Utah Department of Health & Human Services

Salmonella (Non-typhoidal)

Disease plan

Quick links

Last updated: 12/15/2023, by Delaney Moore

Questions about this disease plan?

Contact the Utah Department of Health and Human Services Office of Communicable Diseases: 801-538-6191

Salmonella critical clinician information

Clinical evidence

Signs/symptoms

- Most common symptoms include diarrhea (sometimes bloody), abdominal pain, fever, nausea, and vomiting
- Complications may include:
  - Bacteremia
  - Localized infections which may present as septicemia, abscess, arthritis, or cholecystitis

Period of communicability

- *Salmonella* is communicable as long as the infected person excretes *Salmonella* bacteria in his/her stool. This can last from days to months, but rarely lasts more than 1 year.

Incubation period

- Range 6–72 hours (average of 12–36 hours), though incubation periods longer than 3 days have been documented

Mode of transmission

- Fecal-oral

Laboratory testing

Type of laboratory test and timing of specimen collection

- Culture is the preferred method for *Salmonella* diagnosis[1]
  - Specimens for culture should be collected as soon as possible, ideally within the first few days of illness, and should be processed as soon as possible to ensure bacterial isolation
- PCR and other rapid tests are available and specimens should be collected as soon as possible
- Serologic testing is unreliable and not recommended[2]

Type of specimens

- Stool, blood, and urine are all acceptable specimens[1]

Treatment recommendations

Type of treatment

- Supportive care
- Antibiotics are not generally recommended for patients who have uncomplicated non-typhoidal *Salmonella* because treatment may prolong asymptomatic carriage and disturb the microbiome[3]

Prophylaxis

- None

Case and contact management

Isolation of case

- Per Utah Rule R392-100, food handlers must be restricted from food handling activities or excluded from work until one of the following criteria is met:
  - Two negative stool samples not earlier than 48 hours after antibiotics are discontinued and at least 24 hours apart, OR
  - More than 30 days have passed since resolution of vomiting and/or diarrhea, OR
  - More than 30 days have passed since diagnosis if the employee didn't have symptoms

• Other individuals at high potential of transmitting the infection may be required to limit or restrict their activities per local health department discretion. This includes but is not limited to people involved in patient care, childcare, and people who handle medical equipment that enters the GI tract (ex: endoscopes).
Quarantine of contacts • Contacts with diarrhea who are food handlers should be considered the same as a case and shall be handled in the same fashion. Otherwise, no restriction.
Infection control procedures
• Enteric precautions

Why is *Salmonella* important to public health?

Salmonella bacteria were discovered more than a century ago. *Salmonella* primarily results in a mild to severe diarrheal illness, known as acute gastroenteritis. An estimated 1.35 million cases of *Salmonella* occur annually in the U.S., with 26,500 hospitalizations and 420 deaths.[6] *Salmonella* is a leading cause of foodborne disease with many national and local outbreaks detected each year.

Disease and epidemiology

Clinical description

Gastroenteritis: infection with non-typhoidal *Salmonella* usually results in gastroenteritis. The most common symptoms include diarrhea (sometimes bloody), stomach cramps, fever, nausea, and vomiting. Diarrhea usually resolves without treatment and lasts 4–7 days. Occasionally, patients may require hospitalization due to severe dehydration, which is more common among infants, the elderly, and people who are immunocompromised.

Bacteremia and vascular infection: any *Salmonella* serotype can cause bacteremia. However, the syndrome is most common with *S.* Choleraesuis and *S.* Dublin infections.[7,8]

Localized infections: as many as 10% of persons who have *Salmonella* bacteremia develop localized infections that may present as septicemia, abscess, arthritis, or cholecystitis.[9]

Causative agent

Salmonella generally refers to disease caused by any serotype of bacteria in the genus salmonella, other than *Salmonella* Typhi (the *Salmonella* species that causes typhoid fever; for more information on typhoid fever please see the Typhoid fever disease plan). The genus *Salmonella* consists of 2 species, *Salmonella enterica* (divided into 6 different subspecies) and *Salmonella bongori*. Based upon high levels of DNA similarity, most clinically important salmonellae are formally classified within a single subspecies, *Salmonella enterica.* All human pathogens are regarded as serovars within the subspecies of *S. enterica*.[10]

Three-dimensional computer-generated image of *Salmonella* serotype Typhi bacteria (CDC Photo, 2014)

Differential diagnosis

Shigella, *E. coli* O157:H7, *Campylobacter*, *Yersinia enterocolitica*, and bacterial food poisoning may show similar signs and symptoms.

