

First U.S. Case of MERS-CoV Identified in Indiana

Strong interdepartmental and federal partnerships and practiced emergency procedures allowed the Indiana State Department of Health to quickly identify and contain a novel case of MERS-CoV.

Middle East respiratory syndrome coronavirus (MERS-CoV), a novel virus that attacks and infects the respiratory system, was first identified in Saudi Arabia in 2012. Since then, MERS-CoV has spread across the Arabian Peninsula to countries such as Jordan, Yemen, and Qatar. Symptoms of MERS include severe respiratory illness, cough, shortness of breath, and fever. While MERS is in the same family and shares similar symptoms with severe acute respiratory syndrome (SARS), MERS has a 30 percent mortality rate and SARS has a 10 percent mortality rate. Although MERS is less infectious than SARS, many scientists fear that future mutations may transform MERS into a very dangerous public health threat.

The first case of MERS in the United States was identified in Indiana on May 1, 2014. The patient was a U.S. citizen working as a healthcare worker in Saudi Arabia. The patient started feeling poorly around April 18. On April 24, the patient flew from Riyadh, Saudi Arabia to London, England and then to Chicago. In Chicago, the patient caught a bus to Highland, Indiana where a relative picked him up and drove him to their residence. On April 28, symptoms worsened and the family determined that the patient needed to go to the emergency room to be evaluated. The patient was then hospitalized, and on April 30, the hospital contacted the Indiana State Department of Health (ISDH) about collecting a specimen from the patient to test for MERS-CoV. On May 1, testing at the Indiana State Department of Health Laboratory (ISDHL) indicated that the patient was infected with MERS-CoV; on May 2, CDC confirmed these results.

ISDH quickly and efficiently initiated proper emergency procedures to ensure that the patient received quality care and to protect and test all possible points of contact. Working with key interstate departments and CDC, allowed for rapid testing and information distribution to providers and the public. Through a team effort, the patient was treated and no other cases were identified. A huge public health threat was successfully averted.

Steps Taken:

- After learning of a suspected case of MERS, ISDH immediately informed CDC, who jumpstarted efforts and preparations in handling this case.
- ISDH identified the patient's household composition and determined whether or not any members had traveled. Additionally, ISDH constructed a running list of those who had contact with the patient, including household members; those on the list were informed and tested. ISDH assisted the local health department with daily active surveillance for household members.
- On May 1, after the positive confirmation of MERS, ISDH requested an epidemiological assistance (Epi-Aid) team from CDC that consisted of a group of scientists with specialized training and disease control experience. With help from the Epi-Aid team, ISDH's field epidemiology team was able to locally test and monitor healthcare workers, household members, and anyone who had extended contact with the infected patient.
- The ISDHL and Epidemiology Resource Center (ERC) worked almost 24-hours a day to coordinate specimen collection and testing efforts with the treatment hospital.

- The CDC-funded Epidemiology and Laboratory Capacity cooperative agreement supported ISDH staff and reinforced the ERC and laboratory teams. ISDH funding financed all ISDH activities.
- After consultation with the ISDH and CDC, the hospital asked employees who had been exposed to the patient, prior to diagnosis, to stay home until tests confirmed they were not infected with MERS. All healthcare workers assisting with the infected patient were given an ID with a GPS locator to keep track of who was in and out of the patient's room and for how long. Hospital management conducted daily active surveillance of healthcare workers who had been exposed to the patient.
- Since MERS is a novel virus, CDC's lab thoroughly documented antibody levels of the patient before and after infection for future study. The ISDH used BioFire's FilmArray, a diagnostic tool, to check for co-infection. The patient donated blood while hospitalized, which allows for new research and testing.
- ISDH's preparedness division activated a public call center and a healthcare provider line. The call center was activated for one-hour on Friday, May 2, and was fully functional seven days a week (8 a.m. – 4 p.m.) by Saturday, May 3.
- ISDH's Office of Public Affairs (ISDHOPA) issued detailed press releases about the patient's condition and common symptoms and features of MERS. ISDHOPA also organized a press conference at the treatment hospital for Governor Mike Pence, Indiana State Health Commissioner William VanNess, CDC staff, and the hospital executive staff. The press conference highlighted the success and importance of local hospital preparedness and state-level coordination in rapid detection and treatment of emerging infectious diseases to protect the public from potentially fatal outbreaks.
- The Indiana Health Alert Network System was used to give healthcare providers up-to-date information on the status of the case and proper procedures to take given another possible case of MERS. ISDH worked with Indiana Hospital Association to deliver updated information to all hospital staff and personnel about the condition of the patient and warning signs of MERS.

Results:

- ISDH provided assistance and guidance to the hospital, which helped treat and release the infected patient.
- Standing emergency procedures were successfully identified and everyone at risk was alerted. Through rapid contact testing and treatment of the infected patient, MERS was contained and the risk of an outbreak was eliminated.

Lessons Learned:

- Given this novel case of MERS, knowing when and who to contact, especially within state government and CDC, was crucial to help contain this disease and prevent an outbreak.
- The close relationship between the health department and clinical labs in the state allowed ISDH to quickly distribute guidelines and training for collecting and handling specimens, and how to properly identify and diagnose MERS.
- Strong federal and interdepartmental partnerships allowed ISDH to leverage different expertise, increase capacity, and promptly respond to the health concerns of both the patient and the public. Effective collaboration among hospital personnel, ISDH's offices, state agencies, and CDC, allowed for a successful response to the MERS case.
- Distributing information via multiple outlets to several audiences was extremely important. ISDH's epidemiology resource center, laboratory, public health preparedness and emergency response, and

office of public affairs distributed information to providers and the general public while also issuing situational reports to the Governor's office every two hours. All of these reports were constructed in different ways to best serve different audiences.

- Increased efforts were needed to disseminate information to the public without igniting fear in the community. ISDH faced an acute level of concern from people who thought they might have been exposed. Regular updates to both the public and state officials and rapid testing helped alleviate these concerns.
- ISDH was challenged with a significant amount of labor-intensive work, as each specimen was collected and documented manually. If this information had been sent electronically, ISDH could have saved time. Although electronic technology existed, it had not been fully institutionalized at the hospital; time constraints hindered set up and employee training made it impossible for ISDH to fully implement the electronic technology during this epidemiologic investigation.

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Citations

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