Why the MERS virus is winning

Some Western scientists say people are dying needlessly of MERS. Saudi authorities say that's not true

BY KATE KELLAND

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In a north London laboratory on a Saturday in September 2012, an email arrived from a team of virologists in the Netherlands that spooked even some of the world's most seasoned virus handlers.

It contained details of a mysterious viral pathogen that had been found in two patients – a Qatari in intensive care in Britain, and a Saudi who died in a Jeddah hospital of pneumonia and renal failure.

This information-sharing between world-leading specialists proved fruitful: Within days the new virus had been identified as one never seen before in humans, had some of its genes sequenced, and its genetic ancestry published online for scientists around the world to see.

Yet that international collaboration was not to last.

Instead, Western scientists allege, the cooperation gave way to a Saudi culture of suspicion and stubbornness that has allowed the Middle East Respiratory Syndrome (MERS) virus, as it has become known, to kill more than 175 people in Saudi Arabia, spread throughout the region and reach as far as Malaysia, Greece, Lebanon and – via Britain – the United States.

The disease, like its cousin Severe Acute Respiratory Syndrome (SARS), causes coughing, fever and sometimes fatal pneumonia. More than 650 people worldwide have been infected with it, and MERS is reaching new victims every day in the Saudi kingdom, killing around 30 percent of them.

Experts say these infections and deaths could have been stopped well within the two years since MERS first emerged – and would have been if Saudi authorities had been more open to outside help offered by specialist teams around the world with the technology, know-how and will to conduct vital scientific studies.

But according to scientists involved in tracking MERS over the past two years, the Saudis have rejected repeated offers of help – including from World Health Organisation (WHO) experts, as well as the Dutch specialists at the Erasmus Medical Centre in Rotterdam and the London team working for Public Health England (PHE).

ZOONOTIC EVENT? Much evidence points to camels as a possible source of MERS infection, but scientists still have no idea how people get the disease. **REUTERS/FAISAL AL NASSER**

> "There is so much missing in our knowledge of this infection.
>
> **Jeremy Farrar**
> Wellcome Trust

In Saudi Arabia, no case-control study has been completed, meaning fundamental questions cannot be answered about the virus' capabilities, where it came from, and what it might do next.

"It's really a tragedy for these people who get sick," said David Heymann, a professor of infectious disease epidemiology, chairman of PHE and head of global health security at Britain's Royal Institute of International Affairs.

"It's just so frustrating not to know how people are getting infected and to see people continue to get infected and die from a virus which maybe they wouldn't have to get if we knew more."

Saudi Deputy Health Minister Ziad Memish told Reuters he was "surprised" by such criticisms, describing work done by his Ministry of Health since the emergence of the disease as "nothing but collaborative." He pointed out that scientists still struggle to understand other deadly viruses decades after they were first identified, and questioned the motives of some critics.

"I'm happy" with the way the Saudi authorities have handled this virus outbreak, "and will continue to involve more partners to make knowing the details of the virus a global success," he said in an email.

SO LONG, SO LITTLE KNOWLEDGE

Scientists say what stands out about the MERS virus is just how little the world knows about it, even though for almost

two years it has been viewed as one of the top potential pandemic threats by a global network of specialists who keep tabs on all emerging viruses.

Primary responsibility for the response lies with the Saudi Ministry of Health, which under international health regulations reports to the WHO on MERS cases.

The ministry has from the start worked intermittently with various global agencies and institutions, including the WHO, the U.S. Centres for Disease Control and Prevention, the University of Columbia and Ecohealth Alliance. Some of them have expressed frustration about Saudi authorities' apparent lack of urgency. The WHO, for example, has conducted several scientific missions to the Middle East, primarily to provide support for Saudi Arabia and its neighbours to start the research needed to get on top of the outbreak. Yet much of this work remains undone.

So far, much evidence points to camels as a possible infection source – with the virus staging a so-called zoonotic event by jumping from animals to people. But scientists still have no idea how people are getting infected, whether by eating camel meat, or drinking the milk, touching blood or other body fluids, or simply being nearby when they cough or sneeze.

There is also no good data on how many people may be catching the virus but showing no or few symptoms, or how to successfully treat patients who get sick with MERS.

"There is so much missing in our knowledge of this infection after 20 months – whether it be the epidemiology, the transmission routes, the virology, or behavioural change," said Jeremy Farrar, an infectious disease specialist and director of the Wellcome Trust international charity.

