2019 AZID Outbreak Investigation

Tabletop Exercise

Situation Manual - Facilitator's Version

June 25, 2019

ARIZONA DEPARTMENT
OF HEALTH SERVICES

PREPAREDNESS

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Preface

The 2019 Arizona Infectious Disease (AZID) Outbreak Investigation Tabletop Exercise (TTX) is sponsored by the Arizona Department of Health Services (ADHS). This Situation Manual (SITMAN) was produced at the direction of the Arizona Department of Health Services (ADHS) with the input, advice, and assistance of the 2019 Public Health TTX Exercise Planning Team.

The Situation Manual (SITMAN) gives officials, observers, and players from participating organizations the information necessary to observe or participate in a healthcare exercise focusing on participants' emergency response plans, policies, and procedures as they pertain to their preparedness and response capabilities. The information in this document is current as of the date of publication, June 25, 2019, and is subject to change as determined by the 2019 AZID TTX Exercise Planning Team.

The 2019 Arizona Infectious Disease Tabletop is an *unclassified exercise*. The control of information is based more on public sensitivity regarding the nature of the exercise than on the actual exercise content. Some exercise material is intended for the exclusive use of exercise planners, facilitators, and evaluators, but players may view other materials deemed necessary to their performance. The SITMAN may be viewed by all exercise participants.

All exercise participants should use appropriate guidelines to ensure the proper control of information within their areas of expertise and to protect this material in accordance with current jurisdictional directives. Public release of exercise materials to third parties is at the discretion of ADHS.

This SITMAN and TTX were supported by the U.S. Department of Health and Human Services (HHS), Office of the Assistant Secretary for Preparedness and Response (ASPR), Office of Preparedness and Emergency Operations (OPEO), Division of National Healthcare Preparedness Programs (NHPP) HPP Cooperative Agreement

Catalog of Federal Domestic Assistance (CFDA) number 93.889. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of HHS.

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1. The title of this document is the *2019 AZID Outbreak Investigation Tabletop Exercise.*

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3. At a minimum, the attached materials will be disseminated only on a need-to-know basis and, when unattended, will be stored in a locked container or area offering sufficient protection against theft, compromise, inadvertent access, and unauthorized disclosure.

4. For additional information, please contact the Exercise Point of Contact:

Liam Hicks
Arizona Department of Health Services
150 N. 18th Ave, Suite 140
Phoenix, AZ 85007
(480) 273-7833
Liam.Hicks@azdhs.gov

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4:15PM - 5:00PM	**Large Group Brief Back, Questions/Comments, and Evaluation (Black Canyon Room)**
5:00 PM	**Adjourn**

Note: Agenda is subject to change if necessary

Exercise Overview

Exercise Name	2019 AZID Outbreak Investigation Tabletop Exercise
Exercise Dates	June 25th, 2019
Mission Area(s)	Prevention, Protection, Mitigation, Response
Domains	Community Resilience (1), Incident Management (2), Information Management (3), Countermeasures and Mitigation (4), Surge Management (5), Biosurveillance (6)
Objectives	• Determine Incident Command's team composition and operational priorities. • Identify the role of the Health Care Coalitions in this response. • Determine a threshold for standing up an Emergency Operations Center (EOC). • Determine when to issue public information alerts, warnings, and notifications. • Identify methods for collaboration between agencies. • Identify which stakeholders should be incorporated into information flow. • Determine communication needs during a disease outbreak of unknown origin. • Determine the infection control measures that should be implemented.

Objectives cont.	• Determine the precautionary protective measures associated with this outbreak that should be communicated to the public. • Determine methods for medical surge capacity. • Discuss epidemiologic clues indicative of a disease outbreak. • Determine the source of an outbreak. • Discuss prevention measures to be implemented to protect the public. • Describe the clinical features, epidemiology, and control of cases in an outbreak. • Describe collection of appropriate specimens and proper handling of specimens. • Obtain and conduct confirmatory testing and analysis of clinical and environmental laboratory specimens.
Scenario	Unknown Disease Outbreak Investigation
Sponsor	Arizona Department of Health Services
Participating Organizations	Public health emergency preparedness coordinators, environmental health, epidemiology staff, tribal partners, laboratorians, hospital staff, public information officers
Point of Contact	Liam Hicks, MPH Arizona Department of Health Services 150 N. 18th Ave, Suite 140 Phoenix, AZ 85007 (480) 273 7833 Liam.Hicks@azdhs.gov

General Information

Introduction

This Outbreak Investigation TTX is designed to establish a learning environment for local health departments, and community partner participants to exercise their outbreak plans, policies, and procedures. To ensure an effective exercise, subject matter experts (SMEs) and representatives from numerous federal, state, and local agencies have planned and will participate in the exercise conduct and evaluation. This Situation Manual (SITMAN) was produced at the direction of the Arizona Department of Health Services (ADHS) with the input, advice, and assistance of the 2019 Public Health TTX Exercise Planning Team.

Confidentiality

The Outbreak Investigation TTX is an unclassified exercise. Control of exercise information is based on public sensitivity regarding the nature of the exercise rather than the actual exercise content. Some exercise material is intended for the exclusive use of exercise planners, controllers, simulators, and evaluators, but players may view other materials deemed necessary to their performance.

All exercise participants should use appropriate guidelines to ensure the proper control of information within their areas of expertise and protect this material in accordance with current ADHS directives.

Any inquiries concerning the authorized use of this document or any other exercise-related materials should be directed to the Exercise Point of Contact, Liam Hicks (see contact information above).

Purpose

The purpose of the ADHS sponsored Outbreak Investigation TTX is to evaluate the public health and healthcare response to an outbreak of unknown origin.

Exercise Objectives and Core Capabilities

The following exercise objectives in Table 1 describe the desired outcomes for the exercise. The objectives are linked to the national preparedness domains and capabilities, which are distinct critical elements necessary to achieve specific mission area(s). The objectives and aligned core domains and capabilities were selected by the Exercise Planning Team.

Domain	**Domain 1: Community Resilience**	**Domain 2: Incident Management**	**Domain 3: Information Management**
Capability	Community Recovery Community recovery is the ability to collaborate with community partners, (e.g., healthcare organizations, businesses, education, and emergency management) to plan and advocate for the rebuilding of public health, medical, and mental/behavioral health systems to at least a level of functioning comparable to pre-incident levels, and improved levels where possible.	Emergency Operations Coordination Emergency operations coordination is the ability to direct and support an event or incident with public health or medical implications by establishing a standardized, scalable system of oversight, organization, and supervision consistent with jurisdictional standards and practices and with the National Incident Management System.	Emergency Public Information and Warning Emergency public information and warning is the ability to develop, coordinate, and disseminate information, alerts, warnings, and notifications to the public and incident management responders.
Objectives	• Determine Incident Command's team composition and operational priorities. • Identify the role of the Health Care Coalitions in this response.	• Determine a threshold for standing up an Emergency Operations Center (EOC).	• Determine when to issue public information alerts, warnings, and notifications.

Domain	Domain 3: Information Management (cont.)	Domain 4: Countermeasures and Mitigation	Domain 5: Surge Management
Capability	Information Sharing Information sharing is the ability to conduct multijurisdictional, multidisciplinary exchange of health-related information and situational awareness data among federal, state, local, territorial, and tribal levels of government, and the private sector. This capability includes the routine sharing of information as well as issuing of public health alerts to federal, state, local, territorial, and tribal levels of government and the private sector in preparation for, and in response to, events or incidents of public health significance.	Non-Pharmaceutical Interventions Non-pharmaceutical interventions are the ability to recommend to the applicable lead agency (if not public health) and implement, if applicable, strategies for disease, injury, and exposure control.	Medical Surge Medical surge is the ability to provide adequate medical evaluation and care during events that exceed the limits of the normal medical infrastructure of an affected community. It encompasses the ability of the healthcare system to survive a hazard impact and maintain or rapidly recover operations that were compromised.
Objectives	• Identify methods for collaboration between agencies. • Identify which stakeholders should be incorporated into information flow. • Determine communication needs during a disease outbreak of unknown origin. • Identify methods of collaborating on disease investigations between public health and law enforcement.	• Determine the infection control measures that should be implemented. • Determine the precautionary protective measures associated with this outbreak that should be communicated to the public.	• Determine methods for medical surge capacity.

