might include patient name or other identifier, DSHS or laboratory specimen identification number, specimen source, date of specimen collection, date of birth, county of residence, date of onset (if known), symptoms, underlying conditions, treatments and outcome of case, and risky foods eaten, foods eaten leading up to illness, or other risky exposures, such as animal contact and travel, reported by the case or surrogate.

Line list example:

ID	Name	Age	Sex	Ethnicity	Onset	Symptoms	Food	Animal	Notes
1	NT	34	F	W/N	2/4/16	Bl. D, F	Chicken, eggs	Dog	Dog food
2	PR	2	M	U/U	1/30/16	V,D,F	Chicken, spinach	None	Brother ill

- If the outbreak was reported in association with an apparent common local event (e.g., party, conference, rodeo), a restaurant/caterer/home, or other possible local exposure (e.g., pet store, camp), contact hospitals in your jurisdiction to alert them to the possibility of additional *Salmonella* Paratyphi cases.
- If isolates have not already been submitted to the DSHS laboratory for confirmation and WGS, request hospital/clinical labs submit isolates for confirmation and WGS testing. See Laboratory Procedures.
- Work with any implicated facilities to ensure staff, students, residents, and volunteers receive hand hygiene education, and review hygiene and sanitary practices currently in place including:
 - Policies on and adherence to hand hygiene
 - Storage and preparation of food
 - Procedures for changing diapers and toilet training
 - Procedures for environmental cleaning
- Recommend that anyone displaying symptoms seeks medical attention from a healthcare provider.
- Restrict individuals from handling food, engaging in child-care, healthcare work, or attending child-care, per the “Exclusions” portion of the Case Investigation section.
- Enter outbreak into NORS at the conclusion of the outbreak investigation. See Reporting and Data Entry Requirements section.

WGS clusters:

- For clusters of cases with indistinguishable WGS patterns detected by CDC/PulseNet and/or the DSHS laboratory, a member of the DSHS EAIDU foodborne team will notify appropriate DSHS regional epidemiologists, usually by email, who will then notify appropriate local health departments of cases within their jurisdiction.
- The local/regional health department with cases in their jurisdiction should:
 - Interview the case patient, even if they have already been interviewed as part of a routine disease investigation, using the cluster specific questionnaire attached in the email notification.
 - Fax the completed questionnaire promptly within timeframe designated in cluster notification to DSHS EAIDU at **512-776-7616** or email securely to an EAIDB foodborne epidemiologist.
 - If the health department having jurisdiction of a case is unable to reach a case-patient after 3 attempts during normal working hours, and they are not able to call after hours, please call the DSHS regional office or DSHS EAIDU to discuss further.
 - If an interview is unattainable or the case is lost to follow-up, fax/securely email medical records and any case information to DSHS EAIDU.
 - Please complete as much information obtained from medical/laboratory records (e.g., demographics, symptomology, onset date, etc.) on investigation form and fax/email securely to DSHS EAIDU noting case is LTF.
- Local/regional health department with cases will be notified by the EAIDU foodborne team of any CDC or DSHS conference calls and may participate, if able.

Note:

- If a food item or food establishment is implicated, the lead epidemiologist for foodborne diseases will notify the DSHS Division of Regulatory Services about the outbreak and the possibility of a common contaminated food source for the cases.
- Decisions about testing implicated food items can be made after consultation with an EAIDU foodborne epidemiologist and the DSHS Laboratory. The general policy is to test only food samples implicated in suspected outbreaks, not in single cases.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements

Confirmed and clinically suspected cases are required to be reported **within 1 week** to the local or regional health department or DSHS EAIDU at **(800) 252-8239** or **(512) 776-7676**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed** and **probable** cases,
 - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
 - A case should not be counted as a new case if laboratory results were reported within 365 days of a previously reported infection in the same individual, unless additional information is available indicating a separate infection. A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax completed Typhoid and Paratyphoid Fever Surveillance Report to DSHS EAIDU at **512-776-7616** or email securely to an EAIDU foodborne epidemiologist.

