

## Typhoid Fever (*Salmonella typhi*) Investigation Overview

The following guidelines provide a brief overview of the steps of a *Salmonella typhi* investigation. *Salmonella enterica* serogroup *typhi* is a bacterium that causes the diarrheal disease Typhoid Fever. The disease is spread by the fecal-oral route and is usually transmitted by contaminated food or water. Most people in the United States with typhoid fever become infected while traveling abroad, most often to countries where these diseases are common. Typhoid Fever is spread through sewage contamination of food or water and through person-to-person contact. Close contacts who are symptomatic but are not laboratory confirmed would be considered probable cases.

For additional support, consult the NC Communicable Disease Branch at (919) 733-3419.

**\*\* This disease requires an additional [CDC Typhoid/Paratyphoid Form](#) be completed and attached to event located in the CD Manual**

### Basic Steps of a Typhoid Fever Investigation

1. Collect clinical information	<ul style="list-style-type: none"> <li>Lasting high fevers, weakness, stomach pains, headache, loss of appetite, diarrhea, constipation, cough, some develop a rash</li> <li>Most often foreign travel associated                             <ul style="list-style-type: none"> <li>If 2 or more epidemiologically linked cases are identified report as an outbreak</li> </ul> </li> </ul>
2. Review laboratory information	<p>Evaluate laboratory results to determine if requirements of the case definition are satisfied.</p> <ul style="list-style-type: none"> <li><b>Serologic evidence alone is not sufficient for a diagnosis. Isolation of the organism by CTD or culture is required</b></li> <li>Recommend reporting laboratory forward the specimen to the SLPH                             <ul style="list-style-type: none"> <li><a href="https://slph.ncpublichealth.com/forms.asp">https://slph.ncpublichealth.com/forms.asp</a> ; DHHS form 3390</li> </ul> </li> </ul>
3. Incubation period	<ul style="list-style-type: none"> <li>The incubation period ranges from 6-30 days</li> <li>The duration is 3 – 4 weeks to months without treatment</li> </ul>
4. Manage the case	<ul style="list-style-type: none"> <li>Verify that case has been appropriately tested</li> <li>Interview the case and complete the Part 2 Form/risk history and clinical packages in NCEDSS</li> <li>Ill individuals, except for high risk described below, may return to normal activities when asymptomatic and following best practice hand hygiene.</li> <li>All high risk* cases must have 3 consecutive negative stools (and urine cultures in areas endemic for schistosomiasis) at least 24 hours apart with initial culture being done 48 hours after completion of antibiotics and not earlier than 1 month after onset. If any of these results are positive, repeat cultures at monthly intervals until at least 3 consecutive negative cultures are obtained.</li> </ul> <p><b>Food Employees</b> In addition to the above bullet:</p> <ul style="list-style-type: none"> <li>Exclude from food handling until                             <ul style="list-style-type: none"> <li>asymptomatic, and</li> <li>culture negative, and</li> <li>following best practice hand hygiene.</li> </ul> </li> <li>Inform Environmental Health Specialist and CD Branch that a food handler has been excluded.</li> </ul> <p><b>Healthcare Employees</b> In addition to the above bullet:</p> <ul style="list-style-type: none"> <li>If healthcare worker with direct patient care, same exclusion criteria as food handler apply.</li> </ul> <p><b>Childcare Employees/Attendees</b> In addition to the above bullet:</p> <ul style="list-style-type: none"> <li>If childcare attendee younger than 5 years of age, exclude until 3 negative stool specimens. For those 5 years of age and older, exclude until 24 hours without diarrhea. Supervised hand washing of class should be encouraged.</li> <li>If positive <i>S. paratyphi</i> case in childcare attendee or staff member, stool</li> </ul>

	<p>specimens should be collected from attendees and staff members. Those who test positive should be excluded.</p> <p><b>Household Contacts</b></p> <ul style="list-style-type: none"> <li>Household contacts of cases should not be employed in sensitive occupations (e.g., food handlers, healthcare workers, childcare worker) until two negative stools at least 24 hours apart have been obtained.</li> <li>Case and contacts should be instructed in proper hand washing before preparing, eating or servicing food and after defecation. Health department representative should be confident that proper hand washing technique is being followed.</li> </ul>
5. Identify symptomatic contacts of case	<ul style="list-style-type: none"> <li>Contacts: <ul style="list-style-type: none"> <li>Symptomatic contacts (without positive laboratory results) to a confirmed case, investigate as probable cases</li> </ul> </li> </ul>
6. Identify source of exposure	<ul style="list-style-type: none"> <li>Interview case regarding travel history</li> <li>Obtain food history to include seafood (particularly oysters), water source, raw fruits/vegetables, milk/milk products. Include source (location seafood acquired from, restaurant, grocery store, deli, etc.) <ul style="list-style-type: none"> <li>Ask about contact to other individuals with similar signs and symptoms</li> <li>Include Environmental Health Section in the investigation</li> <li>Inform CD Branch of the case.</li> </ul> </li> </ul>
7. Manage high risk cases/contacts*	<ul style="list-style-type: none"> <li>Course of action will depend on the presence of symptoms and any high-risk setting (e.g., healthcare worker, daycare worker, food handler)</li> <li>Follow applicable control measures in the “Manage the case” section above.</li> </ul>
➤ Symptomatic Contacts	<ul style="list-style-type: none"> <li>Refer to healthcare provider for appropriate testing and treatment</li> <li>Provide control measures</li> </ul>

8. Implement Control Measures	<ul style="list-style-type: none"> <li>• Wash your hands carefully with soap and water after using the bathroom.</li> <li>• Do not prepare or serve food for other people.</li> <li>• Follow applicable control measures in the “Manage the case” section above.</li> </ul>
9. Special Considerations	
<ul style="list-style-type: none"> <li>➤ <i>Antibiotics</i></li> </ul>	<ul style="list-style-type: none"> <li>• Antibiotic treatment is recommended</li> </ul>
<ul style="list-style-type: none"> <li>➤ <i>Typhoid Vaccine</i></li> </ul>	<ul style="list-style-type: none"> <li>• Typhoid vaccine is of limited value to those exposed to active cases. It may be considered for use in those individuals who have been exposed to carriers</li> </ul>
<p>*High-risk contacts include individuals at high-risk for severe illness or complications, healthcare workers, childcare workers and food handlers</p> <ul style="list-style-type: none"> <li>➤ <i>Resources –</i> <ul style="list-style-type: none"> <li>• <a href="#">Home   Typhoid Fever   CDC</a></li> <li>• <i>Public health operational guidelines for typhoid and paratyphoid, GOV.UK, updated 11/28/2023</i></li> </ul> </li> </ul>	