

## Epidemiological Report

# Typhoid fever

Historic series 2010 – 2021

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## INTRODUCTION

Typhoid fever is an acute bacterial disease of worldwide distribution that is directly associated with low socioeconomic levels, especially in regions with precarious conditions of basic sanitation, personal and environmental hygiene. In endemic areas, it most frequently affects individuals between 15 and 45 years of age, decreasing the attack rate with age, but if not properly treated, it can lead to death.<sup>1</sup>

Its reservoir is the human being, however, individuals with gastric achlorhydria, the elderly and immunocompromised are more vulnerable.<sup>2</sup> Recurrent *Salmonella* infection is one of the hallmark clinical conditions of AIDS/HIV.<sup>1</sup>

The main symptoms are: high fever, headache, general malaise, lack of appetite (anorexia), slow heart rate, enlarged spleen (hepatosplenomegaly), pink spots on the trunk (typical roseola), pulse/temperature dissociation, constipation or diarrhea, and a dry cough.<sup>1</sup> These symptoms can be confused with those of other conditions. Thus, the doctor can request specific tests, such as blood, feces, urine and spinal aspirate/puncture, which is the most effective. TF is suspected when the individual has persistent fever with or without one or more of these signs and symptoms.

The case can be confirmed by clinical-laboratory criteria, which is when the person presents a clinical condition compatible with the disease, in addition to the isolation of *Salmonella typhi* or detection by the PCR technique; or clinical-epidemiological criterion, when the person presents a clinical condition compatible with the disease and epidemiological link with the case confirmed by laboratory criteria.<sup>2</sup>

Treatment lasts about 14 days, depending on the severity of the disease. Rest and constant hydration are essential for a good recovery from typhoid fever. It is also important that people undergoing treatment wash their hands thoroughly with soap and water after using the toilet, avoiding preparing or serving food to others, in order to reduce the chance of person-to-person transmission of the infection. Patients with gallstones or biliary abnormalities that do not respond to antibiotic treatment should be cholecystectomized.<sup>1</sup>

## ETIOLOGICAL AGENT

Typhoid fever is caused by *Salmonella enterica*, serotype *Typhi* (*Salmonella typhi*), a Gram-negative bacterium of the family *Enterobacteriaceae*.<sup>2</sup>

Its elimination time from the human organism varies from one to three weeks and can reach three months. Between 2% and 5% of patients become chronic carriers of TF and can transmit the disease for up to a year.<sup>1</sup>

## TRANSMISSION MODE

The transmission can be:

- direct, through direct contact with the patient's or carrier's hands; and
- indirect, related to water and food contaminated by the feces or urine of the patient or carrier. In the case of food products, contamination generally occurs by handling oligosymptomatic carriers or patients (with discrete clinical manifestations).

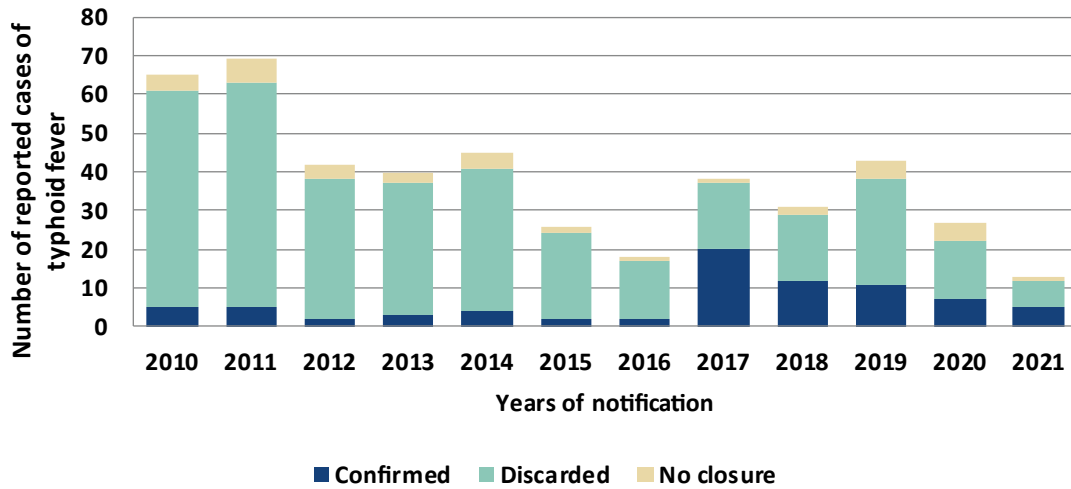
Vegetables washed with contaminated water, undercooked or raw seafood (molluscs and crustaceans), unpasteurized milk and dairy products and frozen products can transmit *S. typhi*. In the latter case, since freezing does not destroy the bacteria – ice cream, for example – they can be transmission vehicles.<sup>2</sup> Factors extrinsic to food, such as environmental factors (temperature and humidity existing in conservation, storage, production, marketing and consumption sites), also significantly interfere with the growth and viability of *Salmonella typhi*.<sup>2</sup>