When an outbreak is investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at **512-776-7676**
- Enter outbreak information into the **National Outbreak Reporting System (NORS)** at the conclusion of the outbreak investigation.
 - For NORS reporting, the definition of an outbreak is two or more cases of similar illness associated with a common exposure.
 - The following should be reported to NORS:
 - Foodborne disease, waterborne disease, and enteric illness outbreaks with person-to-person, animal contact, environmental contact, or an indeterminate route of transmission.
 - Enter outbreaks into NORS online reporting system at <https://wwwn.cdc.gov/nors/login.aspx>
 - Forms, training materials, and other resources are available at <http://www.cdc.gov/nors/>
- To request a NORS account, please email FoodborneTexas@dshstexas.gov
 - Please put in Subject Line: NORS User Account Request
 - Information needed from requestor: name, email address, and agency name
 - After an account has been created a reply email will be sent with a username, password, and instructions for logging in.

Shiga toxin-producing *Escherichia coli*

BASIC EPIDEMIOLOGY

Infectious Agent

Shiga toxin-producing *Escherichia coli* (STEC) bacteria. *E. coli* are Gram-negative, rod-shaped bacteria that naturally exist in the mammalian digestive system. Over a hundred serotypes exist, however the most common serogroups isolated from persons with diarrheal illness in North America are O157, O26, O111, O103, O45, O145, and O121. *E. coli* O157 and other serotypes produce potent cytotoxins called Shiga toxins. Shiga toxin-producing genes commonly identified are *stx1* and *stx2*.

Transmission

Transmission occurs via the fecal-oral route and can occur through the ingestion of food or water that has been contaminated with human and animal feces. Transmission can also occur via direct contact with an infected person, fomite, animal or an animal's environment. Person to person spread is common within households and daycare centers.

Incubation Period

STEC is shed in the stool of an infectious person for a variable amount of time after diarrhea has resolved, however, shedding typically occurs for 1 week or less in adults, but up to 3 weeks in one-third of infected children. Prolonged carriage is uncommon.

Communicability

The duration of excretion of the pathogen is typically 1 week or less in adults, but 3 weeks in one-third of children. Prolonged carriage is uncommon.

Clinical Illness

Symptoms can vary but predominant symptoms include severe abdominal pain and non-bloody diarrhea which can become bloody after 3 to 4 days.

Severity

Hemolytic uremic syndrome (HUS) is a serious complication of STEC infections and can begin as symptoms resolve, usually within 3 weeks of infection. About 15% of young children and a smaller proportion of adults with *E. coli* O157 diarrhea develop HUS. HUS typically requires dialysis and death can occur in 3 to 5% of cases.

DEFINITIONS

Clinical Case Definition

An infection of variable severity characterized by diarrhea (often bloody) and abdominal cramps. Illness can be complicated by hemolytic uremic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP); asymptomatic infections can also occur, and the organism can cause extra-intestinal infections.

Laboratory Confirmation

- Isolation of *E. coli* from a clinical specimen with detection of Shiga toxin or Shiga toxin genes
- Isolation of *E. coli* O157:H7 from a clinical specimen

Notes:

- As required by TAC, all cases of Shiga toxin-producing *E. coli* infections, including *E. coli* O157:H7, and cases where Shiga toxin activity is demonstrated, must submit isolates or specimens to the DSHS laboratory.
- *Escherichia coli* non-O157:H7 isolates must also have Shiga toxin-production verified to qualify for the "confirmed" case status. Shiga toxin can be demonstrated by EIA or PCR testing.

Case Classifications

- **Confirmed:** A case that meets the laboratory criteria for diagnosis; when available, O and H antigen serotype characterization should be reported.
- **Probable:**
 - A case with isolation of *E. coli* O157 from a clinical specimen, without confirmation of the H antigen or detection of Shiga toxin or Shiga toxin genes, **OR**
 - A clinically compatible illness in a person with identification of an elevated antibody titer to a known Shiga toxin-producing *E. coli* serotype **OR**
 - A clinically compatible illness in a person with detection of Shiga toxin or Shiga toxin genes in a clinical specimen using a CIDT and no known isolation of *Shigella* from a clinical specimen, **OR**
 - A clinically compatible illness in a person with detection of *E. coli* O157 or Shiga toxin-producing *E. coli* in a clinical specimen using a CIDT, **OR**
 - A clinically compatible case that is epidemiologically linked to a confirmed or probable case with laboratory evidence, **OR**
 - A clinically compatible illness in a person that is a member of a risk group as defined by public health authorities in an outbreak
- **Suspect:**
 - Identification of an elevated antibody titer against a known Shiga toxin-producing serogroup of *E. coli* in a person with no known clinical compatibility **OR**
 - Detection of Shiga toxin or Shiga toxin genes in a clinical specimen using a CIDT and no known isolation of *Shigella* from a clinical specimen in a person with no known clinical compatibility, **OR**
 - Detection of *E. coli* O157 or Shiga toxin-producing *E. coli* in a clinical specimen using a CIDT with no known clinical compatibility, **OR**
 - A person with a diagnosis of post diarrheal HUS/TTP

