



Editorial

Middle East Respiratory Syndrome– advancing the public health and research agenda on MERS- lessons from the South Korea outbreak



The weekly epidemiological record of the World Health Organisation 15th May 2015¹ states that ‘the cases of Middle East Respiratory Syndrome (MERS) recently exported to other countries have not resulted in sustained onward transmission to persons in close contact with these cases on aircraft or in the respective countries outside the Middle East.’ This situation has changed rapidly and remarkably. Five days after the publication of this report, the first case of a MERS-coronavirus (MERS-CoV) infection in Seoul, South Korea was reported on 20 May 2015². This patient had a history of recent travel to the Middle East. Over the ensuing three weeks, the number of secondary, tertiary and perhaps quaternary cases of MERS from this single patient rose rapidly and has become the largest case cluster of MERS occurring outside the Middle East. The Korean outbreak appears from the available data to be attributable to poor infection control measures, although the hospital air-conditioning system’s lack of ventilators may have resulted in the rapid extensive spread of MERS among patients and staff³. Furthermore, MERS-CoV was detected in bathrooms and on doorknobs indicating ineffective disinfection procedures.

As of June 9th 2015, there have been 95 cases (with 7 deaths) of MERS-CoV infection associated with the South Korean outbreak³. Over two thirds of all confirmed cases have been reported from St. Mary’s Hospital, a 400 bed facility in Gyeonggi Province, Seoul and at least 14 facilities have reported MERS cases during the outbreak. This unusually large number of secondary (80 cases) and tertiary (14 cases) associated with an imported case of MERS by a traveller is a significant development (as per 11th June 2015). Furthermore, whilst the Korea outbreak has focussed global attention, a nosocomial outbreak of MERS in Hufoof, Saudi Arabia has been on going since 20 Apr 2015 and resulted in 26 cases over the past 3 weeks⁴. There continue to be MERS cases reported from Jeddah and Riyadh, which are “sporadic” community cases. To date Saudi Arabia has reported 1026 MERS cases including 450 deaths (44 percent) since the first MERS case was reported in September, 2012.

The South Korean and Hufoof outbreaks raise several important concerns:

First the Korean outbreak emphasizes that MERS-CoV remains a major threat to global health security and could have epidemic potential with time, even in the absence of virus mutation.

Second the nature of the virus and its evolution into a more virulent form continues to need close monitoring. Genomic sequencing studies of MERS-CoV obtained from the first Korean

case published by the Chinese Center for Disease Control and Prevention⁵ has shown homology with MERS-CoV strains originating from Saudi Arabia. Whilst no significant variation has been identified it remains crucial that genomic studies for as many MERS cases as possible are performed.

Third, up to a million pilgrims from over 182 countries will travel to Mecca, Saudi Arabia for the Ramadan period which begins on June 18th 2015 and the threat of further global spread remains.

Fourth, for the past 18 months, MERS and other global infectious diseases threats were totally overshadowed by the Ebola virus disease epidemic⁶, highlighting the inadequacies of global surveillance systems to focus concurrently on several emerging and re-emerging infectious diseases simultaneously.

Fifth, many basic questions about the epidemiology, pathogenesis and management of MERS-CoV remain to be answered⁸.

Sixth, it’s been 3 years since MERS was identified as a lethal new viral respiratory infection of humans⁹ and primary cases of MERS-CoV infection continue to occur throughout the year⁷ in the Middle East. The South Korean outbreak now illustrates the need to enhance MERS-CoV surveillance systems, and heightens global awareness of MERS and the importance of infection control measures.

Finally, the Korean outbreak emphasizes the importance of individuals, especially healthcare workers, recognizing that they may have been exposed to MERS patients and seeking medical care and self-quarantining at an early time during the disease course.

Moving forward, it is critical that global efforts are focussed urgently on the basic science and on clinical and public health research so that the exact mode of transmission to and between humans, and new drugs and other therapeutic interventions and vaccines can be developed^{6,7}. Two coronaviruses, SARS-CoV and now MERS-CoV, which cause severe respiratory disease with high mortality rates emerged within the past two decades¹⁰, reinforcing the need for clinically efficacious antivirals targeting coronaviruses. Lessons learnt from the recent Ebola Virus Disease could also be applied to MERS¹¹. Whilst MERS does not yet constitute an International Public Health Emergency the Korean outbreak is an extraordinary event. Previous estimates of the epidemic potential of MERS-CoV have not found that it had pandemic potential¹², suggesting that airborne, human-to-human transmission is rare, but the present outbreak indicates that simple hygiene is

important, especially in health care facilities. The index patient arrived at a health care system that was able to identify MERS as a risk given his travel itinerary and had the laboratory resources to rapidly identify the virus.

With continuing spread of MERS-CoV to countries outside the Middle East and to all continents, MERS remains a public health risk and possible consequences of further international spread could be serious in view of the patterns of nosocomial transmission within healthcare facilities. Further spread to countries with weak health systems and laboratory facilities unable to rapidly identify an unexpected virus may result in a widespread outbreak or an epidemic in many of the 182 countries from which Ramadan, Hajj and Umrah pilgrims originate.

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