Domain	**Domain 6: Biosurveillance**	**Domain 6: Biosurveillance (cont.)**
Capability	Public Health Surveillance and Epidemiological Investigation Public health surveillance and epidemiological investigation is the ability to create, maintain, support, and strengthen routine surveillance and detection systems and epidemiological investigation processes, as well as to expand these systems and processes in response to incidents of public health significance.	Public Health Laboratory Testing Public health laboratory testing is the ability to conduct rapid and conventional detection, characterization, confirmatory testing, data reporting, investigative support, and laboratory networking to address actual or potential exposure to all-hazards. Hazards include chemical, radiological, and biological agents in multiple matrices that may include clinical samples, food, and environmental samples (e.g., water, air, and soil). This capability supports routine surveillance, including pre-event or pre-incident and post-exposure activities.
Objectives	● Discuss epidemiologic clues indicative of a disease outbreak. ● Determine the source of an outbreak. ● Discuss prevention measures to be implemented to protect the public. ● Describe the clinical features, epidemiology, and control of cases in an outbreak.	● Describe collection of appropriate specimens and proper handling of specimens. ● Obtain and conduct confirmatory testing and analysis of clinical and environmental laboratory specimens.

Table 1. Exercise Objectives and Associated Preparedness Domains and Capabilities

Exercise Assumptions and Artificialities

In any exercise, assumptions and artificialities may be necessary to complete play in the time allotted and/or account for logistical limitations. Exercise participants should accept these considerations and should not allow this to negatively impact their participation. During this exercise, the following apply:

- The exercise scenario is plausible, and events occur as they are presented.
- All players receive information at the same time.

Participant Roles and Responsibilities

The term participant encompasses many groups of people, not just those playing in the exercise. Groups of participants involved in the exercise, and their respective roles and responsibilities, are as follows:

- Players: Players are personnel who have an active role in discussing or performing their regular roles and responsibilities during the exercise. Players discuss or initiate actions in response to the simulated emergency.
- Facilitators: Facilitators provide situation updates and moderate discussions. They also provide additional information or resolve questions as required. Key Exercise Planning Team members also may assist with facilitation as subject matter experts (SMEs) during the exercise.
- Evaluators: Evaluators are assigned to observe and document certain objectives during the exercise. Their primary role is to document player discussions, including how and if those discussions conform to plans, policies, and procedures.
- Observers: Observers do not directly participate in the exercise. However, they may support the development of player responses to the situation during the discussion by asking relevant questions or providing subject matter expertise.

Exercise Structure

This exercise will be a discussion-based, facilitated exercise. Players will participate in the following four modules:

- Module 1: Family Fun
- Module 2: Contact Tracing
- Module 3: Healthcare Facility Outbreak
- Module 4: Cleaning and closeout

Each module begins with an update that summarizes key events occurring within that time period. After the updates, participants review the situation and engage in a group discussion of appropriate response issues.

Exercise Guidelines

The following guidelines have been developed to ensure that the exercise objectives are met in a reasonable amount of time and that the TTX runs smoothly.

- This exercise will be held in an open, low-stress, no-fault environment. Varying viewpoints, even disagreements, are expected.
- Respond to the scenario using your knowledge of current plans and capabilities.
- Keep the exercise's objectives in mind throughout the exercise.
- Treat the scenario incidents as real events. Play your appropriate role.
- Issues and procedures flowing from each module presented will be discussed.
- After reviewing each part of the scenario, participants will have a few minutes to answer each question and consider the appropriate and courses of action. Following this, a facilitated general discussion of response issues and actions related to this exercise scenario will be conducted.
- Participate openly and focus discussions on appropriate topics. Asking questions, sharing thoughts, and offering problem-solving recommendations to improve response efforts are strongly encouraged, as these will enhance the exercise experience.
- Keep your comments focused and consider the time constraints. The discussions will explore policies, decisions, actions, and key relevant issues, which will require participants to respect the observations, opinions, and perspectives of others.
- Decisions are not precedent setting and may not reflect your organization's final position on a given issue. This exercise is an opportunity to discuss and present multiple options and possible solutions.

Exercise Control

The exercise will be controlled and guided by the facilitator. The facilitated TTX uses a scenario-based approach to create the decision-making environment for participants to act in their potential operational roles. This is a no-fault exercise that focuses on the identification and analysis of issues of common concern.

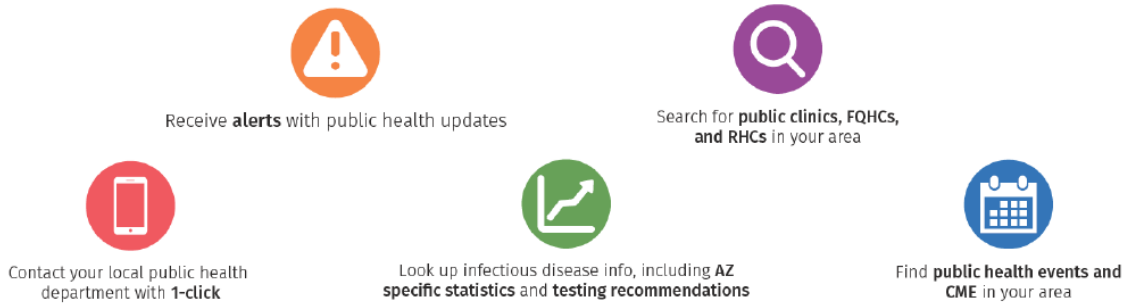
During the TTX, an objective facilitator will lead participants through the activities surrounding the scenarios. The facilitator is responsible for keeping discussions on track with exercise objectives and ensuring that all issues are explored (time permitting).

Exercise Evaluation

Exercise evaluation is an essential element of a successful exercise program. A good evaluation is part of a progressive exercise program where exercises are planned, conducted, and evaluated as building blocks to competency in incident management for the long–term. The evaluation portion of the exercise program is aligned with the established program metrics.

Evaluations provide an objective assessment of the participants' discussions. They have been designed to support an assessment of exercise objectives and capabilities. The goal of evaluation is to validate strengths and identify opportunities for improvement among participating organizations. Evaluations help to identify ways to build on strengths and improve capability. The evaluation methodology for this TTX focuses on the adequacy of and familiarity with the jurisdiction's plans, policies, procedures, resources, and interagency/inter-jurisdictional relationships that support the performance of critical tasks required to respond to an unknown respiratory outbreak.

During the TTX, an evaluation team will be listening for themes in discussions and issues. These issues will then be reviewed during the hot wash. Lessons learned during the exercise will allow participants to update their current response plans and strategies as needed.



Have questions, problems, or feedback? Reach out to us at IDAZ@azdhs.gov | www.azhealth.gov/idaz

Module 1

October Gets a Little Bit Scarier

Saturday, October 19, 2019

Meet Grandpa. He is 79 years old, enjoying his retirement in Arizona. His son and his family recently moved last year to be closer to Grandpa, and often go on family outings together. Getting into the fall festivities a pumpkin patch trip has been scheduled, and Grandpa is really excited to spend time with his grandson. However, Grandpa for the past few days hasn't been feeling well. The morning of the festivities, Grandpa states he is feeling better, however, while at the pumpkin patch he has a dizzy spell and collapses. His son jumps into action and rushes him to Dromedary Hospital. While at Dromedary Hospital, Grandpa presents with the following symptoms: fever, cough, and shortness of breath. He is given supportive care (inhaler, IV, etc.) and sent home.

Facilitator: *Provide participants with a blank calendar* ***(Handout 1)***

Facilitator: *Provide participants with the AZ Communicable Diseases Reporting Rules list* ***(Handout 2)***

Sunday, October 20, 2019

Overnight, while at home, Grandpa's condition continues to worsen. Concerned about his father's well-being, his son takes Grandpa to Camelback Regional Hospital for a second opinion. Grandpa proceeds to be admitted. A battery of tests are run, and initial tests show that Grandpa's kidney function is severely decreased. Grandpa is no stranger to irregular kidney function as he has been receiving dialysis twice a week for the last 6 months while awaiting a kidney transplant. The attending doctor, after reviewing Grandpa's symptoms (fever, cough, and shortness of breath), orders a respiratory panel.

Question 1: At this point, what key information would you want to take note of? What additional questions would you want to ask? [Domain 6: Biosurveillance]

Answer:

- *Current knowledge: symptoms (fever, cough, shortness of breath), current kidney failure for Grandpa.*
- *Additional questions: recent travel, sick contacts, any lab testing done at Dromedary Hospital, any additional comorbidities.*

In the meantime, Grandpa continues to receive supplemental care and fluids.

