



Outbreak Response Unit, and Centre for Emerging Zoonotic and Parasitic Diseases  
National Institute for Communicable Diseases (NICD)  
Office: 011 555-0395 / Fax: 0867 583 326

An outbreak of plague has been declared in Madagascar. According to the WHO situational report released on 4<sup>th</sup> October 2017, 194 suspected, probable and confirmed cases with 30 deaths (case fatality 15.5%) have been reported from 20 districts in 10 regions. Of these, 124 cases (with 21 deaths) have had the pneumonic form of plague. Players from an international basketball competition from 23<sup>rd</sup> September to 1<sup>st</sup> October have been affected including a coach from the Seychelles who died, and a South African player. **South African clinicians are advised to be on high alert for cases amongst persons returning from Madagascar, or their immediate contacts.**

## What is plague?

Plague is a zoonotic disease caused by a bacterium *Yersinia pestis*. Where plague is endemic, it is usually found in rodents and is spread by fleas from rodent to rodent, or to other mammals. Humans may acquire plague from persons with pneumonic plague through droplet transmission or from direct contact with infected rodents or through the bite of an infected flea. The incubation period ranges from 2-8 days.

### Clinical case definition for suspected plague

Specimens should be requested for plague testing in any person who:

- Has returned from Madagascar within the last 10 days, or has been in contact with someone who has returned from Madagascar **AND**
- Has symptoms compatible with pneumonic plague (fever, cough, pneumonia, sepsis syndrome) or bubonic plague (lymphadenopathy, a 'bubo')

Please Call the NICD  
Hotline on  
082 883 9920  
to discuss the case and  
arrange testing for all  
cases of suspected  
plague

## Infection control and prevention for persons with suspected plague

Persons with suspected bubonic, septicaemic or pneumonic plague who have respiratory symptoms including tachypnoea or cough, or evidence of pulmonary involvement on chest radiography, should be isolated and droplet precautions implemented. The patient and health care workers should wear surgical masks. Eye protection should be used to prevent mucous membrane splashes. Hand hygiene is critically important.

## What specimens should be submitted for testing and how should specimens be submitted?

Septicaemic and pneumonic plague:

- Sputum or tracheal aspirates may be submitted to NICD
- Blood cultures may be taken according to standard aseptic procedures and submitted to a routine laboratory. However, any blood culture specimens that are flagged positive by automated blood culture systems should NOT be processed in a routine laboratory, but should be sent immediately to the NICD for processing
- Blood for serological testing may be taken in a yellow top serum-separator tube and sent to the NICD. Sputum specimens or tracheal aspirates should be submitted in a sterile sputum jar.

Bubonic plague:

- Pus or sero-sanguinous fluid aspirated from bubo. If the bubo is not purulent, 1 ml of sterile saline can be injected into the bubo, and aspirated. Place pus or fluid in sterile sputum jar or into Cary-Blair transport medium if transport to the laboratory will be delayed. Specimens should be refrigerated until transport to the laboratory takes place.

### Where to send specimens:

1. **Labelled specimens clearly: "SUSPECTED PLAGUE for laboratory testing"**
2. Blood cultures should be submitted to the routine NHLS or private diagnostic laboratory. Once blood cultures are flagged positive, untouched bottles should be sent to NICD (see below)
3. Sputum, tracheal aspirates or pus should be sent to NICD.
4. **Mark all specimens Attention Dr Jenny Rossouw, Centre for Emerging and Zoonotic Diseases, National Institute for Communicable Diseases, 1 Modderfontein Road, Sandringham, Johannesburg, 2192"**
5. **Call the NICD hotline to arrange rapid transport**



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## What precautions should be observed when collecting specimens for plague testing?

Patients with suspected plague who have respiratory symptoms (even those with the bubonic form of plague) should be placed in respiratory isolation. Sputum should be collected in a safe manner with adequate ventilation and observing strict hand hygiene and droplet precautions. Health care workers who are collecting tracheal aspirates should wear protection for mucous membranes and N95 respirators. Apply standard precautions when aspirating pus from a bubo, or collecting blood for serological testing. Infection control measures are not required after 48 hours of appropriate antibiotic therapy has been administered, AND there is a favourable clinical response.

## How is plague diagnosed and confirmed?

A rapid diagnosis for plague can be done by testing for *Yersinia pestis* F1 antigen in clinical specimens by immunofluorescence, or by enzyme-linked immunoassay (ELISA), or other validated antigen detection systems. Plague is confirmed through culture of the *Yersinia pestis* from clinical specimens. Plague may also be diagnosed through detection of antibodies to plague in paired sera, taken 2 weeks apart. Plague may be diagnosed through demonstration of a change in antibody titre in paired serum specimens taken 4-6 days apart.

## Procedure in event of a positive test for plague

- Inform the infection prevention and control team, and implement appropriate infection control measures immediately (if these were not in place before).
- Consult the laboratory pathologist, or the NICD (through the NICD call phone number above) for management advice including treatment and post-exposure prophylaxis
- **Do NOT inform the media, nor the public until appropriate persons and professionals have been consulted and a communications strategy is agreed upon.**
- Comprehensive guidelines for diagnosis and management are found on the NICD web page: [www.nicd.ac.za/](http://www.nicd.ac.za/) under the 'Diseases A-Z' tab, section 'Plague'

## Public health response to suspected cases of plague consists of

### 1. Identification and risk assessment of contacts

- All contacts of suspected cases of plague should be identified BEFORE laboratory confirmation is obtained.
- *Yersinia pestis* is transmitted through droplet contact. Droplets are relatively large, settle rapidly, and do not escape a 2-3 meter radius of the infected person.
- A contact is any person who has shared an airspace within a 2 meter radius of a suspected or confirmed case of plague during the incubation period or after commencement of clinical symptoms and includes:
  - Persons living and/or sleeping in the same household;
  - Sexual contacts or persons in contact with respiratory secretions
  - If the index case is a young child, persons who care for the child
  - Healthcare workers who have given mouth-to-mouth resuscitation to the patient or have dressed the wounds of a case of bubonic plague without appropriate infection control procedures

### 2. Administration of appropriate post-exposure prophylaxis to all contacts according to the Table.

### 3. Follow up of contacts.

- All contacts should be followed up for a period of 10 days. Quarantine/isolation is not required.

## Prevention of plague in exposed persons.

Plague may be prevented before exposure or after exposure through the administration of antimicrobial chemoprophylaxis. No vaccine is available for the prevention of plague. Antimicrobial prophylaxis may be administered according to the table below.

**Table: Antimicrobial post-exposure prophylaxis for persons exposed to a suspected or confirmed case of plague**

Antibiotic	Dose and duration
Ciprofloxacin	<u>Adults:</u> 500mg po 12hrly x 7 days <u>Children:</u> 10-15mg/kg orally 12 hrly for 7 days
Doxycycline	<u>Adults</u> 100mg po 12 hrly x 7 days <u>Children &gt;8 years and &gt;45kg:</u> adult dose above <u>Children &gt;8 years, &lt;45kg:</u> 2mg/kg po 12 hourly <u>Children &lt;8 years:</u> not indicated