

GASTROENTERITIS; BACTERIAL

Includes Bacterial Foodborne Toxins; For Unspecified Diarrheal Illness, See Diarrhea Case Definition

Background

This case definition was developed in 2016 by the Armed Forces Health Surveillance Branch (AFHSB) for the purpose of epidemiological surveillance of infections associated with bacterial gastroenteritis important to military associated populations. The definition is based on a case definition developed for a *Medical Surveillance Monthly Report (MSMR)* article on bacterial, viral, and parasitic gastrointestinal infections including diarrheal illness.¹

Clinical Description

Bacterial gastroenteritis is an inflammation of the stomach and intestines caused by bacteria. Specific bacterial pathogens and foodborne toxins are associated with eating or drinking contaminated food or water, exposure to animals, travel to a particular country, and preexisting medical conditions. Most often, contamination occurs when food comes into contact with animal or human waste or through improper food handling and preparation. The most common bacteria associated with infections and outbreaks are *Campylobacter jejuni*, *E. coli*, *Salmonella*, and *Shigella*. The incubation period, symptoms, and duration of infection varies depending on the species of bacteria. All, however, cause diarrhea, nausea, vomiting, and abdominal cramping. Diagnosis is based on clinical symptoms and laboratory testing of a stool specimen. Mild infections are usually self-limited. Moderate to severe infections may require antibiotic treatment specific for the bacteria species. Management also involves avoidance of contaminated food, rehydration, diet modification, and rest.²

Case Definition and Incidence Rules

For surveillance purposes, a case of bacterial gastroenteritis is defined as:

- *One hospitalization or outpatient medical encounter* with any of the case defining diagnoses of bacterial gastroenteritis (see ICD9 and ICD10 code lists below) in the *primary or secondary* diagnostic position; or
- *One record of a reportable medical event (RME)* of a *confirmed* case of bacterial gastroenteritis with a diagnosis of interest (see list of conditions below).

Incidence rules:

For individuals who meet the case definition:

- The incidence date is considered the date of the first hospitalization, outpatient medical encounter or reportable medical event that includes a defining diagnosis of bacterial gastroenteritis.

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¹ Armed Forces Health Surveillance Center. Gastrointestinal Infections, Active Component, U.S. Armed Forces, 2000-2012. *Medical Surveillance Monthly Report (MSMR)*. 2013 October; 20(10): 7-11.

² Centers for Disease Control and Prevention (CDC). Foodborne, Waterborne, and Environmental Diseases (DFWED). <http://www.cdc.gov/ncezid/dfwed/index.html>; accessed March, 2016.



Case Definition and Incidence Rules *(continued)*

- An individual is considered a new incident case if *at least 60 days* have passed since the last medical encounter with a case defining diagnosis of bacterial gastroenteritis (*see explanation of “gap” rule below*).

Exclusions:

- None

Codes

The following ICD9 and ICD10 codes are included in the case definition:

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Cholera	A00 (<i>cholera</i>)	001 (<i>cholera</i>)
	A00.0 (cholera due to <i>Vibrio cholera</i> 01, biovar cholera)	001.0 (due to <i>Vibrio cholera</i>)
	A00.1 (cholera due to <i>Vibrio cholera</i> 01, biovar eltor)	001.1 (due to <i>Vibrio cholera</i> el tor)
	A00.9 (cholera, unspecified)	001.9 (cholera, unspecified)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Salmonella gastroenteritis (<i>Non-typhoidal</i>)	A02.0 (<i>Salmonella</i> enteritis) <i>[For non-enteric Salmonella infections see code set below]</i>	003.0 (<i>Salmonella</i> gastroenteritis)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Shigellosis	A03 (<i>Shigellosis</i>)	004 (<i>Shigellosis</i>)
	A03.0 (Shigellosis due to <i>Shigella dysenteriae</i>)	004.0 (<i>Shigella dysenteriae</i>)
	A03.1 (Shigellosis due to <i>Shigella flexneri</i>)	004.1 (<i>Shigella flexneri</i>)
	A03.2 (Shigellosis due to <i>Shigella boydii</i>)	004.2 (<i>Shigella boydii</i>)
	A03.3 (Shigellosis due to <i>Shigella sonnei</i>)	004.3 (<i>Shigella sonnei</i>)
	A03.8 (other shigellosis)	004.8 (other specified shigella infections) <i>(continued on next page)</i>