## EPIDEMIOLOGICAL SITUATION

From the analysis of reported cases of typhoid fever in the state of São Paulo (SSP), it is possible to notice a downward trend in notifications, which account for 457 cases in the period from 2010 to 2021. Of this total, 78 were confirmed, 341 were discarded and 38 were not properly closed in the system, although they could be considered discarded given the epidemiological investigation.

By observing the case confirmations, however, it is possible to infer that 2017 was the year that presented the highest number of confirmations (20). It is worth noting, however, that just one case is already considered an outbreak and aggravation of immediate notification ([Graph 1](#)).

**Graph 1.** Reported cases of typhoid fever according to case closure classification. SSP, 2010 to 2021.\*

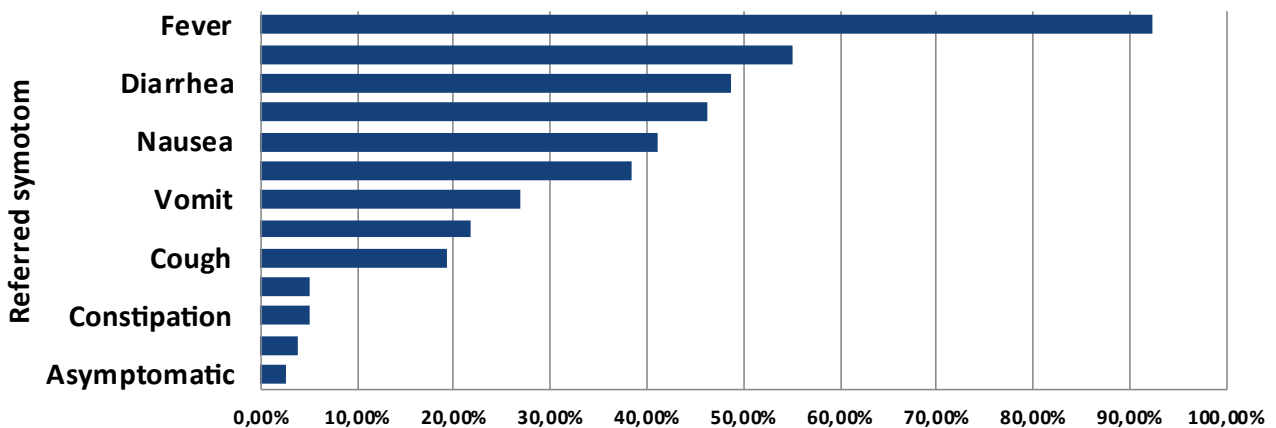


Source: DDTHA/CVE/CCD/SES-SP. \*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

Regarding confirmed cases that year, according to a report from the city of São Paulo, an outbreak of FT occurred in a day care center, with seven confirmed cases, one of which was an asymptomatic carrier.<sup>3</sup>

When analyzing the signs and symptoms reported by patients and recorded in the notifications in the period evaluated, it is inferred that, among those confirmed, fever was the most frequent symptom (92.3%), as expected, given the case definition, followed by of abdominal pain (55.13%) and diarrhea (48.72%). Only 2.56% of those confirmed were asymptomatic (Graph 2).

