**Outbreak! A Classroom Simulation of a Unified Response to a Progressing Epidemic**

**Authors:**

Zachary Jenkins, PharmD, BCPS – Cedarville University School of Pharmacy  
Sabrina Neeley, PhD, MPH – University of Dayton School of Education & Health Sciences  
Sylvia Ellison, MA, MPH – Ohio State University Wexner Medical Center  
Sara Paton, PhD – Wright State University Master of Public Health Program  
Scott Hall, PhD - University of Dayton Clinical Mental Health Counseling Program

Fabrice Juin, MPH - Public Health - Dayton & Montgomery County  
Sheri Gladish, MD - Wright State University Master of Public Health Program

**Notes For Organizers and Facilitators:**

* Students will be instructed to format their name within Zoom to read: “First Name, Professional Designation” We have found that these labels allow students, facilitators and observers to easily identify each team member’s discipline. This is particularly useful if facilitators or observers are assessing team member participation and collaboration. Please remind students to change their name within Zoom accordingly. The professional designations for each participating profession are listed below for your convenience:
  + Medicine - MD or DO
  + Pharmacy – PharmD
  + Nursing – RN
  + Public Health – MPH
  + Clinical Mental Health – CMH
  + Social Services – SS
* Students will initially begin this activity with their own disciplines in Zoom Room A. An announcement will be sent out that will direct students to move to Zoom Room B to complete the activity with their interprofessional team. This is a necessity given the limitations of breakout rooms with Zoom. It is possible that we will lose some of these students in transition between rooms, so you may notice students popping in and out of Zoom rooms following this transition.
* During T3, Part 3, an announcement will be sent out via Zoom to all participants indicating that a number of team members have been exposed to the virus. At this time, several team members will be declared “dead” or otherwise incapacitated and will be no longer able to participate in team discussions. We use this as a simulation of what happens when key individuals cannot participate in interprofessional collaboration and response.

**Outbreak! A Classroom Simulation of a Unified Response to a Progressing Epidemic**

# Activity Learning Objectives

1. Place the interests of patients and populations at the center of an interprofessional response to a disease outbreak, with the goal of promoting health and health equity across the lifespan.
2. Maintain competence in one’s own professional role appropriate to the scope of practice.
3. Organize and communicate information with patients, families, community members, and health team members in a form that is understandable, avoiding discipline-specific terminology when possible.
4. Communicate the importance of teamwork in patient-centered care and population health programs and policies.
5. Perform effectively on teams and in different team roles to plan, deliver and evaluate patient/population-centered care and population health programs and policies that are safe, timely, efficient, effective, and equitable.
6. Engage diverse professionals who complement one’s own professional expertise, as well as associated resources, to develop strategies to meet specific health and healthcare needs of patients and populations.
7. Incorporate understanding of how structural bias and social inequities undermine health.

# Simulation Overview

This simulation will place students in the role of interacting as a member of a multidisciplinary unified response team. The team will work together to develop solutions to the rising threat of an infectious outbreak that originates in the Miami Valley region of Ohio.

# Schedule

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Time** | **Activity** | **Zoom Room** |
| Orientation | 5:30 – 5:38pm | Welcome & Orientation | 1 |
| **Phase 1**  **50 minutes**  5:40 – 6:30pm | 5:38pm – 5:50pm | T2 Case Part 1  (Intraprofessional)  Breaking News Video 1 (5:40) | 1 |
| 5:46 – 6:13pm | T2 Case Part 2 – 3  (Interprofessional) | 2 |
| 6:13 – 6:30pm | Debriefing | 2 |
| **Phase 2**  **60 minutes**  6:30 – 7:30pm | 6:30 – 6:45pm | T3 Case Part 1 (Interprofessional) | 2 |
| 6:45 - 7:05pm | T3 Case Part 2 - 3 (Interprofessional)  Breaking News Video 2 (6:50)  Kill Participants (6:50, after video) | 2 |
| 7:05 - 7:30pm | Presentations / Debriefing | 2 |

# Facilitator role

Your task is to serve as a role model for your profession as well as provide collaborative communication. To do this effectively, you must understand the domains of interprofessional education (IPE). You must also understand the case and how your students will develop and unravel the scenario. During the activity, you must be available to assist each team member, regardless of their profession. You must also understand how leadership may rotate for the safety of our patients. Finally, you must be able to provide guidance to the students as they work through this exciting, engaging case study.

