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# *Plague Fact Sheet*

(11/13/01)

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Plague is an infectious disease of animals and humans caused by *Yersinia pestis*, a bacterium.

Plague exists in nature as a disease of wild rodents, including rats, ground squirrels, and prairie dogs. Plague is transmitted primarily by fleas as part of an etiologic agent (*Y. pestis*)-arthropod vector-vertebrate host cycle. Carnivores (e.g., dogs, coyotes, raccoons, and skunks) may become infected, but with the exception of cats, they rarely develop clinical signs. Infection of carnivores is most likely due to ingestion of plague-infected animals rather than fleabites. Domestic cats appear to be at increased susceptibility and about 50% of those affected will eventually succumb to the disease.

Humans may develop bubonic, primary septicemic, or pneumonic plague from the bite of infected fleas; by handling tissues of infected animals, especially rodents and rabbits; by contact with airborne droplets from human patients or household pets (especially cats) with plague pharyngitis or pneumonia; or through careless manipulation of laboratory cultures.

Clinical signs in humans usually develop within 2 to 8 days of infection and include sudden onset of headache, fever, chills, and weakness. An acutely swollen and painful lymph node (bubo) often appears approximately 24 hours after the start of clinical signs. Some individuals may develop septicemia without a bubo (primary septicemic plague) or septicemia may occur secondary to bubonic plague. Gangrene (hence the name “black death”), coagulopathies, and multiple organ failure may result from advanced plague septicemia.

Secondary pneumonic plague develops in about 10 to 15% of patients with bubonic or primary septicemic plague by spread of *Y. pestis* to the lungs. Clinical signs in patients with pneumonic plague include cough, chest pain, bronchopneumonia, and hemoptysis. Primary pneumonic plague caused by inhalation of *Y. pestis* is rare, but has been reported after handling of cats with pneumonic plague.

The case fatality rate for untreated bubonic plague in humans is about 50%. Untreated primary septicemic plague and pneumonic plague are invariably fatal. Modern therapy has markedly reduced fatalities from bubonic plague. Pneumonic and septicemic plague also respond if recognized and treated early.

Foci of plague exist on all continents, with the exception of Australia. In North America, plague is found in animals and their associated fleas from the Pacific Coast to the Great Plains, and from southwestern Canada to Mexico. Human cases have developed in New Mexico, Arizona, Colorado, Nevada, and California.

*Y. pestis* may be identified microscopically by examination of Gram, Wright, Giemsa, or Wayson’s stained smears of peripheral blood, sputum, and bubo or cerebrospinal fluids. Finding bipolar-staining, ovoid, Gram-negative organisms permits a rapid presumptive diagnosis of plague. Organisms may also be identified through bacteriologic culture.

Historically, the treatment of choice for bubonic, septicemic, and pneumonic plague has been streptomycin; however, this drug is no longer readily available. Alternatives include gentamicin, doxycycline, ciprofloxacin, and chloramphenicol.

Prevention of plague is based on control of rodents and vectors. Insecticides should be used to control insect populations, and these should be applied prior to or simultaneously with methods to eradicate rodent reservoir populations. Preventing contact between domestic hosts and wild rodent sources of infection is also important. Cats and dogs should be kept indoors and food and shelter should be denied to rats or wild rodents around residences and recreational areas. Pets should be regularly defleaed.

Plague resulting from aerosolization of *Y. pestis* is of most concern when considering the use of plague as a biological weapon.

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