Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, met His Excellency Engineer Khalid bin Abdulaziz Al Falih to brief him on the outcomes of the mission

Background

Since its emergence in 2012, cases of Middle East respiratory syndrome (MERS) continue to occur in countries of the Eastern Mediterranean Region signifying that the global threat of MERS has not yet subsided. Last year, the outbreak in South Korea was a strong reminder that MERS-CoV remained an international health threat and could cause severe disruption to health, economic and social services if health systems remain unprepared. It also became evident last year that hospital outbreaks of MERS in Saudi Arabia could escalate both nationally and internationally into a perpetual global health threat. In view of this, it was necessary to assess and understand what progress has been made in Saudi Arabia, where over 80% of laboratory-confirmed cases of MERS have occurred, in controlling the virus, including preventing its international spread.

In 2015, 2 important technical missions were conducted by WHO in Saudi Arabia. The World Organisation for Animal Health (OIE), the Food and Agriculture Organization of the United Nations (FAO) and a host of other international health partners participated in these 2 missions.

The aim of the first mission, from 17 to 20 February, was to assess progress in the control of a MERS outbreak in the country. It resulted in a set of strategic and technical recommendations to support the Ministry of Health in successfully containing transmission in the community, preventing its spread in hospitals, and addressing travel-related cases. The second WHO mission was conducted on 23 August in view of a major hospital outbreak reported from Riyadh. The main objectives of this mission were to better understand the scale of the threat and underlying risk factors for repeated hospital outbreaks of MERS in the country and provide guidance on public health control measures undertaken by the Government to stop the outbreak.

The objectives of the current mission, which was conducted in Saudi Arabia from 11 to 14 January 2016, were to:

- review the ongoing MERS situation;
- assess progress in implementing previous mission recommendations;
- identify main areas of public health research to better address remaining knowledge gaps; and
- agree on a joint operational plan for WHO and the Ministry of Health of Saudi Arabia for collaborative work and research to prevent and control MERS-CoV.

The mission included, in addition to WHO staff, experts on MERS-CoV from OIE; the United States Centers for Disease Control and Prevention, Atlanta; University of Bonn, Germany; Institute of Pasteur, France; European Centre for Disease Prevention and Control, Sweden; University of Hong Kong; Public Health England, United Kingdom; and Mount Sinai Hospital, Canada.

Members of the mission met with the Deputy Ministers of the Ministries of Health and Agriculture and their teams involved in MERS operations, and officials of King Abdulaziz City for Science and Technology; attended weekly meetings of the National and Regional (Al Hasa) Command and Control Center (CCC); and visited animal and human health laboratories and the following hospitals – Prince Mohammed Bin Abdulaziz Hospital, Riyadh; National Guard Hospital, Riyadh; King Fahd Medical City, Riyadh; and King Fahd General Hospital Hofuf, Al Hasa. The team also visited a camel research facility, slaughterhouse and market in Hofuf, Al Hasa, as part of the mission.

On the final day of the mission, Dr Ala Alwan, WHO Regional Director for the Eastern Mediterranean, joined the mission and, met His Excellency Engineer Khalid bin Abdulaziz Al Falih and briefed him on the outcomes on the final day of the mission.

Summary of findings and observations

The mission noted the substantial progress made in the control of MERS-CoV in last 12 months, including in:

- accumulating knowledge and learning lessons to control hospital outbreaks and and applying evidence-informed hospital infection control measures to prevent hospital outbreaks of MERS;

- establishing a mechanism to monitor compliance by hospitals in implementing appropriate infection prevention and control (IPC) measures;
- improving collaboration between the human and animal health sectors;
- establishing an electronic surveillance system for MERS and real-time mechanism to track and respond to cases or outbreaks;
- conducting research to evaluate information gaps identified during previous WHO missions, and
- establishing a mechanism to support and fund priority health research on MERS to address key knowledge gaps.

Surveillance for human infections from MERS

The mission acknowledged that the surveillance system for detecting and monitoring both suspected and laboratory-confirmed cases of MERS has improved through the establishment of the Health Electronic Surveillance Network (HESN). All suspected and laboratory-confirmed cases of MERS are now entered into this web-based surveillance system, which is accessible to most health care facilities and facilitates for the Ministry a real-time alert, investigation and response. However, the surveillance systems remain "responsive" in detecting suspected cases early. It is important to establish a sentinel-based surveillance system for severe acute respiratory infection (SARI) in the country which would facilitate identification and systematically testing for in order to identify and test systematically for MERS-CoV any cases that present to health facilities with pneumonia or pneumonia-like syndromes and to monitor testing rates in order to reduce the risk of missed cases. Other challenges include a shortage of human resources, especially a trained public health workforce for joint animal/human investigation and contact tracing.

Hospital outbreaks – experiences in IPC and lessons learned

The mission noted that incidence of hospital outbreaks in hospitals owned by the Ministry of Health has decreased. The challenge remains in preventing and controlling nosocomial outbreaks from MERS in hospitals owned by other ministries and in private hospitals. There is also a growing body of experience from MERS outbreaks in hospitals, which are used to address identified weaknesses and improve infrastructures, patient flow, IPC compliance, and early detection of cases in patients who present in health care facilities. A clear example is how the National Guard hospital outbreak in Riyadh in August 2015 led to significant improvements and changes in all National Guard hospitals throughout the country. There are, however, concerns that this process is still reactive, rather than proactive.