# Team Member roles

## MPH

### Who am I?

You are the Assistant Health Commissioner of a large health department. Before you became the Assistant Health Commissioner you were the epidemiologist at the same health department.

### Why am I here?

Your health commissioner has put you in charge of leading the outbreak investigation in the community. Your goal will be to lead the outbreak investigation as well as provide your epidemiology perspective as needed. You will also be responsible for ensuring a health equity lens is used in the crisis response to emphasize the inclusion of minoritized and vulnerable community members and groups in the team’s approach.

## Clinical Mental Health

### Who am I?

You are a Clinical Counselor and Supervisor (LPCC-S) at a local mental health agency. You are also on the Board of the Miami Valley Counseling Association.

### Why am I here?

You have been contacted to serve on the unified response team as an advisor to issues related to mental health (specifically issues of managing stress, mental and emotional overload, and panic containment) as it relates to hospital staff, first responders, and the community. You also have the task of identifying and addressing the contrasting mental health needs of minoritized population groups. In addition, you were contacted by the school counselor (who you knew from graduate school) asking if you could brainstorm on best ways to address issues with parents and students.

## Medicine / Nursing

### Who Am I?

You are a physician or advanced practice nurse at a primary care clinic in the Miami Valley. Your role is diagnosing and treating patients who come to your clinic for care, as well as providing health education and preventive health services to your patients.

### Why am I here?

You have volunteered to serve as a representative on the unified response team because you have personally seen a number of recent patients with similar symptoms in your clinic. Your goal will be to provide a healthcare provider’s perspective on how to help manage this potential outbreak. You will also provide the response team with insight regarding the disparate health coverage and medical service needs of different demographic and socioeconomic groups.

## Pharmacy – Community

### Who Am I?

You are the manager of a community pharmacy for one of the major retail pharmacy chains located in Dayton, OH.

### Why am I here?

You have been contacted by the local public health department to serve as a representative on the unified response team on recommendation of your district manager. Your goal will be to provide a pharmacist’s perspective on how to help manage this potential outbreak, while also giving insight on the common barriers to prescribed medication and vaccination among different demographic groups.

## Pharmacy – Institutional

### Who Am I?

You are an emergency medicine pharmacist from a 900-bed teaching hospital located in downtown Dayton, Ohio. Outside of working in the emergency room, you are also a member of the hospital’s Disaster Response and Preparedness Team. Earlier this morning, you saw a breaking news story concerning an 8-year old child who recently died from a possible infection. You are concerned, as you have personally seen several recent cases with similar presentations in your adult patient population.

### Why am I here?

Your hospital has been contacted by the local public health department considering the growing concern of an outbreak. You have personally volunteered to serve as a representative on the unified response team. Your goal will be to provide a pharmacist’s perspective on how to help manage this potential outbreak, while also giving insight on the common barriers to prescribed medication and vaccination among different demographic groups.

## Social Services

### Who am I?

You are the Assistant Director of Social Services at Montgomery County Job & Family Services. In your position, you serve as a connector between Children's Services, the Board of Developmental Disabilities, the Public Defender’s Office, and other local social service organizations.

### Why am I here?

At the request of the health commissioner, your supervising director has assigned you to serve on the unified response team. You will provide insight on some of the relevant cultural and socioeconomic factors that will need to be addressed to foster an equitable response approach. You will also contribute any potential community collaborations and partnerships that could be mobilized to increase response reach and impact.

# T1 – Outbreak Investigation Case

## T1 – Facilitator Notes

MPH students will be provided with this information in advance of the IPE event. They will also be asked to develop an epi curve and an initial case definition, which they will subsequently share with their team members at the beginning of T2.

