Title: Quarantine during South Korean MERS Outbreak

Activities: Establish social distancing measures in healthcare facilities, treatment centers and the broader community; Enforce social distancing measures of infectious patients

Stakeholders: National and subnational health authorities; National and subnational law enforcement

Phases: Surveillance and preparedness; Detection; Early response

Years: 2015

Countries: South Korea

Agent: Middle East Respiratory Syndrome (MERS)

Case study prepared by: Mark Wilcox, October 8, 2019

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On May 20th, 2015, South Korea declared the first case of MERS-CoV in Daejeon. MERS, or the Middle East Respiratory Syndrome, is a respiratory disease similar to SARS (severe acute respiratory syndrome). The first case of MERS in South Korea came from a man who had recently returned from a business trip in four Middle Eastern countries, including Saudi Arabia. The man, upon return, sought care at several hospitals.[1] By the time the outbreak came to an end, there had been overall 186 laboratory-confirmed cases and 38 deaths, with an attack rate of about 3.7%, case fatality ratio of 44.0%, and a median incubation period of 6.1 days.[2]

The disease spread quickly throughout hospitals around Seoul. The practice of "doctor shopping" meant that patient zero interacted with two different hospitals before being diagnosed with the MERS virus. Patient zero was in the first hospital from May 15th to the 17th, and the second hospital from the 22nd to the 28th. The patient was not upfront about his symptoms nor his travel history, which limited the ability of medical professionals to correctly diagnose him. Although he was first entered clinical care on the 15th, it took until the 30th to isolate him from other patients

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[1] Madison Park, "South Korea MERS Outbreak Grows as 1,369 in Quarantine" (CNN, June 4, 2015), https://www.cnn.com/2015/06/03/world/south-korea-mers/index.html.

[2] Jung Wan Park et al., "Hospital Outbreaks of Middle East Respiratory Syndrome, Daejeon, South Korea, 2015," Emerging infectious diseases (Centers for Disease Control and Prevention, June 2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5443424/.

in the hospital.[3] The rather significant gap between arrival and diagnosis facilitated the spread of MERS amongst those that had interacted with the patient throughout the process.

In order to curb infections in South Korea, the government issued cohort quarantines in the hospitals starting on June 1st, 2015. Cohort quarantines are when people are separated because they have been exposed or potentially exposed to a positive case. To the government's advantage, many of the individuals placed under quarantine were already confined to the hospital.

The cohort quarantine placed individuals that may have been exposed in the same setting or at similar times in the same hospitalization area. This meant that many patients that waited in the same room as patient zero, or were treated in the same room, we put back into their areas for quarantine. Clinicians were kept within the hospital to help treat and care for those that were under quarantine. These individuals were given personal protective equipment.

Those that had treated the patients who could be infected or were found to be infected were commonly placed in a home-based quarantine. There were restrictions imposed on interactions with their family members until the period of incubation for the disease had passed.

Overall, between the home-based quarantine and those in the hospital, there were about 6,700 people in quarantine during the height of the outbreak.[4]

There were some issues that arose with the cohort quarantine. First, keeping the population inside the hospital did limit exposure to the general community, but it also forced patients of varying levels of illness to interact. This was exceptionally dangerous whenever the healthcare workers that treated the individuals did not use their protective gear properly, as was documented in at least one hospital.

Another primary issue with the cohort quarantine comes from the impact on the society. On one level, the forced separation greatly distressed family members. Family members typically fulfilled the roles of primary care providers, and helped each other out of sickness. With the quarantine, there were severe limitations on the in-person interactions between family members, with some hospitals instituting a visitor ban. This meant that family members could only drop off

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[3] Jung Wan Park et al., "Hospital Outbreaks of Middle East Respiratory Syndrome, Daejeon, South Korea, 2015," Emerging infectious diseases (Centers for Disease Control and Prevention, June 2017), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5443424/.

[4] Ju-min Park, "Quarantine Area: Korean Patients Tested by MERS Lockdown," Reuters, June 17, 2015, https://www.reuters.com/article/us-health-mers-southkorea-hospitals/quarantine-area-korean-patients-tested-by-mers-lockdown-idUSKBN0OX2P320150618.

resources or goods to hospital security, and then these would be delivered to the patients. At most, family members could see each other from a distance.[5]

As a result of the quarantine and fear of further outbreak, many schools in the area directly surrounding the hospitals closed. Although a method of restricting potential spread of the disease, many healthcare professionals found this to be unnecessary because the virus had not reached the general community outside of the hospital. Instead, the closure of schools accelerated fears of people that were no longer proportional to the level of actual threat that MERS posed to them. Other practices, such as wearing protective face masks in public, had similar effects of increasing concerns without much practical use.[6] The government had troubles calming these fears because of their lack of transparency, especially in revealing which hospitals had potentially been infected with MERS.

Overall, the quarantine and restrictions in place were effective at limiting the impact of MERS in South Korea. The government took several measures to make sure that people were abiding by the quarantine set in place. During the quarantine, officials would call people that were under home-based quarantine twice a day. If there was no answer, then the police would be sent to the home to investigate. If anyone was found to be breaking the quarantine, or to be lying about their potential contact with infected patients, then they were penalized. Anyone who broke either of these rules would face up to two years in prison or a fine of approximately 18,000 USD.[7] Another, more passive way that the government tracked compliance was through the monitoring of cell phones to identify if someone had left the location of where they were supposed to be staying at.[8]

There was one notable violation of the quarantine, which was a man who had left the country after being in contact with someone who was found positive with MERS. The man left to China, where he was later diagnosed as positive with MERS as well. This increased international travel had the potential to be much more dangerous.[9]

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[5] Ju-min Park, "Quarantine Area: Korean Patients Tested by MERS Lockdown," Reuters, June 17, 2015, https://www.reuters.com/article/us-health-mers-southkorea-hospitals/quarantine-area-korean-patients-tested-by-mers-lockdown-idUSKBN0OX2P320150618.

[6] Dennis Normile, "MERS Outbreak in Korea May Be Past Its Peak, Panel Says," Science, June 14, 2015, https://www.sciencemag.org/news/2015/06/mers-outbreak-korea-may-be-past-its-peak-panel-says.

[7] Choe Sang-hun, "After MERS, South Korea Authorizes Prison for Quarantine Scofflaws" (The New York Times, June 26, 2015), https://www.nytimes.com/2015/06/27/world/asia/after-mers-south-korea-authorizes-prison-for-quarantine-scofflaws.html.

[8] Reuters, "South Korea to Track Mobile Phones to Enforce Mers Virus Quarantine Rules," The Guardian, June 8, 2015, https://www.theguardian.com/world/2015/jun/07/mers-virus-outbreak-south-korea-reports-fifth-death-as-cases-rise-to-64.

[9] Reuters, "South Korea to Track Mobile Phones to Enforce Mers Virus Quarantine Rules," The Guardian, June 8, 2015,

The quarantine only lasted for about two months, before the last patient was released and medical workers stopped receiving new cases. After the quarantine, the outbreak in South Korea was deemed as over, which would remain until another case arose in 2018.

Please include case study summary text below this line.

In 2015, South Korea experienced an outbreak of MERS that was centered between two hospitals in the country. The state responded with a cohort quarantine that involved approximately 6,700 people. The quarantine proved to be effective, with law enforcement supporting the measures with increased penalties. However, problems did arise socially with distancing between families, and internally with the potential for increased transmission within the quarantined population.

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https://www.theguardian.com/world/2015/jun/07/mers-virus-outbreak-south-korea-reports-fifth-death-as-cases-rise-to-64.