Notes:

- EIA and/or PCR positive results for Shiga toxin-production, in the absence of an isolate, can only qualify a case as “probable”.
- Cases meeting confirmed or probable criteria for both STEC and HUS should be reported separately under each condition.
- A case should not be counted as a new case if a positive laboratory result is reported within 180 days of a previously reported positive laboratory result in the same individual, **OR**
When two or more different serogroups are identified in one or more specimens from the same individual each serogroup/serotype should be reported as a separate case.

SURVEILLANCE AND CASE INVESTIGATION**Case Investigation**

Local and regional health departments should promptly investigate all reports of Shiga toxin-producing *E. coli* infections. Investigations should include an interview of the case or a surrogate to get a detailed exposure history. Please use the Shiga Toxin-Producing *Escherichia coli* (*E. coli*) and/or Hemolytic Uremic Syndrome (HUS) Investigation Form available on the DSHS website: <http://www.dshs.state.tx.us/idcu/investigation/>.

Case Investigation Checklist

- Confirm laboratory results meet the case definition.
- Verify that the laboratory has forwarded an isolate or specimen from cases where Shiga toxin activity is demonstrated to the DSHS laboratory. If an isolate has not been sent, please request a specimen be submitted as required.
- Review medical records or speak to an infection preventionist or healthcare provider to verify case definition, identify possible risk factors and describe course of illness.
- Interview the case to get a detailed exposure history and risk factor information.
 - Use the **Shiga Toxin-Producing *Escherichia coli* (*E. coli*) and/or Hemolytic Uremic Syndrome (HUS) Investigation Form** to record information from the interview.

Shiga toxin-producing *Escherichia coli*

- If the case is not available or is a child, conduct the interview with a surrogate who would have the most reliable information on the case, such as a parent or guardian.
- Provide education to the case or his/her surrogate about effective hand washing, food safety practices, and animal contact/handling precautions. See Prevention and Control Measures.
- Fax completed forms to DSHS EAIDU at **512-776-7616** or email securely to FoodborneTexas@dshs.texas.gov.
 - For lost to follow-up (LTF) cases, please complete as much information obtained from medical/laboratory records (e.g., demographics, symptomology, onset date, etc.) on investigation form and fax/email securely to DSHS EAIDU, noting case is LTF.
 - For HUS cases, please also submit the medical record along with the completed form
- Identify whether the case needs to be excluded based on occupation or attendance in a group setting.
- Examples include food handlers, child-care or health-care workers, or attend child-care as long as they have diarrhea. See Exclusions.
- If case is part of an outbreak or cluster, see Managing Special Situations section.
- All confirmed, probable and suspect case investigations must be entered and submitted for notification in the NEDSS Base System (NBS). Suspect cases are not included in the overall case counts but are included for programmatic review. Please refer to the *NBS Data Entry Guidelines* for disease specific entry rules.

Prevention and Control Measures

- Routine hand washing with soap and warm water, especially:
 - Before preparing, handling or eating any food.
 - After going to the bathroom.
 - After changing a diaper.
 - After caring for someone with diarrhea.
 - After handling raw food, especially poultry and beef.
 - After any contact with animals, their living areas or their food.
- Avoid consuming raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider). Prolonged heat treatment is required to destroy Shiga toxin.
- Follow food safety principles in the kitchen, especially:
 - Restrict any food preparation for other individuals until symptoms have resolved
 - Cook ground beef thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F (70°C). Use a thermometer to verify the temperature, as color is not a very reliable indicator of how thoroughly meat has been cooked.
 - Prevent cross-contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after handling raw meat and switching to items consuming raw such as vegetables
 - Wash fresh leafy greens, fruits and vegetables thoroughly with water.
- Avoid swallowing water when swimming and playing in lakes, ponds, streams, swimming pools, and backyard "kiddie" pools.
- Avoid participating in recreational water activities such as swimming while diarrhea is present and for two weeks after diarrhea has resolved.