Monday, October 21, 2019: Mid-Morning

Inject: The nurse has a casual conversation with Grandpa's daughter-in-law. During this conversation, the daughter-in-law mentions her husband's recent business trip to Asia, and that since returning home he has been spending a lot of time with Grandpa.

The nurse communicates the new information about the son's recent travel to Grandpa's doctor. Upon learning this information, the doctor becomes very concerned and calls for an infectious disease (ID) consult, where information on Grandpa's symptoms are discussed in detail.

Upon the conclusion of the ID consult, the ID doctor calls the County Health Department to alert them of a potential respiratory disease of public health concern and ask for further advice. The doctor relays the case details and expresses his concern about recent travel. After all the details of the conversation with the doctor are documented, the County Health Department launches an investigation.

To start, the County Health Department reaches out to the son to obtain dates and location of travel.

Facilitator: *Provide participants with the son's travel details and flight path.*
(Handout 3)

The County Health Department discovers the son was mildly ill with a respiratory disease with symptom onset about five days after returning home (October 10–11). Due to his travel details, there is concern about the son's exposure to poultry, as there has been a recent H7N9 (bird flu) outbreak in China. The County Health Department calls the Arizona Department of Health Services (ADHS) to see if the Arizona State Public Health Laboratory (ASPHL) can perform testing for H7N9.

Inject: ADHS staff confirm that H7N9 testing can be performed at ASPHL.

Question 2: What specimens should be collected? How would you get specimens to ASPHL from your facility? [Domain 6: Biosurveillance]

Answer:

- *Influenza PCR (can include seasonal H1 and H3 as well as novel H5 and H7).*
- *NP swab in Hanks or VTM.*
- *Will vary by jurisdiction but may include courier service.*

Grandpa is still admitted at Camelback Regional Hospital, and his condition continues to worsen as he has now developed severe pneumonia.

Question 3: What type of precautions would be recommended for Grandpa at this time? [Domain 4: Countermeasures and Mitigation]

Answer: *Airborne, Contact, and Standard precautions. These are the recommended precautions for suspected novel influenza.*
https://www.cdc.gov/flu/avianflu/novel-flu-infection-control.htm

ADHS Office of Infectious Disease Services (OIDS) collaborates with the County Health Department to develop a Health Alert Network (HAN) alert message in preparation if the specimen is positive for H7N9. HANs are used to distribute important public health alerts to public health officials and healthcare professionals across the state. If the specimen is positive for H7N9, OIDS will coordinate with ADHS Bureau of Public Health Emergency Preparedness to release the HAN.

Question 4: What information would you want to include in the HAN? [Domain 6: Biosurveillance]

Facilitator: *Provide participants with the HAN Request Form. Have the group bullet point out main points/information they would include in the HAN.* ***(Handout 4)***

Answer: *See example HAN (facilitators only). Use below example to probe for answers.*

Example HAN:

Confirmed Case of H7N9 influenza in Arizona

The Arizona Department of Health Services and **X** County Department of Public Health have confirmed **ONE** case of H7N9 influenza in **X** County.

Public health is coordinating with facilities to follow up with potentially exposed individuals.

Arizona providers are recommended to:

- Consider H7N9 as a diagnosis for patients with influenza-like illness (100F fever, and cough or sore throat) and exposure to a confirmed case or travel to an affected country.
- Minimize further exposures of patients and staff. This includes using masks, immediate airborne isolation or being the last appointment of the day.
- Immediately report and coordinate specimen collection with the local health department.

For more information on measles, please visit the CDC Influenza webpage at https://www.cdc.gov/flu/avianflu/h7n9-virus.htm
To report cases or for additional information, please contact your local health department (http://www.azdhs.gov/preparedness/epidemiology-disease-control/index.php#resources-county).

Question 5: Does your jurisdiction (county/tribal health department, hospital/healthcare facility) have a pandemic influenza plan? What is this plan? What would be some triggers for you to use this plan? [Domain 1: Community Resilience]

Answer:

Will vary by participants, trigger might include:

- *Detection of a case with a novel influenza strain;*
- *Unknown infection with travel to a high-concern area.*

Monday, October 21, 2019: Afternoon

ASPHL receives the specimens, and performs a novel influenza PCR. Anxiously checking the results, the laboratorian breathes a sigh of relief. Thank goodness, it is **NEGATIVE.** The results are communicated to the County Health Department.

Question 6: Upon learning these results, what other possible diseases would be on your differential? [Domain 6: Biosurveillance]

Answer:

- *Legionella;*
- *Adenovirus;*
- *Enterovirus;*
- *Parainfluenza;*
- *Coronavirus, including novel viruses (e.g., SARS, MERS).*

Monday October 21, 2019: Late Evening

Inject: An Epidemiologist doing a news scan, discovers that there is a current MERS outbreak in South Korea during the exact time frame that the son was visiting. Uh oh!

Facilitator: *Provide participants with the MERS testing algorithm* ***(Handout 5)***

Question 7: Does Grandpa meet the criteria for testing? Explain. Does the son? ASPHL has the remaining NP specimen from testing for novel influenza, would this specimen be sufficient for MERS-CoV testing? If not, what specimens would you collect? [Domain 6: Biosurveillance]

Answer:

Yes. Fever and pneumonia or acute respiratory distress syndrome (based on clinical or radiological evidence) AND close contact with a symptomatic traveler who developed fever and acute respiratory illness (not necessarily pneumonia) within 14 days after traveling from countries in or near the Arabian Peninsula or countries currently experiencing a MERS outbreak. Answers may vary.

Points to ponder when determining which specimen types to collect from a patient under investigation (PUI):

- The number of days between specimen collection and symptom onset.
- Symptoms at the time of specimen collection.

Collection of all three specimen types (lower respiratory, upper respiratory, and serum specimens) for testing using the CDC MERS rRT-PCR assay is recommended.

Lower respiratory specimens are preferred. However, collecting nasopharyngeal and oropharyngeal (NP/OP) specimens, and serum, are strongly recommended depending on the length of time between symptom onset and specimen collection.

Respiratory specimens should be collected as soon as possible after symptoms begin, ideally within 7 days. However, if more than a week has passed since symptom onset, respiratory samples should still be collected with emphasis on lower respiratory specimens.

Tuesday, October 22, 2019: Morning

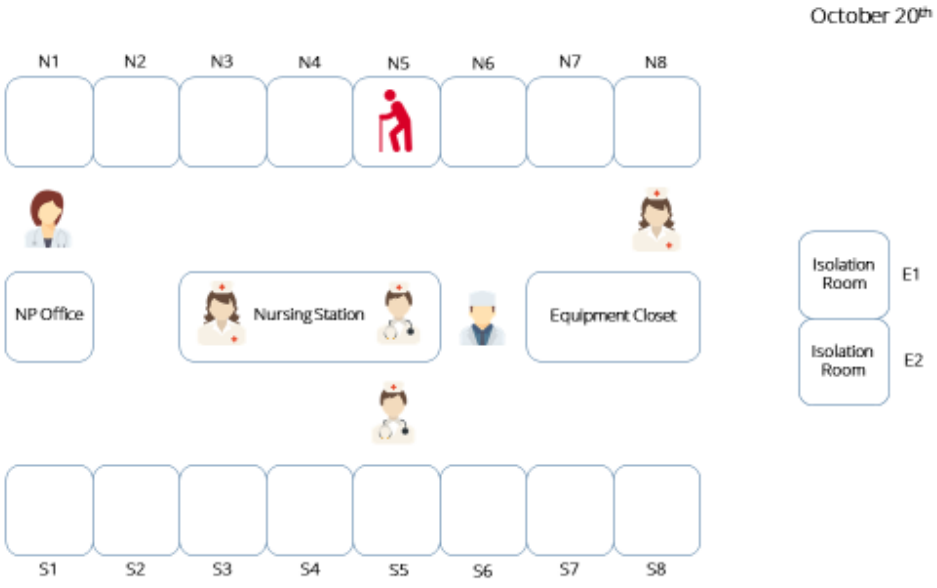
Appropriate specimens are collected, and MERS-CoV testing is approved for Grandpa, and the son. Later that day, the ADHS VPD team receives a call from the ASPHL reporting Grandpa's specimen was **POSITIVE** for MERS-CoV by PCR!