	A03.9 (shigellosis, unspecified)	004.9 (shigellosis, unspecified)
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Condition	ICD-10-CM Codes	ICD-9-CM Codes
Other bacterial intestinal infections; includes <i>Escherichia coli</i> (<i>E.coli</i>)	A04 (other bacterial intestinal infections)	008.0 (<i>Escherichia coli</i> [<i>E.coli</i>])
	A04.0 (enteropathogenic <i>Escherichia coli</i> infection)	008.01 (enteropathogenic <i>E.coli</i>)
	A04.1 (enterotoxigenic <i>Escherichia coli</i> infection)	008.02 (enterotoxigenic <i>E.coli</i>)
	A04.2 (enterovasive <i>Escherichia coli</i> infection)	008.03 (enterovasive <i>E.coli</i>)
	A04.3 (enterohemorrhagic <i>Escherichia coli</i> infection)	008.04 (enterohemorrhagic <i>E.coli</i>)
	A04.4 (other intestinal <i>Escherichia coli</i> infections)	008.00 (<i>E.coli</i> , unspecified) 008.09 (other intestinal <i>E.coli</i> infections)
	A05.5 (campylobacter enteritis)	008.43 (campylobacter)
	A04.6 (enteritis due to <i>Yersinia enterocolitica</i>)	008.44 (<i>Yersinia enterocolitica</i>)
	A04.7 (enterocolitis due to <i>Clostridium difficile</i>)	008.45 (<i>Clostridium difficile</i>)
	A04.8 (other specified bacterial intestinal infections)	008.1 (<i>Arizona</i> group of paracolon bacilli) 008.2 (intestinal infection due to <i>Aerobacter aerogenes</i>) 008.3 (<i>Proteus mirabilis</i>)(<i>morganii</i>) 008.4 (other specified bacteria) - 008.41 (intestinal infection due to <i>Staphylococcus</i>) - 008.42 (intestinal infection due to <i>Pseudomonas aeruginosa</i>) - 008.46 (other anerobes) - 008.47 (other gram negative bacteria) - 008.49 (intestinal infection due to other organisms)
A04.9 (bacterial intestinal infection, unspecified)	008.5 (bacterial enteritis, unspecified)	



Condition	ICD-10-CM Codes	ICD-9-CM Codes
Other bacterial foodborne intoxication and infection	A05 (other bacterial foodborne intoxications, not elsewhere classified)	005 (other food poisoning; bacterial) (continued on next page)
	A05.0 (foodborne staphylococcal intoxication)	005.0 (staphylococcal food poisoning)
	A05.1 (botulism food poisoning)	005.1 (botulism food poisoning)
	A05.2 (foodborne <i>Clostridium perfringens</i> [<i>Clostridium welchii</i>] intoxication)	005.2 (food poisoning due to <i>Clostridium perfringens</i> [<i>C.welchii</i>])
	A05.3 (foodborne <i>Vibrio parahaemolyticus</i> intoxication)	005.4 (food poisoning due to <i>Vibrio parahaemolyticus</i>)
	A05.4 (foodborne <i>Bacillus cereus</i> intoxication)	005.8 (other bacterial food poisoning) - 005.89 (other bacterial food poisoning)
	A05.5 (foodborne <i>Vibrio vulnificus</i> intoxication)	005.81 (food poisoning due to <i>Vibrio vulnificus</i>)
	A05.8 (other specific bacterial foodborne intoxications)	005.3 (food poisoning due to other <i>Clostridia</i>)
	A05.9 (bacterial foodborne intoxication, unspecified)	005.9 (food poisoning, unspecified)

Development and Revisions

- In March of 2016 the case definition was updated to include ICD10 codes.
- The definition was developed by the AFHSC *Medical Surveillance Monthly Report (MSMR)* staff for an October 2013 article on gastrointestinal infections caused by bacteria.¹ The case definition was developed based on reviews of the ICD9 codes, the scientific literature, and previous AFHSC analyses.

