

# Department of Defense Armed Forces Health Surveillance Center Global MERS-CoV Surveillance Summary (24 JUN 2015)



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# DEPARTMENT OF DEFENSE (AFHSC)

## Global MERS-CoV Surveillance Summary #58

### 24 JUN 2015



**CASE REPORT:** From SEP 2012 to 24 JUN 2015, 1,421 (+22) cases of Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported including 518 (+20) deaths in the Kingdom of Saudi Arabia (KSA), Jordan, Qatar, United Arab Emirates (UAE), United Kingdom, France, Germany, Tunisia, Italy, Oman, Kuwait, Yemen, Malaysia, Greece, Philippines, Egypt, Lebanon, Netherlands, Iran, Algeria, Austria, Turkey, Republic of Korea (ROK), China, Thailand, and the U.S.

Since the last summary, ongoing transmission continues in urban areas of KSA, predominately in the city of Hafoof. While incidence appears to be declining, transmission continues in ROK bringing the total to 179 confirmed cases, 4 suspect cases, and 27 deaths reported by the ROK MOHW. These ROK cases are included in the above total case count. WHO reports the decline in incidence in ROK has coincided with stronger contact tracing, monitoring, and quarantining efforts – suggesting that disease control measures are working. No community-based infections have been reported anywhere in the world to date, according to WHO. (More information on the ROK outbreak can be found on page 3).

Additionally, two new cases, included in the above total case count, were reported; one in UAE and one in Thailand (exported from Oman). No new confirmed cases have been reported in Thailand since its only case was reported on 20 JUN; at least 175 contacts are being monitored for symptoms and a suspect case was reported in a young girl returning from ROK. Other suspect cases have been reported in Guam and Japan. Media report the suspect cases in Vietnam and Czech Republic have been ruled out.

**DIAGNOSTICS:** Clinical diagnostic testing is available at NAMRU-3, LPMC, NHRC, USAFSAM, SAMMC, WRNMMC, and NIDDL (NMRC). Tripler AMC has been removed from this list as they presently cannot compliantly perform the MERS-CoV assay; however they should be able to perform testing once the appropriate equipment is received. Brian Allgood Army Community Hospital transitioned to fully operational testing capability as of 22 JUN.

Surveillance testing capability is available at NHRC, AFRIMS, NAMRU-2, NAMRU-3, NAMRU-6, and Camp Arifjan. Additionally all 50 state health laboratories and the New York City DHMH have been offered clinical testing kits. On 8 JUN, AFHSC updated [MERS-CoV testing guidelines](#) for DoD components on their website. These guidelines are aimed at capturing mild cases that may present in healthier populations such as DoD personnel.

The Korea National Institutes of Health and Seoul National University have sequenced samples from the ROK cluster and found the, “Chinese and Korean viruses are however divergent enough from the Riyadh 2015 cluster to potentially be derived from a separate zoonotic event in the Arabian Peninsula...[however] the new MERS-CoVs are unlikely...to present different virulence or transmission properties.”

**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 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 33 spatial clusters predominately involving close contacts. Limited camel-to-human transmission of MERS-CoV has been proven to occur; and recent studies suggest camels infected with MERS-CoV may appear asymptomatic but are able to shed large quantities of the virus from the upper respiratory tract. Media outlets, as well as the ECDC and a review article in the American Journal of Infection Control, indicate “strict infection control measures are essential, given that MERS-CoV survival on hospital surfaces is at least 48 hours and that it has been detected for up to 16 days in respiratory specimens and stool and up to 13 days in urine.”

The most recent known date of onset is 21 JUN 2015; however at least 40% of symptomatic cases have been reported without onset date. Due to inconsistencies in reporting, it is difficult to determine a cumulative breakdown by gender, however AFHSC is aware of at least 378 cases in females to date. On 18 JAN, Qatar’s SCH reported that their recent studies have shown people in the 50-69 year age group are more vulnerable to the MERS-CoV virus. CDC reports 228 of the total cases have been identified as healthcare workers (HCWs). Of these, 134 were from KSA, 31 from UAE, 5 from Jordan, 2 from Iran, 1 from Tunisia, and 21 from ROK. Characteristics of reported cases are limited, however, CDC reports among the 228 HCW cases: 11 died; 55 were asymptomatic; 20 had comorbidities; and 15 presented with only mild symptoms. On 31 MAR, WHO released a [MERS-CoV Situation Update](#) stating that the recent epidemiological and demographic characteristics of the outbreak are not significantly different from those reported in previous years.

