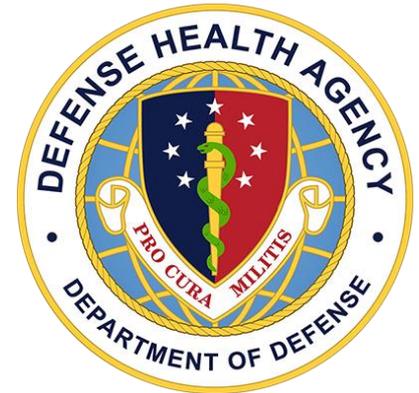


Department of Defense  
Armed Forces Health Surveillance Branch  
Global MERS-CoV Surveillance Summary  
(19 OCT 2016)



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# DEPARTMENT OF DEFENSE (AFHSB)

## Global MERS-CoV Surveillance Summary #94

### 19 OCT 2016 (next Summary 2 NOV)

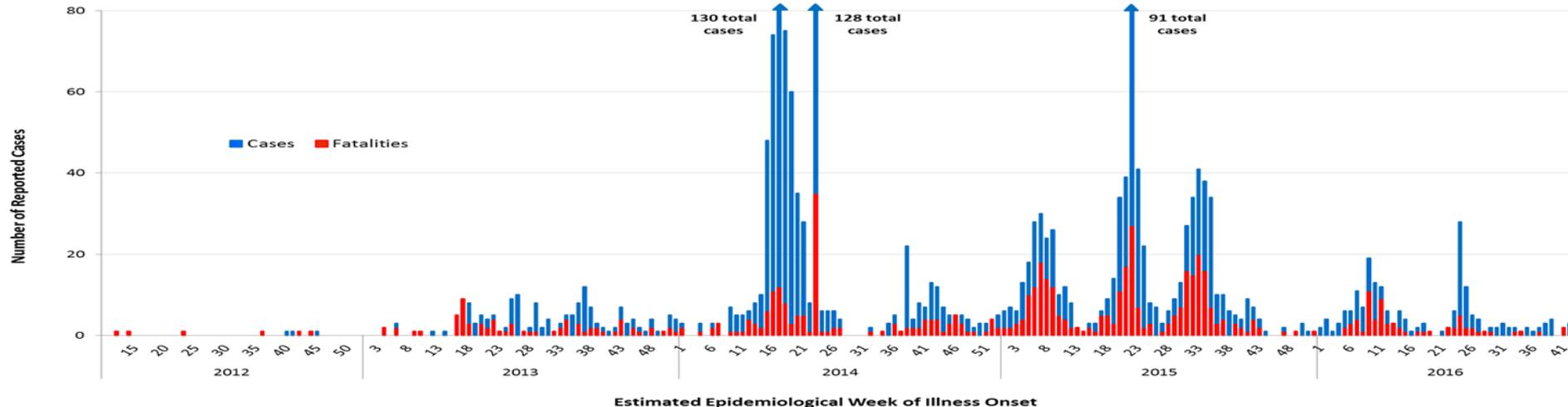


**CASE REPORT:** As of 19 OCT 2016, 1,894 (+5) cases of Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported, including at least 584 (+2) deaths (CDC reports at least 668 (+1) deaths as of 18 OCT) in the Kingdom of Saudi Arabia (KSA) (+5), Jordan, Qatar, United Arab Emirates (UAE), United Kingdom (UK), France, Germany, Tunisia, Italy, Oman, Kuwait, Yemen, Malaysia, Greece, Philippines, Egypt, Lebanon, Netherlands, Iran, Algeria, Austria, Turkey, Republic of Korea (ROK), China, Thailand, Bahrain, and the U.S. AFHSB's death count (Case Fatality Proportion (CFP) - 31%) includes only those deaths which have been publicly reported and verified. While CDC's death count (CFP - 37%) may present a more complete picture, it's unclear when and where those additional deaths occurred during the outbreak.

On 12 OCT, OIE reported one new outbreak of MERS-CoV in camels in Riyadh that began on 28 SEP and was associated with a confirmed human case. During the month of SEP, KSA MOH reported four new cases of MERS-CoV in Riyadh, including one primary case who had direct contact with camels; this may be the case to which OIE is referring.

