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Editorial

Middle East Respiratory Syndrome - need for increased vigilance and watchful surveillance for MERS-CoV in sub-Saharan African Africa

1. Introduction and background

The past two decades have witnessed the emergence of several new and old respiratory tract infectious diseases, which threaten global health security due to their epidemic potential.[1,2] These include multi-drug resistant TB, Severe Acute Respiratory Syndrome (SARS), avian and swine influenza and more recently the Middle East Respiratory Syndrome (MERS). MERS is a new zoonotic disease of humans caused by a coronavirus (MERS-CoV) which was first isolated in September, 2012 from a patient who died from a severe respiratory disease in Jeddah Saudi Arabia.[3] Since then MERS has attracted global media attention because it is associated with a high mortality (44%) in individuals who have co-morbidities such as diabetes, chronic renal, liver or lung illnesses or in those who are immunocompromised.[4,5]

The recent unprecedented outbreak of the MERS[6,7] in South Korea which arose consequential to the importation of MERS-CoV by a South Korean traveler to the Middle East, alarmed global public health authorities and highlights the potential of MERS-CoV to spread across the globe and cause local outbreaks. The WHO Director general convened the ninth meeting of the Emergency Committee (EC) under the International Health Regulations regarding MERS-CoV on 16 June 2015 to discuss the Korean outbreak.[8] As of 23rd June the total number of MERS cases reported from the Republic of South Korea now stands at 175 (94 currently receiving treatment, 54 recovered, 27 deaths.[6,8] Of 175 cases, 80 patients and 33 hospital staff had contracted the virus nosocomially, 62 friends, colleagues and relatives had come in contact within healthcare facilities while visiting family members with MERS.

2. Global distribution of MERS cases

Virological and serological studies from several Middle Eastern, West and East African countries indicate that bats and dromedary camels are likely reservoirs of MERS-CoV.[9–12] However, human MERS-CoV infections appear to be endemic only to countries in the Middle East where sporadic cases continue to occur in the community throughout the year.[13] From currently available data it appears that MERS-CoV does not transmit easily from person to person and to date no sustained community transmission has been documented. As of 22nd June 2015, 1038 cases of MERS-CoV infection with 459 deaths (44% mortality) have been notified to the World Health Organization,[13] a large majority of MERS cases have been reported from Saudi Arabia and the United Arab Emirates. MERS cases have also been detected in Algeria, Austria, China, Egypt, France, Germany, Greece, Iran, Italy, Jordan, Kuwait, Malaysia, Netherlands, Philippines, Lebanon, Oman, Qatar, Tunesia, Turkey, Yemen, United Kingdom, and United States of America. All MERS cases reported from the USA, European and Asian countries had a history of travel to the Middle East. MERS cases continue to be reported from the Middle East with on going MERS outbreak in Hufoof, Saudi Arabia.[13] The outbreak in Seoul, Republic of Korea, has been linked to a single individual who had travelled to Saudi Arabia. The first MERS case in Thailand was reported last week and the patient had a history of travel to the Sultanate of Oman.[13]

3. MERS and sub-Saharan Africa

Of note is the striking absence of any MERS cases (primary or travel related) reported from sub-Saharan African (SSA) countries.[14,15] The reasons MERS-CoV predominantly affects humans in the Middle East and is not endemic in Africa where MERS-CoV-infected camels and bats are present requires further study. A likely explanation may be that this may simply reflect the lack of clinical awareness of exposure risk, diagnosis and treatment of respiratory tract infections largely remains clinically based and empiric in most SSA countries coupled with absence of surveillance.[14]

Every year an estimated 10 million pilgrims from over 182 countries travel to the Kingdom of Saudi Arabia to participate in Hajj pilgrimage, the mini-pilgrimage Umrah (which is performed at any time of the year), or for the month of Ramadaan.[16] Of these, an estimated 1 million pilgrims come from sub-Saharan African countries. There were no cases of MERS reported during the 2012, 2013 and 2014 Hajj pilgrimages or the Ramadaan period.[17–19] However, the risk of MERS-CoV spreading globally remains due to the continuous influx of pilgrims and the persistent low levels of endemic MERS-CoV transmission to humans in Saudi Arabia. There is also the possibility that MERS-CoV may mutate into a form more adaptable for human to human transmission over time.

The potential risk of MERS-CoV infection to pilgrims who visit Saudi Arabia from different regions of the world was estimated by Coker and colleagues[20] based on overall incidence of MERS cases in Saudi Arabia since its first discovery in 2012. Their estimates based on the most likely scenario using recent pilgrim numbers for sub-Saharan Africa are that there will be at most ten returning pilgrims each year with MERS-CoV infections. National surveillance systems should be on alert for the low but long-lasting risk of MERS-CoV infected pilgrims returning from the Umrah throughout the year, and also for the large numbers of refugees at several conflict zones in the Middle East (those migrating from Syria to Turkey and from the Yemen border into Saudi Arabia and beyond).

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4. Lessons from the Korea MERS outbreak

The recent MERS outbreak in the Republic of Korea was associated with secondary, tertiary, quarternary and quinary cases of MERS-CoV transmission, though fortunately there has been no sustained community transmission.[6,8] The Republic of Korea MERS-CoV outbreak has many similarities with that of previously reported MERS-CoV outbreaks which occurred at healthcare facilities in several cities in Saudi Arabia and from Jordan[21–24] which were all associated with breaches and gaps in infection prevention and control protocols.