Laboratory identification

Culture of stool, blood, or urine is the preferred method for *Salmonella* diagnosis. However, over the last several years, there has been an increasing shift to using culture-independent diagnostic tests (CIDTs).[1] Internal DHHS data show that the most commonly used CIDT for *Salmonella* in Utah is polymerase chain reaction (PCR) and most laboratories utilizing PCR use the BioFire FilmArray®. Serologic testing is unreliable and not recommended.[2]

Specimens should be collected as soon as possible, ideally within the first few days of illness, and should be processed as soon as possible to ensure bacterial isolation.

> **UPHL:** The Utah Public Health Laboratory (UPHL) accepts stool specimens for isolation and whole genome sequencing (WGS). All isolates from other laboratories should be submitted to UPHL. UPHL aims to complete WGS on all *Salmonella* samples.

Treatment

For the majority of cases, treatment consists of supportive care and rehydration. Antibiotics are not generally recommended for patients who have uncomplicated non-typhoidal *Salmonella* because antibiotic therapy may prolong asymptomatic carriage and disturb the microbiome. However, antibiotic treatment is recommended for:

- patients who have HIV infection
- other immunocompromised patients (organ transplant recipients; those receiving corticosteroids or other immunosuppressive agents; those with cancer or lymphoproliferative disease with current or recent chemotherapy; and those with sickle cell disease, hemoglobinopathies, or disorders of the reticuloendothelial system, including cirrhosis)
- patients older than age 50 who have cardiac, valvular, or endovascular abnormalities, or substantial joint disease
- people who have severe illness, such as severe diarrhea (9 to 10 stools per day), high or persistent fever, or a condition requiring hospitalization.
- adults age 65 or older[3]

Resistance to essential antibiotics is increasing in *Salmonella*. Antimicrobial susceptibility testing can help when choosing an appropriate therapeutic agent.[1]

Case fatality

Case fatality for non-typhoidal *Salmonella* in the United States is usually <1%.[11]

Reservoir

Salmonella bacteria are widely distributed in animals, including livestock, pets, poultry, other birds, reptiles, and amphibians. Most infected animals are chronic carriers. Humans can also be a source of infection.

Transmission

Salmonella is transmitted via the fecal-oral route. The most common mode of transmission is ingestion of food or water that has been contaminated with human or animal feces. This includes raw or undercooked poultry, eggs and egg products; undercooked meats; and raw milk or raw milk products. However, any food contaminated with the bacteria can be a source of infection. In most circumstances, contaminated food must be subject to time and temperature conditions that allow reproduction of the bacteria to numbers that can cause disease in those who ingest the contaminated food. In addition, reptiles such as iguanas and lizards are chronic carriers of these bacteria and can be sources of infection. Person-to-person spread can also occur, especially among household contacts, preschool children in childcare, and the elderly and developmentally disabled who live in residential facilities. Transmission can also occur from person-to-person through certain types of sexual contact (oral-anal contact).

Susceptibility

All people are susceptible to *Salmonella*. However, certain groups are more likely to become infected:

- children younger than age 5 are the most likely to get a *Salmonella* infection
- infants (children younger than 12 months) who are not breast fed are more likely to get a *Salmonella* infection
- infants, adults aged 65 and older, and people who have a weakened immune system are the most likely to have severe infections
- people who take certain medicines (for example, stomach acid reducers) are at increased risk of infection

Incubation period

The incubation period for *Salmonella* is 12–36 hours, with a range of 6–72 hours. However, incubation periods longer than 3 days have been documented.

