

## PLAGUE – FREQUENTLY ASKED QUESTIONS

5 October , 2017

### 1. What is plague?

Plague is a zoonotic disease caused by the bacterium *Yersinia pestis*. Plague is found mainly in rodents, and is spread by fleas from rodent to rodent, as well as from rodents to other animals (including dogs) and humans, or accidentally from fleas to humans. Plague is still present in parts of Africa, the Americas and Asia, and is considered a re-emerging disease with 1,000 to 5,000 human cases reported to the World Health Organization (WHO) each year.

### 2. How is plague transmitted?

The most common route of infection for humans is through the bite by a rat flea infected with the disease. People can also get infected through direct contact with infected bodily fluids or tissues whilst handling a sick or dead animal that was infected with plague. Another mode of infection is through inhaling infectious respiratory droplets after close contact with humans or animals with pneumonic plague.

### 3. Who can get plague?

Persons who come into contact with rat fleas that are infected with plague, or who handle rodents that have died from plague, or who are in contact with humans or animals infected with pneumonic plague, are at risk of getting plague.

### 4. Where does plague occur in South Africa and on the African continent?

The last case of human plague in South Africa was reported in 1982 in Coega (Eastern Cape Province) after being dormant for over 10 years. There are 3 national plague surveillance sites (Nelson Mandela Bay Metropolitan – Coega area (Eastern Cape Province), eThekweni Municipality (KwaZulu-Natal Province) and the city of Johannesburg in Gauteng Province). Rodents are trapped and tested for plague antibodies; if there is a positive result then public health measures are put into place to prevent infection of humans. Countries in southern Africa where plague has been reported in the last decade include Madagascar, Democratic Republic of Congo, Uganda, Mozambique, Malawi, Tanzania, Angola, Namibia and Zimbabwe. There is currently a plague outbreak in Madagascar (first reported on 10 December 2013) which is affecting humans, with over 190 cases of suspected and confirmed plague, including 124 cases of pneumonic plague reported.

### 5. How does plague affect animals?

Rodents are susceptible to plague bacteria, and become ill or die following infection. An outbreak of plague in rodents is often observed as an unusual 'die-

off' of rodents, or an absence of rodent infection in an area usually infested. Under these circumstances, rodent fleas are more likely to bite and infect other animals or humans, as their natural hosts have died.

## **6. What are the signs and symptoms of plague?**

Three forms of plague may occur after an incubation period of 2 to 8 days (maximum 15 days) after exposure to the organism:

1) Bubonic plague commences usually after being bitten by an infected rat flea. The patient will present with sudden onset of fever, chills, headache, weakness and swelling of lymph nodes (glands) draining the area of the bite. The patient may also complain of abdominal pain, nausea, vomiting and diarrhoea. If treatment is commenced, symptoms usually resolve within 3 to 5 days. If not treated, the disease becomes more severe and complications may occur including septicaemic plague or pneumonic plagues, which are often fatal.

2) Septicaemic plague may present as a complication of untreated bubonic plague or as the first presentation of plague. It is characterised by fever, chills, extreme weakness, abdominal pain, shock, and possibly bleeding into the skin and other organs. Skin and other tissues may turn black and die, especially on fingers, toes, and the nose.

3) Pneumonic plague can result from untreated bubonic or septicaemic plague, but can also develop after inhaling infectious droplets from an infected individual. Pneumonic plague is characterised by fever, headache, weakness, and a rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Pneumonic plague is infectious, and is transmitted by droplet spread.

## **7. How is plague diagnosed?**

Plague may be diagnosed through culture of clinical specimens (e.g. pus from the swollen lymph node, or blood or sputum) or by detection of antibodies to plague on a blood specimen. Laboratory testing is done in specialised laboratories under strict biosafety conditions.

## **8. How is plague treated?**

Antibiotics are effective in the treatment of plague, and should be started as soon as possible to prevent complications. The antibiotics used for treating plague include tetracyclines (such as doxycycline), fluoroquinolones (such as ciprofloxacin) and aminoglycosides (including streptomycin and gentamycin).

## **9. How can plague be prevented?**

Rodent and flea control as well as surveillance for the disease in the wild rodent population are the main measures used to monitor the risk of outbreaks. A

vaccination is available for persons at high-risk such as laboratory workers, but its effectiveness is not fully known.

**10. Who can I contact for more information?**

Plague is a notifiable disease and all suspected and confirmed cases should be reported immediately to the local, provincial and national departments of health.

For assistance with diagnostic queries, contact the NICD Centre for Emerging and Zoonotic Diseases, Special Bacterial Pathogens Laboratory: (Tel)+27 11 555 0306, or the NICD Hotline +27 82 883 9920 (for use by healthcare professionals only)