Middle East Respiratory Syndrome Outbreak Toolbox

Updated: September 2019

Key reference documents

- Middle East respiratory syndrome (MERS) information page (Geneva: World Health Organization).

Case definitions

WHO suggested outbreak case definition

Suspected case:

- a person with an acute respiratory infection, with history of fever/cough and indications of pulmonary parenchymal disease (e.g. pneumonia or acute respiratory disease syndrome (ARDS)), based on clinical or radiological evidence, who requires admission to hospital, with no other etiology that fully explains the clinical presentation¹ (clinicians should also be alert to the possibility of atypical presentations in patients who are immunocompromised); and any of the following:
  - the person resides in the Middle East,² in particular where human infections have been reported, and in countries where MERS-coronavirus (CoV) is known to be circulating in dromedary camels;
  - the patient is part of a cluster³ of acute respiratory illness that occurs within a 14-day period, without regard to place of residence or history of travel;
  - the disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, without regard to place of residence or history of travel;
  - the person develops an unusual or unexpected clinical course, especially sudden deterioration despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified that fully explains the clinical presentation;

¹ Testing should be according to local guidance for management of community-acquired pneumonia. Examples of other etiologies include Streptococcus pneumoniae, Haemophilus influenzae type B, Legionella pneumophila, other recognized primary bacterial pneumonias, influenza and respiratory syncytial virus.
² See map of the Middle East (New York: United Nations).
³ A ‘cluster’ is defined as two or more persons with onset of symptoms within the same 14-day period, and who are associated with a specific setting such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.
• a person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, and who has travelled within 14 days before onset of illness to the Middle East or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred;

• individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures:
  o close physical contact with a confirmed or probable case of MERS-CoV infection, while that patient was ill;
  o a health care facility in a country where hospital-associated MERS-CoV infections have been reported;
  o direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission.

Probable case: 

• Definition 1:
  o a febrile acute respiratory illness with clinical, radiological or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or ARDS); and
  o direct epidemiologic link with a laboratory-confirmed MERS-CoV case; and
  o testing for MERS-CoV is unavailable, negative on an inadequate specimen or inconclusive.

• Definition 2:
  o a febrile acute respiratory illness with clinical, radiological, or histopathological evidence of pulmonary parenchymal disease (e.g. pneumonia or ARDS) that cannot be explained fully by any other etiology; and
  o the person resides or travelled in the Middle East, or in countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred; and
  o testing for MERS-CoV is inconclusive.

• Definition 3:
  o an acute febrile respiratory illness of any severity; and
  o direct epidemiologic link with a confirmed MERS-CoV case; and
  o testing for MERS-CoV is inconclusive.

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4 ‘Close contact’ is defined as:
• health care-associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient;
• working together in close proximity or sharing the same classroom environment with a MERS-CoV patient;
• travelling together with MERS-CoV patient in any kind of conveyance;
• living in the same household as a MERS-CoV patient.


6 The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

7 Inconclusive tests may include:
• A positive test by nucleic acid amplification assay for a single target without further testing.
• Evidence of sero-reactivity by a single convalescent serum sample ideally taken at least 14 days after exposure by a screening assay (ELISA or IFA) and a neutralization assay, in the absence of molecular confirmation from respiratory specimens.
Confirmed case: A person with laboratory confirmation of MERS-CoV infection, irrespective of clinical signs and symptoms. Discarded case: Negative laboratory results.

WHO surveillance case definition


Data collection tools

Case investigation form(s): MERS-CoV initial interview questionnaire of cases in English (Geneva: World Health Organization; 2017).

Line list: Not available.

Electronic tools: In development.

Laboratory confirmation


Response tools and resources


Clinical management of severe acute respiratory infection when Middle East respiratory syndrome coronavirus (MERS-CoV) infection is suspected: Interim guidance (Geneva: World Health Organization; 2018).

Training

Other resources

• Management of asymptomatic persons who are RTPCR positive for Middle East respiratory syndrome coronavirus (MERS-CoV) (Geneva: World Health Organization; 2018).
• Managing epidemics: key facts about major deadly diseases (Geneva: World Health Organization; 2018).
• Home care for patients with Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infection presenting with mild symptoms and management of contacts (Geneva: World Health Organization; 2018).
• Case-control study to assess potential risk factors related to human illness caused by Middle East Respiratory Syndrome Coronavirus (MERS) (Geneva: World Health Organization; 2014).
• Infection prevention and control during health care for probable or confirmed cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection (Geneva: World Health Organization; 2015).