Period of communicability

The disease is communicable for as long as the infected person excretes *Salmonella* bacteria in their stool. This can last from days to months, depending on the serovar, but rarely lasts more

than 1 year.[9] Treatment with antibiotics can prolong carriage by disturbing the normal gut microbiome.[3]

Epidemiology

Salmonella has a worldwide distribution, with approximately 1.35 million cases occurring annually in the U.S.[6] The majority of cases are sporadic, but large outbreaks have occurred from common food and animal sources. National outbreaks of note between 2018–2023 have been linked to ground beef, melons, diced onions, backyard poultry, small turtles, and bearded dragons.[12] Internal DHHS data show Utah has approximately 350 *Salmonella* cases per year, with *S.* Enteritidis, *S.* Newport, and *S.* Typhimurium as the most common serovars.

Public health control measures

Public health responsibility

- Investigate all suspect cases of disease and fill out and submit appropriate disease investigation forms.
- Provide education to the general public, clinicians, and first responders regarding disease transmission and prevention.
- Identify clusters or outbreaks of this disease and determine the source.
- Identify cases and sources to prevent further transmission.

Prevention

Environmental measures

Implicated food items must be removed from consumption. A decision about testing implicated food items can be made in consultation with an enteric epidemiologist at the Utah Department of Health and Human Services (DHHS) and UPHL.

The general policy of UPHL is to test only food samples implicated in suspected outbreaks, not in single cases (except when botulism is suspected). If holders of food implicated in single case incidents would like their food tested, they may be referred to a private laboratory that will test food or store the food in their freezer for a period of time in case additional reports are received. However, in certain circumstances, a single, confirmed case with leftover food that had been consumed within the incubation period may be considered for testing.

Personal preventive measures/education

To avoid exposure to *Salmonella*, people should:

- Always wash your hands thoroughly with soap and water before you eat or prepare food, after you use the toilet, after you change diapers, and after you touch pets or other animals (especially reptiles).
- Wash a child's hands as well as your own hands after you change diapers, and throw the diapers away in a closed-lid garbage can.
- Wash your hands thoroughly and frequently when you are ill with diarrhea or when you care for someone with diarrhea. Scrub your hands for at least 15–20 seconds after you clean the bathroom; after you use the toilet or help someone use the toilet; after you change diapers; before you handle food; and before you eat.
- Keep food that will be eaten raw, such as vegetables, from becoming contaminated by animal-derived food products.
- Don't let infants or young children touch reptiles, such as turtles or iguanas, or their cages.
- If you are elderly or immunocompromised, avoid reptiles when you choose pets.
- Do not use reptiles as classroom pets in childcare facilities or schools.
- Make sure to thoroughly cook all food products from animals, especially poultry and eggs, and avoid consuming raw or cracked eggs, unpasteurized milk, or other unpasteurized dairy products.
- Avoid fecal contact that may result from oral-anal sexual contact. Latex barrier protection (dental dam) may prevent the spread of *Salmonella* to a case's sexual partners and may prevent exposure to, and transmission of, other fecal-oral pathogens.

Chemoprophylaxis

None.

Vaccine

None.

Isolation and quarantine requirements

Isolation: Per Utah Rule R392-100[4,5], food handlers must be restricted from food handling activities or excluded from work until one of the following criteria is met:

1. Two negative stool samples not earlier than 48 hours after antibiotics are discontinued and at least 24 hours apart, OR
2. More than 30 days have passed since resolution of vomiting and/or diarrhea, OR
3. More than 30 days have passed since diagnosis if the employee didn't have symptoms

> ***Note*:** Other individuals at high potential of transmitting the infection may be required to limit or restrict their activities per local health department discretion. This includes but is not limited to people involved in patient care, childcare, and people who handle medical equipment that enters the GI tract (ex: endoscopes).

Hospital: Enteric precautions.

Quarantine: Contacts with diarrhea who are food handlers or are at high potential of transmitting the infection should be considered the same as a case and shall be handled in the same fashion. Otherwise, no restrictions.

> ***Note:*** The local health department will decide which cases and/or contacts require negative stool samples.

