

Salmonellosis (Non-Typhoid) Surveillance Protocol



Provider Responsibilities

1. Report all cases to your local health department within the timeframe indicated:
Sporadic case of Salmonellosis- should be reported within 72 hours of diagnosis.

Outbreaks of Salmonellosis- should be reported immediately (see definition of outbreaks in public health action section).

Laboratory Responsibilities

1. Report all positive Salmonella tests to the local health department in the patient's county of residence within 72 hours of result. Send or fax a copy of the laboratory result, including antibiotic sensitivities to the local health department in the county of residence of the case patient.
2. Submit all non-typhoidal Salmonella isolates to the Office of Laboratory Services (OLS) for serotyping and pulsed field gel electrophoresis (PFGE) at 167 11th Avenue, South Charleston, WV 25303. Telephone 304-558-3530. For forms and other information, visit www.wvdhhr.org/labservices .

Public Health Action

For investigation of sporadic cases:

Initial report must be filed within 72 hours of first notification

1. Complete the Public Health Sections of the WVEDSS Foodborne Disease Reporting Form. Use of the WVEDSS Foodborne Disease Reporting Form will prompt a complete and appropriate investigation, to include:
 - Exposure to animals, including reptiles, chicks and ducks
 - Three day food history
 - Identification of high-risk persons or symptomatic individuals for further investigation
 - Identification of specific behaviors that may be associated with Salmonella infection.
2. Identify other cases, including probable cases (symptomatic persons who are epidemiologically linked to a culture-confirmed case), and investigate completely as in above.

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3. Enter case investigation and laboratory information into WVEDSS. Print a copy and store according to your local records retention policies. Mail or fax a copy of the laboratory report to IDEP.

4. Institute appropriate control measures:

If the case patient works in or attends a day care facility:

- Interview the manager/operator and check attendee records to identify suspect cases that occurred within the past month.
- Provide educational information to the manager/operator and staff regarding proper food handling and hand washing, especially after changing diapers.
- Collect stool samples from all symptomatic staff members and children or attendees who have been ill in the previous two months.
- Do an environmental inspection if there are any other suspected cases.
- Instruct the manager/operator to notify the local health department if new cases of diarrhea occur. Call or visit once a week for two weeks to verify surveillance and if appropriate hygienic measures are being carried out.
- Exclude symptomatic individuals who are involved in direct care of infants.
- Exclude asymptomatic employees with questionable hygienic habits.
- Exclude symptomatic daycare attendees.

If the case is a food handler:

- Conduct an environmental inspection of the facility. Interview the manager/operator and check attendee records to identify suspect cases that occurred the previous month. Ask if there have been any complaints from any patrons during the past month.
- Collect stool samples from all symptomatic individuals who have been ill the previous month.
- Exclude symptomatic individuals who are involved in food handling. Exclude asymptomatic individuals with questionable hygienic habits. Asymptomatic foodhandlers with adequate hygienic habits do not need to be excluded but should be counseled on the importance of good handwashing, personal hygiene, and removing themselves from working and notifying their supervisor whenever they have diarrheal illness.
- Excluded food handlers should only return to work after two consecutive negative stool cultures are collected 24 hours apart. If antibiotics are given, the initial culture should be taken at least 48 hours after the last dose.

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If the case works at a health care or residential care facility:

- Identify any abnormal incidence of diarrheal illness within the past month. If so, identify any common source outbreaks or sources of exposure.
- Conduct an environmental inspection of the facility.
- Exclude symptomatic individuals who are involved in the care of the elderly, immuno-compromised, and institutionalized patients until two negative stool samples are taken 24 hours apart and at least 48 hours after the last dose of antibiotics are taken.
- Asymptomatic individuals with adequate hygienic habits do not need to be excluded but should be counseled on the importance of good handwashing, personal hygiene, and removing themselves from working and notifying their supervisor whenever they have diarrheal illness.

For investigation of a suspected outbreak:

Outbreak is defined as greater than expected numbers of cases reported during a certain time frame –OR- 2 or more epidemiologically linked cases from 2 or more households

Foodborne disease outbreak is defined as two or more persons who experience a similar illness after ingestion of a common food. Please note exceptions: one case of botulism, *vibrio cholerae* or chemical poisoning constitutes an outbreak.