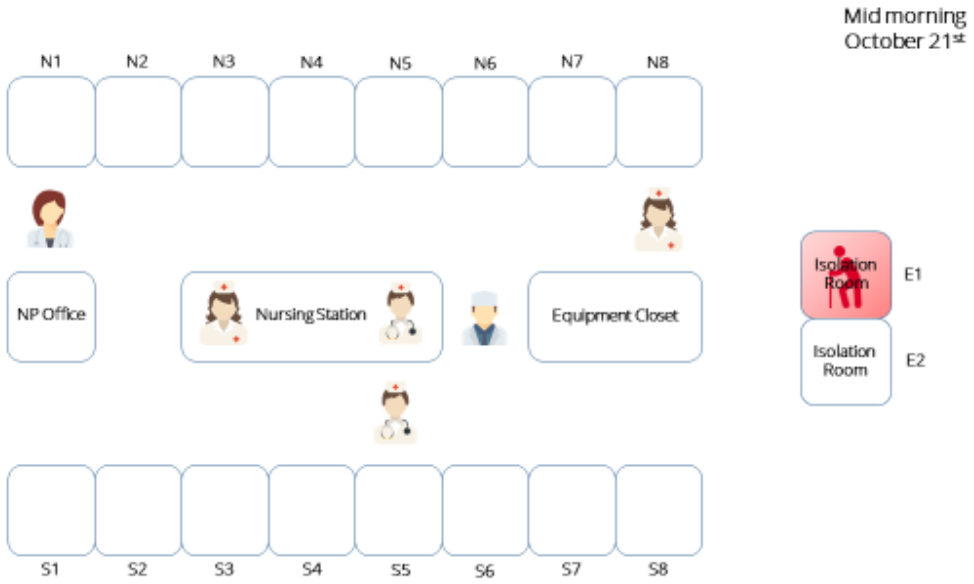
Module 2

Part 1: Facility Trace Back

Tuesday October 22, 2019: Afternoon

Now a confirmed MERS case, the panic ensues. The IP at Camelback Regional Hospital conducts a retrospective look back at Grandpa's stay. Grandpa has been in the facility for approximately 48 hours. During his stay, Grandpa exposed various parts of the hospital. He was in the ER for 4 hours, from which he was transferred to the ICU on 10/20, where he resided on droplet precautions until novel influenza was suspected mid-morning 10/21.





Question 8: Does your facility have protocols in the event of a MERS case? How often are these updated? What infection control procedures should be implemented? What resources would you potentially refer to? [Domain 4: Countermeasures and Mitigation]

Answer:

- *Ensure adherence to hand hygiene, PPE, precautions, airborne isolation room.*
- *Use caution when performing aerosol-generating procedures.*
- *Manage visitor access and movement within the facility.*
- *Monitor and manage ill and exposed healthcare personnel.*
- *Train and educate healthcare personnel.*
- *Implement environmental infection control.*
- *https://www.cdc.gov/coronavirus/mers/infection-prevention-control.html*

Camelback Regional Hospital has transferred Grandpa into a negative pressure room and implemented the appropriate isolation precautions, however, Grandpa has possibly exposed the whole ICU for 27 hours, including employees. All exposures are under enhanced surveillance.

Question 9: Since MERS can be transmitted through the air, how would your facility address concerns regarding air flow/circulation within the unit and to other areas of the hospital?

Answer: *Answers may vary.*

Question 10: What steps should you take to monitor healthcare personnel (HCP) who might have been exposed (e.g., provided care to MERS patient)? What steps would you take if healthcare personnel develop symptoms? [Domain 4: Countermeasures and Mitigation; Domain 6: Biosurveillance]

Answer:

- *HCP who care for patients with MERS should be monitored for a period of 14 days after the last known contact with a MERS patient, regardless of their use of PPE.*
- *HCP who develop any respiratory symptoms after an unprotected exposure to a patient with MERS-CoV should not report for work or should immediately stop working.*
- *For asymptomatic HCP who have had an unprotected exposure to a patient with MERS-CoV, exclude from work for 14 days to monitor for signs and symptoms of respiratory illness and fever.*
- *Facilities and organizations providing healthcare should:*
    - *Implement sick leave policies for HCP, including contract staff and part-time personnel, that are non-punitive, flexible and consistent with public health guidance (e.g., policies should ensure ill HCP who may have*

MERS-CoV infection stay home, unless hospital admission for isolation and treatment is recommended);

- *Ensure that all HCP are aware of the sick leave policies.*

- *Provide employee health services that:*
  - *Ensure that HCP have ready access, including via telephone, to medical consultation and, if needed, prompt treatment.*

Due to his failing kidneys, Grandpa needs to continue his scheduled twice-weekly dialysis. Grandpa's physician seeks out the IP to consult with them on this scenario.

Question 11: What are some logistical infection control considerations in Grandpa receiving dialysis while under strict isolation precautions? How would this be accomplished? [Domain 4: Countermeasures and Mitigation]

Answer: *Dedicated dialysis machine will remain in his room. Ensuring that the healthcare providers helping administer the dialysis follows the proper precautions.*

Part 2: Contact Tracing - Health Department

Tuesday, October 22, 2019 (Same time period as above)

Upon receiving the notification from ASPHL that the specimen is MERS-CoV positive, ADHS communicates with the County Health Department to notify them of the MERS-CoV positive result. A public health nurse at County A initiates contact tracing for possible exposures.

Question 12: Is the son still at risk of transmitting MERS-CoV? What recommendations would you have for the son? [Domain 4: Countermeasures and Mitigation]

Answer:

- *According to WHO "patients can shed the virus after resolution of symptoms, but the duration of infectivity is unknown."*

- *According to the CDC "For people with confirmed MERS-CoV infection, isolation and movement restrictions are removed upon determination by public health authorities that the person is no longer considered to be infectious. A confirmed case of MERS* ***is considered to no longer be infectious after two respiratory specimens (preferably lower respiratory tract) collected 24 hours apart are confirmed negative by the CDC rRT-PCR MERS-CoV assay, and the patient has clinical improvement."***

Due to uncertainty if the son is still infectious, public health recommends that he self-isolate at home, while his family isolates elsewhere monitoring symptoms. County A coordinates specimen collection for the son.

Question 13: Contact tracing is going to be very labor intensive. Do you have any surge capacity/plans for when you need more assistance with contact tracing and other public health activities? [Domain 5: Surge Management]

Answer: *Answers will vary by jurisdiction.*

Wednesday, October 23, 2019

The son is considered no longer infectious as he has two respiratory specimens collected 24 hours apart that are confirmed **negative** by the CDC rRT-PCR MERS-CoV assay.

Thursday, October 24, 2019

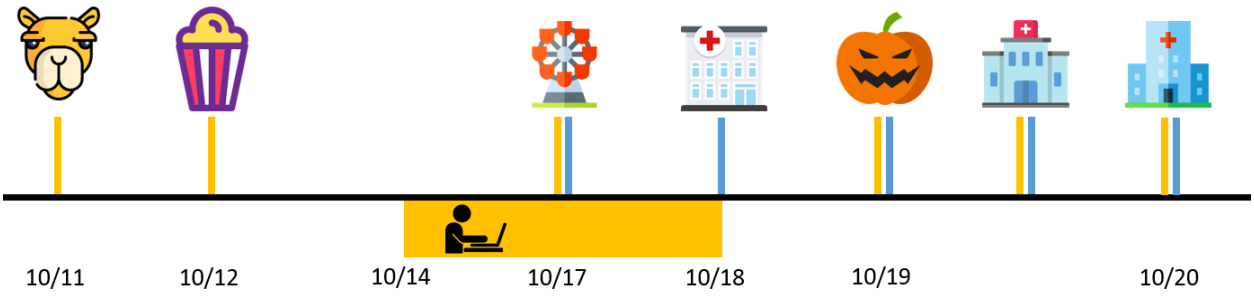
After some quick internet searches and referring to the CDC and AAP Red Book, it is established that MERS has an incubation period of 2–14 days, with the average length being about 5 days. New cases would be expected 2–14 days from any known exposure. County A has collected information on the whereabouts of Grandpa and his son during their respective infectious periods, which for MERS is the beginning of symptom onset. The county identified the following exposures:

Son:

- A trip to the zoo;
- A movie;
- AZ State Fair (Duration: 3 hours);
- Worked remotely due to not feeling well;
- Pumpkin Patch (Duration: 1 hour);
- Dromedary Hospital – ED (Duration: 2 hours);
- Camelback Regional Hospital
    - ED (Duration: 4 hours);

Grandpa:

- AZ State Fair (Duration: 3 hours);
- Havasupai Urology Medical Practice Specialists (H.U.M.P.S)
    - Dialysis (Duration: 4 hours);
- Pumpkin Patch (Duration: 1 hour);
- Dromedary Hospital – ED (Duration: 2 hours);
- Camelback Regional Hospital:
    - ED (Duration: 4 hours);
    - Subsequently transferred to the ICU.



