



Sylvatic Plague Vaccine Frequently Asked Questions

PLAGUE

Q: What is plague?

A: Plague is a disease caused by bacteria called *Yersinia pestis*. It is transmitted by fleas and afflicts many kinds of mammals, including humans. In the United States, 10-20 people are diagnosed with plague each year. The disease is treatable with antibiotics.

Q: What are the symptoms of plague?

A: Symptoms usually start 2-6 days after becoming infected. Symptoms include fever, chills, weakness, and swollen and painful lymph nodes. The infection can spread from the lymph nodes to other parts of the body, including the lungs. There are three types of plague: bubonic (infection of the lymph nodes), septicemic (infection of the blood), and pneumonic (infection of the lungs). Pneumonic plague can be spread from person-to-person and must be treated immediately to prevent death.

Q: How do you contract plague?

A: Most often, people become infected by being bitten by infected fleas. People may also become infected by handling infected animals or their tissues. People can also become infected by breathing in the bacteria, such as from other people or animals with pneumonic plague who are coughing.

Q: Where does plague occur in the U.S.?

A: Most human cases in the United States occur in two regions: 1) northern New Mexico, northern Arizona, and southern Colorado; and 2) California, southern Oregon, and far western Nevada.

Q: Why should I be worried about plague in wildlife?

A: Wild animals, especially rodents, can act as a source of plague for people and their pets. Rock squirrels and their fleas are the most frequent sources of human infection in the southwestern states. For the Pacific states, the California ground squirrel and its fleas are the most common source. Many other rodent species, for instance, prairie dogs, wood rats, chipmunks, and other ground squirrels, suffer plague outbreaks and some of these occasionally serve as sources of human infection. Dogs and cats that roam the outdoors may bring infected fleas back to the home that can then bite people. Pets, especially cats, can become infected by hunting and eating infected rodents and pass the infection on to people. People who handle infected wild animals may become infected through flea bites, contamination of open wounds, or inhaling the bacteria.

Q: What does plague do to prairie dogs?

A: Prairie dogs are highly susceptible to plague and regularly experience outbreaks with devastating losses; 90% or more of the prairie dogs in a colony can die during an outbreak, often

resulting in local or even regional extinctions. Plague mortality is a serious conservation issue for prairie dogs and the animals that depend on them.

Q: Why should we care about prairie dog population management?

A: Some prairie dog species in Colorado are candidates for listing as threatened or endangered species by the U.S. Fish and Wildlife Service. Successful development of a plague vaccine will provide a tool to manage prairie dog populations in some areas so further listing action will be unnecessary.

Q: Why are prairie dogs an important part of the ecosystem?

A: Prairie dogs play a key role in the prairie and montane ecosystem. Numerous kinds of animals depend on prairie dogs and their colonies for food and habitat. Burrowing owls and mountain plovers depend on prairie dog colonies for nesting and breeding habitat. Prairie dog burrows are used as homes by many animals, including burrowing owls, rabbits, badgers, weasels, and snakes. Other animals, such as the swift fox, coyote, weasels, hawks, eagles, and the endangered black-footed ferret rely on prairie dogs for food. Although the vegetation around prairie dog colonies can be sparse, it is more nutritious than plants on uncolonized areas, because the digging activities of prairie dogs help to aerate the soil allowing greater water penetration, and their dung acts as a fertilizer.

SAFETY AND PREVENTION

Q: How can I tell if an animal has plague?

A: Often the first sign of a plague outbreak in prairie dogs and other rodents is a noticeable absence of the animals where they had previously been plentiful. Dead rodents may be found with blood oozing from their nostrils or mouth. Pet cats that are infected can become severely ill very quickly with high fever and swollen lymph nodes in the neck. Prompt veterinary treatment is important.

Q: What can I do to reduce the risk of plague infection for me and my pets?

A: It is important to avoid contact with wild rodents and their fleas. Do not pick up or touch dead animals. If plague has recently been found in your area, report any observations of sick or dead animals to the local health department or law enforcement officials. Eliminate sources of food and nesting places for rodents around homes, work places, and recreation areas; remove brush, rock piles, junk, cluttered firewood, and potential food supplies, such as pet and wild animal food. Make your home rodent-proof. If you anticipate being exposed to rodent fleas, apply insect repellent to clothing and skin, according to label instructions, to prevent flea bites. Wear gloves when handling potentially infected animals. If you live in areas where rodent plague occurs, treat pet dogs and cats for flea control regularly and do not allow these animals to roam freely. Health authorities may use appropriate chemicals to kill fleas at selected sites during animal plague outbreaks.

SYLVATIC PLAGUE VACCINE

Q: What is sylvatic plague vaccine?

A: Sylvatic plague vaccine (SPV) is a modified raccoon poxvirus that produces two proteins of *Yersinia pestis*. These proteins do not cause plague but act to stimulate the production of

antibodies against plague. The vaccine is contained in peanut butter-flavored bait that is readily eaten by prairie dogs.

Q: How does a prairie dog get vaccinated by eating this bait?

A: When a prairie dog eats the peanut butter-flavored bait containing the vaccine, the tissues inside the animal's mouth are exposed to the vaccine. The prairie dog will produce antibodies that help protect them from plague if bitten by an infected flea. In laboratory studies, consumption of baits by prairie dogs resulted in significant protection against plague infection.

Q: How long does the vaccine last?

A: Available research suggests this vaccine should be effective for at least 9 months in prairie dogs and probably longer. However, it is difficult to determine how immune systems in individual animals will respond to the vaccine.

Q: How do you know which animals eat the bait?

A: The baits contain a biomarker, Rhodamine B, providing a safe, non-lethal way to determine if an animal has eaten a bait. After an animal eats a bait, the biomarker is incorporated into hair and whiskers as they grow. Whiskers of animals that have eaten baits luminesce when viewed under a special microscope. Biomarker is also excreted in the feces which turn a red color.

Q: Is this bait dangerous?

A: No. The vaccine in these baits cannot cause plague and has been shown to be safe in several kinds of animals. Other vaccines that use the same virus have been shown to be safe in numerous types of animals, including rabbits, sheep, cats, and dogs.

Q: Can I get plague from contact with the vaccine?

A: No. The vaccine does not contain whole plague bacteria, but only two genes from the bacterium. The virus that carries these genes has been altered to reduce its ability to cause disease.

Q: What if I find SPV-laden bait?

A: It is best to leave the bait where you found it. The risk of human infection with the vaccine virus is low, but it is best to avoid contact. If you need to pick up the bait, wear gloves or use a plastic bag to avoid skin contact with the bait. As with any biological matter, wash your hands thoroughly with soap and water after any contact with bait.

Q: What if my dog or cat eats SPV-laden bait?

A: The virus used in the vaccine has been shown to be safe in many different kinds of animals, including domestic dogs and cats. Eating a large number of baits may cause a temporary upset stomach in your pet but does not pose a long-term health risk. Do not attempt to remove bait from your pet's mouth; doing so may cause you to be bitten. If your pet becomes ill from consuming baits, please contact your veterinarian.

Q: Can I use this bait to vaccinate my dog or cat?

A: No. This vaccine is only for use in prairie dogs. Currently, there is no plague vaccine for pets.