**BACKGROUND:** In SEP 2012, [WHO reported two cases of a novel coronavirus](#) (now known as MERS-CoV) from separate individuals – one with travel history to the KSA and Qatar and one in a KSA citizen. This was the sixth strain of human coronavirus identified (including SARS). Limited human-to-human transmission has been identified in at least 51 spatial clusters as of 19 OCT, predominately involving close contacts. Limited camel-to-human transmission of MERS-CoV has been proven to occur. The most recent known date of symptom onset is 6 SEP 2016. The KSA Ministry of Health (MOH) has previously admitted to inconsistent reporting of asymptomatic cases. Due to these inconsistencies, it is also difficult to determine a cumulative breakdown by gender; however, AFHSB is aware of at least 590 (+1) cases in females to date. CDC reports 306 (+1) of the total cases have been identified as healthcare workers (HCWs).

Global MERS-CoV Epidemiological Curve by Illness Onset



(+xx) represents the change in number from the previous AFHSB Summary of 5 OCT 2016.

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**RELEVANT STUDIES:** On 11 OCT, CDC published the results of a retrospective [study](#) examining risk factors for MERS-CoV infection among HCWs. Testing for MERS-CoV antibodies revealed an attack rate of 8.0% (20 of 250 HCWs) among those who worked in units where MERS-CoV patients were treated. Attack rates varied by hospital unit, from 11.7% in the ICU to 4.1% in the ED. Attack rates also varied by occupation, with the highest rate (29.4%) identified in radiology technicians, followed by nurses (9.4%), respiratory therapists (3.2%), and physicians (2.4%). These attack rates were substantially higher than in previous reports that used nonserologic methods of detection. The authors also found there was a lower risk of MERS-CoV infection among HCWs using N95 respirators compared to HCWs using medical masks. These findings may suggest N95 respirators are more protective against MERS-CoV infection while in close contact with an infected patient, highlighting the possible role of short-range aerosol transmission of MERS-CoV in healthcare settings.

Another recent CDC [study](#) evaluated the persistence of MERS-CoV antibodies among eight probable MERS-CoV cases associated with an outbreak in Zarqa, Jordan, occurring MAR-APR 2012, where the first known cases of MERS-CoV were retrospectively identified. Antibodies against MERS-CoV, including neutralizing antibodies, were identified in six (86%) of seven persons at 34 months after the 2012 outbreak.

On 24 AUG, [CDC](#) released updated estimates on the number of MERS-CoV cases. Using data from travelers to the region, the authors estimated 3,250 (95% CI 1,300-6,600) severe MERS cases occurred in the Middle East during SEP 2012-JAN 2016, which is 2.3-fold higher than the number of laboratory-confirmed cases recorded in these countries. The authors last estimated the incidence of MERS-CoV two years ago; since then the number of recorded cases has increased by more than 15 times. While significantly larger than the case count mentioned above, these results complement the results from a previous [serologic study by KSA](#) that reported antibodies to MERS-CoV were found in 0.15% of the population. On 4 MAR, CDC published a [study](#) that tested archived serum (from 2013-2014) from livestock handlers in Kenya for MERS-CoV antibodies to search for autochthonous MERS-CoV infections in humans outside of the Arabian Peninsula. The study found two (out of 1,122 samples) tested positive, providing evidence of previously unrecorded human MERS-CoV infections in Kenya.

**DIAGNOSTICS/MEDICAL COUNTERMEASURES:** On 13 OCT, Aethlon Medical, Inc., announced it had completed multiple milestone achievements under a contract with the Defense Advanced Research Projects Agency (DARPA), including the validation of the Aethlon Hemopurifier. The medical device can rapidly eliminate viral pathogens such as MERS-CoV from the circulatory system of infected individuals. The Hemopurifier is currently under review in multiple FDA approved studies as a broad-spectrum treatment against infectious viral pathogens.

Among other proposed treatments for MERS-CoV is the use of animals to produce human antibodies. In AUG, WHO [recognized](#) the SAB Biotherapeutics bovine-based platform as one of six promising new technologies that could improve the response to global disease outbreaks. Phase I clinical trials of SAB's human antibody treatment (SAB-301) began 24 MAY, and a clinical report is expected by the end of the first quarter in 2017.

**INTERAGENCY/GLOBAL ACTIONS:** WHO convened the Tenth International Health Regulations (IHR) Emergency Committee on 2 SEP 2015 and concluded the conditions for a Public Health Emergency of International Concern (PHEIC) had not yet been met.