**INTERAGENCY/GLOBAL ACTIONS:** WHO reiterated on 3 FEB that people with diabetes, renal failure, or chronic lung disease, and immunocompromised persons are considered to be at high risk of severe disease from MERS-CoV infection. WHO convened the Ninth International Health Regulations (IHR) Emergency Committee on 16 JUN to discuss MERS-CoV and concluded that the conditions for a Public Health Emergency of International Concern (PHEIC) have not yet been met. The Committee noted the findings of the recent ROK-WHO MERS Joint Mission which stated the main factors contributing to the spread of MERS-CoV in ROK are:

- Lack of awareness among HCWs and the public about MERS-CoV
- Suboptimal infection prevention and control measures in hospitals
- Close and prolonged contact of infected MERS-CoV patients in hospitals
- The practice of seeking care at multiple hospitals (“doctor shopping”)
- The custom of many visitors or family members staying with infected patients in hospital rooms.

CDC has elevated their travel notice for MERS-CoV in the ROK to a [Travel Watch Level 1](#). CDC is maintaining their [Travel Alert Level 2](#) for MERS-CoV in the Arabian Peninsula, which includes specific precautions for the upcoming Hajj (approximately 20 – 25 SEP 2015) and Umrah Pilgrimages (approximately 17 JUN – 17 JUL 2015). A recent study by CDC examined respiratory pathogens identified during MERS-CoV screening in travelers returning to Ontario, Canada, from regions affected by the virus during NOV 2012 – JUN 2014. The authors found that influenza A and B viruses and rhinovirus were the most commonly identified pathogens during these screenings.

On 11 JUN, CDC released a [Health Advisory](#) to provide updated guidance in the evaluation of patients for MERS-CoV infection. These have been revised to include individuals with a travel history to a healthcare setting in ROK. On 19 JUN, WHO noted that “it is not always possible to identify patients with MERS-CoV early, so it is necessary for all health care facilities to have standard infection prevention and control practices in place” to prevent transmission. On 9 JUN, the U.S. Embassy in ROK posted an [updated U.S. Citizen Security Message regarding MERS-CoV](#) for AMCITs in ROK.

Text updated from the previous report will be printed in red; items in (+xx) represent the change in number from the previous Summary (17 JUN 2014).

All information has been verified unless noted otherwise. Sources include the ROK MOHW, KCDC, U.S. Embassy in ROK, U.S. CDC, WHO, KSA MOH, ECDC, and SCH Qatar.

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**ROK OUTBREAK BACKGROUND:** The index case for the ROK cluster had previously travelled to Bahrain, UAE, KSA, and Qatar. The case was involved in agricultural activities during his travel, however he reported no contact with camels. **According to WHO, none of the index case's contacts during his travels were found to have contact with animals, have visited health care facilities, or had contact with cases of MERS-CoV, therefore the source of his infection remains unknown.** The individual developed symptoms on 11 MAY, seven days after returning to ROK, and is currently undergoing treatment. Initially the index case did not disclose his entire travel history and was admitted to four different hospitals before the correct diagnosis was made. In that time, many close contacts and healthcare workers were exposed to MERS-CoV.

Since 20 MAY, when the index case was first reported in the media, a cluster of **179 cases, 4 suspected cases, and 27 fatalities** have been reported by the Korean CDC (KCDC). **As of 23 JUN, 175 cases have been confirmed by WHO.** Most of the deaths associated with this ROK outbreak have occurred in people with underlying medical conditions. The ROK MOHW reports that 17% of all cases reported in the ROK outbreak are HCWs; however AFHSC notes only **12%** of cases reported by the KCDC have been identified as HCWs.

At least **14** hospitals in ROK have reported ongoing transmission associated with this outbreak (see map) and **at least 88** hospitals have reported seeing or treating at least one MERS-CoV patient as of 22 JUN. According to WHO, there have been three large clustering events among the cases reported so far involving Pyeongteak Saint Mary's Hospital, Samsung Medical Center, and one case that seeded two smaller outbreaks at Dae Cheong Hospital and KonYang University Hospital. Each of these clusters can be explained by a combination of different factors such as crowded environments in ERs, close and unprotected contact with asymptomatic cases, and possible fomite transmission.

On 24 JUN, Samsung Medical Center extended its partial shut down of operations (not accepting new outpatients and inpatients, closure of emergency ward, suspension of non-emergency surgeries, and limits on family visitation) until further notice. More than 70 people and two HCWs have been infected with MERS-CoV at Samsung Medical Center to date. **Kunkook University Hospital announced on 24 JUN that will partially shut down operations until further notice.**

**RESPONSE EFFORTS IN ROK:** Part of the ongoing response efforts in ROK include a new initiative to create "Safe Hospitals," or hospitals with improved infection control and prevention capabilities. **As of 24 JUN, 250 hospitals in ROK have been deemed "safe" by health officials in ROK.** The MOHW also reported that 236 emergency rooms to date have created separate spaces called 'selective clinics' to specifically treat suspected cases of MERS-CoV and improve infection control measures for screening patients.