Case investigation

Reporting

Note: The following section is copied directly from CSTE position statement 16-ID-03.[13]

Report any illness to public health authorities that meets any of the following criteria:

1. Any person with *Salmonella* spp. isolated from a clinical specimen.
2. Any person with *Salmonella* spp. detected in a clinical specimen using culture-independent diagnostic tests (CIDT).
3. Any person with diarrhea and who is a contact of a *Salmonella* case or a member of a risk group defined by public health authorities during an outbreak investigation.
4. A person whose healthcare record contains a diagnosis of *Salmonella*.
5. A person whose death certificate lists *Salmonella* as a contributing or underlying cause of death.

Other recommended reporting procedures

- Report all cases of *Salmonella* according to state regulations.
- Reporting should be ongoing and routine.
- Frequency of reporting should follow the Utah Department of Health and Human Services routine schedule.

Table 1: Criteria to determine whether a case should be reported

Criterion	Reporting	
Clinical evidence		
Clinically compatible illness		N
Healthcare record contains a diagnosis of *Salmonella*	S	
Death certificate contains *Salmonella* as a contributing or underlying cause of death	S	
Laboratory evidence		
Isolation of *Salmonella* spp. from a clinical specimen	S	
Detection of *Salmonella* spp. in a clinical specimen using a CIDT	S	
Epidemiologic evidence		
Epidemiologically linked to a *Salmonella* case		O
Member of a risk group as defined by public health authorities during an outbreak investigation		O

Notes:

S = This criterion alone is Sufficient to report a case

N = All "N" criteria in the same column are Necessary to report a case.

O = At least one of these "O" (One or more) criteria in each category (e.g., clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to report a case.

* A requisition or order for any of the "S" laboratory tests is sufficient to meet the reporting criteria.

Case definition (CSTE position statement, 2016)

Note: The following section is copied directly from CSTE position statement 16-ID-03.[13]

Salmonella (non-typhoidal)

Clinical criteria

An illness of variable severity commonly manifested by diarrhea, abdominal pain, nausea, and sometimes vomiting. Asymptomatic infections may occur and the organism may cause extra-intestinal infections.

Laboratory criteria

Supportive laboratory evidence: detection of *Salmonella* spp. in a clinical specimen using a CIDT. Confirmatory laboratory evidence: isolation of *Salmonella* spp. from a clinical specimen.

Epidemiologic linkage

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

Case classification

Confirmed: a case that meets the confirmed laboratory criteria or diagnosis.

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.

Criteria to distinguish a new case of this disease or condition from reports or notifications which should not be counted as a new case for surveillance:

- 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.
- When 2 or more different serotypes are identified from one or more specimens from the same individual, each should be reported as a separate case.

Table 2: Criteria for defining a case of *Salmonella*

Criterion	Probable		Confirmed
Clinical evidence			
Clinically compatible illness	N		
Laboratory evidence			
Detection of *Salmonella* spp. in a clinical specimen using a CIDT		N	
Isolation of *Salmonella* spp. from a clinical specimen			N
Epidemiologic evidence			
Epidemiologically linked to a confirmed or probable case of *Salmonella* with laboratory evidence	O		
Member of a risk group as defined by the public health authorities during an outbreak investigation	O		
Criteria to distinguish a new case			
Not counted as a new case if occurred within 365 days of a previously reported *Salmonella* infection in same individual (unless separate serotype as described below)		N	N
Report separate serotypes as distinct cases.			N

Notes:

N = All "N" criteria in the same column are Necessary to classify a case.

O = At least one of these "O" (One or more) criteria in each category (clinical evidence and laboratory evidence) in the same column—in conjunction with all "N" criteria in the same column—is required to report a case.

Case investigation process

- Use the case report form and interview the patient to determine:
    - if the patient works in or attends a high-risk setting (food service, childcare, healthcare)
    - likely source of infection
- Provide education to the patient about disease transmission and prevention
- Exclude food handlers from work until diarrhea has resolved. Negative stool specimens may also be required.
- Make sure isolate is submitted to UPHL

Outbreaks

CDC defines a foodborne outbreak as "an incident in which 2 or more people experience a similar illness resulting from the ingestion of a common food."[14] To confirm an outbreak of *Salmonella*, the same Salmonella species must be isolated from clinical specimens from at least 2 ill persons or the species must be isolated from an epidemiologically implicated food. The source of the infection should be identified and measures should be taken to identify additional ill persons and/or to remove the source from consumers. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces.

