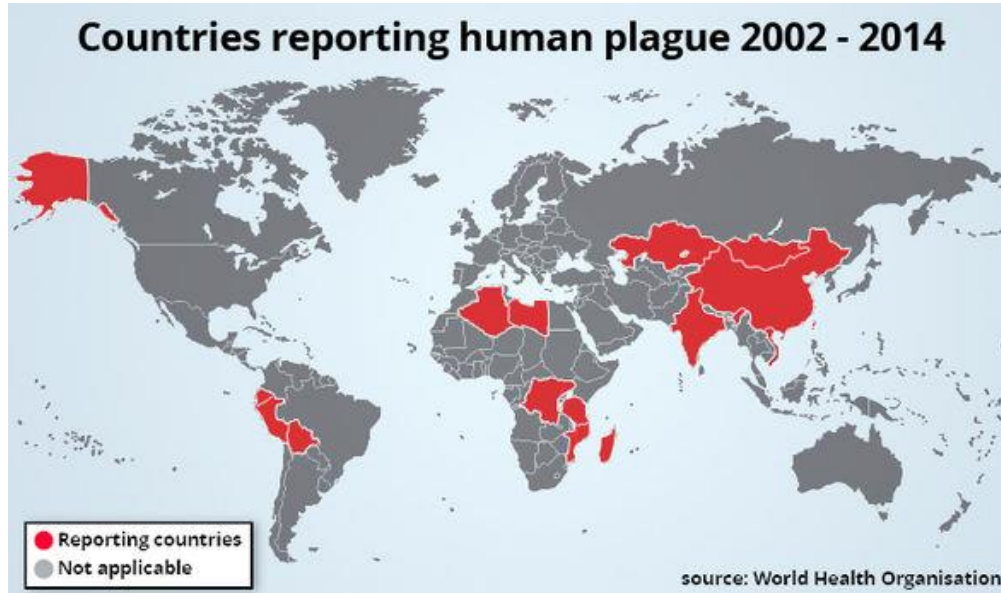


19 October 2017

Advisory on Plague

WHAT IS PLAGUE?

Plague is an infectious disease caused by the zoonotic bacteria, *Yersinia pestis*. This bacteria often infects small rodents (like rats, mice, and squirrels) and is usually transmitted to humans through the bite of an infected flea, or by handling an animal infected with plague. Known as “black death”, plague was infamous for killing millions of people in Europe during the fourteenth century. Pneumonic plague, a particular form of plague infection, is transmitted through infected droplets in a sick person’s cough. Today, modern antibiotics are effective in treating plague. However, without prompt treatment, the disease can cause serious illness or death.

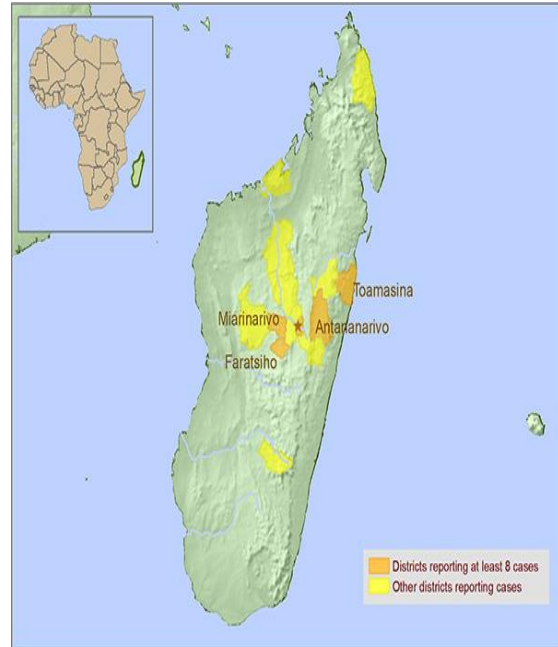


Plague epidemics have occurred in Africa, Asia, and South America; but since the 1990s, most human cases have occurred in Africa. The three most endemic countries are the Democratic Republic of Congo, Madagascar, and Peru. In Madagascar cases of bubonic plague are reported nearly every year, during the epidemic season (between September and April).



WHAT IS THE CURRENT SITUATION OF PLAGUE IN SINGAPORE AND INTERNATIONALLY?

Madagascar has reported a total of 449 cases of plague from 1 Aug to 10 Oct 2017 (322 cases of pneumonic or pulmonary plague, 123 cases of bubonic plague and 1 case of septicaemic plague), with 48 deaths (case fatality rate of 11.6). There has also been a rise in the rate of increase in the number of cases, especially the pneumonic form. Unlike the usual endemic pattern in Madagascar, the plague season began early this year and the current outbreak has unusually affected major urban centres including typically non-endemic areas. There is also a shift from the bubonic form of plague to the pneumonic form. Pneumonic plague is the most virulent form and can be transmitted through infected droplets.



