

## Plague

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### Introduction

Plague is a zoonotic infection with a spectrum of clinical manifestations caused by the Gram negative bacterium *Yersinia pestis*.

The disease is most commonly transmitted by fleas, with several species of wild rodent being the natural hosts, although other mammals such as cats and dogs can also become infected.

Plague is still reported consistently from several countries in Africa, Asia, South America and rural parts of the USA. Plague has spread from China at the end of the last century and extended to the rest of Asia, Europe, Africa and North and South America. In 1994 India reported more than 800 cases of pneumonic plague; however cultures did not confirm the presence of plague.

### Epidemiology

(Data from the [Travel Health Surveillance Section](#) of the Health Protection Agency Communicable Disease Surveillance Centre)

### Global Epidemiology

### Plague Risk in UK Travellers

### Risk for Travellers

Plague is a rare disease in travellers. In the 1994 epidemic in India several states were involved but no travellers were affected.

The risk is highest in those who may have contact with rodents such as field workers.

## Transmission

Plague bacteria are carried in the gullet of fleas. The gullet becomes blocked by replicating bacteria, which forces the fleas to regurgitate bacteria while feeding on mammals.

The most important hosts for transmission of plague to man are the domestic black rat and the brown sewer rat. The disease is maintained in rural areas by hosts that include gerbils, squirrels and prairie dogs.

Direct spread between humans is possible in pneumonic forms of the disease by droplet infection.

## Signs and Symptoms

Plague can have several clinical manifestations; bubonic plague is the most common. Other manifestations include septicaemic plague without bubo, pneumonic plague (primary or secondary to bacteraemia), meningitis, and pharyngitis.

Following an incubation period of two to five days, plague has a sudden onset of fever, chills, headache, malaise, myalgia and nausea.

In bubonic plague, bacteria move from the site of inoculation to regional lymph nodes that enlarge and become painful swellings known as bubos.

The bacteria can spread via the bloodstream resulting in septicaemia that if untreated, can lead to a rapid deterioration and death.

In pneumonic plague the bacteria either infiltrate the lungs causing primary pneumonia, or secondary pneumonia occurs after bacteraemic spread in bubonic plague. This causes severe shortness of breath and cough with blood stained sputum, leading to respiratory failure. Pneumonic plague is rapidly fatal if untreated.

## Treatment

Diagnosis of plague is made by detection of the bacillus in an aspirate of a bubo, sputum or blood.

Prompt treatment is important to achieve clinical cure; therefore antibiotics are usually commenced on clinical diagnosis. The drugs of choice are streptomycin, tetracycline or chloramphenicol.

## Prevention

Plague vaccine is no longer available in the UK and is rarely indicated. When needed for exceptional circumstances, e.g. for high- risk laboratory workers, it can be imported from the United States.

Travellers should take steps to avoid contact with rodents by disposing of rubbish.

[Insect bite avoidance](#) measures should be employed such as the use of repellent on skin and insecticide on clothing, to discourage flea bites.

Tetracycline, doxycycline or trimethoprim-sulphamethoxazole can be used as chemoprophylaxis in persons who will be in close contact with plague pneumonia.

## Reading List

Smith MD. Plague. In: Cook GC, Zumla A (editors.) Manson's Tropical Diseases 21<sup>st</sup> edition. 2003 Elsevier Science Ltd Edinburgh: Elsevier Science Ltd; 2003

## Links

Health Protection Agency [www.hpa.org.uk/infections/topics\\_az/plague/menu.htm](http://www.hpa.org.uk/infections/topics_az/plague/menu.htm)