Identifying case contacts and case contact management

Childcare

Since *Salmonella* may be transmitted from person-to-person through fecal-oral transmission, it is important to follow-up on cases in childcare settings. General recommendations include:

- Exclude children with *Salmonella* infection who have diarrhea until their diarrhea has resolved
- Children with *Salmonella* infection who have no diarrhea and are not otherwise ill may be excluded or may remain in the program if special precautions are taken
- Most staff in childcare programs are considered food handlers. Those who have *Salmonella* in their stool (symptomatic or not) can remain on site but must not prepare food or feed children until they meet the requirements in the Utah Food Code.[4,5]

School

Since *Salmonella* may be transmitted from person-to-person through fecal-oral transmission, it is important to follow-up on cases in school settings. The following general guidelines are recommended:

- Exclude students or staff with *Salmonella* infection who have diarrhea until their diarrhea has resolved.

- Students or staff with *Salmonella* infection who do not handle food, have no diarrhea or have mild diarrhea, and are not otherwise sick may remain in school if special precautions are taken.
- Students or staff who handle food and have *Salmonella* infection (symptomatic or not) must not prepare food or feed children until they meet the requirements in the Utah Food Code.[4,5]

Community residential programs

Actions taken in response to a case of *Salmonella* in a community residential program depends on the type of program and the level of functioning of the residents.

In long-term care facilities, place residents with *Salmonella* on standard (including enteric) precautions until their symptoms subside. Staff members who give direct patient care (feed patients, give mouth or denture care, or give medications) are considered food handlers and should be excluded from direct patient care until they meet the requirements in the Utah Food Code.[4,5] In addition, staff members with *Salmonella* infection who are not food handlers should not work until their diarrhea is resolved. Negative stool samples may be required for non-food handler staff at local health department discretion.

In residential facilities for the developmentally disabled, staff and clients with *Salmonella* must refrain from handling food until they meet the requirements in the Utah Food Code.[4,5] In addition, staff members with *Salmonella* infection who are not food handlers should not work until their diarrhea is resolved.

References

1. Parry, C. M. (2015). Salmonellosis. In D. L. Heymann (Ed.), 21st ed.). *Control of communicable diseases manual* (21st ed.). American Public Health Association. https://ccdm.aphapublications.org/doi/full/10.2105/CCDM.2745.127

2. Centers for Disease Control and Prevention (2023). *CDC yellow book 2024: Health information for international travel.* Oxford University Press. https://wwwnc.cdc.gov/travel/yellowbook/2024/infections-diseases/salmonellosis-nontyphoidal

3. Centers for Disease Control and Prevention. (2023, July 3). *Information for healthcare professionals and laboratories.* https://www.cdc.gov/salmonella/general/technical.html

4. Food Service Sanitation, Utah Administrative Code R392-100 (2023). https://adminrules.utah.gov/public/rule/R392-100/Current%20Rules

5. Food and Drug Administration. (2013.) *Food code: 2013 recommendations of the United States Public Health Service Food and Drug Administration*. U.S. Department of Commerce. https://www.fda.gov/food/fda-food-code/food-code-2013

6. Centers for Disease Control and Prevention. (2023, November 17). *Salmonella.* https://www.cdc.gov/salmonella/

7. Chiu, C. H., Su, L. H., & Chu, C. (2004). Salmonella enterica serotype Choleraesuis: epidemiology, pathogenesis, clinical disease, and treatment. *Clinical microbiology reviews*, *17*(2), 311–322. https://doi.org/10.1128/CMR.17.2.311-322.2004

