

Plague

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Plague is a flea-borne infection caused by the bacteria *Yersinia pestis*. It is a disease that affects humans and other mammals.

Plague most often has been associated with the death of millions of people in the Middle Ages. However, it still is found sporadically in some parts of the world. For instance, cases occur nearly every year in the western US, particularly the region known as the Four Corners (Arizona, New Mexico, Utah and Colorado).

In fact, plague still can be found in rodent populations in western North Dakota. A study done in 1996 showed that some wild carnivores (badgers, coyotes) tested positive for antibody to *Yersinia pestis*, indicating they had been exposed to the bacteria, probably through consumption of sick or dead prairie dogs.

The bacteria are maintained in nature by movement between rodents and their fleas. When this circulation is at a low rate, it essentially is unnoticeable and referred to as an enzootic cycle. Occasionally, when the rodent populations are dense, the amount of bacteria transmitted by fleas will increase, and an epizootic or “die-off” of rodents will occur. Wild carnivores (and some domestic cats and dogs in rural areas) then become infected when preying on rodents that are sick or dead as a result of *Y. pestis* infection.

The Disease in Animals

Of all the domestic animal species, cats appear to be the most susceptible to plague. Cats typically become infected through the ingestion of *Y. pestis*-infected rodents. Affected cats will develop swollen lymph nodes in the neck, and, if untreated, the disease can progress to pulmonary plague.

While dogs can develop plague through the same exposure route, they are not as susceptible to the infection as cats. Successful treatment of sick cats would require early diagnosis of the disease.

The Disease in Humans

Human infections can occur when people are bitten by a rodent flea carrying the plague bacterium, are handling the carcass of an animal that has died of plague or through exposure to respiratory droplets from animals or individuals with pulmonary plague.

Human plague is found in essentially three types:

- **Bubonic plague** is characterized by the sudden onset of flulike symptoms with swollen lymph nodes (buboes).
- **Septicemic plague** occurs when the bacteria gains access to the blood stream and causes symptoms of shock.
- **Pulmonary plague** involves infection of the respiratory tract and is the most serious form of the disease.

If untreated, the development of plague can be progressive, moving from bubonic to septicemic to pulmonary. If an individual has had potential exposure to the plague bacterium through any of the routes discussed above, he or she should contact his or her physician immediately.

Diagnosis

A diagnosis of plague is made by history of exposure, clinical signs, and identification of the organism through culture, examination of blood smears or molecular diagnostic techniques. Early diagnosis is the key to successful treatment.

Between 1900 and 2010, 999 confirmed or probable human plague cases occurred in the U.S. In recent decades, an average of seven human plague cases have reported each year (www.cdc.gov/plague/maps/index.html).

Treatment

Because *Yersinia pestis* is a bacterium, it will respond to antibiotic therapy. A physician will help set the proper course of treatment.

Risk of Exposure

Animal owners and health-care workers should be aware of the potential exposure to *Y. pestis* in the pets they own or treat. Personal protective equipment (masks, gloves, gowns) should be used when handling suspect cases. If exposure is believed to have occurred, contact your physician immediately.

Exposure Point

Here are tips for reducing the risk of exposure to plague:

- Sick animals, cats in particular, should be seen by a veterinarian.
- In plague endemic areas (where the disease occurs naturally), treat dogs and cats for fleas.
- Eliminate environments around your home where rodents can flourish.
- Do not pick up or touch dead animals.
- Wear gloves if handling or skinning wildlife.
- Use insect repellent if you are working or involved in recreation outdoors.
- Owners of plague-positive animals should confer with their veterinarian and physician to determine what their level of exposure has been. Post-exposure antibiotic therapy may be warranted in some cases.

No vaccine for humans or animals is available.

For more information on this and other topics, see www.ag.ndsu.edu

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