



## PLAGUE

### Frequently Asked Questions

#### What is plague?

Plague is an infectious disease in humans and animals caused by the bacteria *Yersinia pestis*. Wild rodents, especially ground squirrels and prairie dogs, are the natural sources for plague. The disease is spread to animals and humans through infected fleas, by direct contact with the tissues or body fluids of an animal infected with plague, or by inhaling infectious droplets from persons or animals.

#### What types of plague are there?

There are three forms of plague. They are all caused by *Y. pestis* but are transmitted differently and their symptoms differ.

- *Bubonic plague* is the most common form of plague. This occurs when an infected flea bites a person or when materials contaminated with *Y. pestis* enter through a break in a person's skin. Patients develop swollen, tender lymph glands (called buboes) as well as fever, headache, chills, and weakness. Bubonic plague does not spread from person-to-person.
- *Pneumonic plague* occurs when *Y. pestis* infects the lungs. This type of plague can spread from person-to-person through the air by respiratory droplets. Becoming infected in this way usually requires direct and close contact with the ill person or animal. Pneumonic plague may also occur if a person with bubonic or septicemic plague is untreated and the bacteria spread to the lungs. Pneumonic plague is the least common but most rapidly fatal form of the plague.
- *Septicemic plague* occurs when plague bacteria multiply in the blood. It can be a complication of pneumonic or bubonic plague or it can occur by itself. When it occurs alone, it is caused in the same ways as bubonic plague. Septicemic plague does not spread from person to person.

#### What are the signs and symptoms of plague?

- Symptoms of *bubonic plague* include fever, chills, muscle aches, headache, nausea, vomiting, diarrhea, abdominal pain, and extreme exhaustion. Swollen and tender lymph nodes near the flea-bitten area are typical of bubonic plague.
- Patients with *pneumonic plague* usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or

watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

- If *septicemic plague* occurs as a complication of bubonic plague, buboes may be present. Symptoms include fever and chills; abdominal pain, diarrhea and vomiting; bleeding from your mouth, nose or rectum, or under your skin; shock; and blackening and death of tissue (gangrene) in your extremities, most commonly your fingers, toes and nose. The gangrene associated with septicemic plague inspired the nickname Black Death for the 14th-century pandemic.

### **How do people become infected with bubonic plague?**

Bubonic plague occurs when an infected flea bites a person, transmitting *Y. pestis* particles during feeding. Bubonic plague can also be transmitted when materials contaminated with *Y. pestis* enter through a break in a person's skin.

### **How do people become infected with pneumonic plague?**

Pneumonic plague occurs when *Y. pestis* infects the lungs. Transmission can take place if someone breathes in *Y. pestis* particles suspended in respiratory droplets from a person (or animal) infected with pneumonic plague. Respiratory droplets are spread most readily by coughing or sneezing. Becoming infected in this way usually requires direct and close (within 6 feet) contact with the ill person or animal. Pneumonic plague may also occur if a person with bubonic or septicemic plague is untreated and the bacteria spread to the lungs.

### **Does plague occur naturally?**

Yes. The World Health Organization reports 1,000 to 3,000 cases of plague worldwide every year. An average of 5 to 15 cases occurs each year in the western United States. These cases are usually scattered and occur in rural to semi-rural areas. Most cases are of the bubonic form of the disease. Naturally occurring pneumonic plague is uncommon, although small outbreaks do occur. Both types of plague are readily controlled by standard public health response measures.

### **How can a person avoid getting bubonic plague?**

People living, working, or playing in areas with active plague infection in wild rodents need to take precautions to:

- dispose of food and garbage,
- avoid sick or dead animals,
- treat dogs and cats with insecticides to prevent flea infestation, and
- use insect repellents when outdoors in areas where there is a risk of flea exposure.

**Can a person exposed to pneumonic plague avoid becoming sick?**

People having direct and close contact with someone with pneumonic plague should wear tightly fitting disposable surgical masks. If surgical masks are not available, even makeshift face coverings made of layers of cloth may be helpful in an emergency. People who have been exposed to a contagious person can be protected from developing plague by receiving prompt antibiotic treatment.

**What is the incubation period for plague?**

Someone exposed to *Y. pestis* through a flea bite or by breathing in infective particles would become ill about 2 to 7 days following exposure.

**How is plague diagnosed?**

The first step is evaluation by a health worker. If the health worker suspects plague, samples of the patient's blood, sputum, spinal fluid, or lymph node aspirate are sent to a laboratory for testing. Once the laboratory receives the sample, preliminary results can be ready in less than two hours. Confirmation will take longer, usually 24 to 48 hours.

**Can plague be treated?**

As soon as a doctor suspects that a person has plague, the patient will need to be admitted to an isolation room in a hospital. There, the infected person will receive powerful antibiotics directly into the veins (intravenously) or muscles (intramuscularly) for at least 10 days.

Streptomycin and gentamicin are the most effective drugs against plague. Other alternatives include intravenous doxycycline (Vibramycin), ciprofloxacin (Cipro), and chloramphenicol (Chloromycetin).

If serious complications occur, such as bleeding abnormalities, organ failure, and respiratory distress, then respiratory support, intravenous fluids, and oxygen may be necessary.

Even if a person does not have signs or symptoms of infection, treatment with preventive, oral antibiotics for seven days after direct exposure to a person with pneumonic plague is necessary.

**What should someone do if they suspect they or others have been exposed to plague?**

Get immediate medical attention. To prevent illness, a person who has been exposed to plague must receive antibiotic treatment without delay. If an exposed person becomes ill, antibiotics must be administered within 24 hours of their first symptoms to reduce the risk of death.

Notify authorities. Immediately notify local or state health departments so they can begin to investigate and control the problem right away.

**How long can plague bacteria exist in the environment?**

*Yersinia pestis* is easily destroyed by sunlight and drying. Even so, when released into air, the bacterium will survive for up to one hour, depending on conditions.

**Is a vaccine available to prevent plague?**

Currently, no plague vaccine is available in the United States. Research is in progress, but vaccines are not likely for several years or more.

**Links:**

CDC - <http://www.cdc.gov/plague/>