

Middle East respiratory syndrome coronavirus (MERS-CoV)

Key facts

- Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (MERS-CoV) that was first identified in Saudi Arabia in 2012.
 - Coronaviruses are a large family of viruses that can cause diseases ranging from the common cold to Severe Acute Respiratory Syndrome (SARS).
 - Typical MERS symptoms include fever, cough and shortness of breath. Pneumonia is common, but not always present. Gastrointestinal symptoms, including diarrhoea, have also been reported.
 - Approximately 36% of reported patients with MERS have died.
 - Although in recent outbreak majority of human cases of MERS have been attributed to human-to-human infections, camels are likely to be a major reservoir host for MERS-CoV and an animal source of MERS infection in humans. However, the exact role of camels in transmission of the virus and the exact route(s) of transmission are unknown.
 - The virus does not seem to pass easily from person to person unless there is close contact, such as occurs when providing unprotected care to a patient.
 - Till 15th June, 2015 Globally, since September 2012, WHO has been notified of 1289 laboratory-confirmed cases of infection with MERS-CoV, including at least 455 related deaths
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Symptoms

The clinical spectrum of MERS-CoV infection ranges from no symptoms (asymptomatic) or mild respiratory symptoms to severe acute respiratory disease and death. A typical presentation of MERS-CoV disease is fever, cough and shortness of breath. Pneumonia is a common finding, but not always present. Gastrointestinal symptoms, including diarrhoea, have also been reported. Severe illness can cause respiratory failure that requires mechanical ventilation and support in an intensive care unit. Approximately 36% of reported patients with MERS-CoV have died.

The virus appears to cause more severe disease in older people, people with weakened immune systems, and those with chronic diseases such as cancer, chronic lung disease and diabetes.

Source of the virus

MERS-CoV is a zoonotic virus that is transmitted from animals to humans. The origins of the virus are not fully understood but, according to the analysis of different virus genomes, it is believed that it originated in bats and was transmitted to camels sometime in the distant past.

Transmission

Non-human to human transmission: The route of transmission from animals to humans is not fully understood, but camels are likely to be a major reservoir host for MERS-CoV and an animal source of infection in humans. Strains of MERS-CoV that are identical to human strains have been isolated from camels in several countries, including Egypt, Oman, Qatar, and Saudi Arabia.

Human-to-human transmission: The virus does not appear to pass easily from person to person unless there is close contact, such as providing unprotected care to an infected patient. There have been clusters of cases in healthcare facilities, where human-to-human transmission appears to be more probable, especially when infection prevention and control practices are inadequate. Thus far, no sustained community transmission has been documented.

The virus appears to be circulating throughout the Arabian Peninsula, primarily in Saudi Arabia, where the majority of cases (>85%) have been reported since 2012. Several cases have been reported outside the Middle East. Most of these infections are believed to have been acquired in the Middle East, and then exported outside the region. The ongoing outbreak in the Republic of Korea is the largest outbreak outside of the Middle East, and while concerning, there is no evidence of sustained human to human transmission in the Republic of Korea. For all other exported cases, no secondary or limited secondary transmission has been reported in countries with exported cases.

Prevention and treatment

No vaccine or specific treatment is currently available. Treatment is supportive and based on the patient's clinical condition.

As a general precaution, anyone visiting farms, markets, barns, or other places where camels and other animals are present should practice general hygiene measures, including regular hand washing before and after touching animals, and should avoid contact with sick animals.

The consumption of raw or undercooked animal products, including milk and meat, carries a high risk of infection from a variety of organisms that might cause disease in humans. Animal products that are processed appropriately through cooking or pasteurization are safe for consumption, but should also be handled with care to avoid cross contamination with uncooked foods. Camel meat and camel milk are nutritious products that can continue to be consumed after pasteurization, cooking, or other heat treatments.

People with diabetes, renal failure, chronic lung disease, and immunocompromised persons are considered to be at high risk of severe disease from MERS-CoV infection. These people should avoid contact with camels, drinking raw camel milk or camel urine, or eating meat that has not been properly cooked.

Health-care facilities

Transmission of the virus has occurred in health-care facilities in several countries, including from patients to health-care providers and between patients in a health care setting before MERS-CoV was diagnosed. It is not always possible to identify patients with MERS-CoV early or without testing because symptoms and other clinical features may be non-specific.

Infection prevention and control measures are critical to prevent the possible spread of MERS-CoV in health-care facilities. Facilities that provide care for patients suspected or confirmed to be infected with MERS-CoV should take appropriate measures to decrease the risk of transmission of the virus from an infected patient to other patients, health-care workers, or visitors. Health-care workers should be educated and trained in infection prevention and control and should refresh these skills regularly.

Travel

WHO does not recommend the application of any travel or trade restrictions or entry screening related to MERS-CoV.

WHO encourages all countries to enhance their surveillance for severe acute respiratory infections (SARI) and to carefully review any unusual patterns of SARI or pneumonia cases.

Countries, whether or not MERS cases have been reported in them, should maintain a high level of vigilance, especially those with large numbers of travellers or migrant workers returning from the Middle East. Surveillance should continue to be enhanced in these countries according to WHO guidelines, along with infection prevention and control procedures in health-care facilities.

WHO continues to request that Member States report to WHO all confirmed and probable cases of infection with MERS-CoV together with information about their exposure, testing, and clinical course to inform the most effective international preparedness and response.

Outbreak in Republic of Korea:

WHO recommends continuation of strong disease control measures to bring MERS-CoV outbreak to an end

A joint mission by the World Health Organization and the Republic of Korea's Ministry of Health and Welfare concluded that while the outbreak that began last month has been large and complex, it is showing a similar epidemiological pattern to previous hospital-associated MERS CoV outbreaks in the Middle East, which have been fully controlled by strong basic public health measures such as infection prevention and control.

Further, the virus is currently clustered around health facilities and found no evidence that it was circulating in the community. "However, continued monitoring for this is critical,".

The experts in epidemiology, risk communications, virology, clinical management, infection prevention and control, as well as public health specialists, identified several reasons why the virus, which arrived in the country with a single infected traveller, was able to go on to infect large numbers of people in a relatively short time. These included:

- The fact that the MERS CoV was unexpected and unfamiliar to most physicians in the Republic of Korea;
- Sub-optimal prevention and control measures in some hospitals, related in part to overcrowding in emergency rooms and patients in rooms with many beds;
- The possible impact of habits and customs such as so-called "doctor-shopping", where patients seek care at a number of medical facilities, as well as visits to hospitalized patients by many friends and family members.

The mission was unable to conclude whether environmental contamination, inadequate ventilation or other factors played a role in the transmission of the virus in the outbreak.

Important steps recommended:

- Early and complete identification of all contacts;
- Quarantine or isolation and monitoring of all contacts and suspected cases;
- Full implementation of infection, prevention and control measures;
- Prevention of travel, especially internationally, of infected persons and contacts.

There have been 150 confirmed cases of MERS CoV (including 1 confirmed case in China) reported in the current outbreak, with 18 deaths, till 15th June, 2015.

Scientists in the Republic of Korea have completed full genome sequencing of the MERS coronavirus circulating in that country. Chinese scientists have likewise fully sequenced virus isolated from a patient who was exposed to the disease in Korea and subsequently travelled to China, where his infection was diagnosed.

What has been observed so far does not point conclusively to any significant biological change in the viruses from either Korea or China.