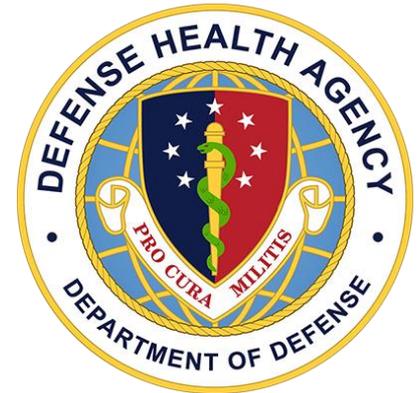


Department of Defense  
Armed Forces Health Surveillance Branch  
Global MERS-CoV Surveillance Summary  
(1 JUN 2016)



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*For questions or comments, please contact:*

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# DEPARTMENT OF DEFENSE (AFHSB)

## Global MERS-CoV Surveillance Summary #84

### 1 JUN 2016 (next Summary 15 JUN)



**CASE REPORT:** As of 1 JUN 2016, 1,806 (-2) cases of Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported, including at least 564 (-127) deaths (CDC reports at least 645 deaths as of 16 MAY) in the Kingdom of Saudi Arabia (KSA), 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. Changes in case and death counts reflect an extensive data verification effort since our last summary on 18 MAY; no new cases have been reported since 15 MAY. 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 - 36%) may present a more complete picture, it's unclear when and where those additional deaths occurred during the outbreak.

**DIAGNOSTICS/MEDICAL COUNTERMEASURES:** Clinical diagnostic testing is available at BAACH, NAMRU-3, LPMC, MAMC, NHRC, USAFSAM, SAMMC, TAMC, WBAMC, WRNMMC, and NIDDL (NMRC). Surveillance testing capability is available at NHRC, AFRIMS, NAMRU-2, NAMRU-3, NAMRU-6, USAMRU-K, and Camp Arifjan. All 50 state health laboratories and the NYC Department of Health and Mental Hygiene (DOHMH) were offered clinical testing kits. On 23 FEB 2016, AFHSB updated MERS-CoV testing guidelines for DoD which are aimed at capturing mild cases that may present in healthier populations such as DoD personnel. A recent study published by CDC reviewed the current state of preclinical development and research on medical countermeasures for MERS-CoV. The authors identified the following current research priorities: standardization of animal models and virus stocks for studying disease pathogenesis and efficacy of medical countermeasures; development of MERS-CoV diagnostics; improved access to nonhuman primates to support preclinical research; studies to better understand and control MERS-CoV disease, including vaccination studies in camels; and development of a standardized clinical trial protocol. In their latest Weekly Monitor publication, the KSA MOH released their most recent case definitions for suspected, probable, and confirmed cases of MERS-CoV to clarify classification of those with mild symptoms or inconclusive lab results.

**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) have not yet been met. However, the Committee also emphasized that they still have concerns as transmission from camels to humans continues in some countries, instances of human-to-human transmission continue to occur in health care settings, and asymptomatic cases are not always being reported as required. On 7 APR, Egypt announced it has completed phase 1 (cross-sectional studies in domestic animals with camel contact) and will begin phase 2 (longitudinal studies in high-risk camel populations) of a MERS-CoV surveillance project with USAID and FAO. On 17 APR, Saudi media reported that the KSA Ministry of Agriculture (MOA) banned transportation of camels from farms to markets to prevent slaughter and sale. On 11 MAY, CDC updated their Level 2 Travel Notice for MERS-CoV in the Arabian Peninsula to include more information on possible sources of exposure and to remove information pertaining specifically to the Hajj and Umrah pilgrimages.

**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 50 (+13) spatial clusters 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 2 MAY 2016. The KSA 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 507 cases in females to date. CDC reports 244 of the total cases have been identified as healthcare workers (HCWs). A study published in Clinical Infectious Diseases found extensive evidence for MERS-CoV contamination of environmental surfaces and in the air of patients' rooms and a common corridor, despite adherence to standard disinfection protocols. 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. A CDC study examined MERS-CoV infection in alpacas in a region of Qatar where MERS-CoV is endemic; the authors found MERS-CoV antibodies in all 15 animals, demonstrating their susceptibility to MERS-CoV and suggesting a broader geographic range of MERS-CoV circulation than previously determined. Another CDC study found that camel breeding should be classified as a risk for human acquisition of MERS-CoV, specifically the handling of camels under one year of age. The study also found that camel calves lose maternal MERS-CoV antibodies at 5-6 months of age, which may have implications for camel vaccine development.

Text updated from the previous report will be printed in red; items in (+xx) represent the change in number from the previous Summary (18 MAY 2016).

