Plague

Plague is a Class A disease, and must be reported to the state within 24 hours.

Plague is an acute, febrile, zoonotic disease caused by *Yersinia pestis*, a Gram-negative coccobacillus in the family *Enterobacteriaceae*. Due to its high potential for use as a biological weapon, particularly for pneumonic plague, it remains a disease of high concern.

The infectious dose and incubation period may range anywhere from 10 to 500 organisms and one to eight days respectively, depending on the type of disease and mode of transmission. The disease can be transmitted through respiratory droplets, direct and indirect contact, fecal-oral transmission, and via insect vectors, especially the rat flea. Weaponized plague may be transmitted through true airborne transmission, if the organism is altered to permit the bacillus to be suspended in air for a long duration.

In the United States the principal epizootic hosts are ground squirrels, prairie dogs and chipmunks, and a variety of burrowing rats that dwell near humans. Two varieties of rodents, the common black or roof rat (*Rattus rattus*) and the Norway rat or sewer rat (*Rattus norvegicus*), serve as excellent hosts for rat fleas. Plague is more commonly maintained in enzootic cycles among wild rodent populations from a large area spanning the Pacific coast to Texas, Oklahoma, Kansas and the Dakotas. However, human cases occur in two focal regions, mainly the southwestern states of New Mexico, northern Arizona, southern Colorado and the Dakotas. Sporadic cases occur annually within these two foci.

Between 1900 and 2012, 1006 confirmed or probable cases of plague occurred in the U.S., of which over 82% exhibited the bubonic form, followed by septicemic (10%), and pneumonic (8%). An average of seven human plague cases (range: 1 to 17 cases per year) have been reported each year, affecting people of all ages, though 50% of cases occurred in the 12 to 45-year-old age group. Median age of the patient was 29 years (range = 1 to 94 years), and 65% of infected patients were male. White non-Hispanics accounted for 55% of all cases; 16% of cases were seen in American Indian and Asian persons.

While the last urban plague epidemic in the U.S. occurred in the 1924-1925 time period in Los Angeles, with no person-to-person transmission of plague reported since then, a recent report by the Centers for Disease Control and Prevention identified the first case of possible human-to-human transmission during a plague outbreak in Colorado in June 2014.

Most cases of plague in Louisiana, if any, are reported in people that have traveled either to western parts of the U.S. or to international locations.

Although no longer available in the U.S., an inactivated whole-cell *Y. pestis* vaccine has been approved in the past; it is recommended only for persons older than 18 years of age whose occupation regularly places them at high risk for exposure to the bacillus, or plague-infected rodents. Prophylaxis is also indicated for people with close exposure to cases of pneumonic plague. Infection control and prevention activities include standard and droplet precautions with appropriate personal protective equipment (PPE).
Taking personal protection precautions such as use of repellents containing DEET/permethrin, rodent and insect control, and employing steps to reduce rodent habitat around homes are necessary to reduce infection and transmission of plague.

**Outbreak in Louisiana**

All cases of human plague infection in Louisiana occurred from 1900 to 1925, when cases were restricted exclusively to port cities on the Pacific and Gulf coasts. No cases have been reported in Louisiana since a plague outbreak in New Orleans that ended in 1921. Early recognition of the importance and severity of the disease, together with implementation of strong preventive and control measures resulted in the control of the epidemic. Preventive measures, including a rat-trapping campaign, had already been in place since the detection of the first case of bubonic plague in the U.S. in 1912. Louisiana witnessed two plague outbreaks from 1900 to 1925, the result of increased trade and commerce between port cities in the U.S. and other countries. Both outbreaks occurred in the city of New Orleans.

The first outbreak occurred in the years 1914 to 1915, and resulted in 31 cases, of which 10 were fatal. The index case was identified as a Swedish sailor who arrived in New Orleans and died as a result of bubonic plague. An epidemiological investigation indicated that the deceased was a resident of the Volunteers of America Home located at 713 St. Joseph Street in New Orleans when he developed symptoms. He was later treated at Charity Hospital. More cases of plague were identified thereafter at the rate of one case every three days, with a peak month in August.

To limit transmission of plague, a number of preventive measures were taken and ordinances were passed to strengthen the efforts. Residents were evacuated from the Volunteers of America Home and quarantined outside city limits. All furnishings inside the home were burned in a bonfire. Infected patients were placed in an isolated ward and were treated with anti-plague serum. Other measures included implementation of a prevention strategy for the entire city, consisting of reducing the rat population through a massive trapping campaign, destruction of breeding sites, transformation of city landscapes, ‘rat-proofing’ of buildings, and enforcing the use of closed garbage cans. Housing codes were also enacted that mandated the elevation of dwellings above ground level. Houses of the infected were subjected to fumigation, burning, and complete leveling. These control and prevention activities proved to be very successful, and later served as a model to control plague outbreaks elsewhere in the country.

The second outbreak occurred in New Orleans from 1919 to 1921 causing 25 cases and 11 deaths. In the late 1920s New Orleans was declared free of bubonic plague.