According to the WHO, approximately 10,000 people are considered to be potential contacts of a MERS-CoV case in ROK. According to MOHW, approximately 3,103 people are still being monitored for symptoms (2,207 are quarantined at home and 896 are quarantined in a health care facility) and 11,201 people have been released from quarantine as of 24 JUN. Media report the ROK government intends to compensate those who have lost income as a result of the isolation and quarantine efforts. Media report that approximately 440 schools are still closed to prevent further transmission. **On 19 JUN, the WHO put out an updated risk assessment on the MERS-CoV situation globally and in ROK.** This assessment notes, "it can be expected that further cases will be detected in the coming days and weeks including in settings outside health care facilities."

**EXPORTATIONS FROM ROK:** The tenth confirmed case associated with ROK cluster did not adhere to quarantine orders and travelled to China, via Hong Kong, on 26 MAY. This individual previously visited his father, who had contact with the ROK index case, in the hospital and became symptomatic before travel. This is the first imported case of MERS-CoV reported in China. Information on contact tracing efforts is limited, however AFHSC is aware of at least 77 contacts of the index case in China that are being monitored for symptoms. Additionally, all 33 contacts of the index case previously being monitored for symptoms in Hong Kong, have been released. **On 23 JUN, a suspect case was reported in a 4 year old girl returning from ROK to Thailand on 9 JUN. The girl has respiratory symptoms consistent with MERS-CoV and has been quarantined at Chaiyaphum Provincial Hospital for observation.**

**INTERAGENCY ACTIONS FOR ROK OUTBREAK:** Media report that the ROK government has set up a special task force to oversee the government response to the outbreak. On 9 JUN, ROK President Park Geun-hye announced she had delayed her planned travel to the U.S. in order to deal with MERS-CoV outbreak. **Korean media report that foreign visitors to ROK will receive MERS-CoV insurance free of charge for the next three months. The plan covers any healthcare compensation for any visitor who receives a confirmed MERS-CoV diagnosis within 20 days of entry and for any deaths that occur within 20 days of diagnosis. This insurance is intended to revive the economic decline impacting tourism in ROK. Media report the Central Bank of Korea will provide 650 billion won, or \$590 million, to small and midsize companies affected by the outbreak, to prevent further economic decline.**

**MEDICAL COUNTERMEASURES IN DEVELOPMENT:** On 16 JUN, **ROK announced** that it plans to begin trials of an experimental plasma treatment for MERS-CoV. This "treatment" involves giving blood from previous MERS-CoV patients, who have successfully fought off infection, to patients currently struggling with the viral infection. Other countermeasures in development include:

Research Group	Type of Countermeasure	Present Stage of Development
ROK MOHW	Plasma treatment	Clinical trials stage
Inovio Pharmaceuticals and GeneOne Life Sciences	DNA-based vaccine	Phase 1 trial announced
Novavax and University of Maryland School of Medicine	Recombinant nanoparticle vaccine	Preclinical Testing phase
U.S. NIH and Fudan University	M336 antibody treatment	Preclinical Testing Phase
Greffex	Treatment	Not yet announced
Abviro	Treatment	Not yet announced
Shanghai Kaibao	Treatment	Not yet announced
Nanovirivide	Treatment	Not yet announced
Purdue University	Enzyme Inhibition Treatment	Not yet announced
Ludwig-Maximilians-Universitaet (LMU) in Munich	Modified Vaccinia virus Ankara (MVA) vaccine	Phase 1 clinical trials

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All information has been verified unless noted otherwise. Sources include CDC, WHO, KSA MOH, ECDC, NEJM, SCH Qatar, and ASM.