Exclusions

School/child-care: No exclusion specified for Shiga toxin-producing *E. coli* but the standard exclusion for diarrhea or fever applies:

- Children with diarrhea should be excluded from school/child-care until they are free from diarrhea for 24 hours without the use of diarrhea suppressing medications.
- Children with a fever from any infection should be excluded from school/child-care for at least 24 hours after fever has subsided without the use of fever suppressing medications.

Food Employees: Symptomatic food employees infected with Shiga toxin-producing *E. coli* are to be excluded from work. Asymptomatic food employees diagnosed with an infection from Shiga toxin-producing *E. coli* are to be excluded from working in a food establishment serving a highly susceptible population or restricted if

they do not serve a highly susceptible population.

Food employees can be reinstated with approval from the Regulatory Authority and if one of the following conditions is met:

- Medical documentation stating that the food employee is free of infection from Shiga toxin-producing *E. coli* based on test results showing two consecutive, negative stool specimen cultures. The stool specimens should be collected at least 24 hours apart and not sooner than 48 hours after the last dose of antibiotics, if antibiotics were given. (Antibiotics are not recommended for treating illness due to STEC or asymptomatic carriage of STEC.) OR
- More than 7 days have passed since the food employee became asymptomatic (without the use of diarrhea suppressing medications) OR
- The food employee did not develop symptoms and more than 7 days have passed since being diagnosed.

Please see Guide to Excluding and Restricting Food Employees in Appendix A.

MANAGING SPECIAL SITUATIONS

Outbreaks

If an outbreak is suspected, notify the DSHS Emerging and Acute Infectious Disease Unit (EAIDU) at (512) 776-7676, or email an EAIDU foodborne epidemiologist at FoodborneTexas@dshs.texas.gov.

The local/regional health department should:

- Interview all cases suspected as being part of the outbreak or cluster.
- Request medical records for any case in your jurisdiction that died, is lost to follow-up, was too ill to be interviewed, or for whom there are no appropriate surrogates to interview.
- Prepare a line list of cases in your jurisdiction. Minimal information needed for the line list might include patient name or other identifier, DSHS or laboratory specimen identification number, specimen source, date of specimen collection, date of birth, county of residence, date of onset (if known), symptoms, underlying conditions, treatments and outcome of case, and risky foods eaten, foods eaten leading up to illness, or other risky exposures, such as animal contact and travel, reported by the case or surrogate.

Line list example:

ID	Name	Age	Sex	Ethnicity	Onset	Symptoms	Food	Animal	Notes
1	NT	34	F	W/N	2/4/16	Bl. D, F	Chicken, eggs	Dog	Dog food
2	PR	2	M	U/U	1/30/16	V,D,F	Chicken, spinach	None	Brother ill

- If the outbreak was reported in association with an apparent common local event (e.g., party, conference, rodeo), a restaurant/caterer/home, or other possible local exposure (e.g., pet store, camp), contact hospitals in your jurisdiction to alert them to the possibility of additional STEC cases.
- If isolates have not already been submitted to the DSHS laboratory for confirmation and whole genome sequencing, request hospital/clinical labs submit isolates for confirmation and whole genome sequencing testing. See Laboratory Procedures.
- Work with regulatory staff to conduct an environmental assessment, if needed.
 - Collect information on the implicated facility including:
 - Food safety practices, operations, anything that was unusual about the time period in question
 - Obtain names and contact information of those present at facility during

outbreak time frame, e.g., employees, food workers, customers, residents, students, etc.