Case Definition and Incidence Rule Rationale

- This case definition does not include gastroenteritis secondary to drugs, radiation, allergies, and diet, and does not include gastroenteritis secondary to seafood toxin or other non-bacterial food toxin ingestion.
- This case definition uses a 60-day “gap in care” incidence rule to define a new incident case of bacterial gastroenteritis. Use of this methodology presumes that medical encounters for bacterial gastroenteritis that occur within 60 days of a previous such encounter constitute follow-up care of the previously diagnosed case. The goal of the “gap in care” rule is to lessen the frequency with which encounters for follow-up care are treated as new incident cases of the condition. The “gap in care” rule differs slightly from an absolute 60-day incidence rule in which an individual may be considered an incident case once every 60 days.
- Not all of the conditions documented in this case definition are Reportable Medical Events in the Armed Forces. See <https://www.afhsc.mil/Home/ReportableEvents> for a list of reportable events. Investigators wishing to compare specific causes of bacterial gastroenteritis may want to consider the implications of these case finding criteria on the individual conditions.



- The AFHSB has developed more specific case definitions for Salmonella infection and Typhoid Fever. See <https://www.afhsc.mil/Home/CaseDefinitions>. Both definitions differ slightly from the ones documented here (i.e., the diagnosis of interest may be listed in *any* diagnostic position and individuals may be considered an incident case once every 180 days).

Code Set Determination and Rationale

- The code set documented here, used to identify cases of Salmonella gastroenteritis, includes ICD9 code 003.0 and ICD10 code A02.2 (*Salmonella* gastroenteritis) only. As a reference, codes for *non-enteric* Salmonella infection are included in the “Comments” section. This code set includes nonspecific codes for Salmonella infection (e.g., localized, unspecified, and other Salmonella infection). When data are available, these codes will be further analyzed to determine if they indicate Salmonella gastroenteritis.
- The code set used for the October 2013 MSMR article on gastrointestinal infections did not include the ICD9 codes below. These codes are included in this document and will be included in the code set for future analyses.
 - 008.1 (*Arizona* group of paracolonic bacilli)
 - 008.2 (intestinal infection due to *Aerobacter aerogenes*)
 - 008.3 (*Proteus mirabilis* or *morganii*)
 - 008.42 (intestinal infection due to *Pseudomonas aeruginosa*)
 - 008.44 (intestinal infection due to *Yersinia enterocolitica*)
 - 008.46 (intestinal infection due to other anaerobes)
 - 008.49 (intestinal infection due to other organisms)
 - 008.5 (bacterial enteritis, unspecified)

Reports

AFHSB reports on bacterial gastroenteritis in the following reports:

- Monthly: AFHSB Reportable Events Monthly Report. Available on the AFHSC website at: <https://www.afhsc.mil/Home/ReportableEvents>.
- Weekly: DoD Communicable Disease Weekly Report; Summary of Communicable Reportable Events by Service; Available on the AFHSC website at: <http://www.afhsc.mil>; see “Reports and Publications”.

Review

Mar 2016	Case definition reviewed and adopted by the AFHSB Surveillance Methods and Standards (SMS) working group.
Feb 2013	Case definition reviewed and adopted by the AFHSC <i>MSMR</i> staff.

Comments

The intent of the October 2013 *MSMR* article was to investigate bacterial gastrointestinal infections in the U.S. Armed Forces. The analysis was not specific for bacterial gastroenteritis. It included a diverse set of gastrointestinal illnesses that, in general, shared both the portal of entry for the causative agents and the manner of acquisition (i.e., foodborne, waterborne, person-to-person contact and, animal contact). The infections below were included in the *MSMR* report on gastrointestinal infections but are not included here because, although they are infectious disorders that begin in the



gastrointestinal tract, they generally do not produce symptoms and illnesses typically associated with gastroenteritis. Investigators wishing to investigate illness due to these organisms may want to utilize the codes for the corresponding GI-related conditions.