## T1 – Case Details

#### August 15:

A group of 40 US citizens from Dayton, Ohio departed on a medical mission trip to China. The group was made up of college students, high school students, adult chaperones, and healthcare professionals (MDs, nurses, pharmacy). All pre-travel medical checks and vaccinations were completed for the group. They traveled within China for two weeks.

#### August 29:

The medical mission group begins two days' travel back to Dayton, Ohio.

#### August 31:

The group arrives home in Dayton, Ohio. Group members disperse and go back to their homes, schools, families, workplaces, and medical practices, etc.

#### September 1:

Upon return home, 7 people in the group are feeling run down:

* Nurse, female, age 45
* MD, female, age 68
* High school vice-principal (chaperone), male, age 35
* College student, male, age 20
* College student, female, age 20
* High school student, female, age 16
* High school student, male, age 16

All 7 are experiencing small, persistent cough. The adults initially are taking it in stride. They attribute feeling poorly to travel fatigue.

#### September 2:

All travelers go back to work & school. Seven with cough return to work and school with tissues, cough drops, vitamin C, etc.

#### September 3:

The 4 students not feeling well stay in to rest after becoming fatigued from their first day back in school.

#### September 5:

Two days later, the small cough progresses to include fever and chills. Ill travelers make doctor appointments, urgent care, and ER visits. First focus of diagnosis is on respiratory infection, pneumonia, with treatment tending towards antibiotics (Z pack, etc.).

#### September 7:

Some family, friends, and colleagues of ill travelers are now showing signs & symptoms of illness. This includes an 8-year-old elementary school student (3rd grade). The elementary student has a high fever (103.3). Physician exam notes shortness of breath, diffuse rales, bilateral rhonchi (lung sounds indicating fluid). 3rd grader receives pneumonia Dx. Soon after develops nausea and vomiting and is admitted to hospital.

## T1 - MPH Student Prompt

This is an Interprofessional Experience, so collaborating with other students is encouraged.

1. Create an Epi Curve.
2. Decide what is important to know from the primary and secondary cases and create descriptive figures/tables from the data of the 40 people who went on the trip and the friends and relatives who became ill.
3. Create an initial Case Definition, based on your data from T1.
4. What steps should be taken in the health department at this time?
5. Bring 1-3 those to the IPE Outbreak Exercise, Time 2 on April 12, 2019 at 5:30. When you meet with your Interprofessional group you will need to debrief your Interprofessional group on T1.

# T2 – Outbreak Investigation Case ( 5:40 PM, 50 minutes)

## T2 – Facilitator Notes

Students will work in small groups with their own professions for the first portion of this activity (10 minutes). Students will then reconvene as a multidisciplinary group (25 minutes). Facilitators will encourage the group members to interact with each other where necessary. Additional information for the case will slowly be unveiled throughout the activity at the designated times described below.

## T2 – Case Details (Part 1, 7 minutes)

*The following case details will be released to students at 5:40pm.*

#### September 9: 9:00 A.M.

*[Video] Breaking Story on local news: An 8-year old child with no underlying health conditions who was hospitalized with fever and shortness of breath has died less than 72-hours after admission. Local hospitals and clinics are reporting a dramatic increase in numbers of patients reporting similar symptoms and hospitalizations are increasing rapidly. The local public health department and the children’s hospital announce they will hold a press conference this evening to discuss the situation.*

#### September 9: Morning

Eight patients requesting same day appointments present to a local primary clinic within a one-hour period this morning, all complaining of similar symptoms. The patients all report that the symptoms began approximately 2-3 days prior, came on suddenly, and their condition rapidly deteriorated, despite at-home treatment with OTC analgesics, hydration, and rest.