- If food is suspected:
 - Obtain menus
 - Interview food employees for illness history and job duties.
 - Collect food samples or embargo food, if necessary.
 - Decisions about testing implicated food items can be made in consultations with an EAIDU foodborne epidemiologist.
 - Identify and correct any items that may have contributed to the outbreak
- Work with any implicated facilities to ensure staff, students, residents, and volunteers receive hand hygiene education, and review hygiene and sanitary practices currently in place including:
 - Policies on, and adherence to, hand hygiene
 - Storage and preparation of food
 - Procedures for changing diapers and toilet training
 - Procedures for environmental cleaning
- Recommend that anyone displaying symptoms seeks medical attention from a healthcare provider.
- Exclude individuals from handling food, engaging in child-care, healthcare work, or attending child-care, as long as they are symptomatic. See Exclusions in Case Investigation section.
- Enter outbreak into NORS at the conclusion of the outbreak investigation. See Reporting and Data Entry Requirements section.

Whole Genome Sequencing clusters:

- For clusters of cases that meet the cluster definition based on allele differences detected by CDC/PulseNet and/or the DSHS laboratory, a member of the DSHS Central Office EAIDU foodborne team will notify appropriate DSHS regional and/or local health department epidemiologists.
- Local/regional health departments with cases in their jurisdiction should:
 - Interview the case patient, even if they have already been interviewed as part of a routine disease investigation, using the cluster specific questionnaire attached in the email notification.
 - Fax the completed questionnaire promptly within timeframe designated in the cluster notification to DSHS EAIDU at **512-776-7616** or email securely to an EAIDU foodborne epidemiologist.
 - If the health department having jurisdiction of a case is unable to reach a case-patient after 3 attempts during normal working hours, and they are not able to call after hours, please call the DSHS regional office or DSHS EAIDU to discuss further.
 - If an interview is unattainable or the case is lost to follow-up, fax the completed coversheet and any case information to DSHS EAIDU.
 - Local/regional health department with cases will be notified by the EAIDU foodborne team of any CDC or DSHS conference calls and may participate, if able.

Notes:

- If a food item or food establishment is implicated, an EAIDU foodborne epidemiologist will notify appropriate state and/or federal partner agencies regarding the outbreak and the possibility of a common contaminated food source for the cases.
- Decisions about testing implicated food items can be made after consultation with an EAIDU foodborne epidemiologist and the DSHS Laboratory. The general policy is to test only food samples implicated in suspected outbreaks, not in single cases.

REPORTING AND DATA ENTRY REQUIREMENTS

Provider, School, Child-Care Facility, and General Public Reporting Requirements

Confirmed, probable, and clinically suspected cases are required to be reported **within 1 week** to the local or regional health department or DSHS EAIDU at **(512) 776-7676**.

Local and Regional Reporting and Follow-up Responsibilities

Local and regional health departments should:

- Enter the case into NBS and submit an NBS notification on all **confirmed, probable, and suspect** cases.
 - Please refer to the *NBS Data Entry Guidelines* for disease-specific entry rules.
 - A case should not be counted as a new case if a positive laboratory result is reported within 180 days of a previously reported positive laboratory result in the same individual, unless additional information is available indicating a separate infection such as different serotypes/serogroups.
 - A notification can be sent as soon as the case criteria have been met. Additional information from the investigation may be entered upon completing the investigation.
- Fax completed forms to DSHS EAIDU at **512-776-7616** or email securely to FoodborneTexas@dshs.texas.gov.

When an outbreak is being investigated, local and regional health departments should:

- Report outbreaks within 24 hours of identification to the regional DSHS office or to EAIDU at **512-776-7676**.
- Enter outbreak information into the **National Outbreak Reporting System (NORS)** at the conclusion of the outbreak investigation.
 - For NORS reporting, the definition of an outbreak is two or more cases of similar illness associated with a common exposure.
 - The following should be reported to NORS:
 - Foodborne disease, waterborne disease, and enteric illness outbreaks with person-to-person, animal contact, environmental contact, or an indeterminate route of transmission.
 - Enter outbreaks into NORS online reporting system at <https://wwwn.cdc.gov/nors/login.aspx>
 - Forms, training materials, and other resources are available at <http://www.cdc.gov/nors/>
- To request a NORS account, please email FoodborneTexas@dshs.texas.gov
 - Please put in Subject Line: NORS User Account Request
 - Information needed from requestor: name, email address, and agency name
 - After an account has been created, a reply email will be sent with a username, password, and instructions for logging in.