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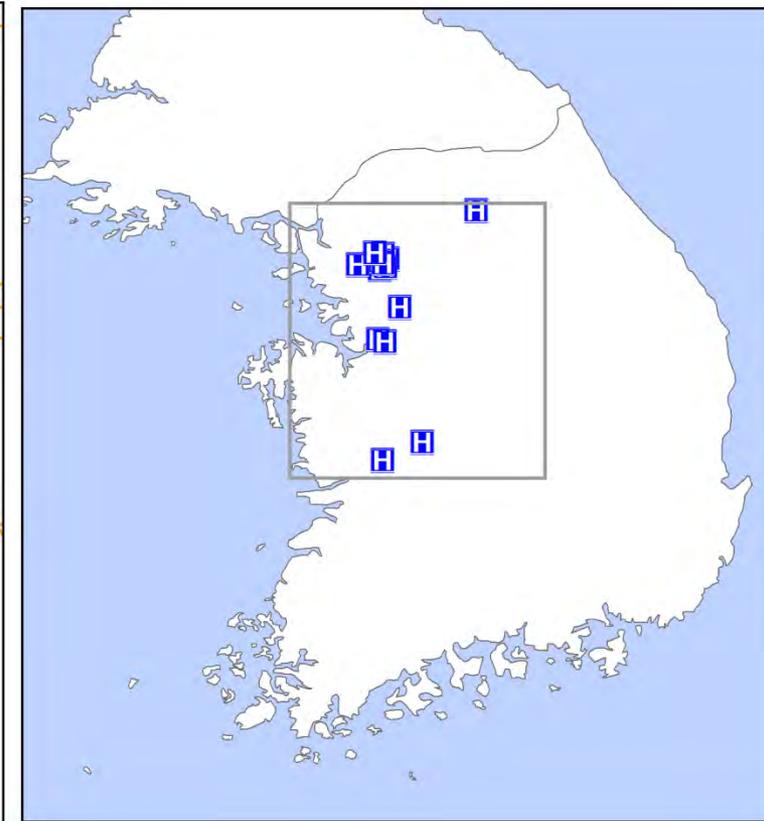
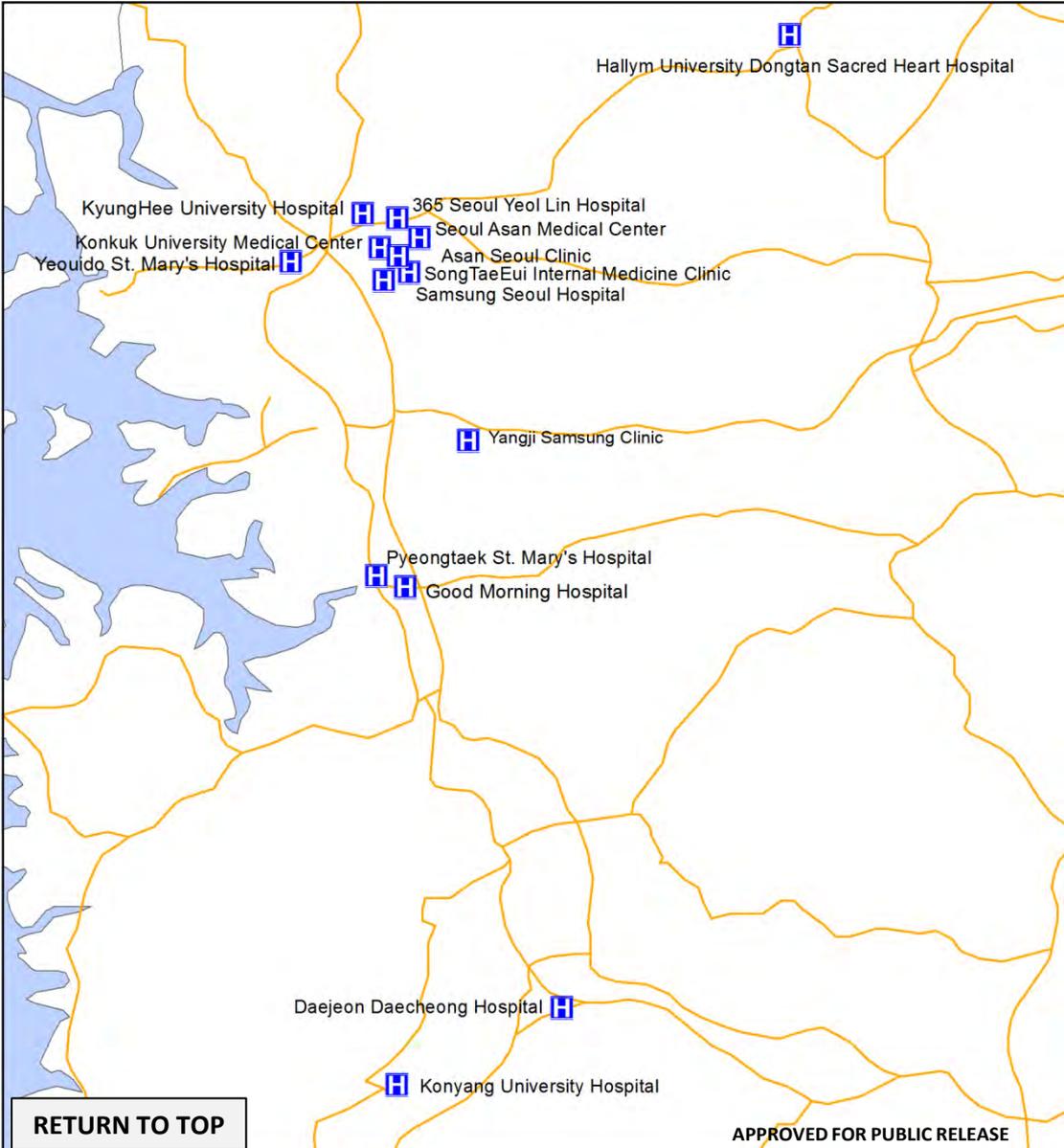
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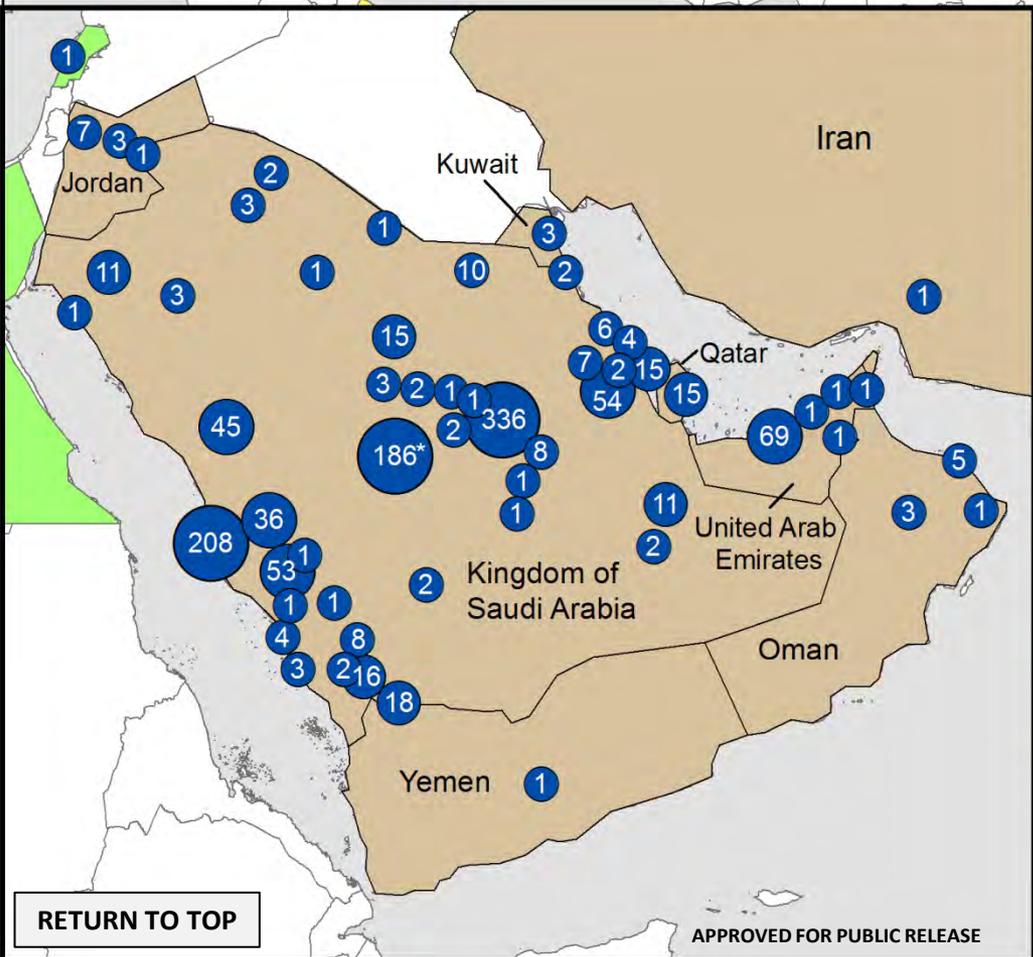
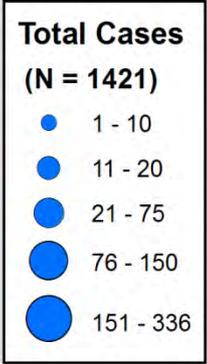
