MERS-CoV: Q&A

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1. When was Middle East Respiratory Syndrome coronavirus (MERS-CoV) detected and where? How many cases have there been since, and in general, in what areas of the world?

The first case of the Middle East Respiratory Syndrome coronavirus (MERS-CoV) was detected in Jordan in 2012. Since then there have been 540 confirmed cases and 148 confirmed deaths[i], with the majority detected in Saudi Arabia. Cases were also reported in Oman, Qatar, the United Arab Emirates and Yemen. Cases of travellers leaving Saudi Arabia and entering countries in Asia, Europe, North Africa and the United States of America have also been reported.

2. With the increase of infections since April 2014, has the virus evolved?

Even though the number of human cases has increased greatly since April 2014 - likely because of increased awareness, surveillance and documented exposure with and without clinical disease - investigations show that there have not been any significant changes in the genome of MERS-CoV, and that the genome has remained stable during these recently reported cases.

3. How does MERS-CoV spread?

Most of the cases reported have occurred through human-to-human transmission. However, the primary causes are more probably transmitted through contact with non-human sources (e.g. through the environment or through an unknown animal source). The possibility of an unknown clinically healthy human as the link between an infected animal and clinically human remains to be shown. To determine such transmission possibilities thorough epidemiological investigations, field history recording, and collaboration between public health officials and veterinary authorities are warranted.

4. New scientific studies claim that camels are the source of MERS-CoV. Does FAO agree with these findings? Why are they important?

These studies have reported high proportions of camels with antibodies against MERS-CoV or a closely related virus in countries where human cases were detected and in countries with no reported cases. Some of these studies have shown that MERS-CoV has been circulating in camels in Saudi Arabia since 1992 and in the UAE since 2003. Investigations around human cases in a farm in Qatar have described for the first time genetic evidence of MERS-CoV infection in nasal swabs form seropositive camels in that farm. Other studies in KSA, Egypt and Oman have also reported the isolation of the virus from some camels. A recent study from Saudi Arabia showed that the virus in camels is capable of infecting humans and could be the source of infection, but that it may be only certain strains (genotypes) that can be transmitted to humans and capable of infecting them. All these studies suggest a possible role for the camels as intermediate hosts of the MERS-CoV but do not provide evidence that the virus is transmitted from camels to humans.

FAO concurs with the researchers' conclusion that the antibody findings in camels indicate that a virus similar or closely related to the MERS-CoV occurs in many camel populations and that some camels may carry the virus. However further studies are needed in order to understand how the virus passes from its natural host or reservoir to humans.

5. What are the countries with the biggest camel population?

Camels are widely spread throughout the world and serve important economic, livelihood, nutritional and social purposes. They are used as draft animals, for dairy and meat production, and for recreation as they are also used in ceremonial and racing events. Dromedary camels ("one hump") occur mainly in arid areas, and their highest populations are found in the Horn of Africa. FAO and its partners have long supported camel-related livelihoods as an important resource for vulnerable populations.

Countries with the largest camel populations are: Somalia, Sudan, Kenya and Niger, in that order. (Source, FAOSTAT 2014).

6. If camels are the source of the virus, can other hosts, like bats, be ruled out?

Current knowledge of the clinical and epidemiological or transmission risks for MER-CoV is incomplete and further studies are need to identify the source of the virus and the mode of transmission to humans. In light of this, FAO and its collaborating partners – the World Health Organization (WHO) and the World Organisation for Animal Health (OIE) – do not wish to exclude any potential sources at this stage. In-depth and carefully planned investigations need to be carried out to ensure that all reasonable possibilities are considered and have suggested possible laboratory studies that could shed additional light on existing field data.

7. Why is it important to find the source? What does it mean?

It is important to identify the sources of emerging infections and to appreciate the means by which microbes can “spill over” into human populations or the spread between animals. Better understanding of virus sources and methods of spread can be employed to help people and their animals avoid exposure. This knowledge can also be used to design methods to better prevent, detect and control the disease, devise national, regional and global strategies to reduce the risks that viruses pose to health and trade. Understanding the source can help in the design of methods to protect the safety and livelihoods of livestock/animal holders.

8. If more research is needed to get clarity on the virus, what should scientists be looking for exactly?

Using modern techniques, the isolation of viruses or identifying fragments of its genetic makeup allows scientists to collect a wealth of information about MERS-CoV and analyse the environmental context where the samples were obtained. This information can provide evidence concerning where the infection may have risen and when, who was exposed, and who was not, what the conditions were or the behaviour for such exposure/infection. Future investigations will need to focus on characterizing the viruses and on their genetic comparison. In addition, the potential risk practices and behaviours for exposure need to be addressed.

9. Do countries have sufficient infrastructure to carry out virus research?

FAO stands ready to work with and assist any member country, upon request, in developing the capacities required to conduct field and laboratory investigations. In addition, FAO works with numerous specialised Reference Centres around the world. Through these centres, FAO can provide expert services depending on the needs of a country or region.

10. What are the precautionary measures FAO recommends to consumers and producers to protect themselves against the virus?

FAO does not currently have any specific information about exposure to MERs-CoV until the field and laboratory studies recommended can gain further insight on the behaviour of the virus. FAO recommends people follow best practices commonly employed in the preparation or consumption of foods (e.g. clean surfaces, clean knives/spoons during food preparation, hand washing, thoroughly cooking meats and pasteurization of dairy products). Such measures will protect against a wide range of diseases; they are not specific to MERS-CoV. FAO also recommends that individuals who are debilitated because of chronic health conditions or undergoing treatments for an illness not expose themselves to unnecessary risks. More authoritative and precise guidance should be sought by recommendations offered by the World Health Organization (WHO; www.who.int).

11. What has FAO done since the first human MERS-CoV case has been detected, and what is FAO planning next?

FAO has been working through its network of offices around the world and in close collaboration with WHO and OIE. As part of normal preparedness measures, FAO and its partners have been planning for the provisioning of expert advice and technical assistance upon the request of countries responding to the emergence of the disease should animal populations be considered involved.

FAO, in collaboration with the Government of Sultanate of Oman and convened a regional technical consultation meeting on MERS-CoV in Muscat, Oman from 20-21 May 2014 with the participation of 11 countries from the region in addition to representatives from OIE, WHO and the Secretariat of the Gulf Cooperation Council countries. . The principal objectives of the meeting were to review the current knowledge on the disease, analyse the recent developments in diagnostic and surveillance tools, identify and agree upon the actions that will minimize the spread of the disease and discuss intra-regional cooperation investigations. The participants at the meeting agreed on the “Muscat declaration” which urges countries in the region to increase surveillance of the virus in animal species, prioritize research to investigate the role of animal species in the epidemiology of MERS-CoV and promote coordinated initiatives at the regional level for information-sharing.

[i] As of 9 May 2014. FAO GLEWS includes human cases confirmed by official sources (Ministries of Health and WHO) in the FAO EMPRES-i database.