These lapses in Korean hospitals enabled MERS-CoV infected and uninfected patients, staff and visitors to mix freely in busy and crowded accident and emergency departments, within wards and multi-bed hospital rooms, with no isolation or quarantine of suspected cases. Public health measures such as enhanced contact tracing and isolation and quarantine put in place by the Korean government to control the outbreak eventually led to the decline in the numbers of MERS cases and the outbreak is being brought under control. The importance of infection controls measures was also illustrated by the Saudi Arabian hospital MERS outbreaks, where well-trained health care and workforce brought the hospital outbreaks under control quickly.[21,22]

The WHO EC meeting noted that[8] "... the outbreak was strongly associated with healthcare settings and that the main factors contributing to the spread of MERS-CoV in the Republic of Korea were:

a) Lack of awareness among health care workers and the general public about MERS;
b) Suboptimal infection prevention and control measures in hospitals;
c) Close and prolonged contact of infected MERS patients in crowded emergency rooms and multibed rooms in hospitals;
d) The practice of seeking care at multiple hospitals ("doctor shopping");
e) The custom of many visitors or family members staying with infected patients in the hospital rooms facilitating secondary spread of infections among contacts."

The WHO EC[8] referred to the outbreak as a '*wake-up*' call and state that in a highly mobile world, all countries should always be prepared for the unanticipated possibility of outbreaks of MERS-CoV and other serious infectious diseases.

The Korean MERS outbreak is the largest recorded from outside the Middle East and the largest imported from a returning traveller to the Middle East, raising several important issues for global surveillance and control. It illustrates that MERS-CoV, three years after its first discovery remains an important global public health risk with many unanswered questions.[25] Further international spread should be anticipated and countries with weaker health systems and lack of laboratory facilities to accurately screen for MERS-CoV need to be vigilant. This will pose major challenges.[25] There are important lessons here for sub-Saharan African and other developing countries from where MERS-CoV cases have not yet been detected.

5. MERS-CoV surveillance in sub-Saharan Africa

As the recent Ebola Virus Disease epidemic illustrates, African countries may be very vulnerable to a Korea-like MERS-CoV outbreak, which may arise from returning pilgrims or other travellers from Saudi Arabia[26] or from traders between Saudi Arabia and the Horn of Africa. MERS-CoV is transmitted through MERS-CoV-infected respiratory secretions for which contact and droplet precautions are recommended.[27–30]

The Korean MERS outbreak highlights that hospitals provide ideal conditions for amplifying MERS-CoV transmission arising from close contact between patients, healthcare and ancillary staff, relatives and other visitors, which enables spread of MERS-CoV.[6,8] It is critical that every country should maintain a high level of vigilance and perform MERS-CoV surveillance according to widely available expert recommendations,[27–30] whether or not MERS cases have been detected in their countries, it ensuring infection prevention and control protocols are in place at all health-care facilities. Those who travel must be educated to follow basic hygiene measures[30] and those develop ill health during their trip to the Middle East, or soon after their return should seek medical care and volunteer the history of travel to their healthcare provider.

Sub-Saharan African governments must pay serious attention to strengthening infection control and public health surveillance systems. All healthcare workers and travellers from Africa to the Middle East should be aware of the threat to global health security posed by MERS-CoV. Considering a diagnosis of MERS at first presentation may be difficult due to non-specific symptoms at clinical presentation. However it is important that prevention and control measures are instituted at first consideration of MERS as a diagnosis to prevent spread of MERS-CoV. Hospitals and clinics providing care for patients infected with suspected or confirmed MERS-CoV infection should take appropriate measures to decrease the risk of MERS-CoV transmission from the infected patient to other patients, doctors, nurses, allied health-care workers, relatives and visitors. Health-care workers should be educated and trained in infection prevention and control and should have continuing professional development on these issues.

Over the past decade, several surveillance systems have been introduced to monitor the emergence of new infectious pathogens.[31] As the Ebola virus epidemic in West Africa showed, surveillance systems in African countries for infectious diseases with epidemic potential require strengthening. More effective national, regional, and international surveillance systems are required to enable rapid identification of emerging respiratory epidemics, diseases with epidemic potential, their specific microbial cause, origin, mode of acquisition, and transmission dynamics.

In light of the Republic of Korea MERS outbreak increased vigilance and surveillance for MERS-CoV should be carried out by health services in African countries using current clinical and public health guidelines for MERS-CoV.[28] Although resources may not allow for making an accurate diagnosis of MERS, a high degree of awareness of the possibility of MERS-CoV infection in all returning pilgrims will allow early, isolation of patients and putting in place infection control measures, avoiding a repeat of the Korea outbreak.

Sub-Saharan African countries need to protect themselves against the possible outbreaks akin to the Korean one. MERS-CoV should be included in list of pathogens by The African Network of Influenza Surveillance and Epidemiology (ANISE)[32] and MERS-CoV should be made part of the Strengthening Influenza Sentinel Surveillance in Africa (SISA)' with national, regional and international reporting mechanisms[33] in liaison with other stakeholders involved in global infectious diseases surveillance. New, low cost, rapid, sensitive and specific diagnostic tests that can be used at all points of healthcare are require for all infectious diseases which threaten global health security.[34] The exact mode of transmission and pathogenesis of MERS-CoV and other novel respiratory tract viruses such as H7N9 influenza A virus require definition so that more effective prevention and management measures can be developed and introduced.[35] A united and coordinated global response is needed to tackle emerging respiratory tract infections and to fill major gaps[25] in the understanding of the epidemiology, transmission dynamics, pathogenesis prevention and control of these infectious diseases.

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