

Measles Outbreak Toolbox

Updated: November 2019



Key reference documents

- [Measles information page](#) (Geneva: World Health Organization; 2018).
- [Measles fact sheet](#) (Geneva: World Health Organization; 2019).



Case definitions

WHO suggested outbreak case definition¹

Suspected case:

- A suspected case is one in which a patient with fever **and** maculopapular (non-vesicular) rash, **or** in whom a health care worker suspects measles.

Probable case:

- Clinically compatible measles: A suspected case with fever and maculopapular (non-vesicular) rash **and** at least one of cough, coryza **or** conjunctivitis, but no adequate clinical specimen was taken and the case has not been linked epidemiologically to a laboratory-confirmed case of measles or other communicable disease.²

Confirmed case:

- **Epidemiologically-linked case:**
A suspected case of measles that has not been confirmed by a laboratory, but was geographically and temporally related with dates of rash onset occurring 7–23 days apart from a laboratory-confirmed case or another epidemiologically-linked measles case.

¹ *Measles: Surveillance standards for vaccine-preventable diseases* (Geneva: World Health Organization; 2018).

² As countries get closer to elimination, the vast majority of measles cases should be confirmed by laboratory or epidemiological linkage. Clinically compatible cases are highly unlikely to be measles when the country is at or near elimination.

- **Laboratory-confirmed case:**

A suspected case of measles that has been confirmed positive by testing in a proficient laboratory, and vaccine-associated illness has been ruled out.³

Discarded case:

- A suspected case that has been investigated and discarded as non-measles (and non-rubella) when any of the following are true:
 - Negative laboratory testing in a proficient laboratory on an adequate specimen collected during the appropriate time period after rash onset.
 - Epidemiological linkage to a laboratory-confirmed outbreak of another communicable disease that is not measles.
 - Confirmation of another aetiology.
 - Failure to meet the clinically compatible measles case definition.

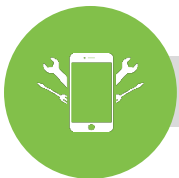
WHO surveillance case definition

- Measles: Surveillance standards for vaccine-preventable diseases (Geneva: World Health Organization; 2018).

WHO other definition

Definition of an outbreak

- A single laboratory-confirmed measles case should trigger an aggressive public health investigation and response in an elimination setting.
- An outbreak is defined as two or more laboratory-confirmed cases that are temporally related (with dates of rash onset occurring 7–23 days apart) and epidemiologically- or virologically-linked, or both.
- An outbreak is considered over after there have been no further epidemiologically- or virologically-linked cases for two incubation periods (46 days) from the date of onset of the last case.



Data collection tools

- Case report form: List of recommended data elements in Data collection, reporting and use. Surveillance standards for vaccine-preventable diseases (Geneva: World Health Organization; 2018).
- Line list: Not available.
- Electronic tools: Not available.

³ Confirmation methods:

- Detection of anti-measles IgM antibody by enzyme immunoassay (EIA). This is the gold standard. Results of IgM should be reported within four days of the specimen's arrival at the laboratory.
- Diagnostically significant titre change in anti-measles IgG antibody level in acute or convalescent sera, or documented seroconversion (IgG negative to IgG positive).
- Positive reverse transcription-polymerase chain reaction (RT-PCR) or viral isolation in cell culture.



Laboratory confirmation

- Manual for the laboratory-based surveillance of measles, rubella, and congenital rubella syndrome (3rd edition) (Geneva: World Health Organization; 2018).
- Specimen collection. In: Surveillance standards for vaccine-preventable diseases (2nd edition) (Geneva: World Health Organization; 2018).



Response tools and resources

- Surveillance standards for vaccine-preventable diseases (Geneva: World Health Organization; 2018).
- Response to measles outbreaks in measles mortality reduction settings (Geneva: World Health Organization; 2009).
- WHO guidelines for epidemic preparedness and response to measles outbreaks (Geneva: World Health Organization; 1999).



Training

- Vaccination during humanitarian emergencies (online course) (New York: United Nations Children's Fund and World Health Organization; 2018).



Other resources

- Measles vaccines: WHO position paper – April 2017. Weekly Epidemiological Record. 2017; 92(17):205–228.
- Surveillance guide for vaccine-preventable diseases in the WHO South-East Asia Region. Module 1: Measles and rubella (New Delhi: World Health Organization Regional Office for South-East Asia; 2017).
- Measles elimination field guide (Manilla: World Health Organization Regional Office for the Western Pacific; 2013).
- Guidelines for measles and rubella outbreak investigation and response in the WHO European Region (Copenhagen: World Health Organization Regional Office for Europe; 2013).
- African regional guidelines for measles and rubella surveillance (Brazzaville: World Health Organization Regional Office for Africa; 2015).
- Measles elimination field guide (2nd edition) (Washington (DC): World Health Organization Regional Office for the Americas; 2005).
- Treating measles in children (Geneva: World Health Organization; 2004).