

## Human Plague — United States, 2015

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Since April 1, 2015, a total of 11 cases of human plague have been reported in residents of six states: Arizona (two), California (one), Colorado (four), Georgia (one), New Mexico (two), and Oregon (one). The two cases in Georgia and California residents have been linked to exposures at or near Yosemite National Park in the southern Sierra Nevada Mountains of California. Nine of the 11 patients were male; median age was 52 years (range = 14–79 years). Three patients aged 16, 52, and 79 years died.

Plague is a rare, life-threatening, flea-borne zoonosis caused by the bacterium *Yersinia pestis*. During 2001–2012, the annual number of human plague cases reported in the United States ranged from one to 17 (median = three cases) (1). It is unclear why the number of cases in 2015 is higher than usual. Plague circulates among wild rodents and their fleas in rural and semirural areas in the western United States (2). Transmission to humans occurs through the bite of infected fleas, direct contact with infected body fluids or tissues, or inhalation of respiratory droplets from ill persons or animals, including ill domesticated cats and dogs (3). The usual incubation period between exposure and illness onset is 2–6 days.

In humans, plague is characterized by the sudden onset of fever and malaise, which can be accompanied by abdominal pain, nausea, and vomiting. There are three main forms of plague, depending upon the route of infection. Bubonic plague, resulting from the bite of an infected flea, accounts for approximately 80%–85% of cases; patients develop a “bubo,” a painful swelling of one or several lymph nodes that progresses during the first few days of illness. Septicemic plague, accounting for approximately 10% of cases, can occur from a flea bite or from direct contact with infectious fluids; infection spreads directly through the bloodstream with no localizing signs. Primary pneumonic plague, occurring in approximately 3%

of plague patients, results from aerosol exposure to infective droplets and is characterized by a fulminant primary pneumonia. Secondary pneumonic plague can result from the spread of *Y. pestis* to the lungs in patients with untreated bubonic or septicemic infection.

The mortality rate for untreated plague has ranged from 66% to 93%; however, in the antibiotic era, mortality has been reduced to approximately 16% (4). Prompt treatment with antimicrobials such as aminoglycosides, fluoroquinolones, or doxycycline greatly improves outcome (4).

Health care providers should consider the diagnosis of plague in any patient with compatible signs or symptoms, residence or travel in the western United States, and recent proximity to rodent habitats or direct contact with rodents or ill domestic animals. Suspicion of plague should prompt 1) collection of blood, bubo aspirate, or sputum samples for *Y. pestis* diagnostic testing; 2) implementation of isolation and respiratory droplet precautions for patients with respiratory involvement; 3) immediate antibiotic treatment (before laboratory confirmation); and 4) notification of public health officials. *Y. pestis*-specific testing is available at state health laboratories. Recommendations for diagnostic testing and antibiotic treatment are available at <http://www.cdc.gov/plague/healthcare/clinicians.html>. Misidentification of *Y. pestis* as *Pseudomonas luteola* and other organisms through the use of automated bacterial identification systems has been reported (5).

Persons engaging in outdoor activities in areas where plague is endemic should wear long pants when possible and use insect repellent on clothing and skin. Persons also should avoid direct contact with ill or dead animals and never feed squirrels, chipmunks, or other rodents. In addition, pet owners should regularly use flea control products on their pets and consult a veterinarian if their pet is ill. Rodent habitat can be reduced



around the home by removing brush, clutter, and potential rodent food sources such as garbage or pet food. Additional information on prevention of plague is available at <http://www.cdc.gov/plague/prevention/index.html>.

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