Facilitator: *Have the participants refer to their blank calendar, and fill out this information along with the incubation period for Grandpa, and when he became infectious.*

With a large number of potential exposures, County A and ADHS convene to discuss exposure communication strategies. A few questions being discussed at the meeting are:

Question 14: Are there any concerns for the exposed locations? Would environmental cleaning for any of these locations be recommended? [Domain 4: Countermeasures and Mitigation]

Answer:

- *Answers may vary.*
- *MERS-CoV remains viable at 48 hours at 20 °C and 40% relative humidity, comparable to an indoor environment on plastic and metal surfaces.* (https://ecdc.europa.eu/en/middle-east-respiratory-syndrome-coronavirus/factsheet)

Question 15: What pieces of information would we include in the press release? What, if anything, would we not want to share? How would communication differ between the facility exposures and the public exposures? [Domain 2: Information Management]

Answer:

- *EpiX and/or press release for public exposures where you cannot identify those exposed.*

There are no right or wrong answers on what information to share, however, at this early point in the investigation, information should be provided with caution because there are many things still unknown about the outbreak.

Some things you might not want to share include:

- *Confidential, personally identifying information;*
- *Havasupai Urology Medical Practice Specialists (H.U.M.P.S)* ;
- *Dromedary Hospital;*
- *Camelback Regional Hospital.*

With the large numbers of potentially exposed individuals in the community, and it being in the midst of influenza season, diagnosing MERS can be tricky. During influenza season, many people will be diagnosed with influenza-like-illness, which is defined as having a 100F fever and a cough or a sore throat. Most people confirmed to have MERS have similar symptoms (fever, cough, and shortness of breath). This makes it difficult to decide who needs to have specimens collected and tested for MERS. A conference call is scheduled between County A and ADHS to discuss what the criteria for testing an individual for MERS-CoV should be.

Question 16: What would be included in your criteria for determining if an individual needs to be tested for MERS-CoV, keeping in mind it is in the middle of influenza season? Would a positive influenza result necessarily rule out an exposed individual from MERS testing? [Domain 6: Biosurveillance]

Answer:

- *Should include symptoms: Fever, cough, or shortness of breath.*
- *Testing: For non-exposed individuals, influenza should first be ruled out before considering MERS on the differential.*
- *An epi link needs to be established.*

Question 17: How will your agency work to triage patients in the emergency department? What methods might you use? How will you ensure that PPE and droplet precautions are maintained? How would you handle the worried well? [Domain 5 Surge Management; Domain 4 Countermeasure and Mitigation]

Answer:

Implement Engineering Controls - Consider designing and installing engineering controls to reduce or eliminate exposures by shielding HCP and other patients from infected individuals. Examples of engineering controls include physical barriers or partitions to guide patients through triage areas, curtains between patients in shared areas, closed suctioning systems for airway suctioning for intubated patients, as well as appropriate air-handling systems (with appropriate directionality, filtration, exchange rate, etc.) that are installed and properly maintained.

The County Health Department starts to compile a linelist of the individuals that are exposed.

Question 18: During the creation of a linelist, what is some information you would want to include? How would you share this linelist between counties (if needed), with ADHS, and with the facilities involved? [Domain 6: Biosurveillance; Domain 3: Information Management]

Answer:

- *Outbreak module is a great way to track an outbreak of any kind. The linelist can be created using MEDSIS cases or attached via an Excel document.*
- *Linelist contents:*
  - *Who/What/When/Where;*
  - *Demographics;*
  - *Classic MERS symptoms;*
  - *Travel information;*
  - *Laboratory/Specimen information;*
  - *Hospital notes;*
  - *Room number;*
  - *Attending;*
  - *Attach medical record.*

Inject: County A, after reaching out to the exposures from the dialysis clinic have identified 3 individuals who have just developed symptoms compatible with MERS. They are instructed to self-isolate, specimen collection is coordinated, and specimens are sent to ASPHL.

Part 3: Emergency Preparedness

An **Emergency Operations Center (EOC)** is a place where experts monitor information, prepare for events, and gather to exchange information and make decisions in the event of an emergency. These are vital centers of coordination for emergency preparedness and response.

The **Incident Command System (ICS)** provides a standardized structure for the command, control, and coordination of public health emergency responses, within which responders from multiple agencies can work together effectively.

https://www.cdc.gov/phpr/eoc/images/eoc-header.jpg

Question 19: Given the different pieces of the investigation that appear to be developing rapidly, would you consider standing up the EOC at this time? Why or why not? What considerations would you take into account when making this decision (for example, what threshold or factors would prompt you to activate the EOC)? If not at this point, would it have been earlier? [Domain 2: Incident Management]

Answer: *Participants may argue for or against standing up the EOC, and some factors to consider might include:*

- *The number of cases;*
- *The severity of the cases;*
- *Multiple stakeholders are involved, to coordinate the response;*
- *The need for standardized public messaging;*
- *The need for coordinated interaction with the media;*
- *The jurisdiction's ability to handle the outbreak with current staffing;*
- *What the director of each jurisdiction thinks;*
- *What ADHS decides regarding standing up their EOC (this may affect other jurisdictions' decisions).*

Due to the growing number of suspect cases, the fact that multiple stakeholders are involved and the severity of MERS (mortality rate of 40%), ADHS decides to stand up their EOC. The local health jurisdictions affected also activate their EOCs. The EOC staff are called together and quickly spring into action.

One of the first tasks of the EOC and the Health Care Coalitions is to help the affected hospitals to ensure the hospitals have coordinated medical surge capacity.

Medical surge capacity is the ability for healthcare facilities to expand from normal operating capacity, which allows them to evaluate and care for a significantly greater number of patients than would normally be expected. This involves sharing resources between facilities.

A **memorandum of understanding** (**MOU**) is an agreement between two or more parties that outlines each parties' responsibilities regarding a specific scenario or task.

Question 20: Does your agency have plans in place to assist with medical surge capacity in large-scale emergencies? What are some options to help provide medical surge capacity? Does your agency have MOUs in place for emergency scenarios? [Domain 1: Community Resilience; Domain 5: Surge Management]

Answer: *Will vary by jurisdiction and participant roles.*

Some ideas may include:

- *Send medical personnel, public health personnel, and nonmedical support personnel to assist at the affected hospitals;*
- *Use hospitals in surrounding areas as back-up for the hospitals with surge;*
- *Send supplies to the hospitals with surge from other healthcare agencies;*
- *Involve alternate care facilities (e.g., emergency medical services, home healthcare agencies, ambulatory care providers, long-term care facilities, outpatient providers). They could help with patient care or provide supplies.*

Module 3

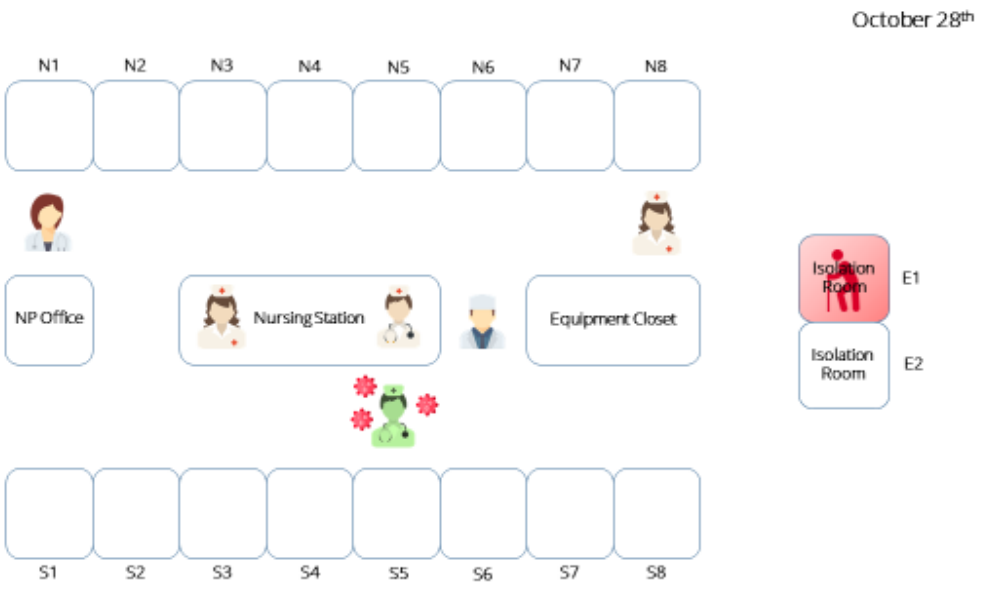
Part 1: The Outbreak Grows

Friday, October 25th, 2019

The dialysis patients exposed at H.U.M.P.S by Grandpa had MERS testing performed. All three came back POSITIVE! Luckily, exposures were limited due to recent symptom onset and education provided from the County Health Department.

