

Current Event

A Roadmap for MERS-CoV Research

World Health Organization (WHO) published strategic public-health goals and global priority research activities on MERS-CoV.

Editorial Notes

The dynamics and the efficient modes of transmission of MERS-CoV from dromedaries, the main animal reservoir for the virus, to humans and between humans is poorly understood. The majority of MERS-CoV outbreaks have occurred within health-care facilities.

Nucleic acid-amplification tests (NAATs) are currently the gold standard of MERS-CoV diagnostic platforms. Serologic assays vary in their performance characteristics, but provide benefits over NAATs in the form of easier implementation and more functionally relevant readouts. There is need for development of simple, dipstick immunochromatographic assays that are suitable for use on livestock and humans (before confirmatory testing of positive results in humans).

Among products being researched for pre- or post-exposure prophylaxis, monoclonal antibodies (mAbs) targeting the receptor-binding domain (RBD) of S are furthest along in the product-development pipeline.

Vaccine-development against MERS-CoV fail to advance beyond phase 1 testing because of absence of an animal model that recapitulates the pathogenesis and natural history of severe human disease, lack of interest from funders and limited industrial support. There are currently a dozen vaccine candidates in preclinical development. All developers are basing their immunogen designs on the S surface glycoprotein, the primary target for neutralizing antibodies during natural MERS-CoV infection. Two of the vaccines have

Research and Product Development Roadmap for MERS-CoV

Strategic goals:

1. To identify circulating species and strains in animal populations;
2. To have better understanding of the natural history of MERS-CoV;
3. To improve diagnostic tests;
4. To initiate a public-health financial model for emerging pathogens prioritized by the WHO blueprint process.

! Effective camels vaccine against MERS-CoV would align with "OneHealth" strategy—in which human, animal and environmental concerns are all considered-

! Stakeholders in research and product development on emerging pathogens must set out a sound strategy now for where to best target their investments in anticipation of future outbreaks.

(Modjarrad K et al. 2016)

Cases of MERS-CoV: International Week (IW) No. 31: 31 July - 6 August 2016

Total	3
Symptomatic (S)	3
Asymptomatic (AS)	0
Healthcare worker (S)	1
Healthcare Worker (AS)	0

been tested in camels, which, if effective, would interrupt transmission of the virus to humans.

Individuals at acute risk during outbreaks would receive a single-dose vaccine, whereas a two-dose vaccine to induce durable protection would be given to those at continual risk, such as camel handlers and health-care workers. A third vaccine indication proposed is for dromedaries, particularly juvenile camels, which pose a greater risk than older camels of transmitting virus to humans. Usually, animals are vaccinated to prevent illness and death within veterinary populations. In the case of a MERS-CoV camel vaccine campaign, however, the primary intent is to prevent infection and disease in human populations. The endpoint for a veterinary vaccine is likely to be the reduction or prevention of viral shedding and interrupt epidemics of MERS. Camel vaccination may be the fastest developmental and regulatory route toward licensing a product that can prevent human MERS-CoV infections and deaths.

Recent Publications:

Modjarrad K, Moorthy VS, Ben Embarek P, Van Kerkhove M, Kim J, Kieny MP. A roadmap for MERS-CoV research and product development: report from a World Health Organization consultation. *Nat Med.* 2016 Jul 7;22(7):701-5.

MERS-CoV in KSA 2016*

Region	Case	Primary	Secondary	U.C.
Riyadh	67	27	38	2
Qassim	37	11	23	3
Najran	11	9	1	1
Jeddah	9	6	2	1
Hail	7	6	0	1
Taif	6	5	1	0
Eastern Region (1)	6	5	1	0
Al-Ahsaa (1)	5	5	0	0
Asir	5	4	1	0
Madinah (1)	4	4	0	0
Al-Baha	2	1	0	1
Bisha	1	1	0	0
Tabuk	1	1	0	0
Makkah	0	0	0	0
Al-Joaf	0	0	0	0
Jazan	0	0	0	0
Northern Borders	0	0	0	0
Qunfotha	0	0	0	0
Hafr Al-Batin	0	0	0	0
Qurayyat	0	0	0	0
Total	161	85	67	9

Case: Confirmed Symptomatic. U.C.: Unclassified cases

*Period: Form 3 Jan to 6 August 2016

Regions with new cases of this week are highlighted in yellow.