All information has been verified unless noted otherwise. For questions or comments, please contact: [dha.ncr.health-surv.list.afhs-ib-alert-response@mail.mil](mailto:dha.ncr.health-surv.list.afhs-ib-alert-response@mail.mil)

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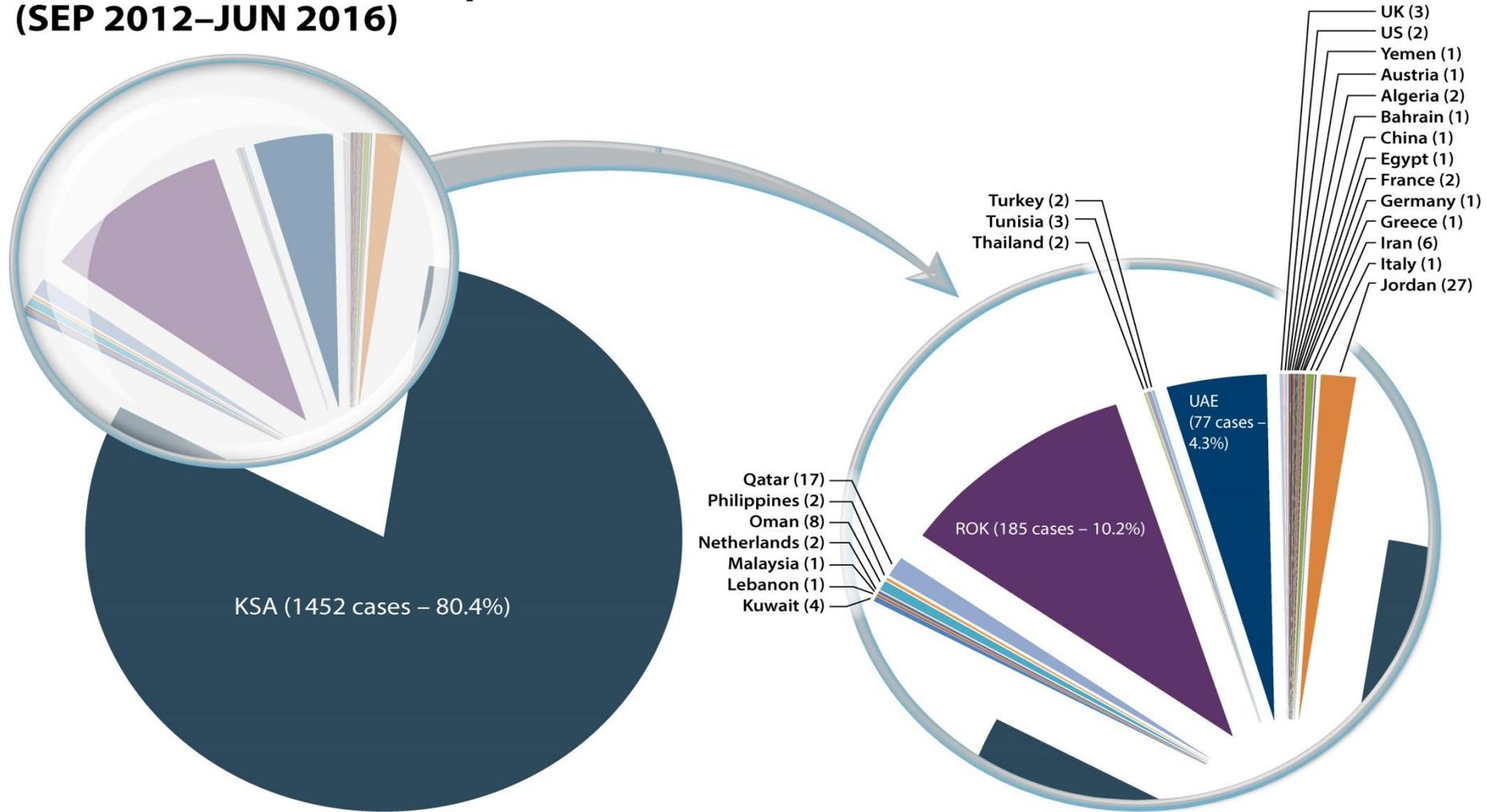
# DEPARTMENT OF DEFENSE (AFHSB)