**Graph 2.** Frequency of symptoms reported in the notification of confirmed cases of typhoid fever. SSP, 2010 to 2021.\*

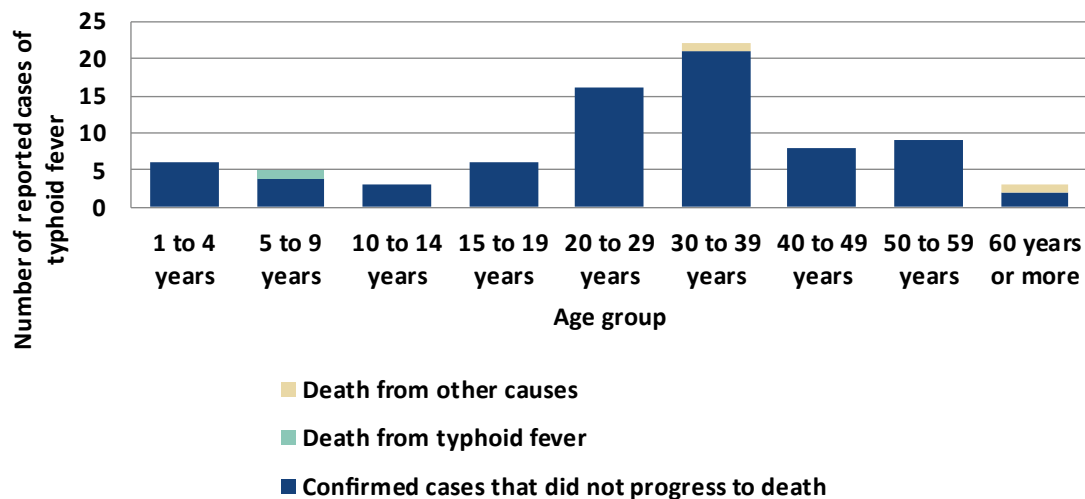


**Frequency % of symptoms of confirmed cases of typhoid fever**

Source: DDTHA/CVE/CCD/SES-SP. \*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

When analyzing the distribution and cases by age, the most frequently confirmed was the age group from 30 to 39 years old (22), followed by 20 to 29 years old (16). Death from typhoid fever occurred in children aged 5 to 9 years (Graph 3).

**Graph 3.** Confirmed cases of typhoid fever according to case evolution, SSP, 2010 to 2021.



Source: DDTHA/CVE/CCD/SES-SP.\*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

Thus, it is noteworthy that, although this disease is more recurrent in individuals between 15 and 45 years of age, even greater attention should be paid to its occurrence in children. This is because the attack rate decreases with increasing age. Upon detection of a case, all care measures must be adopted with the use of antibiotics when indicated, necessary in 88.5% of confirmed cases in the period. Finally, you should focus on hydration.

When we look at the distribution of reported cases from 2010 to 2021 by epidemiological surveillance group (ESG), we can see a greater concentration in the capital and Campinas, the two regions with the highest number of notifications ([Table 1](#)).

These two ESGs also have the highest number of confirmed cases in the period evaluated ([table 2](#)).

**Table 1.** Reported cases of typhoid fever by ESG of residence, state of São Paulo, 2010 to 2021.\*

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL
Araçatuba	2												2
Araraquara		1	3	1				1				1	7
Assis		1	1		1	1							4
Barretos	2	2							1				5
Bauru	2	2		2					1				7
Campinas	15	22	11	11	4	2	4	2	2	2		1	76
Capital	19	14	9	14	22	9	2	24	16	30	19	7	185
Franca		1	1		2								4
Franco da Rocha									1				1
Itapeva								2		1			3
Jales	1		1						1				3
Marília	2								2	2	1	1	8
Mogi das Cruzes	2	3	1	1	2	1	1	1		3	1	1	17
Osasco	4	2		1	1	4	3	1	1	1	3	1	22
Piracicaba	3	8		2	3								16
Presidente Prudente			1			1				1			3
Presidente Venceslau		1											1
Ribeirão Preto	1	1	3		2					1			8
Santo André	2		2	3		3	1	1	2	1			15
Santos	2		1	1	1	1	2		1		1		10
São João da Boa Vista	1	2				1		2					6
São José do Rio Preto	5	4	6	2	3	2	2	2	1		1		28
São José dos Campos	1		1		2		1			1			6
Sorocaba			1		1			1	1			1	5
Taubaté	1						1						2