LABORATORY PROCEDURES

All cases of Shiga toxin-producing *E. coli* infections, including *E. coli* O157:H7, and cases where Shiga toxin activity is demonstrated must be submitted to the DSHS laboratory.

In an outbreak or other special situation, the DSHS Laboratory can culture raw stool or stool in transport medium (e.g., Cary-Blair media) for Shiga toxin-producing *E. coli*. Contact an EAIDU foodborne epidemiologist prior to submitting raw stool or stool in transport medium for culture.

Specimen Collection

- Submit pure cultures on an agar slant at ambient temperatures.
- If a pure culture is not available but Shiga toxin activity is demonstrated,
 - Submit stool specimen in Cary-Blair, Aimes, or Stuarts transport, on wet ice packs, OR
 - Submit stool specimens on broth or MacConkey broth, < 7 days old on wet ice packs, > 7 days old on dry ice.
- For raw stool or stool in transport medium, please refer to table below:

Specimen type	Transport time to lab from time of collection	Transport temperature
Raw stool	≤24 hours	4°C (ice pack)
Raw stool	>24 hours	Freeze immediately at ≤-70°C. Ship on dry ice.

Shiga toxin- producing *Escherichia coli*

Stool in transport solution/medium	Time of collection to ≤3 days	Room temp or 4°C (ice pack)
Stool in transport solution/medium	>3 days	Freeze immediately at ≤-70°C. Ship on dry ice.
All	*The above transport times are optimal for recovery of pathogenic organisms. In the interest of public health, specimens will be accepted up to 30 days from date of collection.	*The above transport temperatures are optimal for the recovery of pathogenic organisms. In the interest of public health, specimens will be accepted at non-optimal temperature transport.

* Note: Pathogen recovery rates decrease over time. For best results, submit ASAP.

Submission Form

- Use DSHS Laboratory G-2B form for specimen submission.
- Make sure the patient's name, date of birth and/or other identifier match exactly what is written on the transport tubes and on the G-2B form.
- Fill in the date of collection and select the appropriate test.
- If submitting as part of an outbreak investigation, check “Outbreak association” and write in name of outbreak.
- Payor source:
 - Check “IDEAS” to avoid bill for submitter.

Specimen Shipping

- Ship specimens via overnight delivery.
- DO NOT mail on Friday, or public holiday, unless special arrangements have been pre-arranged with an EAIDU foodborne epidemiologist or DSHS Laboratory.
- Ship specimens to:

Laboratory Services Section, MC-1947
 Texas Department of State Health Services
 Attn. Walter Douglass (512) 776-7569
 1100 West 49th Street
 Austin, TX 78756-3199

Causes for Rejection:

- Incorrect source of specimen
- Specimen not in correct transport medium
- Missing or discrepant information on form/specimen
- Transport media was expired
- Specimen too old

FOOD SAMPLES AND ENVIRONMENTAL SWABS:

Testing of food and environmental swabs is available at the DSHS laboratory.

For *E. coli* O157:H7, the DSHS laboratory can test:

- Environmental Swabs
- Foods

For the “Big 6” STECs (O26, O45, O103, O111, O121, and O145), the DSHS laboratory can test::

- Environmental Swabs
- Meat Samples
- Milk Samples

Shiga toxin- producing *Escherichia coli*

- Other Foods- decisions to test other food samples not listed above would be evaluated a case by case basis

Decisions about testing implicated food items can be made after consultation with an EAIDU foodborne epidemiologist and the DSHS Laboratory.

General policy

- Test only food samples or environmental swabs from facilities implicated in a suspected outbreak (not associated with single cases).
- In outbreaks, the DSHS lab will not test food samples or environmental swabs unless a pathogen has been identified in a clinical specimen.
- Food samples or environmental swabs must be **collected by a registered sanitarian.**

For further questions, please contact an EAIDU foodborne epidemiologist to discuss further.

REVISION HISTORY

December 2021

- Updated Definitions, Managing Special Situations, and Surveillance and Case Investigation sections

March 2021

- Entire section