

PATHOGEN SAFETY DATA GUIDE TRAINING MODULE CASE STUDY 3

EXPOSURE TO MIDDLE EAST RESPIRATORY SYNDROME CORONAVIRUS (MERS-COV) BY TRANSPORTATION AND HEALTHCARE WORKERS

TARGET AUDIENCE: Transportation workers including airline, airport, transit, shipping, and cargo workers and healthcare workers

How to use this case study

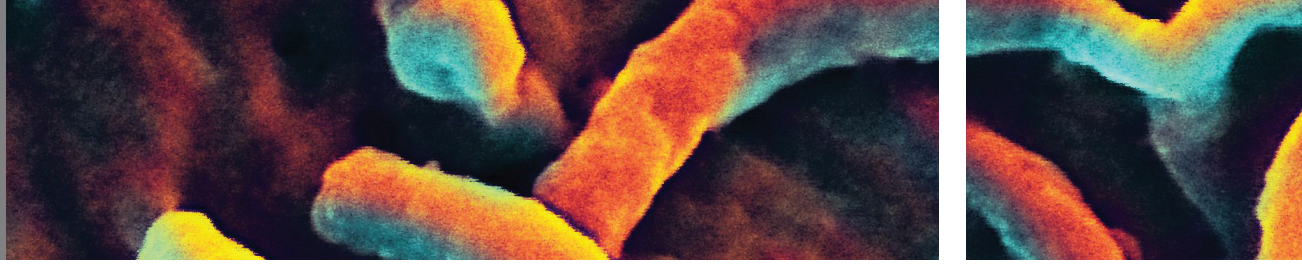
This case study is designed to be used as supplementary or as an alternative to Activities 3 and 4 in the NIEHS WTP's Pathogen Safety Data Guide Training Module.

Participants should work in small groups (4 – 8 people). Each group should select a recorder and reporter who will report back to entire class. Each small group should read through the case study. If time allows, the group should answer the questions in Activities 3 and 4 on the PSD Training Module Worksheet for the pathogen Middle East Respiratory Syndrome Coronavirus (MERS-CoV). Then the group should work on the questions following the case study. If time is short, the questions may be divided among the group members or one or both activities may be omitted.

Case Study

Mr. Smith, a 28-year-old U.S. citizen, was returning home after spending 6 weeks in Saudi Arabia as part of his college study exchange program. While in Jeddah, Saudi Arabia, he had visited numerous hospitals and medical campgrounds for his project about the local healthcare system. During his leisure time, he enjoyed activities in the Arabian Peninsula including camel rides in the Arabian Desert. Four days prior to leaving Saudi Arabia, he began feeling ill and developed a low-grade fever. Not thinking much of it, he departed Riyadh and boarded his flight to London, England. After a 6-hour layover, he continued to Chicago, Illinois. He then took a 70-minute greyhound bus from Chicago to his residence in Indiana. During this time, Mr. Smith continued to feel ill and experienced symptoms of nausea, muscles aches and a cough.

Three days after safely reaching home, Mr. Smith went to the post office to ship a package and



realized he was getting sicker. His fever increased to a temperature of 101° F and he developed respiratory symptoms including runny nose, increased coughing, and shortness of breath. One day later, he went to the emergency department of a hospital near his home and was admitted. A chest x-ray revealed he had a right lower lobe infiltrate. A lower lobe infiltrate is a medical situation where an x-ray of the lungs shows a gray shadow on either the left or right lower lobe of the lung. The shadow can be several things, including a buildup of fluid or a bacterial infection.

The patient required supplemental oxygen immediately. Further testing revealed he was positive for infection with MERS-CoV. Mr. Smith received supportive treatment and was placed in quarantine. After 10 days, he was found no longer symptomatic, tested negative for MERS-CoV and considered to be fully recovered. He was subsequently discharged from the hospital.