Wednesday, October 30, 2019, Morning

The lead nurse of the ICU unit receives a phone call from Nurse A early that morning before her shift to call in sick. She reports a fever and cough since 10/28, and that she tried to power through it but was too sick today. The lead nurse immediately becomes very concerned and calls the facility IP for further advice.



Inject: While having a conversation with the nursing supervisor, the IP discovers that Nurse A was responsible for the daily care of Grandpa. They also observe that the nursing station located on the floor serves as a common area for nurses on the unit. The IP calls the county health department for further advice.

The County Health Department deems Nurse A as a high suspect case, and specimens are collected and sent to ASPHL.

Question 21: Due to Nurse A self-isolating at home, how would specimen collection be coordinated and performed? Who would be responsible for specimen collection? Would you collect at the Nurse A's home? At the hospital? What precautions and PPE would you want to implement? [Domain 6: Biosurveillance]

Answer: *Answers will vary.*

Later that day, the ADHS VPD team receives a call from the ASPHL reporting Nurse A's specimen was **POSITIVE** for MERS-CoV by PCR!

Question 22: What next steps would be taken now that you know that there is transmission within the healthcare setting? Compare and contrast your actions for each of these groups. [Domain 4: Countermeasures and Mitigation]

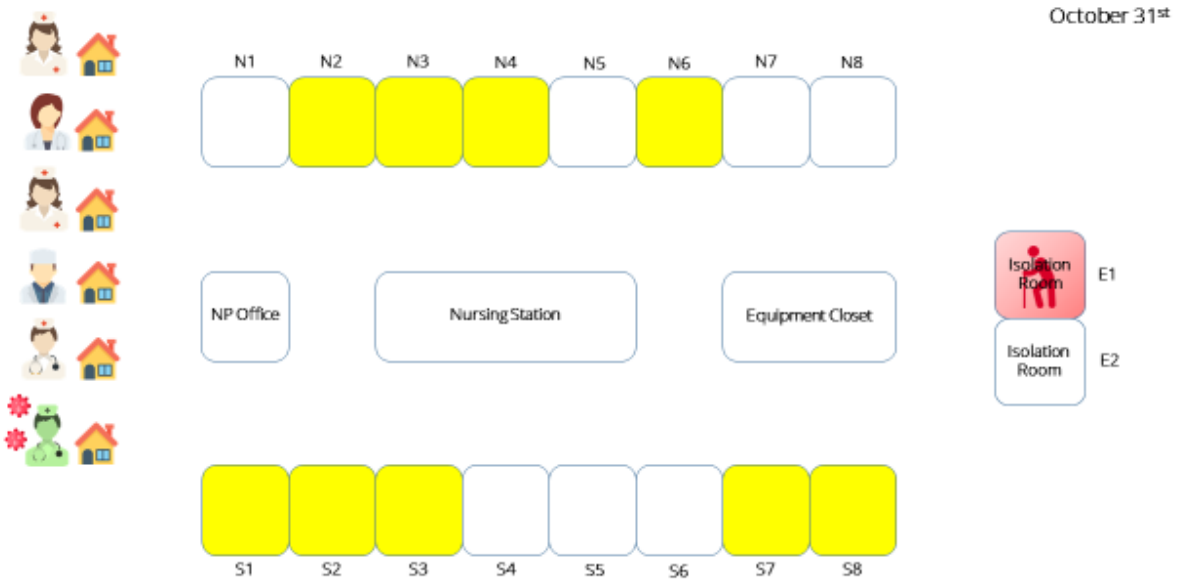
- Actions for public health?
- Actions for healthcare facilities?

Wednesday, October 30, 2019, Evening

The County Health Department received a call from the facility that was providing care to the dialysis patients exposed. Unfortunately, 2 of the 3 have passed away. Marking the first and second death of the outbreak.

Thursday, October 31, 2019, Morning

With the addition of the second confirmed case at Camelback Regional Hospital, everyone in the unit that was exposed to Nurse A or Grandpa are under enhanced surveillance, and those identified that are high risk have been cohorted to the ICU. Employees were sent home to self-isolate and monitor their symptoms.



To summarize the above events. Grandpa entered through the emergency department, where he was triaged on 10/20. From the emergency department, Grandpa was sent to one of the intensive care units. Grandpa was placed on standard, contact, and droplet precautions and was situated in room N5. When novel influenza was suspected on 10/21, he was transferred into a negative pressure room and standard, contact, and airborne precautions were implemented. On 10/30, Nurse A called in sick, was infectious since 10/28, and subsequently tested positive for MERS-CoV**.** The whole ICU is now cohorted and employees exposed have been sent home to self-isolate and monitor for symptoms.

Part 2: The Progression of the Hospital Outbreak

Friday, November 8, 2019

Since 10/31, Nurse A has developed complications and was admitted to Camelback Regional Hospital in the ICU. Unfortunately, Nurse A passed away this morning, bringing the death count up to three.

Question 23: If you are an infection preventionist at Camelback Regional Hospital, what are your responsibilities at this point? Do they change now that a healthcare worker has passed? [Domain 4: Countermeasures and Mitigation; Domain 3: Information Management; Domain 6: Biosurveillance]

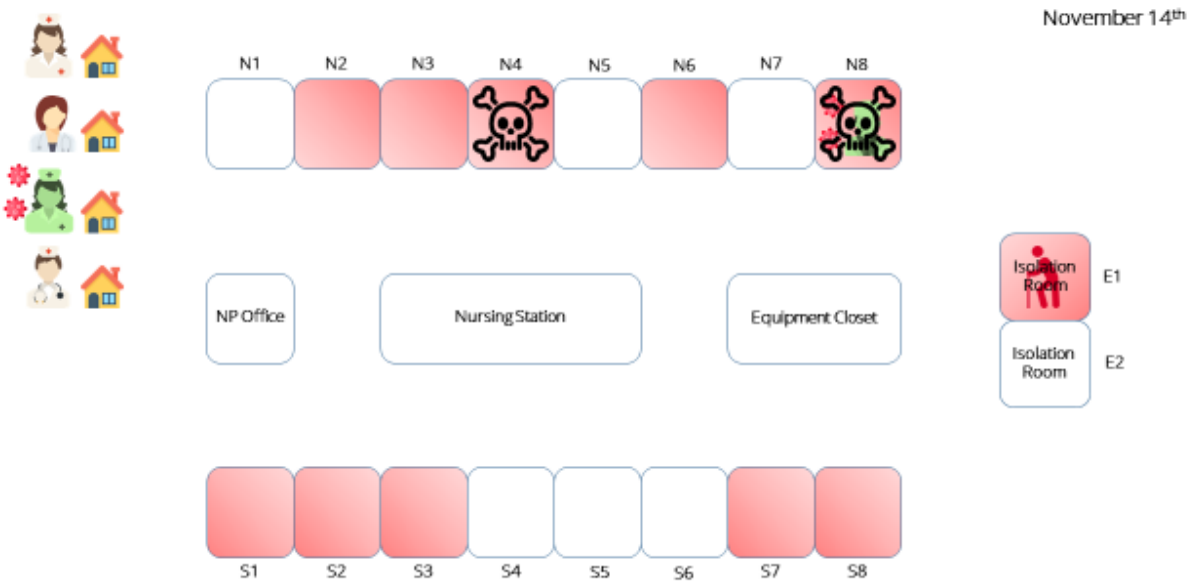
Answer:

Revisit and review your infection control policies:

- *Assessment and triage of acute respiratory infection patients (Concurrent with influenza season);*
- *Patient placement;*
- *Visitor management and exclusion;*
- *PPE for healthcare personnel;*
- *Source control measures for patients (facemasks on suspect patients);*
- *Requirements for performing aerosol generating procedures;*
- *Continue communication with the county health department;*
- *Assist specimen collection and send out coordination.*

Thursday, November 14th, 2019

Two weeks have passed. 11 of the 14 previously identified exposed individuals have developed symptoms. They are now probable MERS cases. This brings the total case count to 16. During this time, one of the patients in the unit developed severe complications and passed away on 11/13. Doctor A also developed symptoms and went on to have complications. He was admitted to the ICU unit, where he passed away on the 11/14.



