

Plague Outbreak Toolbox

Updated: September 2019



Key reference documents

- [Plague information page](#) (Geneva: World Health Organization).
- [Plague fact sheet](#) (Geneva: World Health Organization; 2017).
- [Plague manual: epidemiology, distribution, surveillance and control](#) (Geneva: World Health Organization; 1999).



Case definitions

WHO suggested outbreak case definition

Suspected case:

- any person with sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood-stained sputum, chest pain, difficulty in breathing **and** consistent epidemiological features:
 - exposure to infected animals or humans; **or**
 - evidence of flea bites; **or**
 - residence in or travel to a known endemic focus within the previous 10 days.

Probable case:

- meets the definition for suspected case; **and**
- at least two positive tests (see below), in putative new or re-emerging focus; **or**
- at least one positive test (see below), in known endemic focus.

Corresponding tests (i.e. that must be positive):

- microscopy: material from bubo aspirate, blood or sputum contains Gram-negative coccobacilli, bipolar after Wayson or Giemsa staining;
- F1 antigen detection in bubo aspirate, blood or sputum;
- a single anti-F1 serology without evidence of previous *Y. pestis* infection or vaccination;
- polymerase chain reaction (PCR) detection of *Y. pestis* in bubo aspirate, blood or sputum.

Confirmed case:

- meets the definition for suspected case **and**
- an isolate from a clinical sample identified as *Y. pestis* (colonial morphology) **and** two of the four following tests must be positive:
 - Phage lysis of cultures at 20–25 °C and 37 °C;
 - F1 antigen detection;
 - PCR detection of *Y. pestis*;
 - *Y. pestis* biochemical profile; **or**
- A 4-fold difference in anti-F1 antibody titre in paired serum samples; **or**
- in endemic areas when no other confirmatory test can be performed, a positive rapid diagnostic test using immunochromatography to detect F1 antigen.

WHO surveillance case definition

- Technical guidelines for integrated disease surveillance and response in the African Region (Brazzaville: WHO Regional Office for Africa; 2010).

WHO other definition

Definition of a contact of a case:

- From: Interregional meeting on prevention and control of plague, Antananarivo, Madagascar 1–11 April 2006 (Geneva: World Health Organization; 2006):

“Persons who have come in contact within a closed space (e.g. room, vehicle, barrack, jail) with the suspected pneumonic plague patient during the two days prior to the development of symptoms in the suspected pneumonic plague patient until two days after the suspected pneumonic plague patient has started appropriate antimicrobial treatment, should receive appropriate antimicrobial post-exposure prophylaxis if the exposure has occurred within the previous seven days.”



Data collection tools

- Case investigation form: Not available.
- Line list: In: Operational guidelines on plague surveillance, diagnosis, prevention and control (New Delhi: WHO Regional Office for South-East Asia; 2009 (Chapter 8: Managing an outbreak, p. 60)).
- Electronic tools: Not available.



Laboratory confirmation

- Plague: Resources for clinicians (Atlanta: Centers for Disease Control and Prevention; 2000).



Response tools and resources

- Clinical guidelines: Plague (Geneva: Médecins Sans Frontières ; 2018).
- Global distribution of natural plague foci (Geneva: World Health Organization; 2016).
- National plague control guidelines (Pretoria: Department of Health of the Republic of South Africa).



Training

- Plague: An introduction (Geneva: World Health Organization).
- Plague: knowledge resources for responders (Geneva: World Health Organization).



Other resources

- Managing epidemics: key facts about major deadly diseases (Geneva: World Health Organization; 2018).
- Operational guidelines on plague surveillance, diagnosis, prevention and control (New Delhi: WHO Regional Office for South-East Asia; 2009).
- International meeting on preventing and controlling plague: the old calamity still has a future. Weekly Epidemiological Record. 2006; 81(28):278–284.