

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.