Experiences and what was learnt from this event and other outbreaks in Ministry of Health hospitals appear only to be shared within each individual health care system (Ministry of Health hospitals with other Ministry of Health hospitals only, National Guard hospitals with other National Guard hospitals, etc.). There is limited knowledge-sharing, cross-fertilization and wider

application of improved IPC measures across all hospitals in the country. Despite greater prominence of the Ministry of Health in public health matters, there are still situations in which the Ministry's ability to provide the necessary oversights and regulatory control in other non-Ministry of Health hospitals still remains a challenge. In addition, there is a paucity of resources to implement MERS prevention and response plans in every hospital in the country.

Laboratory diagnostic capabilities (animal and human health)

The regional laboratory of the Ministry of Health in Riyadh appears to be operating well, although it is not participating in external quality assurance programmes. The Ministry of Agriculture laboratory is in a state of transition, and it may take some time for it to become fully functional.

Investigation of primary cases: addressing MERS at the human-animal interface and surveillance of MERS-CoV in dromedaries

Collaboration between the Ministries of Agriculture and Health in investigating primary cases has significantly improved. However, field investigations are conducted separately, thereby missing opportunities to evaluate in a timely manner the role of camels in transmission of the virus to humans. While a number of surveillance initiatives related to detecting MERS-CoV in camels are in planning stage, there is a paucity of resources for its implementation and there is no strategic plan for developing the much needed surveillance system in dromedaries which would identify virus circulation in camels before infection occurs in humans.

Research priorities, studies and support mechanisms

Substantial research on MERS-CoV has been carried out to fill the gaps identified during previous missions of WHO. However, there is a strong need to prioritize epidemiological research on MERS which will aim at addressing key public health questions required for effective global response. Recently, a MERS-CoV research committee was established at the King Abdulaziz City for Science and Technology which includes members from both the Ministry of Health and Ministry of Agriculture. It aims to prioritize and fund MERS-CoV research in the country.

Both the Ministries of Agriculture and Health are planning substantial involvement in research studies, but it is not clear that similar effort is being directed towards the investigational studies that will inform public health action.

Overall management of MERS and intersectoral coordination

The mission was pleased to see the implementation of the Command and Control Centre (CCC) to provide a national and regional focus for the response. This CCC, supported by the Situation Room and the HESN, provides a good basis for effective, coordinated public health action and review. However, the full potential of this system is not yet being exploited.

Conclusion and recommendations

The mission acknowledged that the first phase of the MERS response was designed to respond to acute events, such as the repeated nosocomial outbreaks. The country is now ready to move to the next phase, which is to focus on preparedness to respond to and prevent primary infections in the community and future outbreaks in hospitals.

Therefore, the mission recommended scaling up the following strategic actions in leadership, coordination and operational areas.

1. Expand the national strategic plan for control of MERS with a strong focus on preventing primary cases in the community, as well as stopping rapidly the nosocomial transmission in hospitals through involving all concerned ministries in the country. The plan will require identification of a leader with necessary authority, responsibility and accountability and allocation of appropriate human and financial resources for the plan's effective implementation.

2. Scale up engagement with other sectors, such as the Ministry of Agriculture, Ministry of Municipalities, etc. in preventing community-acquired infections. Of particular importance would be to reinforce and systematize joint investigation by both the animal and human health sectors of each reported case of community-acquired infection. Such joint and collaborative investigation and control efforts under the "one health" approach could effectively contribute to preventing human infections acquired in the community.

3. Identify and implement research to address the key public health questions on MERS that remain unanswered to date. Based on the list of research questions recommended in the last international scientific meeting organized by WHO in Cairo on 5–6 May 2015, the mission recommended that, in consultation with WHO, the new research body King Abdulaziz City for Science and Technology prioritizes research areas to be funded and calls for researchers across the world to submit their research proposals based on this prioritized list.

4. Document and share widely, both nationally and internationally, institutional lessons learnt in the Kingdom in the areas of IPC measures to prevent nosocomial outbreaks of MERS. Such lessons should capture the risk factors for hospital outbreaks and the institutional lessons learnt on best ICP practices for controlling outbreaks of MERS.

5. Elevate the CCC into a multisectoral body, able to effectively coordinate and collaborate with other ministries and sectors involved with any important aspect of MERS-CoV, especially the Ministry of Agriculture, veterinary services, and wildlife sector. Such a multisectoral body could ensure a consistent government policy and communications on all cross-sectional issues related to MERS-CoV and should direct and guide an effective and coordinated response to an outbreak through optimizing communications and collaboration with all government and nongovernmental sectors and agencies involved in a response operation.

MERS remains a global health concern. The scaling up of preventive and control efforts of MERS in the Kingdom of Saudi Arabia, where the majority of global cases have so far occurred, would effectively contribute to enhanced global response to this health threat. It would be a collective responsibility to prevent escalation of any event related to MERS-CoV. In the next course of action, WHO would like to work collaboratively with the Ministry of Health to develop an action plan with time sensitive and achievable goals, in accordance with the agreement reached during the meeting of the mission members with His Excellency the Minister of Health to implement the mission’s recommendations.

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