8. Harvey, R., Friedman, C. R., Crim, S. M., Judd, M., Barrett, K. A., Tolar, B, Folster, J. P., Griffin, P. M., & Brown, A. C. (2017). Epidemiology of Salmonella enterica Serotype Dublin Infections among Humans, United States, 1968–2013. *Emerging Infectious Diseases*, *23*(9), 1493-1501. https://doi.org/10.3201/eid2309.170136

9. Committee on Infectious Diseases, American Academy of Pediatrics. (2021). *Red book: 2021–2024 report of the committee on infectious diseases* (32nd ed.). American Academy of Pediatrics. https://publications.aap.org/redbook/book/347/Red-Book-2021-2024-Report-of-the-Committee-on?autologincheck=redirected

10. Centers for Disease Control and Prevention. (2011). *National* Salmonella *surveillance overvie*w. U.S. Department of Health and Human Services. https://www.cdc.gov/nationalsurveillance/salmonella-surveillance.html

11. Centers for Disease Control and Prevention. (2023). *FoodNet fast.* https://wwwn.cdc.gov/FoodNetFast/PathogenSurveillance/AnnualSummary

12. Centers for Disease Control and Prevention. (2023). *Reports of selected* Salmonella *outbreak investigations*. https://www.cdc.gov/salmonella/outbreaks.html

13. Council for State and Territorial Epidemiologists (CSTE). (2016). *Public Health Reporting and National Notification for Salmonellosis (non-typhoidal)* [Position Statement 16-ID-03]. https://cdn.ymaws.com/www.cste.org/resource/resmgr/2016PS/16_ID_03.pdf

14. Centers for Disease Control and Prevention. (2011). *Foodborne disease outbreak 2011 case definition*. https://ndc.services.cdc.gov/case-definitions/foodborne-disease-outbreak-2011/

Version control

Updated January 2017: Added Why is *Salmonella* Important to Public Health, Identify Case Contacts, Contact Management, Acknowledgements, and Version Control. Updated Differential Diagnosis, Environmental Measures, Laboratory Identification, Treatment, Transmission, Susceptibility, Period of Communicability, Epidemiology, Personal Preventative Measures/Education, Reporting, and Case Definitions.

Updated December 2020: Added Critical Clinician Information and Electronic Laboratory Reporting Processing Rules sections. Updated Importance to Public Health, Disease and Epidemiology, Public Health Control Measures, Case Investigation, and UT-NEDSS/EpiTrax Minimum/Required Fields by Tab. General updates to document formatting.

Updated July 2021: Updated UT-NEDSS/EpiTrax Minimum/Required Fields by Tab. General updates to wording and document formatting.

Updated December 2023: Updated isolation information for food handlers to clarify that a 30 day waiting period is also acceptable, updated statistics on for case counts and antibiotic resistance, clarified that individuals who handle medical equipment that will enter the GI tract should be treated as food handlers, updated references, updated formatting, updated Minimum Dataset, updated and added Case Report Form, standardized different formatting of bacteria and illness name to *Salmonella*.

UT-NEDSS/EpiTrax minimum/required fields by tab

Demographic

- Last name
- First name
- Address
- City
- ZIP code
- County
- State
- Phone number
- Email address
- Date of birth
- Birth sex
- Race
- Ethnicity

Clinical

- Disease
- Onset date
- Visit type
  - (if inpatient) did *Salmonella* cause hospitalization?
- Died
  - (if yes) date of death
  - (if yes) did *Salmonella* cause death?
- Symptoms

Laboratory

- Lab name
- Lab test date
- Collection date
- Specimen source
- Test type
- Organism
- Test result
- Accession number

Contacts

- Any contacts ill with similar symptoms?

