

# National Enteric Disease Surveillance: Typhoid and Paratyphoid Fever Annual Summary, 2010

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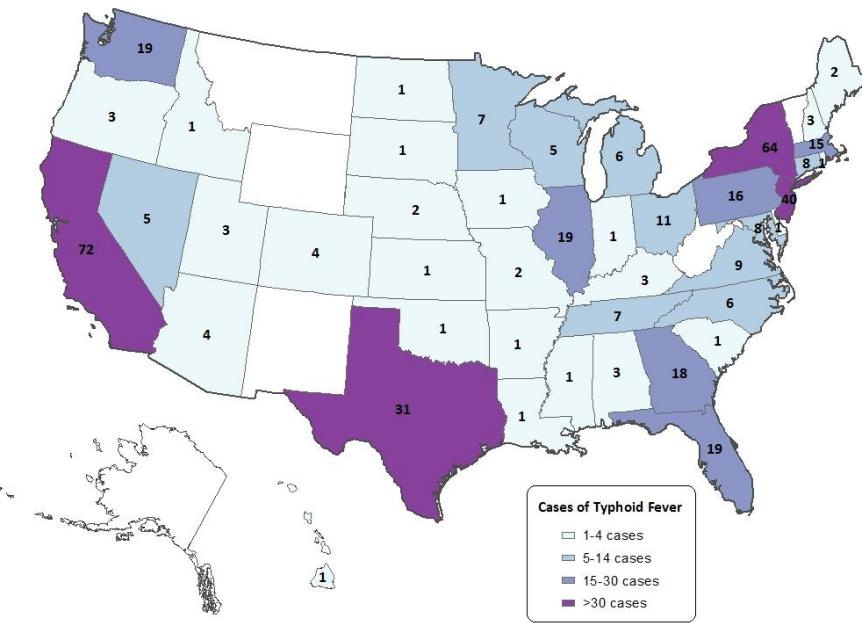
An overview of National Typhoid and Paratyphoid Fever Surveillance (NTPFS) system is available online [http://www.cdc.gov/ncecid/dfwed/PDFs/typhi\\_surveillance\\_overview\\_508c.pdf](http://www.cdc.gov/ncecid/dfwed/PDFs/typhi_surveillance_overview_508c.pdf).

## **National Typhoid and Paratyphoid Fever Surveillance Data**

States reporting at least one typhoid or paratyphoid fever<sup>1</sup> case to the NTPFS during 2010 are shown in Figures 1 and 2.

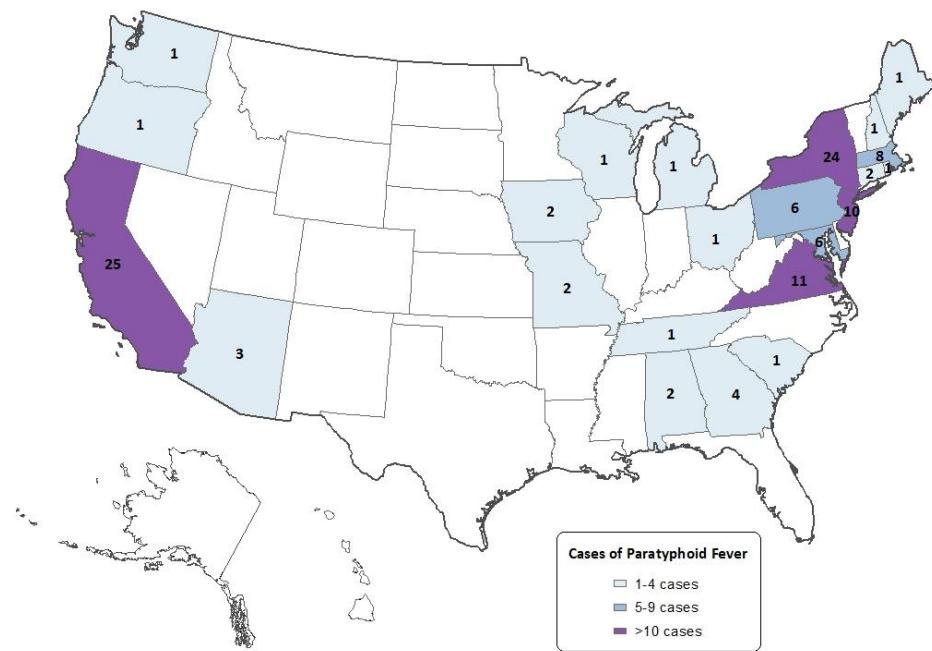
- 44 states and the District of Columbia reported 431 typhoid fever cases (Figure 1)
- 24 states reported 115 paratyphoid fever cases (115 Paratyphi A) (Figure 2)

Figure 1. States reporting at least typhoid fever case to National Typhoid and Paratyphoid Fever Surveillance, 2010 (n=431)



<sup>1</sup> Paratyphoid fever is caused by *Salmonella* serotypes Paratyphi A, Paratyphi B, and Paratyphi C. Two distinct pathotypes of Paratyphi B are recognized; one is associated with paratyphoid fever and the other is associated with uncomplicated gastroenteritis. The two pathotypes have distinct virulence characteristics, and are differentiated based on the ability to ferment tartrate. The paratyphoidal pathotype is unable to ferment tartrate and is designated serotype Paratyphi B; the nonparatyphoidal pathotype ferments tartrate and is designated serotype Paratyphi B var. L(+) tartrate+. Only those laboratory-confirmed as not able to ferment tartrate are included in the annual NTPFS summary. For many Paratyphi B reports submitted to CDC, this information is not available; these reports are therefore excluded from the NTPFS summary.

