

## Emerging Problems in Infectious Diseases

### Lessons to learn from MERS-CoV outbreak in South Korea

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#### Abstract

Since the first identification of Middle Eastern Respiratory Syndrome coronavirus (MERS-CoV) in 2012 the virus has infected 1289 humans with approximately 40% mortalities. Currently South Korea is experiencing the hospital-associated outbreak of MER-CoV that has infected 126 human cases and 13 deaths, as of 12 June 2015, following the return of a MERS infected patient from Middle East. The episode is characterized unique being the largest cluster of patients linked to the single introduction of virus that involves three generations of virus transmission. Human-to-human transmission though was observed on several occasions in past, it is documented as non-sustainable event. The recent outbreak including the healthcare workers, index case's roommates and their caregivers, raises several concerns about the infection control practices and timely diagnosis of MERS

**Key words:** Middle Eastern Respiratory Syndrome coronavirus; acute respiratory syndrome; ARDS; Korea, virus infection.

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#### Introduction

Since Korean health officials on 20 May, 2015, reported the first imported case of Middle Eastern Respiratory Syndrome coronavirus (MERS-CoV) of the country [1] that further led to the largest transmission cluster of the disease worldwide involving 126 human cases and 13 deaths as of June 12, 2015, there has been great concern that whether this is beginning of new epidemic like SARS. The index patient of this outbreak was a 68-year old man who had a travel history of Saudi Arabia, Bahrain and Qatar before returning to South Korea on 4 May. Korean health authorities stated that the patient, initially asymptomatic, sought medical attention at four different local healthcare facilities with developing fever and cough after one week of his arrival from 11 to 20 May. He provided range of exposures to his family members, hospital roommates or ward mates and their caregivers as well as to the healthcare workers that resulted into nosocomial disease outbreak [1,2]. Another five facilities where

secondary cases were transferred provided platform for further disease transmission and appearance of tertiary cases (Figure 1). One of the secondary infected cases also travelled to Guangdong province of China via Hong Kong despite strict travel restrictions imposed by the treating physicians in Korea. The exposure times ranged from 5 minutes to few hours while incubation period ranged from 5 to 18 days, according to the data available by the World Health Organization (WHO) [3]. The outbreak is growing as tertiary cases started appearing from 1 June 2015 (Figure 2), more than 3000 people remain under quarantine and there has been closure of 700 schools located in nearby areas, as per local and international news resources [4]. The outbreak listed South Korea as the third most MERS affected country after Saudi Arabia and the United Arab Emirates [5].

MERS-CoV was first identified in Saudi Arabia in June 2012 [6] and since then there have been 1289 infected cases with 40% mortalities [1,7]. The disease primarily epicentered in Arabian Peninsula has linked



their caregivers and hospital staff that expose them to the infection. The situation raises two serious issues; firstly the key at this point is the timely identification of suspect cases. In this case, index case sought medical attention in four different healthcare facilities that failed to diagnose the disease on time. This gives us a lesson that window from the presence of a suspect case in community or healthcare facility to case confirmation play crucial role in disease spread. The larger the window is, the greater the spread will be. Secondly, we have seen that unfortunately medical evacuation in these hospitals right after identification of index case was delayed and did not help enough to halt further spread that indicates grave concern over the healthcare and infection control practices. This is the era of deadly respiratory viral infections where human being are at the forefront of dealing with the viruses such as MERS, avian influenza H5N1 and H7N9. Therefore infection control measures especially in those healthcare facilities that routinely deal with respiratory diseases such as respiratory, infectious diseases or emergency departments, should be revisited by healthcare watchdogs at national and international levels.

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