Epidemiological

- Food handler
  - Facility name
  - Location
  - Supervisor name
  - Supervisor phone number
  - Did the patient work while ill
  - Important information including dates
- Healthcare worker
  - Facility name
  - Location
  - Supervisor name
  - Supervisor phone number
  - Did the patient work while ill
  - Important information including dates
- Group living
  - Facility name
  - Location
  - Supervisor name
  - Supervisor phone number
  - Did the patient work/attend while ill
  - Important information including dates
- Childcare association
  - Facility name
  - Location
  - Supervisor name
  - Supervisor phone number
  - Did the patient work/attend while ill
  - Important information including dates

Investigation

- Date 7 days before disease onset
- Date 1 day before disease onset
- Travel anywhere in the 7 days before illness started
- Dietary or herbal supplements
- Raw or unpasteurized milk
- Cheese made from raw milk or homemade, farm-fresh, or door-to-door cheeses
- Vegan or plant-based cheeses
- Other raw or unpasteurized dairy products
- Shell eggs
- Anything uncooked and made with raw eggs
- Pre-cut chicken parts or pieces
- Stuffed chicken products such as chicken Kiev or chicken Cordon Bleu
- Ground turkey
- Handle any raw poultry at home or anywhere else
- Hamburger or other ground beef
- Handle any ground beef at home or anywhere else
- Liver or liver pate
- Pepperoni or other salami
- Fish (not canned tuna or salmon)
- Shellfish (shrimp, lobsters, clams)
- Sushi
- Handle any other raw meat at home or anywhere else
- Sprouts
- Onions
- Cucumbers
- Fruit that was already pre-cut and/or prepackaged
- Watermelon
- Cantaloupe
- Honeydew melon
- Papayas
- Peanut butter
- Almond butter or other nut/seed spread
- Other snack foods
- Tahini
- Any other suspect food or drink items
- Visit any places where you saw, touched, or were close to animals (farm, zoo, petting zoo, rodeo)
- Any contact with reptiles
- Any contact with live poultry
- Risk factor 1
- Risk factor details
- Was the case attempted to be reached for an interview?
    - (if yes) Type of interview (full, partial, none) and dates
    - (if no) Reason why no contact attempt was made

Administrative

- Date first reported to public health
- State case status
- Outbreak associated
    - (if yes) Outbreak name
- Probable case?
    - (if yes) Epi linked or laboratory diagnosed

Electronic laboratory reporting processing rules

Salmonella (non-typhoid) rules for entering laboratory test results

The following rules describe how laboratory results reported to public health should be added to new or existing events in UT-NEDSS/EpiTrax. These rules have been developed for the automated processing of electronic laboratory reports, although they apply to manual data entry, as well.

Test-specific rules

Test-specific rules describe what test type and test result combinations are allowed to create new morbidity events in UT-NEDSS/EpiTrax, and what test type and test result combinations are allowed to update existing events (morbidity or contact) in UT-NEDSS/EpiTrax.

Test type	Test result	Create a new event	Update an existing event
Culture	Positive	Yes	Yes
	Negative	No	Yes
	Equivocal	No	Yes
	Other	No	Yes
PCR/amplification	Positive	Yes	Yes
	Negative	No	Yes
	Equivocal	No	Yes
	Other	No	Yes
Total antibody (by EIA, IFA, TRF)	Positive	Yes	Yes
	Negative	No	Yes
	Equivocal	No	Yes
	Other	No	Yes

Whitelist rules

Whitelist rules describe how long an existing event can have new laboratory data appended to it. If a laboratory result falls outside the whitelist rules for an existing event, it should not be added to that event, and should be evaluated to determine if a new event (CMR) should be created.

***Salmonella* (non-typhoid) morbidity whitelist rule:** If the specimen collection date of the laboratory result is 1 year or less after the specimen collection date of the morbidity event, the laboratory result should be added to the morbidity event.

***Salmonella* (non-typhoid) contact whitelist rule:** If the specimen collection date of the laboratory result is 30 days or less after the event date of the contact event, the laboratory result should be added to the contact event.

Graylist rule

We often receive laboratory results through ELR that cannot create cases, but can be useful if a case is created in the future. These laboratory results go to the graylist. The graylist rule describes how long an existing event can have an old laboratory result appended to it.

***Salmonella* (non-typhoid) graylist rule:** If the specimen collection date of the laboratory result is 30 days before to 7 days after the event date of the morbidity event, the laboratory result should be added to the morbidity event.

Other electronic laboratory processing rules

If an existing event has a state case status of "not a case," ELR will never add additional test results to that case. New labs will be evaluated to determine if a new CMR should be created.