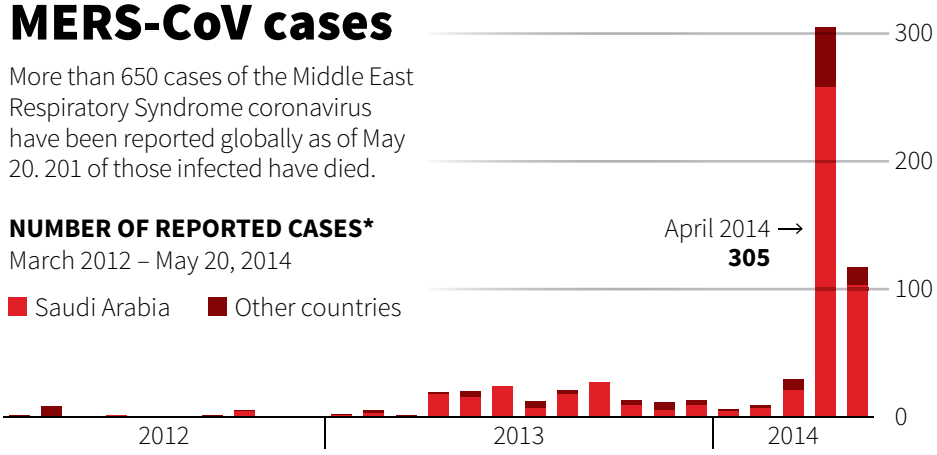
The Saudis have been offered a lot of help, he said, but "they are not open to it."

"The world is very lucky this virus seems to be stable and doesn't seem to be changing, but 20 months in to the emergence of a new virus, just imagine if it had been another SARS."

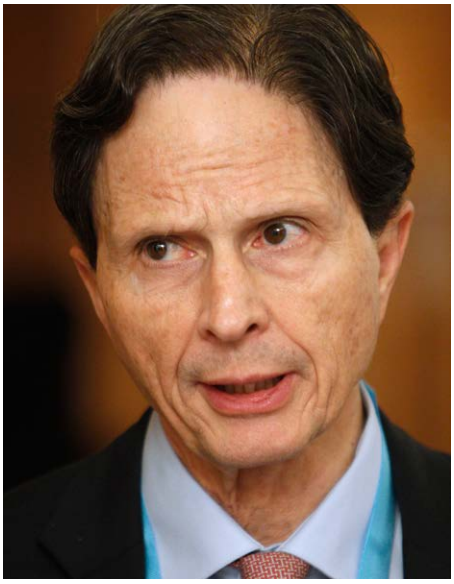
MERS-CoV cases

More than 650 cases of the Middle East Respiratory Syndrome coronavirus have been reported globally as of May 20. 201 of those infected have died.

NUMBER OF REPORTED CASES*
March 2012 – May 20, 2014



*By month of onset, probable place of infection. If month of onset is unknown, the month of reporting is used.
Source: European Centre for Disease Prevention and Control.



CRITIC: David Heymann, head of global health security at Britain's Royal Institute of International Affairs, says people continue to die from MERS even though they could have been prevented from catching it. **REUTERS/EDGAR SU**

Comparisons with SARS have dogged the MERS coronavirus since it first surfaced – not only because the two viruses belong to the same family but also because they cause similar symptoms.

There is one key difference: SARS in 2003 was more dangerous than MERS is now, not because it has a higher fatality rate – the SARS death toll was lower at around 10 percent – but because it spread more easily from person to person.

LIKE SARS, IN MORE WAYS THAN ONE

When SARS hit global headlines in 2003, it had already been circulating unchecked in China for several months. It fell below the radar of the WHO, which was kept in the dark by secretive Chinese officials.

When Beijing did come clean, Public Health England's Heymann, who back then was chief of the WHO's infectious disease section, says public chastising of China, coupled with intensive daily collaboration between specialists, helped bring the outbreak to an end within months. The disease killed almost 800 people worldwide.

"There were three virtual groups – laboratory people, clinicians and epidemiologists – who networked daily by phone and email, working together to solve the problem," Heymann said.

Saudi suspicions about working with teams of researchers outside the kingdom – and the Deputy Minister's desire to stay in

FROM SARS TO MERS: Shoppers wearing masks to protect them from Severe Acute Respiratory System in Hong Kong, 2003, left. The first confirmed U.S. MERS patient was put into isolation at this hospital in Muster, Indiana, in May. **REUTERS/BOBBY YIP/JIM YOUNG**

control – may have been prompted by precisely the information-sharing that characterised the virus's first few days, interviews with key scientists and public health officials involved in tracking MERS since 2012 suggest. Memish did not respond to that suggestion.