1. Obtain case histories for preliminary reports as in sporadic cases above. Focus on possible common source exposures.
2. Verify the diagnosis
3. Gather a 72 hour food history and history of commonly associated exposures for 2 weeks prior to onset of illness
4. Contact IDEP and notify of suspected outbreak.
5. Consult outbreak investigation protocol for complete instructions on investigation of an outbreak.
(http://www.wvdhhr.org/idep/pdfs/idep/Outbreaks/Outbreak_Investigation_Protocol.pdf)

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Epidemiologic investigations may be necessary in cases involving common source, daycare centers, or institutions. Consult with an epidemiologist at IDEP if a common source outbreak is suspected.

Disease Control Objectives

Reduce the incidence of secondary cases of Salmonellosis by:

- Appropriate investigation of outbreaks and clusters to identify and remove any common source of disease.
- Identification and exclusion of cases and probable cases (symptomatic epi-linked contacts) from high-risk settings such as daycare and food preparation.
- Identify cases which might be a source of infection for other persons (e.g. a diapered child, daycare attendee or foodhandler) and prevent further transmission.
- To identify transmission sources of public health concern (e.g. a restaurant or a contaminated public water supply) and stop transmission from such sources.

Disease Prevention Objectives

Reduce the incidence of Salmonellosis by education of the general public to:

- Practice good hand washing as a primary means of preventing person-to-person transmission.
- Practice proper food handling, including thorough cooking of eggs, meat, and poultry, washing of fruits and vegetables prior to consumption, and avoidance of cross-contamination.
- Avoid unsafe foods such as unpasteurized milk, cheese, juice, and cider.
- Practice proper handling of animals, including reptiles.
- Maintain foods at the proper temperature prior to serving.

Disease Surveillance Objectives

- Determine the incidence of Salmonellosis in West Virginia
- Identify demographic characteristics of persons with Salmonellosis
- Identify behavioral risk factors associated with Salmonellosis
- Determine the number of isolates for which serotype and PFGE results are obtained
- Determine the antimicrobial resistance profile of non-typhoidal Salmonella isolates in West Virginia.

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Public Health Significance

While most cases of non-typhoidal *Salmonella* are sporadic, this bacteria can cause large and dramatic outbreaks due to contamination of commercial food products. Multi-state, and even international outbreaks, have been described with this pathogen. Smaller clusters occur frequently due to person-to-person transmission, contamination of foods during preparation or handling, or temperature abuse of foods. Outbreaks are most commonly reported from foods of animal origin; however, large outbreaks have also been associated with tomatoes, cantaloupes, sprouts, grain products, and even non-chlorinated public water supplies. Approximately 40,000 cases of salmonellosis are reported to CDC out of an estimated 1.4 million cases occurring in the United States every year. An estimated 1,000 persons die from salmonellosis every year in the U.S.

Clinical Description

Disease spectrum varies from asymptomatic carriage to bacteremia and focal infections. The most common illness associated with non-typhoidal *Salmonella* infection is an acute self-limited gastroenteritis that is completely indistinguishable from other causes of gastroenteritis caused by other bacterial pathogens. In most cases, diarrhea is moderate in severity and without blood. Fever, abdominal cramping, nausea, vomiting, and chills are frequently reported. Headache, myalgias, and other systemic symptoms may also occur. Diarrhea usually lasts three to seven days. After resolution of acute symptoms, mean duration of carriage of non-typhoidal *Salmonella* strains in the stool is four to five weeks.

Any *Salmonella* serotype can cause bacteremia. Bacteremia occurs in about 1-4% of immunocompetent individuals with non-typhoidal salmonellosis; and in a much higher proportion of individuals with AIDS. *Salmonella* may infect the heart (endocarditis) or atherosclerotic plaque or aneurysms. When a vascular site is infected, blood cultures may be repeatedly positive for *Salmonella*.

Salmonella can cause extra-intestinal infection almost anywhere in the body. Common sites include bones and joints, the central nervous system, lungs, spleen, urinary system, genital sites, including testes or ovaries, the hepatobiliary system, etc.

Etiologic Agent

The pathogen is a gram-negative bacteria in the family Enterobacteriaceae. Currently, there are more than 2460 serotypes. Serotypes have enormous epidemiological importance, and so for simplicity are often used as the species name (though this is not taxonomically correct)

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Reservoir

Domesticated and wild animals, including poultry, swine, cattle, rodents, dogs, cats, birds (including pet ducks and chicks), reptiles (including iguanas, snakes, and turtles).

