



Epidemiological Update: Middle East respiratory syndrome coronavirus (MERS-CoV)¹

17 May 2013

The Pan American Health Organization / World Health Organization (PAHO/WHO) recommends that Member States strengthen surveillance activities to detect any unusual health event, including those that might be associated with Middle East respiratory syndrome coronavirus (MERS-CoV). Member States are reminded of the importance of strict compliance with infection control procedures to minimize the occurrence of infections in health care settings, including those related to MERS-CoV.

Clinicians should also be on alert for the possible occurrence of infections caused by MERS-CoV, and be aware of the guidelines to investigate and manage suspected cases. In particular, clinical staff should have access to up to date information on the procedures for clinical management of cases with infections caused by MERS-CoV.

PAHO/WHO does not advise health screening at points of entry in relation to this event, nor that any international travel or trade restrictions be applied.

As of May 17th 2013, a total of 40 laboratory-confirmed cases of human infection caused by MERS-CoV, including 20 deaths (case fatality rate 50%), have been reported to the WHO. The cases were reported by Germany² (one fatal case), Saudi Arabia (29 cases including 16 fatalities), France³ (2 cases), Jordan (2 fatal cases), the United Kingdom⁴ (4 cases including 1 fatality) and Qatar (2 cases). The onset of the cases' symptoms occurred in late March 2012 and on May 8th 2013. Thirty-one cases (78%) are male and nine cases (22%) are female. The age range is 24 to 94 years old (median = 56) for the 39 cases for which this information is available.

Most patients presented with severe acute respiratory disease requiring hospitalization and eventually required mechanical ventilation or other advanced respiratory support.

To date, five clusters of the disease have been identified, two in Saudi Arabia and one in France, Jordan and the United Kingdom, respectively.

In chronological order, the first cluster was registered in April 2012 in a health care setting in Jordan (including 2 confirmed and 11 probable cases; 10 were health care workers). The second cluster of three cases was registered in October 2012 in Saudi Arabia between members of the same family who resided in the same home. The third cluster occurred in the United

¹ To provide uniformity and facilitate communication about the disease, the Coronavirus Study Group of the International Committee on Taxonomy of Viruses has decided to call the new virus Middle East respiratory syndrome coronavirus (MERS-CoV). WHO and other Committee members strongly urge the use of this name in scientific and other communications.

² The case reported by Germany is a man from the United Arab Emirates who had been transferred from a hospital in Abu Dhabi to Munich by air ambulance.

³ One case reported by France had history of travel to the United Arab Emirates in the days preceding the onset of symptoms.

⁴ One case reported by the United Kingdom had history of travel to Saudi Arabia and Qatar, another case had history of travel to Pakistan and Saudi Arabia in the days preceding the onset of symptoms.

Kingdom, in February 2013, between family members of an infected patient who had recently arrived from Saudi Arabia. The fourth cluster was reported in Saudi Arabia in May 2013 (21 cases including 9 deaths) in a health care facility. The fifth cluster was registered in France, in May 2013, when a patient acquired the infection through a confirmed case with whom he had shared a room during their hospital stay. There was no transmission to the community in any of the aforementioned instances.⁵

Of the few cases reported so far globally, there is scarce information on transmission and other features of this virus. There is evidence of limited human-to-human transmission.⁶ The MERS-CoV itself has not yet been detected in an animal; however, field work investigation is ongoing to determine the presumed animal reservoir of the virus.¹

Recommendations

In light of this situation, PAHO/WHO reiterates the recommendations made on May 10th 2013 encouraging Member States to strengthen surveillance activities to detect any unusual health event, including those that might be associated with MERS-CoV. Health professionals should be informed about the possibility of the occurrence of infection caused by this virus and the actions to be implemented in case of a suspected case.

Clinicians should have access to information on clinical management of patients with acute respiratory failure and septic shock as a result of severe infection caused by MERS-CoV.

PAHO/WHO urges Member states to implement and continue to follow infection control procedures to reduce or minimize the occurrence of infections in health care setting including those associated with MERS-CoV. Further detail is provided of additional measures to consider.

Epidemiological surveillance

PAHO/WHO encourages all Member States to strengthen surveillance for severe acute respiratory illness (SARI) and to carefully review any unusual patterns.

Based on the WHO interim surveillance recommendations for human infection with MERS-CoV,⁷ an epidemiological investigation and laboratory testing for MERS-CoV should be undertaken for persons with the following criteria:

- a) A person with an acute respiratory infection, which may include history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or the acute respiratory distress syndrome (ARDS)), based on clinical or radiological evidence of consolidation, who requires admission to hospital.