During the time Mr. Smith was symptomatic and potentially contagious, public health officials determined that he may have exposed 59 airport and security workers in Saudi Arabia, 108 passengers and 10 crew members during his flight from Saudi Arabia to London, England; 58 passengers and 12 crew members during his flight from London to Chicago; 18 passengers on the greyhound bus from Chicago to Indiana and; 9 individuals at the local post office in Indiana. Before implementation of infection control precautions at the hospital in Indiana, 53 healthcare personnel had unprotected close contact with Mr. Smith and were potentially exposed to his illness. Close contact is defined as a) being within approximately 6 feet (2 meters), or b) within the room or care area, of a confirmed MERS-CoV case for a prolonged period. None of potentially exposed passengers, crew members, and healthcare personnel became symptomatic with MERS-CoV.

Discussion Questions:

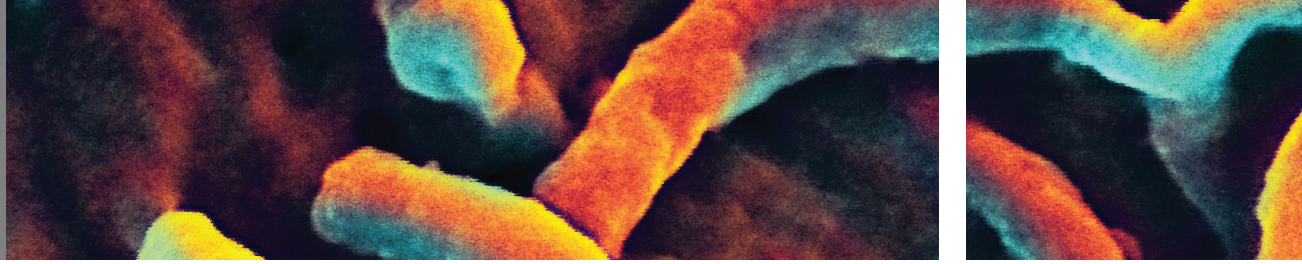
1. In the circumstances in this case study, was it possible to know what the pathogen was when the exposures took place? Yes No

Explain

2. Given the symptoms of fever, coughing, runny nose, and shortness of breath what type of precautions should be implemented? Check all that apply:

Contact Droplet Airborne Aerosol transmissible

Explain



3. Based on the potential exposure routes identified in 2. above, what type of protective controls measures should be implemented:

Engineering controls _____

Administrative controls _____

Personal protective equipment _____

Respiratory protection _____

4. What steps should be taken to prepare for this type of event? Check all that apply:

- Written procedures
- Selection and purchase of necessary equipment
- Worker training
- Equipping airplanes, transit vehicles, and related operations
- Post exposure procedures
- Other? _____

5. Based on what you learned in this case study, are there potential improvements that should be made at your place of employment? Yes No

If yes, please explain and list any potential action steps:

References:

- 1) Centers for Disease Control and Prevention (CDC). MERS in the U.S. <http://www.cdc.gov/coronavirus/mers/us.html#indiana> Accessed October 21, 2016.
- 2) Morbidity and Mortality Weekly Report (MMWR). First Confirmed Cases of Middle East Respiratory Syndrome Coronavirus (MERS-CoV) Infection in the United States, Updated Information on the Epidemiology of MERS-CoV, and Guidance for the Public, Clinicians and Public Health Authorities – May 2014.

Supplemental Reading Material:

- 1) Alhakeem R et al. Exposures among MERS Case-Patients, Saudi-Arabia, January-February 2016. Emerging Infectious Diseases. Volume 22, No. 11. November 2016.
- 2) El Bushra H et al. An outbreak of Middle East Respiratory Syndrome (MERS) due to coronavirus in Al-Ahssa Region, Saudia Arabia, 2015. Eastern Mediterranean Health Journal. Volume 22, No. 7. 2016.
- 3) Gao H et al. From SARS to MERS: evidence and speculation. Front. Med. DOI 10.1007/s11684-016-0466-7.