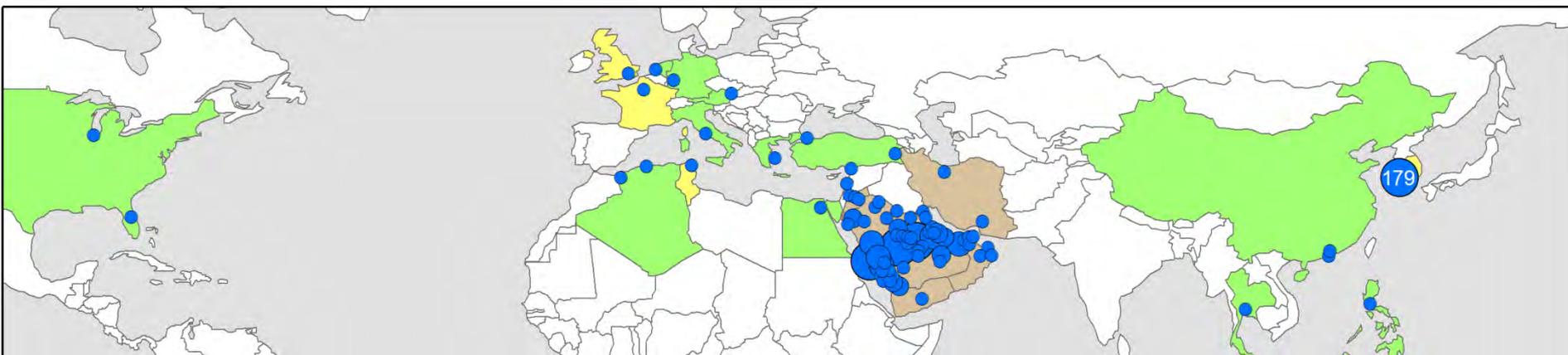
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Hospitals with Known MERS-CoV Transmission in the Republic of Korea  
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**Geographic Distribution of MERS-CoV Cases**  
**1 APR 2012 - 24 JUN 2015**