And one or more of the following criteria:

⁵ Novel coronavirus summary and literature update. Published on 15 May 2013 and available at: http://www.who.int/csr/don/2013_05_15_ncov/en/index.html

⁶ The Health Protection Agency (HPA) UK Novel Coronavirus Investigation team. Evidence of person-to-person transmission within a family cluster of novel coronavirus infections, United Kingdom, February 2013. Euro Surveillance. 2013; 18(11);pii=20427. Available online: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20427>

⁷ Updated as of 18 March 2013 and available at: http://www.who.int/csr/disease/coronavirus_infections/InterimRevisedSurveillanceRecommendations_nCoVinfection_18_Mar13.pdf

- The disease occurs as part of a cluster⁸ that occurs within a 10-day period, without regard to place of residence or history of travel, unless another etiology has been identified.⁹
 - The disease occurs in a health care worker who has been working in an environment where patients with SARI are being cared for, particularly patients requiring intensive care, without regard to place of residence or history of travel, unless another etiology has been identified.⁴
 - Develops an unexpectedly severe clinical course despite appropriate treatment, without regard to place of residence or history of travel, even if another etiology has been identified, if that alternate etiology does not fully explain the presentation or clinical course of the patient.
- b) A person with an acute respiratory illness of any degree of severity who, within 10 days before onset of illness, had close contact¹⁰ with a confirmed or probable case of MERS-CoV infection, while the case was ill.
- c) For countries where MERS-CoV infection has already been detected, the minimum standard for surveillance should be testing of patients with severe respiratory disease requiring mechanical ventilation. The minimum standard should include all those in three categories listed above patients with unexplained pneumonia or ARDS occurring in clusters; health care workers requiring admission for respiratory disease and patients with unusual presentation or clinical course.

The newest cases¹¹ identified, re-emphasize the need for surveillance in recent travelers presenting with symptoms compatible with MERS-CoV who are returning from areas where the virus has been circulating and the need to use lower respiratory tract specimens for diagnosis when they can be obtained.

Reporting cases

National authorities are requested to report all probable and confirmed cases within 24 hours of classification, through the Regional Contact Point for International Health Regulations at the appropriate WHO Regional Office. Current definitions for probable and confirmed cases are available at:

http://www.who.int/csr/disease/coronavirus_infections/case_definition/en/index.html

⁸ A "cluster" is defined as two or more persons with onset of symptoms within the same 10-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.

⁹ 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.

¹⁰ Close contact is defined as:

- Anyone who provided care for the patient, including a health care worker or family member, or who had other similarly close physical contact;
- Anyone who stayed at the same place (e.g. lived with, visited) as a probable or confirmed case while the case was ill.

¹¹ Disease Outbreak News. Available at: http://www.who.int/csr/don/2013_05_08_ncov/en/index.html

Laboratory testing for infection caused by MERS-CoV

PAHO/WHO encourages Member States to follow the WHO interim recommendations for laboratory testing for MERS-CoV. The recommendations are available at: http://www.who.int/csr/disease/coronavirus_infections/LaboratoryTestingNovelCoronavirus_21Dec12.pdf

Any laboratory testing for the presence of this virus should be performed within the capacity of the national laboratory system, in appropriately equipped laboratories by staff trained in the relevant technical and biosafety procedures.

If Member States consider developing diagnostic capabilities for detecting MERS-CoV, real-time RT-PCR assays that are specific for the MERS-CoV, those that have been developed and published, should be considered for this purpose. Further information on these assays is available at the website of the Institute of Virology, Bonn, Germany: <http://www.virology-bonn.de/index.php?id=40>.

When diagnostic capability is not available at the national level, PAHO/WHO recommends that samples of any unusual or unexpected SARI case or SARI cluster with unexplained etiology should be forwarded, immediately, to the WHO Collaborating Center for influenza and other respiratory virus, at the United States Centers for Disease Control and Prevention (US CDC) for additional testing.

Clinical management

To date, the clinical features of MERS-CoV infection is limited and no virus-specific prevention or treatment (e.g. vaccine or antiviral drugs) is available. An international network of clinical experts has been convened by the WHO to discuss therapeutic options. WHO and the International Severe Acute Respiratory and Emerging Infection Consortium have developed and shared a set of research protocols and case report forms to help clinical investigators establish studies of pathogenesis and pharmacodynamics. These are available at: <http://www.prognosis.org/isaric/>.