Fortunately, plague has **not** been detected in Singapore thus far, and travel volume from Madagascar to Singapore is low. However, Singapore remains vulnerable to sporadic importation of the disease. In addition, there is a risk of onward transmission of pneumonic plague in the healthcare setting.

HOW IS PLAGUE TRANSMITTED?

Humans can be infected through:

- the bite of infected vector fleas
- unprotected contact with infectious bodily fluids or contaminated materials
- the inhalation of respiratory droplets/small particles from a patient with pneumonic plague.



WHAT ARE THE SYMPTOMS AND HOW SERIOUS IS IT?

A person usually becomes ill with bubonic plague 2 to 6 days after being infected. Someone exposed to *Yersinia pestis* through the air would become ill within 1 to 3 days.

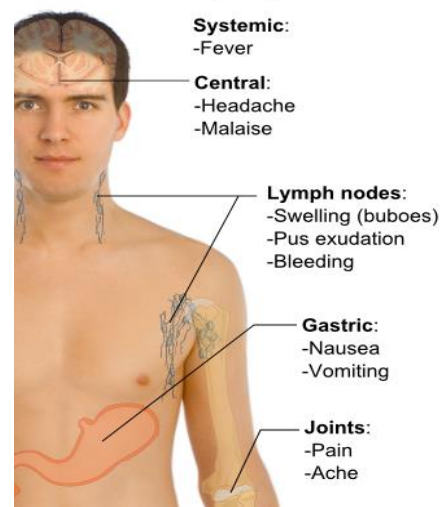
There are three forms of plague infection, depending on the route of infection: bubonic, septicemic and pneumonic.

In bubonic plague, symptoms include sudden onset of fever, headache, chills, and weakness and one or more swollen, tender and painful lymph nodes (called buboes) in the neck, armpits and groin area. This form usually results from the bite of an infected flea. The bacteria multiply in the neighboring lymph nodes which then become inflamed, tense and painful. If the patient is not treated with the appropriate antibiotics, the bacteria can spread to other parts of the body.

Septicaemic plague occurs when infection spreads through the bloodstream. Patients develop 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. This form results from bites of infected fleas or from handling an infected animal.

In pneumonic plague, symptoms include fever, headache, weakness, and a rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery mucous. Pneumonic plague may develop from inhaling infectious droplets or may develop from untreated bubonic or septicemic plague after the bacteria spread to the lungs. The pneumonia may cause respiratory failure and shock.

Symptoms of Bubonic plague



Bubonic plague



Septicemic plague



Pneumonic plague





Plague is a very severe disease in people, particularly in its septicaemic and pneumonic forms. Untreated pneumonic plague has a case-fatality ratio close to 100%.

HOW IS PLAGUE DIAGNOSED?

Confirmation of plague requires laboratory testing which serves to identify *Y. pestis* in a sample of pus from a bubo, blood or sputum. A specific *Y. pestis* antigen can be detected by different techniques. One of them is a Rapid dipstick test, which was validated in the field and is now widely used in Africa and South America, with the support of WHO.

IS THERE ANY TREATMENT AVAILABLE FOR PLAGUE?

Untreated plague can be rapidly fatal, so early diagnosis and treatment is essential for survival and reduction of complications.

Antibiotics and supportive therapy are effective against plague if patients are diagnosed in time.



ARE THERE ANY PREVENTIVE MEASURES AGAINST PLAGUE?

- People, especially health workers, should also avoid direct contact with infected tissues such as buboes, or close exposure to patients with pneumonic plague.
- Routine hand-washing is recommended with soap and water or use of alcohol hand rub.
- Close contacts of patients with pneumonic plague can be given a seven-day course of antibiotic (also known as chemoprophylaxis) to reduce the chance of them coming down with the infection.
- Notwithstanding, travellers to any destination should ensure that they up-to-date on routine vaccines before every trip. These vaccines include measles-mumps-rubella (MMR) vaccine, diphtheria-tetanus-pertussis vaccine, varicella (chickenpox) vaccine, polio vaccine, and annual influenza shots. Those who need to travel to Madagascar should also ensure that they have been vaccinated against preventable conditions such as typhoid, hepatitis A, and rabies (only for selected travellers). These vaccines are available at most of our Raffles Medical Clinics.



IS THERE A VACCINE AVAILABLE TO PROTECT AGAINST PLAGUE?