Some serotypes have been specifically associated with reptiles. Serotype *S. enteritidis* has been specifically associated with eggs and poultry, but has also been associated with an outbreak traced to reptile exposure.

Mode of Transmission

Salmonella is transmitted through the ingestion of food and water contaminated with human or animal waste. Contaminated raw vegetables or fruits have also been implicated in some recent outbreaks. Transmission through the fecal-oral route is important, especially from persons who have diarrhea or who are incontinent.

Incubation Period

6-72 hours, usually 12-36 hours

Period of Communicability

As long as bacilli appear in the stool during illness and usually several days to several weeks thereafter. Prolonged shedding is more prominent in children <5 years of age. Approximately 1% of patients become chronic carriers and continue to excrete organisms for more than 1 year.

Outbreak Recognition

An outbreak is defined as greater than expected numbers of cases reported during a certain time frame or when clustered cases of *Salmonella* are reported. Salmonellosis most commonly occurs from June to August, during the summer months. Outbreak recognition and investigation requires timely and complete epidemiological investigation (risk factors, food history, history of exposure to animals, etc.) paired with timely and complete laboratory investigation (serotyping and pulsed field gel electrophoresis).

Community-based outbreaks have been linked to individual food handlers, improper preparation of eggs, meats and poultry dishes, and exposure to iguanas or other animals. Contaminated water has rarely been implicated in community-based outbreaks involving non-chlorinated public water supplies. National and international outbreaks have been associated with widespread distribution of contaminated commercial food products, vegetables, fruits, cereals, and meats.

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Case Definition

Clinical description

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

Laboratory criteria for diagnosis

Isolation of *Salmonella* from a clinical specimen.

Case classification

Probable: a clinically compatible case that is epidemiologically linked to a confirmed case.

Confirmed: a case that meets the laboratory criteria for diagnosis. When available, O and H antigen serotype characterization should be reported.

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

Preventive Interventions

- Wash hands well after using the toilet, cleaning the toilet, after changing diapers, and after handling soiled towels or linens.
- Wash hands well before, during, and after fixing food.
- Thoroughly cook all foods from animal sources, especially chicken, beef, pork, meat dishes, and eggs.
- After preparing raw meat, thoroughly wash and rinse all utensils, bowls, counters, and hands.
- Use a separate cutting board to prepare raw meats. Use a clean plate for cooked meat. Never return cooked meat to the same plate used for raw meat.
- Marinade or BBQ sauce used on raw meat should not be used on cooked meat.
- Do not eat raw or partially cooked eggs, as in eggnog or homemade ice cream. Use pasteurized egg products from the grocery store for these purposes.
- Cook eggs until the yolks are hard. “Sunny-side up” and “over easy” eggs may be a source of *Salmonella* infection.

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Preventive Interventions (cont)

- Thoroughly rinse or wash fruits and vegetables that will be eaten raw.
- Avoid the use of untreated manure as a fertilizer for fruits and vegetables.
- Drink only pasteurized milk and milk products.
- Keep food at proper refrigeration temperatures.
- Wash hands after handling pets, pet toys, pet feces, pet beds, and pet cages.
- Keep pets out of food-preparation areas.
- Do not clean pet or reptile cages in the kitchen sink or in the bath tub.
- Iguanas or other reptiles should not be allowed to roam the house.
- Do not let children handle reptiles without supervision.
- Reptiles should not be kept in child care centers.
- Households with children under age five, pregnant women, and persons with depressed immune systems, such as AIDS, should not have reptiles.
- Before traveling to developing countries, educate yourself about safe food and water (“boil it, cook it, peel it, or forget it”), and check with your travel clinic about the necessary immunizations.

Treatment

Supportive care as needed for dehydration and electrolyte abnormalities. Antimicrobial therapy usually is not indicated for patient with either asymptomatic infection or uncomplicated (noninvasive) gastroenteritis. Antimicrobial therapy is recommended for people at increased risk of invasive disease. If antimicrobial therapy is initiated, ampicillin, amoxicillin, or trimethoprim-sulfamethoxazole is recommended for susceptible strains.

Surveillance Indicators

- Proportion of investigations with complete demographic information.
- Proportion of investigations with complete information on high-risk occupations.
- Proportion of confirmed cases with known non-typhoidal *Salmonella* serotype.
- Proportion of confirmed cases with antibiotic susceptibility profile.
- Proportion of cases with complete risk factor investigation including three-day food history.

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References

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