

Typhoid

31 January 2018

Key facts

- Typhoid fever is a life-threatening infection caused by the bacterium *Salmonella Typhi*. It is usually spread through contaminated food or water.
- An estimated 11–20 million people get sick from typhoid and between 128 000 and 161 000 people die from it every year.
- Symptoms include prolonged fever, fatigue, headache, nausea, abdominal pain, and constipation or diarrhoea. Some patients may have a rash. Severe cases may lead to serious complications or even death.
- Typhoid fever can be treated with antibiotics although increasing resistance to different types of antibiotics is making treatment more complicated.
- Two vaccines have been used for many years to prevent typhoid. A new typhoid conjugate vaccine with longer lasting immunity was prequalified by WHO in December 2017.

Typhoid fever is a life-threatening infection caused by the bacterium *Salmonella Typhi*. It is usually spread through contaminated food or water. Once *Salmonella Typhi* bacteria are eaten or drunk, they multiply and spread into the bloodstream.

Urbanization and climate change have the potential to increase the global burden of typhoid. In addition, increasing resistance to antibiotic treatment is making it easier for typhoid to spread through overcrowded populations in cities and inadequate and/or flooded water and sanitation systems.

Symptoms

Salmonella Typhi lives only in humans. Persons with typhoid fever carry the bacteria in their bloodstream and intestinal tract. Symptoms include prolonged high fever, fatigue, headache, nausea, abdominal pain, and constipation or diarrhoea. Some patients may have a rash. Severe cases may lead to serious complications or even death. Typhoid fever can be confirmed through blood testing.

Epidemiology, risk factors, and disease burden

Improved living conditions and the introduction of antibiotics resulted in a drastic reduction of typhoid fever morbidity and mortality in industrialized countries. In developing areas of Africa, the Americas, South-East Asia and the Western Pacific regions, however, the disease continues to be a public health problem.

WHO estimates the global typhoid fever disease burden at 11-20 million cases annually, resulting in about 128 000–161 000 deaths per year.

Typhoid risk is higher in populations that lack access to safe water and adequate sanitation. Poor communities and vulnerable groups including children are at highest risk.

Treatment

Typhoid fever can be treated with antibiotics. As resistance to antibiotics has emerged including to fluoroquinolones, newer antibiotics such as cephalosporins and azithromycin are used in the affected regions. Resistance to azithromycin has been reported sporadically but it is not common as of yet.

Even when the symptoms go away, people may still be carrying typhoid bacteria, meaning they can spread it to others through their faeces.

It is important for people being treated for typhoid fever to do the following:

- Take prescribed antibiotics for as long as the doctor has prescribed.

- Wash their hands with soap and water after using the bathroom, and do not prepare or serve food for other people. This will lower the chance of passing the infection on to someone else.
- Have their doctor test to ensure that no *Salmonella Typhi* bacteria remain in their body.

Prevention

Typhoid fever is common in places with poor sanitation and a lack of safe drinking water. Access to safe water and adequate sanitation, hygiene among food handlers and typhoid vaccination are all effective in preventing typhoid fever.

Two vaccines have been used for many years to protect people from typhoid fever:

- an injectable vaccine based on the purified antigen for people aged over 2 years
- a live attenuated oral vaccine in capsule formulation for people aged over 5 years

These vaccines do not provide long-lasting immunity and are not approved for children younger than 2 years old.

A new typhoid conjugate vaccine, with longer lasting immunity, was prequalified by WHO in December 2017 for use in children from the age of 6 months.

All travelers to endemic areas are at potential risk of typhoid fever, although the risk is generally low in tourist and business centres where standards of accommodation, sanitation and food hygiene are high. Typhoid fever vaccination should be offered to travelers to destinations where the risk of typhoid fever is high.

The following recommendations will help ensure safety while travelling:

- Ensure food is properly cooked and still hot when served.
- Avoid raw milk and products made from raw milk. Drink only pasteurized or boiled milk.

- Avoid ice unless it is made from safe water.
- When the safety of drinking water is questionable, boil it or if this is not possible, disinfect it with a reliable, slow-release disinfectant agent (usually available at pharmacies).
- Wash hands thoroughly and frequently using soap, in particular after contact with pets or farm animals, or after having been to the toilet.
- Wash fruits and vegetables carefully, particularly if they are eaten raw. If possible, vegetables and fruits should be peeled.

WHO response

In December 2017, WHO prequalified the first conjugate vaccine for typhoid. This new vaccine has longer-lasting immunity than older vaccines, requires fewer doses and can be given to children from the age of 6 months.

This vaccine will be prioritized for countries with the highest burden of typhoid disease. This will help reduce the frequent use of antibiotics for typhoid treatment, which will slow the increase in antibiotic resistance in *Salmonella* Typhi.

In October 2017, the Strategic Advisory Group of Experts (SAGE) on immunization, which advises WHO, recommended typhoid conjugate vaccines for routine use in children over 6 months of age in typhoid endemic countries. SAGE also called for the introduction of typhoid conjugate vaccines to be prioritized for countries with the highest burden of typhoid disease or of antibiotic resistance to *Salmonella* Typhi.

Shortly after SAGE's recommendation, the Gavi Board approved US\$ 85 million in funding for typhoid conjugate vaccines starting in 2019.