Figure 2. States reporting at least one paratyphoid fever case to National Typhoid and Paratyphoid Fever Surveillance, 2010 (N=115, 115 Paratyphi A)



Demographic and clinical characteristics of patients with typhoid fever and paratyphoid fever are shown in Tables 1 and 2.

- The median age of patients with typhoid fever was 23 years
- The median age of patients with paratyphoid fever was 27 years
- One patient with typhoid fever died (0.3%)

Table 1. Demographic and clinical characteristics of patients with typhoid fever reported to National Typhoid and Paratyphoid Fever Surveillance, 2010 (n=431).

Characteristic (total number)	Count	Percent
Median age in years (range)	23 (<1-77)	--
Female (n=431)	273	50
US Citizen (n=397)	199	50
Vaccinated* (n=420)	13	3
<b>Site of isolation (n=420)</b>		
Blood	364	87
Stool	49	12
Gall bladder	7	2
Other	0	0
Hospitalized (n=431)	312	72
Died (n=404)	1	0.3

\*Received typhoid vaccination within 5 years before onset of illness

Table 2. Demographic and clinical characteristics of patients with paratyphoid fever reported to National Typhoid and Paratyphoid Fever Surveillance, 2010 (n=115).

Characteristic (total number)	Count	Percent
Median age in years (range)	27 (1-68)	--
Female (n=115)	60	52
US Citizen (n=109)	54	50
Vaccinated* (n=111)	14	13
Site of isolation (n=113)		
Blood	92	81
Stool	19	17
Gall bladder	1	1
Other	0	0
Hospitalized (n=115)	67	58
Died (n=113)	0	0

\*Received typhoid vaccination within 5 years before onset of illness

Travel destinations are shown in Table 3.

- 361 (84%) patients with typhoid fever and 103 (89%) patients with paratyphoid fever reported traveling or living outside the United States in the 30 days before illness onset
- Visiting friends or relatives was the most common reason for travel for patients with typhoid fever (59%) and paratyphoid fever (64%)

Table 3. Travel destinations reported to National Typhoid and Paratyphoid Fever Surveillance, 2010 (n=331).

Travel Destination	Typhoid (n=361)	Paratyphoid (n=103)
	no. (%)	no. (%)
India	210 (58)	60 (58)
Bangladesh	57 (16)	19 (18)
Pakistan	23 (6)	10 (10)
Haiti	12 (3)	--
Mexico	12 (3)	--
Other	47 (13)	14 (14)

### ***NNDSS Data***

The National Notifiable Disease Surveillance System (NNDSS) collects and compiles reports of nationally notifiable infectious diseases, including typhoid fever. Reports can be found at [http://www.cdc.gov/mmwr/mmwr\\_nd/index.html](http://www.cdc.gov/mmwr/mmwr_nd/index.html)

### ***Antimicrobial Resistance Data***

The National Antimicrobial Resistance Monitoring System (NARMS) monitors antimicrobial resistance among enteric bacteria (including *Salmonella* serotype Typhi and Paratyphi A, Paratyphi B, and Paratyphi C) from humans. In *Enterobacteriaceae*, resistance to nalidixic acid, an elementary quinolone, correlates

with decreased susceptibility to ciprofloxacin (MIC  $\geq 0.12 \mu\text{g/mL}$ ) and possible fluoroquinolone treatment failure. Multidrug resistance is described in NARMS as resistance to three or more classes of antimicrobial agents, as defined by the Clinical and Laboratory Standards Institute (CLSI).

The most recently published NARMS annual report is from 2010, available at <http://www.cdc.gov/narms/pdf/2010-annual-report-narms.pdf> (2). The 2010 data showed the following:

For *Salmonella* serotype Typhi isolates

- 69% were resistant to nalidixic acid
- 3% were resistant to ciprofloxacin
- 14% were multidrug resistant

For *Salmonella* serotype Paratyphi isolates

- 90% were resistance to nalidixic acid
- 0% were resistant to ciprofloxacin
- 2% were multidrug resistant

### ***Outbreak Data***

The Foodborne Disease Outbreak Surveillance System (FDOSS) collects reports of foodborne disease outbreaks from local, state, tribal, and territorial public health agencies. Reports can be found at [http://cdc.gov/outbreaknet/surveillance\\_data.html](http://cdc.gov/outbreaknet/surveillance_data.html).

- In 2010, one typhoid fever outbreak was reported with 12 cases in three states. Consumption of frozen mamey pulp in a fruit shake was reported by 75% of patients. Traceback investigations implicated 2 brands of frozen mamey pulp from a single manufacturer in Guatemala, which was also implicated in the last domestically acquired typhoid fever outbreak, a 1998-1999 outbreak of typhoid fever in Florida.

### ***References***

1. Centers for Disease Control and Prevention (CDC). Summary of notifiable diseases—United States, 2009. MMWR 2011; 58(53): 1-100
2. Centers for Disease Control and Prevention (CDC). National Antimicrobial Resistance Monitoring System for Enteric Bacteria (NARMS): Human Isolates Final Report, 2009. Atlanta, Georgia: U.S. Department of Health and Human Services, CDC, 2010.
3. Centers for Disease Control and Prevention (CDC). Surveillance for foodborne disease outbreaks—United States, 2009. MMWR 2010; 59(31):973-979

### **Reference Citation:**

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