A plague vaccine is not available. New plague vaccines are in development but are not expected to be commercially available in the immediate future.



WHAT IS THE CURRENT ADVICE FOR INTERNATIONAL TRAVELLERS?

According to the WHO, the risk of international spread of plague appears very low. It advises against any restriction on travel or trade on Madagascar based on the available information. The risk of infection with *Yersinia pestis* for international travellers to Madagascar is generally low.

However, travellers in rural areas of plague-endemic regions may be at risk, particularly if camping or hunting or if contact with rodents takes place. In addition, travellers to previously non-endemic regions from where cases of pneumonic plague have been recently reported should avoid crowded areas, avoid contact with dead animals, infected tissues or materials, and avoid close contact with patients with pneumonic plague.

Travellers can protect against flea bites using repellent products for personal protection against mosquitoes, which may equally be protective against fleas and other blood-sucking insects.





WHAT SHOULD A TRAVELLER DO IF SUSPECTED TO HAVE A POTENTIAL EXPOSURE TO PLAGUE?

Travellers should immediately notify health care personnel if they had potential exposure to pneumonic plague patients, or had other high risk exposures, such as bites from infected fleas or direct contact with body fluids or tissues of infected animals, so that chemoprophylaxis can be started early.

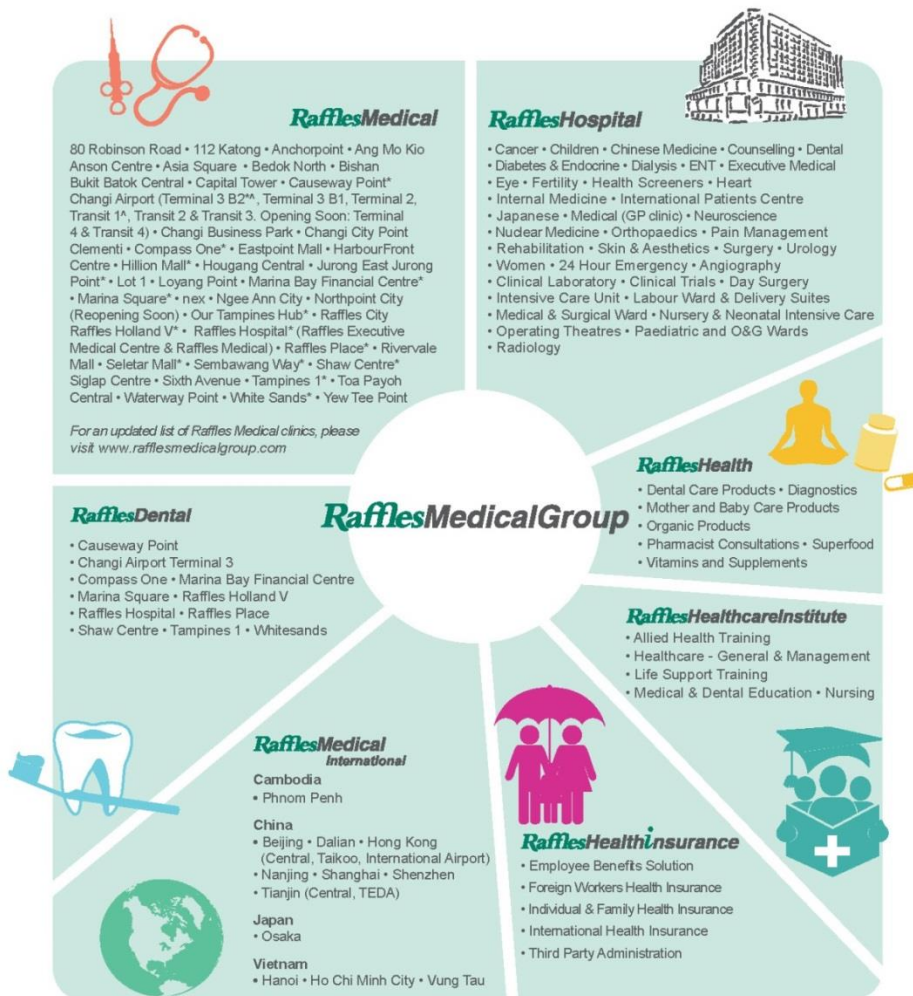
In case of symptoms of fever, chills, painful and inflamed lymph nodes, or shortness of breath with coughing and/or blood-tainted sputum, travellers should immediately stay away from crowded areas, put on a surgical face mask and contact a medical service for further instructions.

Upon return from travel to Madagascar, travellers should be on alert for above symptoms, and if symptoms appear, they should seek medical care and inform their physician about their travel history to Madagascar.



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