



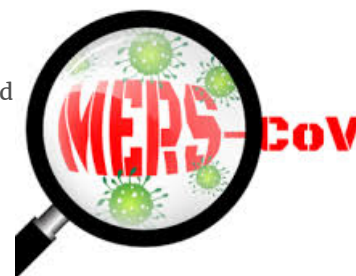
# Middle East Respiratory Syndrome

November 30, 2015 By [Amy Powell](#)

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The Middle East Respiratory Syndrome (MERS) is a new viral respiratory disease of humans first described in 2012. MERS is caused by a novel coronavirus (lineage 2C  $\beta$  CoV).

As of 25 September 2015 the following countries in the Middle East have reported cases: Iran, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, United Arab Emirates (UAE), and Yemen. Countries with travel-associated cases have included Algeria, Austria, China, Egypt, France, Germany, Greece, Italy, Malaysia, Netherlands, Philippines, Republic of Korea, Thailand, Tunisia, Republic of Korea, Thailand, Turkey, United Kingdom (UK), and the United States. The U.S. has had only 2 travel-associated cases, both of whom were healthcare providers who lived and worked in Saudi Arabia. No person-to-person transmission has been documented in the U.S.



***As of 11 September 2015, WHO has reported a total of 1,583 confirmed cases of MERS with 566 deaths.***

MERS-CoV is a zoonotic disease that it transmitted from animals-to-humans. The origins of the virus are not fully understood but it is believed to have originated in bats and then was transmitted to camels. Currently, it is believed that dromedary (single-humped) camels are a major reservoir host for MERS-CoV and an animal source for humans.

MERS may be transmitted from person-to-person: this occurs most commonly when there is close contact such as providing unprotected care to an infected patient. Thus far, no sustained community transmission has been documented. The  $R_0$  for MERS-CoV is generally estimated to less than 0.7 making sustained transmission unlikely unless it mutates. Studies of family clusters and healthcare personnel contacts of patients have reported low frequencies of transmission (i.e., 1-3%). The incubation period of MERS is ~5-day (range, 2-15 days).

MERS has been epidemic in the Middle East in recent years. As of 11 September 2015, the World Health Organization has reported a total of 1,583 confirmed cases of MERS with 566 deaths.

In the summer of 2015, a large outbreak of MERS was reported in the Republic of Korea and China. As of 11 September, the

World Health Organization reported that this outbreak involved 186 total confirmed cases (Republic of Korea 185, China 1) with 36 deaths. The last case of MERS infection in the Republic of Korea that was reported to the WHO was on 4 July 2015.

Clusters of cases have been reported in households and in healthcare facilities, especially when infection prevention and control practices have been inadequate.

The clinical spectrum of MERS infection ranges from asymptomatic or mild respiratory symptoms to severe acute respiratory disease and death. Typical symptoms of MERS include fever, cough and shortness of breath. Pneumonia is common but not always present. Gastrointestinal symptoms frequently (vomiting, diarrhea) occur. Risk factors for more severe disease include older age, comorbidities (e.g., chronic lung diseases, diabetes) and immunosuppression. The reported mortality is ~36%. Currently, there are no specific therapies or vaccines available.

**Infection Control Issues:** Multiple outbreaks of MERS have involved healthcare facilities. One outbreak which involved 23 patients receiving hemodialysis or in the an intensive care unit; the case-fatality rate was 65%. In the recent outbreak in South Korea, substantial transmission was reported in healthcare facilities. For example, one hospital reported a single primary case, 25 secondary cases, and 11 tertiary cases.

Healthcare personnel have been at high risk of acquiring MERS. Al-Tawfiq reported that of 952 cases reported in Saudi Arabia (June 2012 to September 2014) ~27% were healthcare personnel. Factors contributing to intra-hospital transmission include: 1) the initial symptoms of MERS are non-specific leading to a failure to isolate the patient; 2) inadequate compliance with infection control practices; 3) inadequate healthcare facilities (e.g., overcrowding, close proximity of patients to cases); 4) use of aerosol generating procedures and 5) prolonged viral shedding.

Per CDC, key methods for preventing transmission of MERS in healthcare facilities include: screening patients before arrival for travel to the Middle East plus signs and symptoms of MERS; strict adherence to respiratory hygiene in clinics and the emergency department; and early identification of possible patients; prompt institution of contact and airborne isolation for possible cases.

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