



# Plague Information Sheet

## NORAD-USNORTHCOM/SG

### What is plague?

Plague is an infectious disease caused by the bacterium *Yersinia pestis*. The plague was known as the “Black Death” during the 1300’s, due to the decimation of one-third of the European population. Plague is classified as a Category A agent by the Centers for Disease Control and Prevention. Category A agents are believed to pose the greatest potential threat for adverse public health impact and have a moderate to high potential for large-scale dissemination.

### Why are we concerned with plague as a bioweapon?

The availability of *Y. pestis* around the world, capacity for mass production and aerosol dissemination, difficulty in preventing such activities, high fatality rate of pneumonic plague, and potential for secondary spread of cases during an epidemic, the potential use of plague as a biological weapon is of great concern. To complicate the potential for weapon use, a multi-drug resistant *Yersinia pestis* was identified in Madagascar. Further, the Soviet Union had a successful program of making more virulent bacteria and adapting plague for weapon use. With the reforms of the Soviet Union, there is a great fear of this “knowledge” being replicated by other hostile governments using former Soviet scientists.

### Does this disease occur naturally?

Yes, it is a naturally occurring disease. It primarily infects rats, ground squirrels, prairie dogs and other rodents on every populated continent except Australia. Bubonic plague is the most common encountered natural form. Pneumonic plague is rare in the natural state.

### Are there different forms of this disease?

There are three different types of diseases associated with Plague: pneumonic and bubonic, and septicemic. Pneumonic plague affects the lungs, is typically inhaled, can spread person to person and is the most fatal in untreated cases (100% if untreated). Bubonic plague affects the lymph nodes, is the most common form, rarely spreads person to person. Septicemic plague occurs when bacteria multiply in the blood and does not spread person to person. It can be a complication of bubonic or pneumonic plague.

### Is the disease seasonal in its occurrence?

No seasonal occurrences in the literature.

### Where is the disease currently established?

Plague can be found worldwide. Globally, the World Health Organization reports 1,000 to 3,000 cases of plague every year.

### How does it spread?

For humans, the source of infection is usually being bitten by fleas infected with *Yersinia pestis* or by handling an infected animal. Person-to-person: Pneumonic plague is transmitted by large respiratory droplets. You can breathe the tiny particles into your lungs if you have prolonged close contact with somebody with the disease. Bubonic and septicemic plague does not spread person to person.

### What is the risk of catching plague?

Outbreaks in people still occur in rural communities or in cities. They are usually associated with infected rats and fleas that live in the home. No gender or age risk has been identified.

### What are the symptoms of plague?

Pneumonic plague is an infection of the lungs due to either inhalation of the organisms (primary pneumonic plague), or spread to the lungs from septicemia (secondary pneumonic plague). The first signs of illness include high fever, chills, headache, malaise, and muscle aches, followed within 24 hours by a cough with bloody sputum. Gastrointestinal symptoms, including nausea, vomiting, diarrhea, and abdominal pain, may be present. Bubonic plague begins with acute onset of nonspecific symptoms, including painful lymph nodes, high fever, malaise, headache, muscle aches, and sometimes nausea and vomiting. Up to half of patients will have abdominal pain. Bubonic is the most common form and is frequently encountered in rural populations.

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Septicemic plague begins when plague bacteria multiplies in the blood. Patients have fever, chills, abdominal pain, shock and bleeding into the skin and other organisms.

### **How soon do infected people get sick?**

Plague symptoms begins after an incubation period of 1-6 days, with high fever, chills, headache, malaise, gastrointestinal symptoms.

### **How is plague diagnosed?**

An attack using aerosolized plague would be very difficult to diagnosis. It would require more clinical suspicion than actual initial laboratory findings. Suspect plague if a large number of previous health individuals develop fevers, malaise, headache and flu-like symptoms. Definitive diagnosis requires culture of the organism from blood, sputum, CSF, or lymph node aspirates. Animal samples maybe helpful in the diagnosis of the plague.

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

No vaccine is currently available for prophylaxis of plague. The previously available licensed, killed vaccine was effective against bubonic plague, but not against aerosol exposure.

### **Can plague be treated? Yes.**

Pre – exposure? None

Post exposure/prior to onset of symptoms? Plague pneumonia is almost always fatal if treatment is not initiated within 24 hours of the onset of symptoms. Supportive therapy and antibiotics (Streptomycin, gentamicin, doxycycline, chloramphenicol) as indicated for treatment. Duration of therapy is 10 to 14 days. While the patient is typically afebrile after 3 days, the extra week of therapy prevents relapses.

Post exposure/after onset of symptoms? Treatment of bubonic plague is the same as for pneumonic plague. Supportive therapy and antibiotics (Streptomycin, tetracycline, gentamicin, doxycycline, chloramphenicol) as indicated for treatment and secondary infections. Duration of therapy is 10 to 14 days. While the patient is typically afebrile after 3 days, the extra week of therapy prevents relapses.

### **Where will the medications/immunizations to treat infected individuals come from?**

Regionally dependent resources based on national stockpiles.

### **Are there contraindications to vaccine, antibiotic therapy, and other treatments (ie. Pregnancy, immunosuppression, etc)**

Contraindications as indicated for specific antibiotics.

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

The organism remains viable in contaminated water, moist soil, and grains for several weeks. At near freezing temperatures, it will remain alive from months to years but is killed by 15 minutes of exposure to 55°C. It also remains viable for some time in dry sputum, flea feces, and buried bodies but is killed within several hours of exposure to sunlight.

### **Are there ways to test for plague in the environment?**

No field expedient methods are available for testing. Samples must be sent to laboratory for testing.

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

Contact public health officials or contact a medical care provider immediately for further instructions.

### **What can I do to reduce the risk of getting plague or giving it to someone else?**

Person-to-person transmission is possible from another infected person with prolonged face-to-face contact. Epidemic plague is best prevented by effective rodent control.

#### References:

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