

Disease Transmission Case Study: Typhoid Mary

One of the most famous cases of disease transmission involves a cook who worked for eight families in New York State in the early 1900s. Later known as “Typhoid Mary,” this woman showed no symptoms of typhoid but spread it to those who ate the food she prepared. In 10 years, Mary Mallon was responsible for seven epidemics that infected more than 50 people with typhoid fever. One estimate indicates that she may have been indirectly responsible for as many as 200 cases. Authorities first tracked her down in 1907 and isolated her in a cottage on an island. In 1910, she was released after agreeing not to take a food-handling job again—but she did, causing more typhoid outbreaks. The New York health authorities found her again in 1915 working as a “Mrs. Brown” in a maternity hospital in New York, where she had infected another 25 people (2 of whom died). She was sent back to the island and lived there for the remaining 23 years of her life.

Typhoid fever is a life-threatening illness caused by the bacterium *Salmonella typhi*. About 500 cases occur in North America each year, and 70% of these are acquired while travelling internationally. Typhoid fever is still common in the developing world, where it affects about 12.5 million people each year. The carrier is the key link in the transmission of typhoid. The convalescent patient releases both solid and fluid wastes that contain the harmful microorganism. The pathogenic microorganism—a Gram-negative, motile rod that lives only in humans—is transferred to food and finally to the new host. The bacteria then incubate in the new host, usually for one to three weeks, depending on the size of the infecting dose. Then symptoms begin to appear. High fever is followed by chills, headache, malaise, loss of appetite, enlarged spleen, and constipation. In most cases, typhoid fever causes mucus to build up in the respiratory tract, and the patient experiences difficulty breathing. The disease often produces rosy spots on the abdomen. The microorganism does its greatest damage to the digestive tract; small holes or perforations in the small intestine often begin to bleed. The 15% fatality rate of typhoid fever can be reduced to 1% with antibiotic therapy.

Answer the following questions on a separate piece of paper:

1. Describe the bacterium that causes typhoid, and sketch its shape.
2. Draw a flow chart showing how the disease is transmitted.
3. What is the incubation period of this infectious disease?
4. List the symptoms of typhoid.
5. How might the cycle of transmission of typhoid fever be broken?
6. Speculate as to why Mary Mallon did not show any symptoms of typhoid.
7. Why are perforations to the intestine dangerous?
8. What three organ systems are affected by this disease?
9. Should all food handlers be tested for the presence of infectious organisms? State your opinion, with reasons.
10. Explain the following advice for travellers: “Boil it, cook it, peel it, or forget it.” What other advice might you give those planning on visiting areas with a high incidence of typhoid?