Friday, November 15th, 2019

Grandpa's symptoms have progressively gotten better, and the hospital decides to conduct testing to assess if he is still infectious. Grandpa is discharged as two respiratory specimens collected 24 hours apart are confirmed **negative** by the CDC rRT-PCR MERS-CoV assay. YAY!

PART 3: THE SURGE (Preparedness)

Despite the newly implemented staff education and infection control measures at the medical facilities, MERS case counts continued to increase. In addition, several hospital staff have fallen ill/died due to MERS. With the continued number of patients, some other staff are expressing reluctance to continue to work during the MERS outbreak.

Airborne Infection Isolation Rooms (AIIRs) are single patient rooms at negative pressure with a minimum of 6 air changes per hour (12 are recommended for new construction or renovation)

Consider how many AIIRs are available in your facility and the usual occupancy status (e.g., tuberculosis patients).

Question 24 (for hospitals): How does your facility prioritize use of its AIIRS? In the case when all of the AIIRS are in use, how would your facility handle additional patients who need to be placed in an AIIR? [Domain 5: Surge Management]

Answer:

- *If an AIIR is not available, patients should be transferred to a facility where an AIIR is available. Pending transfer, patients should wear a face mask and be isolated in an examination room with the door closed.*

Completely overwhelmed by the number of patients that need an AIIR due to the recent increase in MERS cases, Camelback Regional Hospital is experiencing a shortage. Hospital leadership are aware and are communicating with nearby facilities about the potential of patient transfers.

Question 25: If you were to transfer a MERS case to another facility, what precautions would need to be taken? [Domain 4: Countermeasures and Mitigation; Domain 5: Medical Surge]

Answer:

- *If transport via a dedicated AMT mission, infection control should involve the following matrix of measures:*
  - *Involve the minimum number of crew members required;*
  - *If possible, a primary caregiver should be assigned to the MERS patient;*
  - *Source control (i.e. confining the spread of respiratory secretions at the patient level);*
  - *Engineering controls to limit airborne dissemination of the virus;*
  - *Locate patient as near as practical to the aircraft exhaust or the exhaust of the containment within which the patient is housed. The isolation perimeter should be at least 6 feet away from the patient;*
  - *Use of PPE;*
  - *Use of safe work practices to prevent exposure.*
  - *Cleaning and disinfecting the aircraft after transporting a MERS patient.*

- *If transported via ambulance, infection control should involve the following matrix of measures:*
  - *Involve the fewest EMS personnel required to minimize exposures;*
  - *When possible, use vehicles that have separate driver and patient compartments;*
  - *Set the vehicles ventilation system to non-recirculating mode to maximize the volume of outside air brought into the vehicle. Some vehicles are equipped with a ventilation system that includes HEPA filters, such a unit will increase ACH;*
  - *Use of PPE;*
  - *Use of safe work practices to prevent exposures;*
  - *Clean and disinfect the ambulance after transporting a MERS patient.*

Due to Camelback Regional's ICU being on tight isolation precautions, Camelback Regional's management are tracking how many patients they are admitting that are in need of intensive care and are reporting that they are running low on hospital beds and supplies. Several individuals are very ill, declining rapidly, and are in dire need to be transferred to a facility with open beds in their ICU. Neighboring hospitals are also tracking the resources they have so they can provide backup for Camelback Regional. The hospitals are using the **HAvBED** system, a program that allows hospitals to track how many beds they have available in real-time. The EOC is helping coordinate sending supplies from those hospitals with extra supplies to Camelback Regional.

Question 26: What are some options to provide medical surge capacity to Camelback Regional as a response to an unexpected halting of the ability to provide intensive care to patients admitted there? How would the healthcare coalition help facilitate this? What are some potential barriers? [Domain 5: Surge Management]

Answer: *Some ideas may include:*

- *Send medical personnel, public health personnel, and nonmedical support personnel to assist at the affected hospitals:*
  - *Activate Volunteer Corp (ESAR-VHP).*
- *Use hospitals in surrounding areas as back-up for the busy hospitals.*
- *Send supplies to the busy hospitals from other healthcare agencies.*
- *Involve alternate care facilities (e.g., emergency medical services, home healthcare agencies, ambulatory care providers, long-term care facilities, outpatient providers). They could help with patient care or provide supplies.*

The Arizona Emergency System for the Advance Registration of Volunteer Health Professionals (AZ-ESAR-VHP) is an online volunteer registration system for Arizona healthcare professionals. It is administered by ADHS Bureau of Public Health Emergency Preparedness. Registration of health professionals before a public health emergency allows ADHS, emergency managers, and local health departments to

rapidly identify and mobilize healthcare volunteers. It can also be used for surge capacity for hospitals and healthcare settings.
https://azdhs.gov/preparedness/emergency-preparedness/volunteer/index.php

Question 27: In the case of a large-scale incident such as this, does your facility have stockpiles of resources? If so, what are these stockpiles of? If not, how would your facility request additional resources? Additional staff?
[Domain 5 Surge Management; Domain 3: Information Management]

Answer: *For resource requests, hospitals are supposed to request more supplies through their systems first then request from the county health department. If needed, then request from ADHS (at which point the EOC would likely be activated). If that is still not enough, ADHS would request from the strategic national stockpile (this occurred with H1N1 – we got semis full of equipment).*

EM Resource is another tool that is used to help with medical surge capacity. This system is seen by emergency medical services/911 dispatchers, hospital emergency departments, and health departments. The hospitals can use it to see bed availability at other hospitals, and it also provides contact information for the other hospitals should they need to call. EM Resource is displayed in emergency departments since they show which emergency departments are on diversion, or if there is a person with a gunshot wound that should be showing up, etc. ADHS can put out regional messaging through this system. This will show up in the targeted emergency departments for the director and others to see. Some long-term care facilities are also on EM Resource because these would be the most likely place where a hospital would send some of its less-critical patients to make room for more critical patients.
https://www.juvare.com/solutions/resource-management

- *Independent memorandums of understanding (MOUs) (e.g., between tribes).*
- *MOUs with the state (ADHS).*
- *MOUs with neighboring counties.*
- *AZ-ESAR-VHP.*

- *Through the private healthcare system.*
- *Through the Health Care Coalitions.*

With this many patients, there are a lot of laboratory samples that need to be collected from patients and processed in the laboratory.

Question 28: Given that laboratory capacity at ASPHL will be limited, what criteria would you suggest for prioritizing or identifying the specimens to be tested? How would your facility prioritize collection, transport, and testing of laboratory samples and communicate with public health in this scenario? In an outbreak scenario like this is, is testing everyone necessary? [Domain 6: Biosurveillance]

Answer: *Will vary by participants.*

Under the use of an FDA Emergency Use Authorization (EUA), the ASPHL has the ability to perform PCR testing on respiratory specimens from patients suspected of having MERS.

- *Due to this test being offered under the FDA EUA, patients must meet specific clinical and/or epidemiological criteria and MUST have prior approval for MERS-CoV testing from the Bureau of Epidemiology and Disease Control prior to* ***sample submission****.*
- *Prioritizing samples:*
  - *The number of days between specimen collection and symptoms onset;*
  - *Symptoms at the time of specimen collection.*
- *Collection of all three specimen types: lower respiratory, upper respiratory, and serum specimens for testing using the CDC MERS rRT-PCR assay is recommended.*
  - *Acceptable samples include:*
    - *Nasopharyngeal;*
    - *Oropharyngeal;*
    - *Sputum;*

- *Lower respiratory tract aspirates/washes;*
- *Serum.*

PART 4: MESSAGING AND COMMUNICATION

The media has been very inquisitive about ongoing developments in the outbreak. There have been requests for information for news reports from both public health and from the hospitals and healthcare facilities. It has been a challenge to ensure that all of the information being released is coordinated and correct.