- Imported Cases
- Imported Cases with Local Transmission
- Local Transmission

\*186 cases have been reported in the Kingdom of Saudi Arabia without specific location information

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### Global MERS-CoV NUMBERS AT A GLANCE

	Total in 2012	Total in 2013	Total in 2014	Total in 2015	Cumulative Total (2012-2015)
Confirmed Cases	9	171	777	464 cases (+22)	1421 cases (+22)
Confirmed Deaths*	6 deaths	72 deaths	277 deaths	163 deaths (+20)	at least 518 deaths (+20)
Case-Fatality Proportion	66%	42%	36%	35%	36%
Mean Age	45 years	51 years	49 years	56 years	51 years
Gender Breakdown*	1 female	at least 58 females	at least 175 females	134 females (+9)	at least 378 females (+9)
# of Healthcare Workers (HCWs) reported*	at least 2 HCWs	at least 31 HCWs	at least 87 HCWs	49 HCWs (+5)	at least 228 HCWs (+5)

**\*Disclaimer:** Data reported on MERS-CoV cases are limited and adapted from multiple sources including various Ministries of Health, CDC, and WHO. Consequently, yearly information may not equate to the cumulative totals provided by WHO and CDC.

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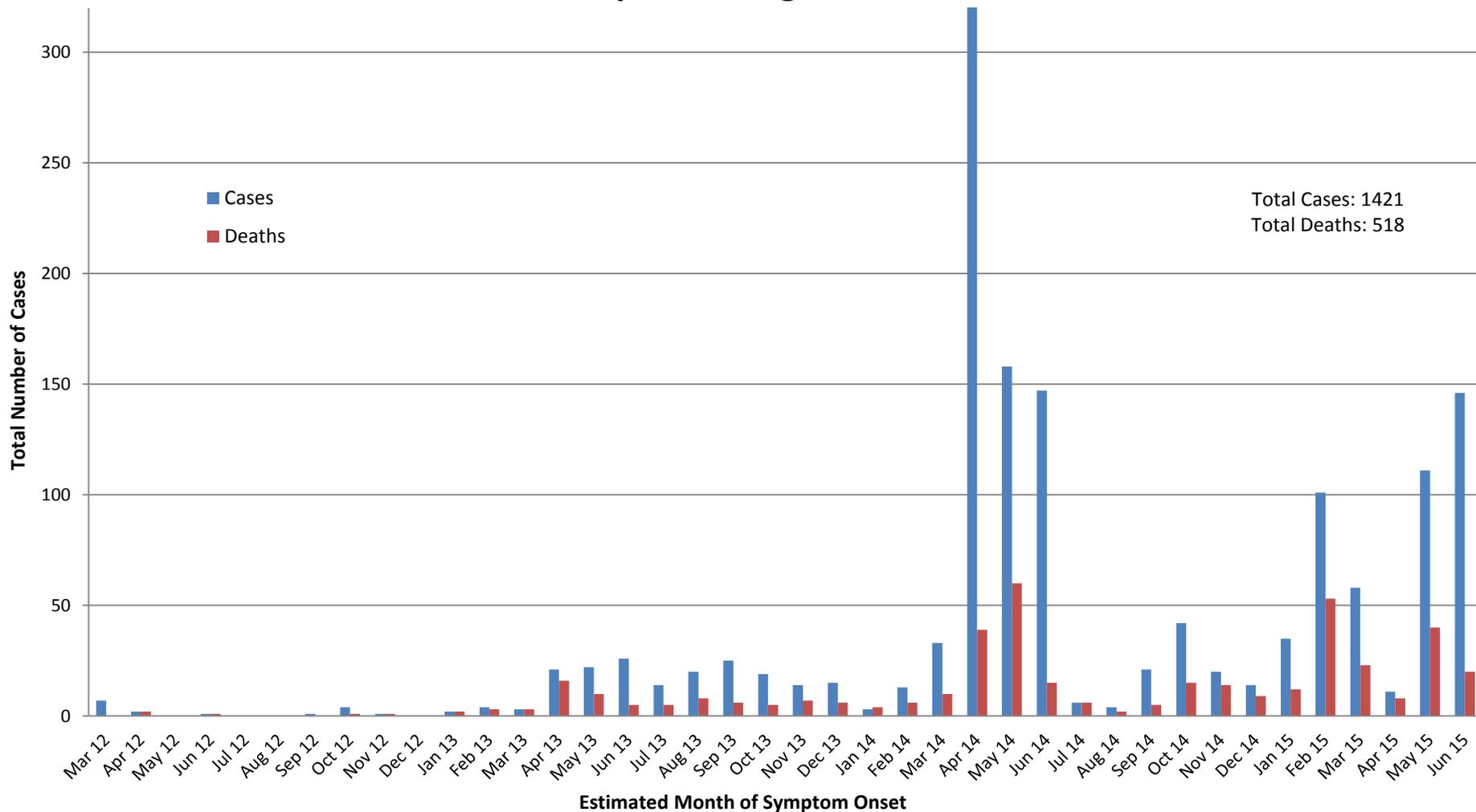
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### MERS-CoV Epidemiological Curve - 24 JUN 2015



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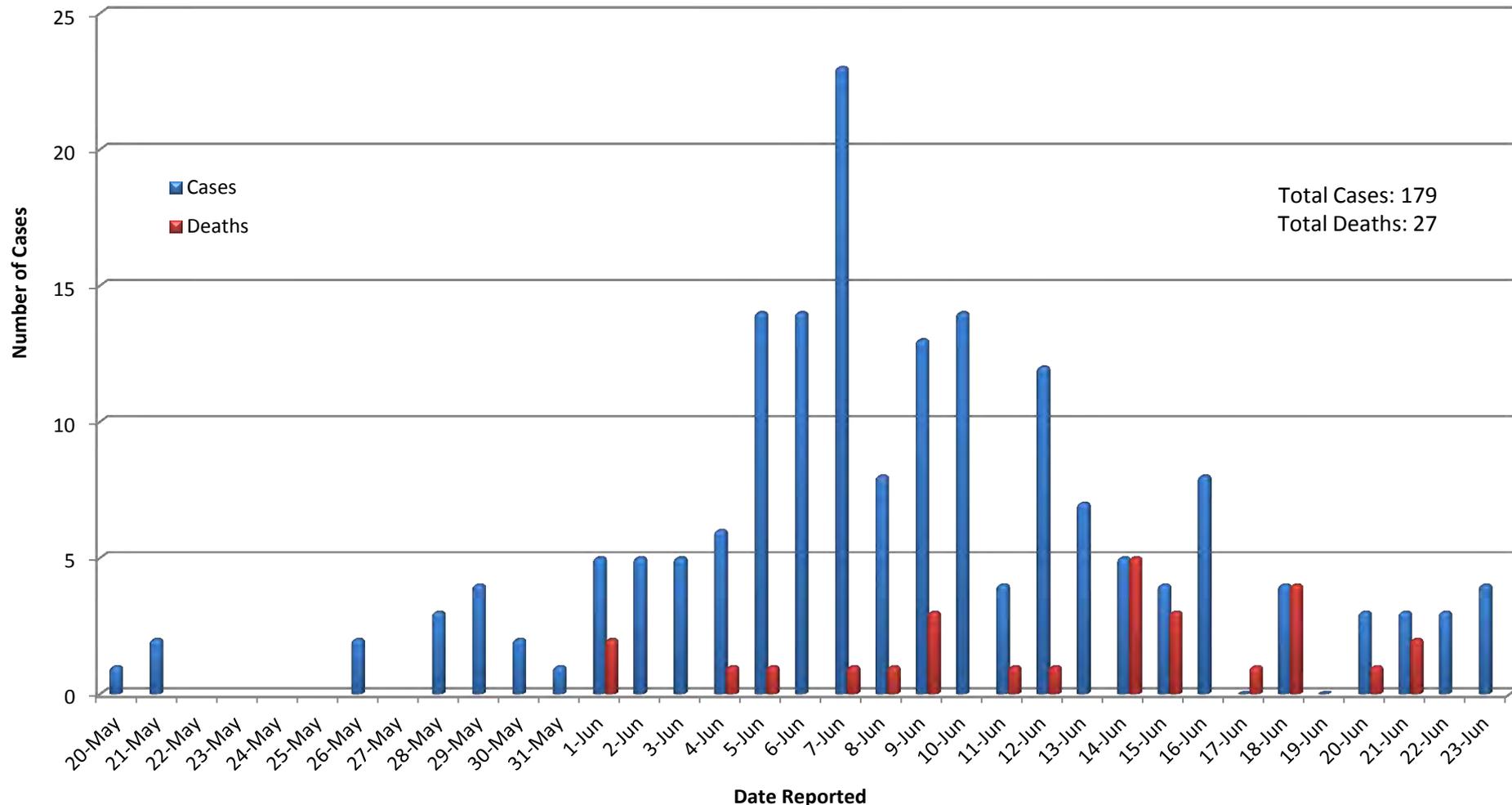
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### ROK MERS-CoV Epidemiological Curve - as of 24 JUN 2015