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## MERS-CoV Diagnostics and Medical Countermeasures at DoD Laboratories



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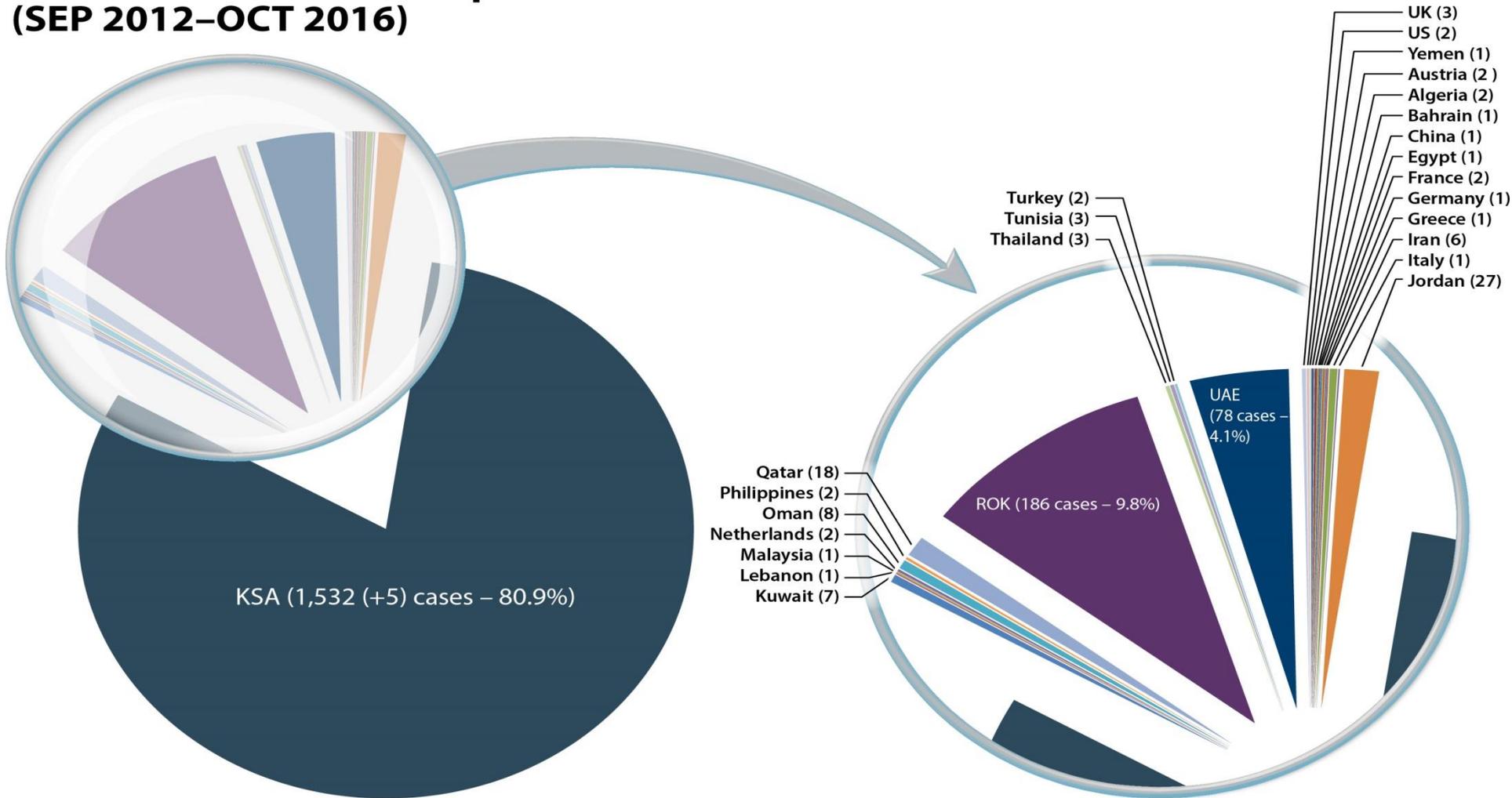
# DEPARTMENT OF DEFENSE (AFHSB)

## Global MERS-CoV Surveillance Summary #94

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### Global Distribution of Reported MERS-CoV Cases\* (SEP 2012–OCT 2016)



\*Data includes confirmed, suspect and probable cases reported by WHO, CDC, and various country MOHs

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