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Salmonella (<i>Non-enteric infection</i>)	A02 (<i>other Salmonella infections</i>)	003 (<i>other Salmonella infections</i>)
	A02.1 (<i>Salmonella sepsis</i>)	003.1 (<i>Salmonella septicemia</i>)
	A02.2 (<i>localized Salmonella infections</i>)	003.2 (<i>localized Salmonella infections</i>)
	- A02.20 (<i>localized Salmonella infection, unspecified</i>)	003.20 (<i>localized Salmonella infections, unspecified</i>)
	- A02.21 (<i>Salmonella meningitis</i>)	003.21 (<i>Salmonella meningitis</i>)
	- A02.22 (<i>Salmonella pneumonia</i>)	003.22 (<i>Salmonella pneumonia</i>)
	- A02.23 (<i>Salmonella arthritis</i>)	003.23 (<i>Salmonella arthritis</i>)
	- A02.24 (<i>Salmonella osteomyelitis</i>)	003.24 (<i>Salmonella osteomyelitis</i>)
	- A02.25 (<i>Salmonella pyelonephritis</i>)	003.29 (below)
	- A02.29 (<i>Salmonella with other localized infection</i>)	003.29 (<i>localized Salmonella infections; other</i>)
	A02.8 (<i>other specified Salmonella infections</i>)	003.8 (<i>other specified Salmonella infections</i>)
	A02.9 (<i>Salmonella infection, unspecified</i>)	003.9 (<i>Salmonella infection, unspecified</i>)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Typhoid Fever (<i>Includes paratyphoid</i>) [See Case Definition and Incidence Rule Rationale above]	A01 (<i>typhoid and paratyphoid fevers</i>)	002 (<i>typhoid and paratyphoid fevers</i>)
	A01.0 (<i>typhoid fever</i>)	002.0 (<i>typhoid fever</i>)
	- A01.00 (<i>typhoid fever, unspecified</i>)	
	- A01.01 (<i>typhoid meningitis</i>)	
	- A01.02 (<i>typhoid fever with heart involvement</i>)	
	- A01.03 (<i>typhoid pneumonia</i>)	
	- A01.04 (<i>typhoid arthritis</i>)	
	- A01.05 (<i>typhoid osteomyelitis</i>)	
	A01.1 (<i>paratyphoid fever A</i>)	002.1 (<i>paratyphoid fever A</i>)
	A01.2 (<i>paratyphoid fever B</i>)	002.2 (<i>paratyphoid fever B</i>)
	A01.3 (<i>paratyphoid fever C</i>)	002.3 (<i>paratyphoid fever C</i>)
	A01.4 (<i>paratyphoid fever, unspecified</i>)	002.9 (<i>paratyphoid fever, unspecified</i>)



Condition	ICD-10-CM Codes	ICD-9-CM Codes
Brucellosis	A23 (<i>brucellosis</i>)	023 (<i>brucellosis</i>)
	A23.0 (brucellosis due to <i>Brucella melitensis</i>)	023.0 (<i>Brucella melitensis</i>)
	A23.1 (brucellosis due to <i>Brucella abortus</i>)	023.1 (<i>Brucella abortus</i>)
	A 23.2 (brucellosis due to <i>Brucella suis</i>)	023.2 (<i>Brucella suis</i>)
	A23.3 (brucellosis due to <i>Brucella canis</i>)	023.3 (<i>Bucella canis</i>)
	A23.8 (other brucellosis)	023.8 (other brucellosis)
	A23.9 (brucellosis, unspecified)	023.9 (brucellosis, unspecified)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Leptospirosis	A27 (<i>leptospirosis</i>)	100 (<i>leptospirosis</i>)
	A27.0 (<i>Leptospirosis icterohemorrhagica</i>)	100.0 (<i>Leptospirosis icterohemorrhagica</i>)
	A27.8 (other forms of leptospirosis)	100.8 (other specified leptospiral infections)
	- A27.81 (aseptic meningitis in leptospirosis)	- 100.81 (leptospiral meningitis; aseptic)
	- A27.89 (other forms of leptospirosis)	- 100.89 (other leptospiral infection)
	A27.9 (leptospirosis, unspecified)	100.9 (leptospirosis, unspecified)

Condition	ICD-10-CM Codes	ICD-9-CM Codes
Listeriosis	A 32 (<i>Listeriosis</i>)	027.0 (Listeriosis)
	A32.0 (cutaneous listeriosis)	
	A32.1 (listerial meningitis and meningoencephalitis)	
	- A32.11 (listerial meningitis)	
	- A32.12 (listerial meningencephalitis)	
	A32.7 (listerial sepsis)	
	A32.8 (other forms of listeriosis)	
	- A32.81 (oculoglandular listeriosis)	
	- A32.82 (listerial endocarditis)	
	- A32.89 (other forms of listeriosis)	
	A32.9 (listeriosis, unspecified)	



Condition	ICD-10-CM Codes	ICD-9-CM Codes
Q fever	A78 (Q fever)	083.0 (Q fever)