Question 29: What messaging would you want to develop for the worried well? What strategies would you use to communicate that message? [Domain 3: Information Management]

Answer: *Answers will vary.*

Question 30: How does this communication change with the first MERS related death? When death counts rise? When healthcare workers are dying due to MERS? [Domain 3: Information Management]

Answer: *Answers will vary.*

Module 4

Part 1: Continued care of MERS Patients

Wednesday, November 20th, 2019

At this point, 7 individuals have died due to MERS and 10 are still hospitalized. Some are still in critical condition.

Question 31: How would visitors be handled during end-of-life situations for confirmed MERS patients or PUIs? [Domain 4: Countermeasures and Mitigation]

Answer:

Visitors who have been in contact with the patient before and during hospitalization are a possible source of MERS-CoV for other patients, visitors, and staff. Restrict visitors from entering the MERS patients' or PUIs' rooms.

- *If end-of-life situation or if a visitor is essential for the patient's emotional well-being and care:*
  - *Screen visitors for symptoms of acute respiratory illness before entering the hospital;*
  - *Evaluate risk to the health of the visitor and ability to comply with precautions;*
  - *Provide instruction before visitors enter patients' rooms on hand hygiene, limiting surfaces touched, and use of PPE;*
  - *Maintain a record of all visitors who enter patient rooms;*
  - *Exposed visitors should be advised to report any signs and symptoms of acute illness to their healthcare provider.*

Question 32: For the patients who died, what considerations need to be taken while handling the body or doing an autopsy? [Domain 4: Countermeasures and Mitigation]

Answer:

OSHA recommends suspension of post mortem or autopsy procedures on patients with suspected/confirmed MERS. If deemed necessary and appropriate, OSHA recommends strict adherence to basic safety procedures used for any autopsy on human remains:

- *Perform autopsies on human remains infected or potentially infected with MERS-CoV in autopsy suites that have adequate air-handling systems. This includes systems that maintain negative pressure relative to adjacent areas. Ensure that room air exhausts directly to the outside, or passes through a HEPA filter, if recirculated. Direct air (from exhaust systems around the autopsy table) downward and away from workers performing autopsy procedures;*
- *Personnel who perform post-mortem care of remains should wear PPE as recommended for Standard, Contact and Airborne Precautions;*
- *Restrict the number of personnel entering the autopsy suite;*
- *Minimize aerosol-generating procedures (AGPs), performing only those that are necessary to perform the autopsy or prepare remains for cremation;*
- *Minimize the number of staff present when performing AGPs. Exclude those who may be necessary for other procedures but not specifically the AGP.*

In lieu of the most recent deaths, multiple staff call outs and evidence of continuous transmission of MERS in the facility, Camelback Regional Hospital leadership has decided to shut down temporarily.

Question 33: Who would be involved in making the decision to shut down your facility? Who would ultimately have authority to do so? What might some trigger points be for your facilities? If the facility is shut down, how will you manage your patients who are currently receiving treatment? Is this a realistic option for your facility? What barriers do foresee arising? [Domain 4: Countermeasures and Mitigation]

Answer: *Will vary by participant.*

- *Coordinate patient transfer with other hospitals:*
  - *Consider surge capacity of other facility that would take in your patients.*
- *Triggers could be:*
  - *Staff callouts (certain %);*
  - *Lack of beds;*
  - *Continued spread.*

PART 2: Environmental Cleaning

Question 34: What type of cleaning do you think should be used to clean a MERS patient's room or patient care areas, including areas where aerosol-generating procedures are performed? What type of disinfectants should be used? What resources would you need to terminally disinfect your entire facility? [Domain 4: Countermeasures and Mitigation]

Answer:

- *Standard cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces prior to applying an EPA-registered disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product's label) are appropriate for MERS-CoV in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.*
- *If there are no available EPA-registered products that have a label claim for MERS-CoV, products with label claims against human coronaviruses should be used according to label instructions.*

Question 35: How should patient devices (dialysis machine) be terminally cleaned? [Domain 4: Countermeasures and Mitigation]

Answer: *The dialysis machine should be cleaned and disinfected according to the manufacturer's guidelines using standard procedures.*

Question 36: What precautions should be taken for environmental services staff as they clean the room? [Domain 4: Countermeasures and Mitigation]

Answer:

- *Use appropriate hand hygiene, PPE (e.g., gloves), and isolation precautions during cleaning and disinfecting procedures.*
- *Pay close attention to cleaning and disinfection of high-touch surfaces in patient-care areas (e.g., bed rails, carts, charts, bedside commodes, bed rails, doorknobs, or faucet handles).*
- *Use EPA-registered chemical germicides appropriate for the surface to be disinfected (e.g., either low- or intermediate-level disinfection) as specified by the manufacturer.*

Question 37: How would you determine the facility was safe to re-open following shutdown due to a MERS outbreak? [Domain 1: Community Resilience]

Answer: *May vary by participant. Thorough cleaning; enough staff; how long does MERS last on surfaces/in air. Air filtration checks.*

Part 3: De-escalation

Monday, November 25th, 2019

Patients who are diagnosed with MERS are being discharged after recovery. No more patients have been diagnosed/suspected with MERS for about 10 days.

Question 38: What would your thresholds be for officially declaring the outbreak over? [Domain 6: Biosurveillance]

Answer: *2 incubation periods without a case. 28 days.*

Question 39: What would be your triggers for deactivating the HEOC and stopping enhanced surveillance? [Domain 2: Incident Management]

Answer: *Will vary by participants. No more cases or decrease in cases; decrease in media attention; decrease in number of worried well.*

Question 40: How would you communicate this de-escalation to the media and the general public? [Domain 3: Information Management]

Answer: *Will vary by participants. Press release; website updates; social media.*

Part 4: Flashback

Question 41: Hindsight is 20/20, what things can you do to prevent an outbreak like this in future? [Domain 4: Countermeasures and Mitigation]

Answer: *Will vary by participants*

- *Minimizing chance of exposures.*
- *Upon arrival and during the visit:*
  - *Take steps to ensure all persons with symptoms of a respiratory infection adhere to respiratory hygiene and cough etiquette, hand hygiene, and triage procedures throughout the duration of the visit;*
  - *Consider posting visual alerts (e.g., signs, posters) at the entrance and in strategic places (e.g., waiting areas, elevators, cafeterias) to provide patients and HCPs with instructions (in appropriate languages) about hand hygiene, respiratory hygiene, and cough etiquette;*
  - *Provide space and encourage persons with symptoms of respiratory infections to sit as far away from others as possible;*
  - *Provide supplies to perform hand hygiene to all patients upon arrival to facility (e.g., at entrances of facility, waiting rooms, at patient check-in) and throughout the entire duration of the visit to the healthcare setting.*

Question 42: Is there anything you would have done differently now knowing what you know? [Domain 4: Countermeasures and Mitigation]

Answers: *Will vary by participants.*

Question 43: Based on this scenario, how well is your agency prepared to respond to a MERS situation in Arizona? Are there any areas where additional training is needed? [Domain 2: Incident Management]

Answers: *Will vary by participants.*

Question 44: What is the most important thing you learned today in terms of managing a large-scale MERS situation? [Domain 4: Countermeasures and Mitigation]

Answers: *Will vary by participants.*

Appendix:

Epi Terminology	Definition
Incubation Period	Period of time from when the individual is exposed to a pathogen to when they develop symptoms and signs.
Latent Period	The period between exposure and the onset of the infectious period.
Infectious Period	Period of time during which an infectious agent may be transferred directly or indirectly from an infected person to another person.
Susceptibility	The state of being susceptible (easily affected/ infected). A susceptible person does not possess sufficient resistance against a particular pathogen to prevent contracting that infection or disease when exposed to a pathogen.

"https://www.cdc.gov/urdo/downloads/CaseDefinitions.pdf"

Table 1. Air changes per hour (ACH) and time required for removal efficiencies of 99% and 99.9% of airborne contaminants*

	Minutes required for removal efficiency	
ACH	99%	99.9%
2	138	207
4	69	104
6	46	69
12	23	35
15	18	28
20	14	21
50	6	8
400	<1	1

*This table can be used to estimate the time necessary to clear the air of airborne *Mycobaterium tuberculosis* after the source patient leaves the area or when aerosol-producing procedures are complete