

WHO RISK ASSESSMENT

Middle East respiratory syndrome coronavirus (MERS-CoV)

24 April 2014

Summary of available information

Since April 2012, 254 laboratory-confirmed cases of human infection with Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported to WHO, including 93 deaths. To date, reporting countries in the Middle East include Jordan, Kuwait, Oman, Qatar, Kingdom of Saudi Arabia (KSA) and the United Arab Emirates (UAE); in Europe: France, Germany, Greece, Italy and the United Kingdom (UK); in North Africa: Tunisia; and in Asia: Malaysia and the Philippines.

The occurrence of new cases seems to follow a seasonal pattern, with increasing incidence from March-April onwards. The number of cases sharply increased since mid-March 2014, essentially in KSA and UAE, where two important healthcare-associated outbreaks are occurring.

As much as 75% of the recently reported cases appear to be secondary cases, meaning that they are considered to have acquired the infection from another infected person. The majority of these secondary cases are mainly healthcare workers who have been infected within the healthcare setting, although several patients who were in the hospital for other reasons are also considered to have been infected with MERS-CoV in the hospital. The majority of the infected healthcare workers presented with no or minor symptoms. Only four instances of transmission within households have been reported, and no large family cluster has been identified. When human-to-human transmission occurred, transmission was not sustained, and to date only two possible tertiary cases have been reported.

The number of cases who acquired the infection in the community has also increased since mid-March. These cases have no reported contacts with other laboratory confirmed cases, and some have reported contacts with animals. Although camels are suspected to be the primary source of infection for humans, the exact routes of direct or indirect exposure remain unknown. Investigations to identify the source of infection and routes of exposure are still ongoing.

Several of the recent cases acquired the infection in KSA or UAE and then travelled to another country, including Greece (1 case), Jordan (1 case), Malaysia (1 case), and the Philippines (1 case). No further transmission has been documented so far. Of note, exported cases occurred in the past that resulted in limited further human-to-human transmission (France and UK).

In view of the increasing number of cases – in particular secondary cases, nosocomial outbreaks and exported cases – the WHO risk assessment has been revisited to determine whether transmission pattern has changed and whether sustained community transmission is occurring.

Risk assessment

This risk assessment is based on currently available data and knowledge, and will be updated as more information is made available. The investigations are still ongoing and new findings on, for

example, exposures to animal and/or environmental source, transmission chains, risk factors for infection among primary cases and healthcare workers, and serological investigations will be critical to make the risk assessment more robust.

Has the transmission pattern of MERS-CoV changed?

The majority of the cases now reported have likely acquired infection through human-to-human transmission and only about a quarter are considered as primary cases, which suggests slightly more human-to-human transmission than previously observed.

One hypothesis is that the transmission pattern and transmissibility have not changed and that the occurrence of two large nosocomial outbreaks reflects inadequate infection prevention and control measures, coupled with intensive contact tracing and screening. Several elements would support this hypothesis: i) the clinical picture appears to be similar to what was observed earlier; secondary cases tend to present with a milder disease than that of primary cases; however, we note that many secondary cases have been reported as asymptomatic; ii) only 2 possible tertiary cases have been reported; iii) the recent exported cases did not transmit further; iv) screening of contacts revealed very few instances of household transmission; and v) no increase in the size or number of household or community clusters has been observed.

An alternative hypothesis is that transmissibility of the virus has increased and is resulting in more human-to-human transmission as the basis for the recent upswing in cases. It is possible that current levels of surveillance are missing cases of mild infection within the community. At this point, there is insufficient information on the recent cases to definitively exclude these hypotheses.

Can we expect additional cases of MERS-CoV infection in the Middle-East countries?

The way humans become infected from an animal and/or environmental source is still under investigation. More individuals are likely to be infected until the mode of transmission is determined and preventive measures implemented to break transmission from the source to humans. For the third consecutive year, the number of cases increase in March-April and it is very likely that more primary cases will occur, and consequently further transmission will occur.

Can we expect additional cases exported to other countries and further transmission?

It is very likely that cases will continue to be exported to other countries, through tourists, travellers, guestworkers or pilgrims, who might acquire the infection following an exposure to the animal or environmental source, or to other cases, in a hospital for instance. Whether these cases will further transmit will depend of the capacity of the receiving country to rapidly detect, diagnose and implement appropriate infection prevention and control measures. Of note, further transmission from exported cases did occur in the past, but transmission was not sustained.

Recommendations

Enhancing infection prevention and control awareness and measures is critical to prevent the possible spread of MERS-CoV in health care facilities. Health-care facilities that provide care for patients suspected or confirmed to be infected with MERS-CoV infection should take appropriate measures to decrease the risk of transmission of the virus from an infected patient to other patients, health-care workers and visitors. It is not always possible to identify patients with MERS-CoV early because some have mild or unusual symptoms. For this reason, it is important that health-care workers apply standard precautions consistently with all patients – regardless of their diagnosis – in all work practices all the time.

Urgent investigations are required to better understand the transmission pattern of this virus. The most urgent include detailed outbreak investigations, case-control studies to understand risk factors for infection, enhancing community studies and surveillance of community-acquired pneumonia to assess whether significant numbers of mild cases resulting from human to human transmission are being missed, and identifying risk factors for infection in the hospital setting. Detailed information on the surveillance strategy and contact tracing would help understand limitations of current data. Although the immediate focus should be on clarifying the magnitude of the human-to-human transmission, no control will be possible until the transmission from the animal/environment source to humans is understood and interrupted.

Based on current information, it is prudent for people at high risk of severe disease due to MERS-CoV, including those with diabetes, chronic lung disease, pre-existing renal failure, or those who are immuno-compromised, to take appropriate precautions when visiting farms, barn areas or market environments where camels are present. These measures might include avoiding contact with camels, good hand hygiene, and avoiding drinking raw milk or eating food that may be contaminated with animal secretions or products unless they are properly washed, peeled, or cooked.

For the general public, when visiting a farm or a barn, general hygiene measures, such as regular hand washing before and after touching animals, avoiding contact with sick animals, and following food hygiene practices, should be adhered to.

WHO recommends increasing efforts to raise awareness of MERS among travellers going to and travelling from MERS-affected countries but otherwise does not advise special screening at points of entry with regard to this event nor does WHO currently recommend the application of any travel or trade restrictions.

More information can be found on

http://www.who.int/csr/disease/coronavirus_infections/en/

Based on current information, the following **working assumptions** to guide the development of public health measures in affected countries and in relation to imported cases are currently recommended.

These recommendations are being continually reviewed as new information about this emerging infectious disease becomes available. Given the severity of illness experienced by some infected cases and the current limitations in understanding of the disease dynamics of this newly emergent virus, WHO recommends public health authorities take a risk based,

precautionary approach to the management of cases, contacts and application of control measures.

Incubation period: 2 - 14 days

Period of infectivity: patients can shed the virus after resolution of symptoms, but the duration of infectivity is unknown. Patients are not contagious during the incubation period.

Asymptomatic cases might not be contagious.

Case and contact definition:

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

Recent studies support the premise that camels serve as the primary source of the MERS-CoV infecting humans and that other livestock are not involved.