* Patient 1: F (Age 12) - Fever (103°F), myalgia, cough, chills, shortness of breath
* Patient 2: M (Age 19) – Fever (101.5°F) myalgia, cough, headache
* Patient 3: M (Age 42) – Fever (101°F), cough, chills, shortness of breath
* Patient 4: M (Age 3) – Fever (104°F), myalgia, cough, lethargy, vomiting
* Patient 5: F (Age 72) – Fever (100.8°F), cough, headache, chills, shortness of breath
* Patient 6: F (Age 34) – Fever (102°F), myalgia, chills, headache
* Patient 7: F (Age 27 – 3 months pregnant) – Fever (101.2°F), cough, chills, shortness of breath
* Patient 8: F (Age 16) – Fever (101.5°F), cough, headache, shortness of breath

Five of the patients demonstrated signs and symptoms of respiratory distress – They were using accessory muscles of breathing, leaning forward, tachypneic (RR 20s-30s), O2 sat low 90s or high 80s on exam at rest on room air, and wheezing audible. Crackles were heard over specific lobes in all five patients, as well as increased fremitus over the same lung area as the crackles in two of the patients. Egophony was present in three of the patients. Because the clinic does not have x-ray facilities, all five patients were sent to the Emergency Department.

### MPH Prompt

**Question 1:** What is the public health role in the public health outbreak at this time? What should public health be doing to prepare? When and what do you communicate to the public?

##### Clinical Mental Health Prompt

**Question 1:** What issues should be addressed with school counselors in the district?

### Physician / Nurse Prompt

**Question 1:** What is going on? What is your differential diagnosis in this situation? How will you know when a patient is considered high risk for this disease?

### Pharmacist Prompt

**Question 1:** What is going on? What is your differential diagnosis in this situation? How will you know when a patient is considered high risk for this disease?

### Social Services prompt

**Question 1:** What service provisions need to be mobilized for the select group of community members that have fallen sick?

## T2 – Case Details (Part 2, 17 minutes)

*The following case details and question prompts will be released to students at 5:50 pm.*

#### September 10: 6:00 P.M.

The Health Commissioner from the local public health department and an infectious diseases physician from the children’s hospital hold a press conference about the situation. The health commissioner states that 173 new patients have been hospitalized with these symptoms.

The physician states that the deceased child did not have any known pre-existing conditions and died within 72-hours of admission. The child was up-to-date on routine immunizations. The hospital is taking steps to isolate any patients with similar symptoms to protect other patients and staff, and patient visitation will be restricted. The physician reminds parents to monitor children who begin experiencing fever, cough and headache and only bring them to the Emergency Department if the child experiences unusual or rapid breathing, develops a bluish color or fever with rash, has difficulty waking up, or is not drinking enough fluids. The health commissioner reminds the public that they need to increase hand washing and self-isolate if symptomatic.

#### September 11: 6:35 A.M.

The Public Health Department has put together a unified response team to develop solutions to the current infectious outbreak. They have convened the group together to present them with their findings.

### Question Prompts

**Question 1:** How should the health professionals in the community organize to address the issue? What role should primary care practices, pharmacies, and hospitals play in managing this outbreak?

**Question 2:** Given this information, how should healthcare providers approach patients who present with influenza-like symptoms?

**Question 3:** What are indicators of stress or emotional instability that should be looked for in children, parents, first responders, and medical staff?

**Question 4:** What is the role of antivirals, antibiotics, and vaccinations in this situation? Who should receive these products first? Who should be turned away? Should patients presenting with these symptoms receive both antibiotics and antivirals?

**Question 5:** Identify three distinct demographic descriptors (each pertaining in some way to the concept of social determinants of health) within the local community that will require special consideration in the unified response team’s approach. Details must differ in categorical classification (e.g., cannot all be race-based or economically based). Feel free to be innovative in your identification; you are welcome to use resources such as Census Bureau data, density maps and opportunity indexes, or community health assessments. For example, Montgomery County 1) *is over 20% Black and African American*, 2) *has over 15% of the population without broadband internet connection*, and 3) *is home to various refugee resettlement and immigrant services programs.*

**Question 6:** What would be the role of the strategic national stockpile in responding to this outbreak?

**Question 7:** What specific action will you take to make sure that children/youth in foster care or residing in shelters are also protected?