Infection prevention and control in health care

PAHO/WHO recommends the rigorous application of health care infection prevention and control measures. During health care of probable or confirmed cases of MERS-CoV infection, further measures should be applied in addition to standard precautions.

As much as possible, the number of health workers, family members and visitors in contact with a probable or confirmed case of MERS-CoV infection should be limited. All visitors and health workers in contact (within one meter) or entering the room or cubicle of a probable or confirmed case of MERS-CoV infection should always:

- wear a surgical mask,
- wear eye protection (i.e. goggles or a face shield),
- wear a clean, non-sterile, long-sleeved gown and gloves (some of these procedures require sterile gloves),
- perform hand hygiene before and after contact with the patient and his or her surroundings and immediately after removal of Personal Protective Equipment (PPE).

With regards to the movement of patients (probable or confirmed case of MERS-CoV infection):

- Avoid the movement and transport of patients out of the isolation room or area unless medically necessary. If transport is required, use routes of transport that minimize exposures of staff, other patients and visitors. The use of designated portable X-ray equipment and other important diagnostic equipment may make this easier.
- Notify, as soon as possible, the receiving area or institution of the patient's probable or confirmed diagnosis and necessary precautions for the clinical management (standard precautions and additional measures).
- Clean and disinfect patient-contact surfaces (e.g. bed) after use.

Interim guidance with further details and recommendations is available on the WHO website at: http://www.who.int/csr/disease/coronavirus_infections/IPCnCoVguidance_06May13.pdf

International travel and trade

PAHO/WHO does not advise the implementation of health screening at points of entry in relation to this event, nor that any international travel or trade restrictions be applied.

References

1. Disease Outbreak News. Available at: <http://www.who.int/csr/don/en/index.html>
2. Novel coronavirus summary and literature update – as of 8 May 2013. Available at: http://www.who.int/csr/disease/coronavirus_infections/update_20130508/en/index.html
3. Corman VM, Eckerle I, Bleicker T, Zaki A, Landt O, Eschbach-Bludau M, van Boheemen S, Gopal R, Ballhause M, Bestebroer TM, Muth D, Müller MA, Drexler JF, Zambon M, Osterhaus AD, Fouchier RM, Drosten C (2012) Detection of a novel human coronavirus by real-time reverse transcription polymerase chain reaction. Euro Surveill 17: pii=20285.
4. Corman VM, Müller MA, Costabel U, Timm J, Binger T, Meyer B, Kreher P, Lattwein E, Eschbach-Bludau M, Nitsche A, Bleicker T, Landt O, Schweiger B, Drexler JF, Osterhaus AD, Haagmans BL, Dittmer U, Bonin F, Wolff T, Drosten C. Assays for laboratory confirmation of novel human coronavirus (hCoV-EMC) infections. Euro Surveill. 2012;17(49):pii=20334

For more information, consult the following links:

- **Novel coronavirus summary and literature update**, available at: http://www.who.int/csr/disease/coronavirus_infections/update_20130508/en/index.html
- **Infection prevention and control during health care for probable or confirmed cases of novel coronavirus (nCoV) infection**, available at: http://www.who.int/csr/disease/coronavirus_infections/IPCnCoVguidance_06May13.pdf
- **Interim recommendations for novel coronavirus surveillance**, available in Spanish at: http://www.who.int/entity/csr/disease/coronavirus_infections/InterimRevisedSurveillancerecommendations_nCoVinfection_18Mar13_es.pdf
- **Interim recommendations for the clinical management of acute respiratory infection in suspected novel coronavirus infection**, available at: http://www.who.int/entity/csr/disease/coronavirus_infections/InterimGuidance_ClinicalManagement_NovelCoronavirus_11Feb13u.pdf
- **Interim recommendations on laboratory testing for novel coronavirus**, available at: http://www.who.int/entity/csr/disease/coronavirus_infections/LaboratoryTestingNovelCoronavirus_21Dec12.pdf
- **Interim recommendations for Laboratory Biorisk Management**, available at: http://www.who.int/entity/csr/disease/coronavirus_infections/NovelCoronavirus_InterimRecommendationsLaboratoryBiorisk_190213/en/index.html
- **Prevention and control of epidemic and pandemic infection-prone acute respiratory diseases during health care**, available in Spanish at: <http://www.paho.org/Spanish/AD/DPC/CD/vir-flu-prev-ctl-irag-epi-pan-6-2007.pdf>