## Global MERS-CoV Surveillance Summary #84

### 1 JUN 2016 (next Summary 15 JUN)



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

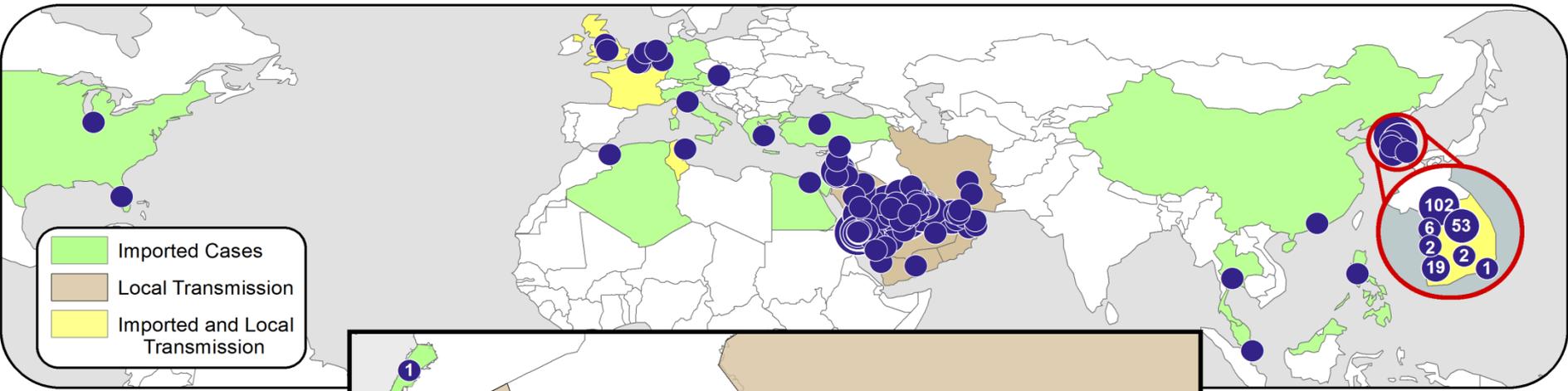


\*Data includes confirmed, suspect and probable cases reported by WHO, CDC, and various country MOHs

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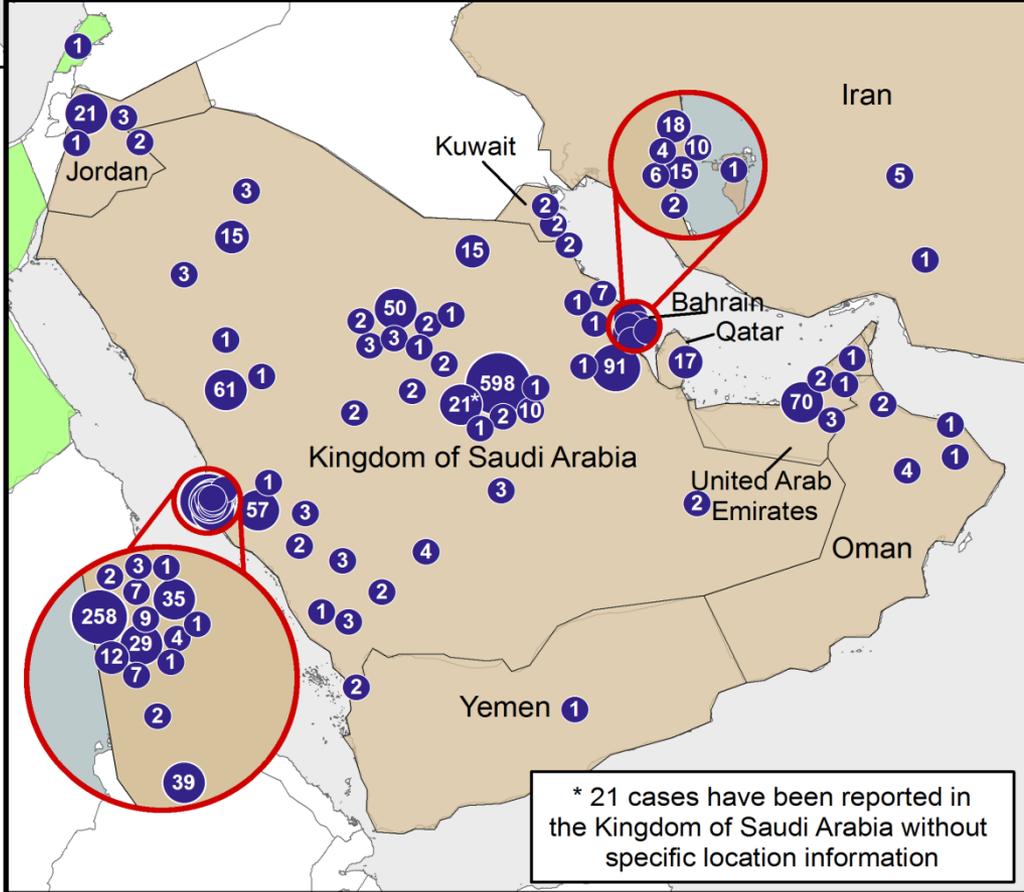


■ Imported Cases  
■ Local Transmission  
■ Imported and Local Transmission

**Geographic Distribution of MERS-CoV Cases**  
 01 APR 2012 - 01 JUN 2016



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**Total Cases**  
N = 1806

- 1 - 10
- 11 - 20
- 21 - 75
- 76 - 150
- 151 - 300
- >300

\* 21 cases have been reported in the Kingdom of Saudi Arabia without specific location information

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# DEPARTMENT OF DEFENSE (AFHSB)

## Global MERS-CoV Surveillance Summary #84

### 1 JUN 2016 (next Summary 15 JUN)



### Global MERS-CoV Epidemiological Curve by Illness Onset