**Question 8:** What actions could be taken to address barriers that may hinder the ability of symptomatic individuals to self-isolate?

## T2 – Case Details (Part 3, 6 minutes)

#### September 13: 6:00 P.M.

On the local news, the superintendent of the largest school district in the metropolitan area reports that absentee rates are rapidly increasing across all schools in the district and are now averaging 42%. The superintendent announces that 3 elementary, 2 middle schools, and 2 high schools will be closed for the next week because absentee rates are above 50% and the district plans to clean and disinfect the buildings. Other school districts nearby are experiencing the same situation and closing schools.

Social media posts indicate that parents are worried about their children and are not only keeping symptomatic children home from school, but also asymptomatic children, in order to reduce the risk of exposure.

Analysis determines that the current illness is caused by influenza A, but confirmation of the exact strain will require further analysis by the CDC.

Medical clinics report that they are seeing an increase in patients asking about the availability of the seasonal influenza vaccine, but the vaccine has not yet been released. Clinics are also reporting that patients are requesting prophylactic Tamiflu®.

Since September 9, locally there have been 327 new hospitalizations and 5 more deaths of patients with the same disease.

### Question prompts

**Question 1:** What types of communications or alerts should be sent out at this time? What role should healthcare providers play in this process? Who would be the recipients of this information? What information would be included in these communications?

**Question 2:** How should local hospitals prepare for a possible influx of sick persons or the worried well? What protocols might your unified response team recommend to them at this time? How should your team intervene in the schools? How would you work with school nursing?

**Question 3:** At this stage of the outbreak, how would the three demographic descriptors identified by your team contribute to your communication efforts and to the operational preparations of the local hospitals.

## T2 – Debriefing (15 minutes)

FACILITATORS: IMPORTANT POINTS TO DISCUSS WITH STUDENTS:

1. How do you control miscommunication and misinformation in situations like this?
2. How do you balance transparency of information with concerns about inducing panic?
3. How do you build trust with the community?
4. How would you empower the healthcare professionals in the community in this situation?
5. What barriers do you think exist between healthcare professionals that may impact the ability to effectively respond to situations like this?

# T3 - Outbreak Investigation Case

## Facilitator Notes

Students will work in their interprofessional groups. Additional information for the case will slowly be unveiled throughout the activity at designated times.

As part of each group’s T3 discussion, each unified response team will develop a 2-minute presentation about how they should best communicate their findings and recommendations with the public and healthcare personnel in the community. **Facilitators should now instruct students to develop these presentations.** Presentations will be delivered during the “debriefing” component of this phase.

## T3 – Case Details (Part 1, 20 minutes)

*The following case details and question prompts will be released to students at 6:30 pm.*

#### September 14

Local school districts have decided to close given the lack of a vaccine and current no-show rate of students. Local, state, and national media are contacting public health and hospitals about the outbreak, and different information is being released by the different hospitals and public health, including false information.

Local hospitals are reporting extremely limited availability of hospital beds.

#### September 15

The CDC has finished analyzing the strain of influenza that has been affecting the public. According to their findings, this strain has been identified as HPAI, and there is not a vaccine that matches the genetics of this current strain of virus. The CDC has recommended that Tamiflu® be utilized for prophylaxis in all healthcare workers and individuals who have had close contact with patients.

#### September 18

A large volume of influenza cases has been identified in regions bordering the Miami Valley area, including Cincinnati and Columbus. In addition, there have been reports of small pockets of cases in 10 other states. The governor of Ohio has now declared a state of emergency. Healthcare organizations are reporting that a large number of employees are not coming to work.

Since September 13, there have been 581 new patients hospitalized and 22 new deaths from this disease.

#### September 19

Due to the timing of this outbreak, community pharmacies are not stocking Tamiflu® in sufficient quantities to address this crisis. As a result, the only Tamiflu® that is available comes directly from the Strategic National Stockpile.

