



Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in Animal Species Regional Technical Consultation Meeting

Muscat, Oman

20-21 May 2014

MUSCAT DECLARATION

The participants in the Regional Technical Consultative Meeting on MERS-CoV express gratitude to the Ministry of Agriculture and Fisheries, Sultanate of Oman for generously hosting this important meeting in Muscat, 20-21 May, 2014, and special thanks to his Excellency Dr. Fuad Jaffer Al Sajwani, the Minister of Agriculture and Fisheries, for his continuous support and engagement to this event.

From 2012 to date, the World Health Organization (WHO) has reported a total of 639 laboratory-confirmed cases of infection with the novel Middle East Respiratory Syndrome coronavirus (MERS-CoV), including 196 deaths. The majority of cases have been reported in the Kingdom of Saudi Arabia (KSA) but cases were also reported in the United Arab Emirates, Qatar, Jordan, Oman and Yemen. Imported cases have also been reported by several countries including France, Germany, Italy, Tunisia, the United Kingdom, Kuwait, Greece, the Philippines, Malaysia, Egypt, the United States of America, Lebanon and the Netherlands. Most of these infections were acquired in the Middle East and a few cases have occurred after close contact with individuals with a travel history from the Middle East.

A sharp increase in the number of human cases particularly in KSA has been recently observed. While this could represent improvements in surveillance strategies, it may be also a signal of a change in the character of the virus that would require urgent action.

Human-to-human transmission is known to occur, but other modes of transmission including from animal to human requires further exploration.

Today, a number of unanswered questions remain concerning the emergence of MERS-CoV and its mechanisms of spread. In ongoing efforts to better understand the role of animal species in the epidemiology of MERS, the Food and Agriculture Organization of the United Nations (FAO) convened a Regional Technical Consultation Meeting on MERS-CoV hosted by the Government of the Sultanate of Oman in Muscat and with the participation of the World Organisation for Animal Health (OIE) and the World Health Organization (WHO) on 20-21 May, 2014.

The meeting was opened by the Minister of Agriculture and Fisheries, His Excellency Dr. Fuad Jaffer Al Sajwani and the FAO Subregional Office Coordinator for the Gulf Cooperation Council States and Yemen and FAO Representative in UAE *ad interim*.

The meeting brought together over 50 participants from 11 countries (Bahrain, Egypt, Ethiopia, Jordan, Kuwait, Oman, Palestine, Qatar, Saudi Arabia, Sudan, United Arab Emirates, and Yemen) in addition to key MERS experts from Centres for Disease Control and Prevention (USA), the Erasmus Medical Center (the Netherlands), the University of Hong Kong, representatives from the Gulf Cooperation Council Secretariat, US Department of Agriculture, and other regional and national organizations. Also in attendance to the Consultative Meeting were representatives of OIE (Paris and Beirut) and WHO (Geneva) as well as staff from FAO Headquarters, Regional Office (Cairo), the sub-Regional office (Abu Dhabi) and the FAO representative in Oman.

The main objectives of this meeting were to:

- review the current state of knowledge on the disease in affected countries and the potential role of animal species in the epidemiological cycle of MERS-CoV;
- analyse the recent developments in diagnostic and surveillance tools to support animal investigations;
- identify the concrete steps and road map for coordinated actions at the regional level with a view to halt the spread of the disease; and,
- discuss and agree on mechanisms for intra-regional cooperation in investigations, research and knowledge sharing and the role of international and regional organizations.

General Conclusions¹

Given the importance accorded to MERS-CoV in the region and around the world, the recent upsurge of human cases in the Arabian Peninsula and the suspected zoonotic transmission involving particularly dromedary camels, the participants agreed on the following statements of necessary action:

- 1- Prioritizing urgent investment in research and continuous and coordinated surveillance programme for MERS-CoV in animal species.
- 2- Strengthening joint or collaborative investigations of confirmed and probable cases through multidisciplinary teams and the systematic search for the source of infection in animals and the environment.
- 3- Promoting coordinated initiatives at the regional level for information sharing and joint efforts to contain the spread of the disease and to investigate the role of animal species in the epidemiology of MERS-CoV.
- 4- Soliciting support from the relevant international organizations and institutions and research centres to complement national efforts for the detection of the virus and the risk management of MERS-CoV.

¹ Recognising the current understanding of the MERS-CoV virus to date and the infection/disease it causes in hosts, transmission dynamics, and pathogenesis is limited. FAO and partners will develop further guidelines as more information becomes available, through a process that includes expert consultations in science, policy and communication.

- 5- Developing communication strategies to ensure appropriate information to the public on MERS-CoV and to avoid possible negative impacts of the crisis on the livestock industry.

With the overarching objectives to:

- Protect human health of MERS-CoV by reducing risk to humans from a potential animal source.
- Ensure animal health and production systems in the region are protected, to support people's livelihoods, maintain cultural values, safe trade, animal welfare, and growth of the economy.
- Provide guidance in risk analysis of MERS-CoV threats to countries in the regions of the Arabian Peninsula, Middle East, North Africa, Horn of Africa, and beyond.

The participants agreed on the following specific recommendations on *surveillance, response in the identification of a human case, research gaps, and regional cooperation*, in addition to address *best practices*:

Surveillance of MERS-CoV in animal species

1. As required by the International Health Regulations (WHO 2005) and World Organisation for Animal Health (OIE), countries must immediately report urgent health events of epidemiological significance within their territories.
2. Joint or well-coordinated investigations should be conducted surrounding the identification of human cases that are inclusive of the environment, livestock and wildlife sectors. Such investigations should include the collection of samples for serological and viral detection (i.e., swabs, tissues) from multiple species. The composition of the investigation teams may include more than medical and veterinary specialists, as the needs require. In undertaking the investigations, systems of unique animal identification within identified barns or holdings should be operated for possible follow-up and monitoring. The samples must be appropriately labelled (species, age, sex, unique identification).
3. Attempts for virus isolation should not be undertaken in laboratories unable to ensure the laboratory safety of its personnel (below level BSL3).
4. Sero-prevalence studies for MERS-CoV are valuable to undertake risk assessment nationally and globally. The determination of high-risk areas for improved MERS-CoV management (prevalence data) could focus surveillance activities and awareness communication.
5. Promote capacity development and technology transfer to countries in need.