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#### MERS-CoV Web Sites

- [WHO](#)
- [WHO Lab Testing Guidance](#)
- [WHO Travel Advice for Pilgrimages](#)
- [WHO 9th IHR Meeting Press Release](#)
- [CDC](#)
- [CDC Travel Advisory for the Arabian Peninsula](#)
- [CDC Travel Advisory for ROK](#)
- [CDC MMWR](#)
- [ECDC](#)
- [AFHSC Detecting and Reporting Guidelines for MERS-CoV](#)

#### Information and News

- [Russian tourist quarantined in Vietnam for MERS check](#) (AsiaOne, 24 JUN)
- [Latest WHO DON on MERS-CoV in the Arabian Peninsula](#) (WHO, 23 JUN)
- [Latest WHO DON on MERS-CoV in ROK](#) (WHO, 23 JUN)
- [Researchers find potential way to beat MERS virus](#) (Znews, 23 JUN)
- [4-year old girl quarantined in Chaiyaphum hospital under suspicion of contracting MERS](#) (Thai VISA News, 23 JUN)
- [South Korean Retailers Pinched by MERS](#) (NYT, 22 JUN)
- [MERS coronavirus: Candidate vaccine gears up for clinical](#) (EurekaAlert, 22 JUN)
- [Thailand says 175 exposed to MERS patient; South Korea reports no new case](#) (Reuters, 20 JUN)
- [WHO MERS-CoV Risk Assessment and Line List of ROK Cases](#) (WHO, JUN 2015)
- [Acute Respiratory Infections in Travelers Returning from MERS-CoV-Affected Areas](#) (CDC EIDJ, JUN 2015)
- [Tests show hospitalized Czech man does not have MERS](#) (Reuters, 17 JUN)
- [Man infected with MERS earlier this year dies in Germany](#) (EuroNews, 16 JUN)
- [South Korea begins plasma treatment trial for Mers](#) (BBC, 16 JUN)
- [China, US develop new MERS treatment](#) (ChinaDaily, 15 JUN)
- [MERS-CoV deaths rise with few drugs in pipeline](#) (Pharmaceutical Market Live, 15 JUN)
- [South Korea Cuts Key Rate as MERS Emerges as Threat to Recovery](#) (NY Times, 11 JUN)
- [CDC EID Journal Articles on MERS-CoV](#) (CDC, 10 JUN)
- [South Korea's Park delays trip to U.S. over MERS outbreak](#) (Washington Post, 9 JUN)
- [Security Message for U.S. Citizens: Seoul \(South Korea\) Updated Information Regarding MERS](#) (OSAC, 9 JUN)
- [WHO DON on first novel coronavirus infection](#) (WHO, 23 SEP 2012)