Source: DDTHA/CVE/CCD/SES-SP. \*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

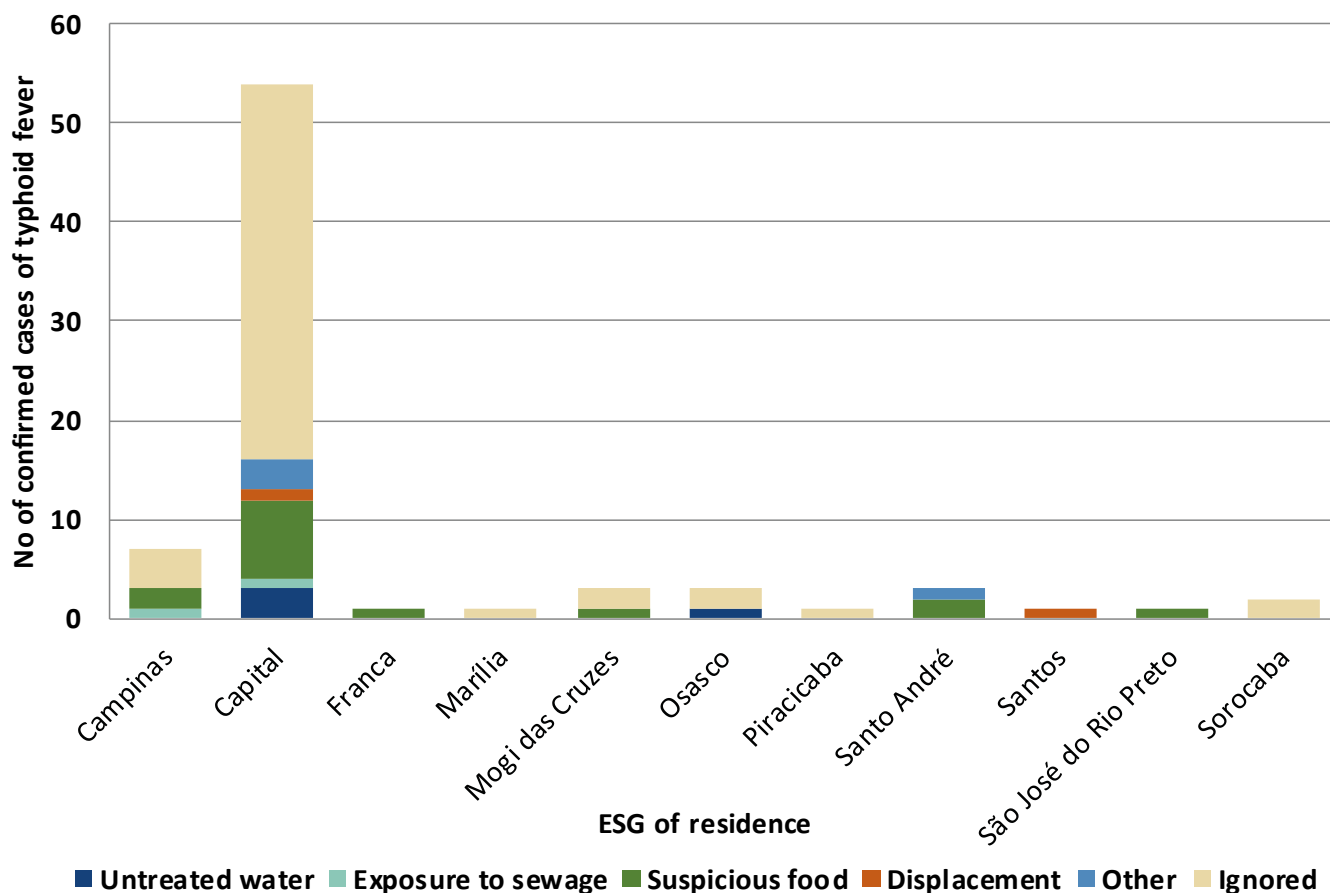
**Table 2.** Confirmed cases of typhoid fever by ESG of residence, state of São Paulo, 2010 to 2021.\*