Response² and risk management

1. In the context of camels suspected of having an epidemiological association with human cases, undertake serological and viral detection in multiple species (and not just focus on camels on the premises). If PCR positive animals are identified
 - a. The case should be immediately reported to OIE.
 - b. It is also advised that:
 - i. The herd be isolated on the premises until animals are retested until PCR negative.
 - ii. Milking and slaughter of positive animals for the purposes of supplying the food chain be prohibited throughout the period of isolation.
 - iii. Animal products (including milk) and all bio-waste (animal faecal matter) be kept on the premises and managed effectively against pests, scavenging animals or cross-contamination
2. The response in animals/herds found to be PCR positive (without associated human cases) should be to report to public health and veterinary authorities, and if necessary PCR positive animals to be isolated and retested as above (b).
3. The response to risk associated with animal importations: any importation bans should be based on scientific evidence of positive reactivity to pathogens of concern. Until more scientific evidence on the role of animals in MERS-CoV becomes available, countries may require testing of animals prior to or at the port of entry. If animals are found PCR positive (to MERS-CoV³) then appropriate measures should be applied to reduce the risk of human exposure, including the possible isolation of positive animals until PCR negative results obtained.
4. MERS-CoV prevention in high risk environments (and specifically for slaughtering plants): Testing of animals prior to transport for slaughter and if found positive by PCR they should not be slaughtered. At slaughter plants, held animals should not be released once they have entered the facilities. (*Occupational aspects covered below*).

Research

Research focusses on the investigation of potential routes of transmission between camels and from camels to humans.

1. An array of domestic livestock species, and if possible, wildlife species should be tested for susceptibility to MERS-CoV.
2. Longitudinal studies should be undertaken in naturally and experimentally infected camels using different age groups and production systems to determine virus shedding in excretions (nasal, fecal, milk and urine) and presence of the virus in meat and serological responses over time, to obtain more information on the natural MERS-CoV infection in dromedary camels, or other species shown to harbour MERS-CoV.

² Response is in reference to three scenarios (a) human case investigations with a history of physical contact with animals within the previous 30 days (acute management response). The character and nature of the contact would be part of the investigation; (b) no human case reported; and (c) animal imports.

³ Other regulatory concerns could enter into the decision making (reactivity to other animal pathogens or welfare issues)

3. Further characterization of viruses identified, including viral genome sequence determination and if possible experimental infections in animal models (dromedary camels). Comparative analysis of diagnostic assays and protocols should be included.
4. Determine the possibilities to develop evidence-based intervention strategies (vaccine or other transmission prevention measures).
5. Develop field PCR assays for ease of screening and rapid risk management.
6. Characterization and mapping of animal production systems and review of specific legislation pertaining to camels and transboundary movements (racing, breeding, slaughterhouse management and compliance).

Regional Coordination

1. The Gulf Cooperation Council (GCC) Secretariat to play an active role in coordination between the GCC countries and Regional and Sub-regional Offices of international organizations.
2. GCC Secretariat to upgrade existing GCC network on agriculture to work as information sharing platform on animal production and health (including veterinary laboratory networking)
3. Countries of the Arabian Peninsula and neighbouring countries to harmonize procedures and measures for animal movement control and border inspection to ensure safe trade of livestock.
4. Need to (re)establish a Regional Centre for Animal Health and Food Safety, which is properly resourced for its sustained function.

Best Practices - Biosecurity

1. The introduction of new animals into a territory should follow OIE Terrestrial Animal Health Code importation guidelines. Whenever feasible, new animals which are introduced to a territory should be individually identified prior to inclusion into herd/flock of the same species. These animals should be placed in a separate location from the existing herd and screened for the absence of infectious diseases of relevance. Farm records should be kept (and made available to competent authorities upon request).
2. Prized camels should be screened for the absence of MERS-CoV virus (PCR) or other high impact disease agents prior to gatherings (i.e., competitions or shows). The introduction of a Passport / Certificate could be instituted as a practice for movement and sanitary control.
3. Camel farm, slaughterhouse, racing and market workers should practice good personal hygiene, including frequent hand washing after touching animals, facial protection where feasible, and the wearing of protective clothing, which should be removed after work and washed daily. Workers should also avoid exposing family members to soiled work clothing, shoes, or other items that may have come into contact with camels or camel excretions. Sick animals should never be slaughtered for consumption. People should avoid direct contact with any animal that has been confirmed positive for MERS-CoV. This particularly applies to people with compromised immunity. (See: www.who.int)

4. Risk communication should be coordinated, and should include advice about risk reduction and hygiene measures, biosecurity measures, as well as conventional food safety advice particularly regarding the proper cooking of meat and only drinking milk that has been pasteurized.

Engagement of the private sector

1. Engagement of the private sector (racing associations, breeding enterprises, meat packing, etc.) is strongly encouraged to ensure broad input, better communication, and compliance.

These specific interim recommendations are to be reviewed and updated as knowledge accumulates and more scientific information on MERS-CoV in animal species becomes available. They should be seen only as practical guidance to assist countries in managing animals found infected with MERS-CoV.

Dated 21 May 2014 at Muscat, Sultanate of Oman.