Ali Mohamed Zaki, an Egyptian microbiologist working at the Dr Soliman Fakeeh Hospital in Jeddah, found and reported the first MERS patient by posting lab results on an international scientific website. Zaki was sacked within a week of going public about the new virus. He has since returned to his native Egypt and now works at the faculty of medicine at Cairo's Ain Shams University.

"I lost my job because of this discovery," he told Reuters. No-one at the Jeddah hospital could be contacted for comment.

The fact the Dutch team with whom Zaki had first communicated took out a patent on the newly identified virus seems also to have rankled. In an email to Reuters, Deputy Health Minister Memish described that move as being driven by a "financial agenda."

Ab Osterhaus, who heads the virology department at the Erasmus Medical Centre in Rotterdam, said patenting the virus was the "normal thing to do" in such a situation, and said his lab freely shared details of the virus with everyone and anyone who wants to conduct research.

There are few patents on viruses, largely because most of them were discovered many years ago. But research institutes often take out patents, at the same time as sharing a virus freely, as a way of encouraging future interest from industry in developing vaccines or other drugs.

"We've always been very open with everything," Osterhaus said.

"Somebody should be doing the epidemiological work in Saudi, and we have all the techniques operational today to be involved in those kinds of studies, so we'd be happy to collaborate. We have offered our services to Memish, but apparently we are not the obvious candidates to help."

Others who worked with Saudi scientists at the very beginning of the outbreak,

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> Saudi Deputy Health Minister

when MERS had not even been named and was only just starting to be investigated, say Saudi authorities – and Memish in particular – wanted an increasing level of control.

Ian Lipkin, a virologist at New York's Columbia University, was among the first to establish a link between the MERS virus and camels. Lipkin told Reuters that he initially worked with Memish, but the two fell out. "I haven't worked with him in six months. We no longer work together at all," he said.

Lipkin declined to give details, saying only: "We're just not in agreement on many things."

A specialist in infectious diseases, Memish has served on advisory committees for the WHO, and published more than 180 papers in the past decade – several in high-impact journals such as The Lancet and The New England Journal of Medicine, according to an analysis by ThomsonReuters IP & Science unit. This volume of work is indicative of a fairly prolific research scientist, but not out of the ordinary.

Zaki said Memish was "very angry" to hear he was to publish a paper along with Osterhaus's team in the New England Journal of Medicine on the discovery of

DEATH OF A DOCTOR: The funeral of SARS doctor Tse Yuen-man in Hong Kong, 2003. SARS was initially more dangerous than MERS. **REUTERS/BOBBY YIP**

the MERS virus. "He (Memish) wanted to have the whole story for himself," Zaki said.

And asked whether he, as discoverer of the virus, has since been able to work from Egypt with Saudi scientists to investigate it in more detail, Zaki added: "No no, not at all."

Memish says he'd be happy to work with Lipkin in the future "if his services will be needed and (would) not duplicate our work with other partners." He did not respond to questions about whether he was trying to claim credit for every MERS investigation.

Memish's boss was replaced as Saudi Health Minister just as MERS appeared to be gathering pace. His replacement, Labour Minister Adel Fakieh, was not available for interview with Reuters. His appointment was seen by commentators as an attempt by the government to be seen taking MERS more seriously.

CRITICAL GAPS

As the frustration over the response emerges, big questions about the deadly virus remain.

Keiji Fukuda, the WHO's head of health security, has been careful not to directly criticise Saudi authorities. But in a media briefing on May 14, he described progress as slow and admitted that despite repeated calls from the WHO, crucial research has not yet been done.

"There are critical gaps in information," Fukuda said. He noted in particular the continuing lack of a case-control study – an essential starting point for determining where a new disease is coming from, who it is infecting, and how. "In principle, everybody accepts that the studies are important to do, and that they may yield some of the critical information that is wanted, but ... it has been slow."

In July 2013, he also said the WHO had "conducted a number of missions in the Middle East, primarily to provide support to assess what is the situation, (and) what investigations should be done."

Memish defends his country's actions and says he has collaborated widely. He points to other infectious viral diseases, such as Ebola, which has caused sporadic but deadly outbreaks in Africa since it was first identified 40 years ago and about which scientists still have limited knowledge.

"All these collaborations have answered many questions but of course (there) still remain some to be answered," he said. "Look at Ebola, which has been around for many years, and tell me ... do we have all the answers on source, mode of transmission from zoonotic source and treatment or vaccine prevention?"

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