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	TOTAL
Campinas	1	2		1		1	1		1				7
Capital	2	1	1	1	2	1		18	9	11	5	3	54
Franca		1											1
Marília												1	1
Mogi das Cruzes	1				1						1		3
Osasco							1		1		1		3
Piracicaba		1											1
Santo André	1							1	1				3
Santos				1									1
São José do Rio Preto					1								1
Sorocaba			1									1	2

Source: DDTHA/CVE/CCD/SES-SP. \*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

To avoid contamination of more people, it is necessary to identify the contagion link, even of all contacts in the case. In this sense, the importance of properly filling out this field is reinforced. Considering the information available in the period, however, it is possible to infer that the highest number of confirmed cases in recent years was related to suspected transmission through contact with contaminated food ([Graph 4](#)).

**Graph 4.** Confirmed cases of typhoid fever according to the suggestion of a link with a possible source of contamination, State of São Paulo, 2010 to 2021.\*



Source: DDTHA/CVE/CCD/SES-SP. \*Data extracted from Sinan and processed by DDTHA on June 14, 2022.

## FORMS OF PREVENTION

According to the Ministry of Health,<sup>1</sup> when it comes to food, it is essential that people observe the following aspects:

- consume treated water;
- select fresh and good-looking food products, which must be washed and disinfected before consumption;
- for disinfection, raw foods such as fruits and vegetables must be immersed for 30 minutes in a solution prepared with a tablespoon of 2.5% sodium hypochlorite for each liter of treated water;



- consume pasteurized milk and derivatives;
- do not use food after the expiration date;
- wash their hands regularly before, during and after food preparation, when handling dirty objects, after touching animals, going to the bathroom and changing diapers, as well as before breastfeeding;
- wash and disinfect all surfaces, utensils and equipment used in food preparation;
- protect food products and kitchen areas from insects, pets and others (keep them in closed containers);
- clean and periodically disinfect the water tanks of public institutions (schools, day care centers, hospitals, health centers, nursing homes, prisons, etc.) every six months or at shorter intervals, if necessary; and
- clean and disinfect domestic water tanks every six months or at a shorter interval, if necessary.

In places where water is considered unsuitable, you should:

- filter and boil the water for 5 minutes and wait 30 minutes before consuming it; or
- filter and disinfect the water with 2.5% sodium hypochlorite (two drops for every liter of water).

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## REFERENCES

1. Ministério da Saúde (BR). Febre tifoide [internet]. Brasília; 2021 [acesso em 17 jun 2022]. Disponível em: <https://www.gov.br/saude/pt-br/assuntos/saude-de-a-a-z/f/febre-tifoide-1>
  2. Ministério da Saúde (BR). Secretaria de Vigilância em Saúde. Departamento de Articulação Estratégica de Vigilância em Saúde. Guia de vigilância em saúde. Febre Tifoide [internet]. 5. ed. Brasília; 2021 [acesso em 17 jun 2022]. Disponível em: [https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/publicacoes-svs/vigilancia/guia-de-vigilancia-em-saude\\_5ed\\_21nov21\\_isbn5.pdf](https://www.gov.br/saude/pt-br/centrais-de-conteudo/publicacoes/publicacoes-svs/vigilancia/guia-de-vigilancia-em-saude_5ed_21nov21_isbn5.pdf)
  3. Secretaria de Saúde de São Paulo (município). Coordenação de Vigilância em Saúde. Informe de febre tifoide 2017: município de São Paulo – SE 1 a 52/2017 [internet]. São Paulo; 2017 [acesso em 17 jun 2022]. Disponível em: [https://www.prefeitura.sp.gov.br/cidade/secretarias/upload/informe\\_febre\\_tifoide\\_2017.pdf](https://www.prefeitura.sp.gov.br/cidade/secretarias/upload/informe_febre_tifoide_2017.pdf)
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