Some morgues are reporting that they have no more capacity.

#### September 22

Rates of hospitalization related to influenza cases are significantly increasing, and local hospitals are scrambling to find room for patients. In many cases, they are being forced to turn patients away or to redirect them to outlying institutions.

### Question Prompts

**Question 1:** What strategies could be implemented to improve work attendance? With the widespread closure of school districts, how could the inability of some parents/guardians to stay home from work to watch affect their children/youth?

**Question 2:** How should Tamiflu® be allocated if a shortage is experienced? Who should receive it as a priority? What are your other treatment options?

**Question 3**: How will outbreak information be communicated to the public so that information is clear and consistent?

**Question 4:** What should be communicated to patients who are “worried well” and scheduling appointments?

**Question 5:** Given your knowledge of how anxiety and panic is influenced by uncertainty, how would you encourage communication with parents, children, and the community at this time?

**Question 6:** Given the progress of the pandemic, what instructions would you share with providers about how to manage patients presenting with influenza-like symptoms? Is this different from what you previously recommended? If yes, how so?

**Question 7:** Since there is no effective vaccine for this strain of HPAI, are there other preventive care options for your patients?

**Question 8:** You recognize that pneumonia is a common complication that occurs for many patients who have had the flu. What would be the role of antibiotics in managing patients with bacterial pneumonia secondary to influenza?

**Question 10:** What considerations would the team have regarding patient triage given the limitations of personnel and resources at this time?

## T3 – Case Details (Part 2, 5 minutes)

*The following case details and question prompts will be released to students at 6:45 pm.*

#### September 23

[VIDEO] *Breaking News: Two Miami Valley Hospital nurses who were infected with HPAI have died. One was admitted to the hospital three days ago, the other was admitted yesterday. The nurses worked on different inpatient floors and both were exposed to patients who were hospitalized with HPAI.*

*At this time, students will be notified via a Zoom announcement that several team members have been exposed to the virus. These students are now considered “dead” or otherwise incapacitated and may no longer speak as part of the group discussion. They will be able to participate again during the debriefing segment.*

#### September 24

Recent reports from local hospitals within the region indicate that healthcare workers are refusing to show up to work, fearful of the recent deaths reported in the news as well as the reported rise of healthcare workers affected by influenza. Current rates of employee absenteeism range from 10 – 15%. Current projections estimate that this number may increase to as much as 20% by the end of the month.

Since September 18, locally there have been 804 new patients hospitalized and 47 deaths from this influenza outbreak. The Ohio Department of Health reports that in the Dayton/Cincinnati/Columbus region, 5329 people have been hospitalized and there have been 206 deaths.

### Question Prompts

**Question 1:** What support might the coalition offer to local healthcare institutions given the rising rates of employee absenteeism?

**Question 2:** With decreased staffing across many service organizations, what additional concerns will arise within disadvantaged and vulnerable families and households? What strategies can be used to address these service gaps?

## T3 – Case Details (Part 3, 5 minutes)

#### September 28

The FDA has reported growing concerns around the supply chain of antimicrobials. Several healthcare institutions have shared that they are experiencing increasing difficulty with receiving their allocations of antimicrobials as more and more agents are being hoarded or purchased by the so-called “gray market” for resale.

#### September 29

More cases of HPAI have been reported throughout the United States. In total, 23 states have now been affected. Tamiflu® has now been placed on national shortage, and SNS supplies are rapidly depleting. In the Miami Valley Region, there is almost no Tamiflu® available, and reallocation of additional Tamiflu® from other regions due to the outbreak progression is unlikely. In consultation with the CDC and the Surgeon General, the president of the United States has declared a national emergency.

#### September 30

News agencies are now reporting several deaths linked to the consumption of large amounts of antimicrobials that are normally utilized in pets. Public health authorities are tieing these cases to a recent string of viral social media posts that have been circulating online.

#### October 1

Since this influenza outbreak began 1 month ago, there have been 75 deaths locally. In the state of Ohio, there have been 601 deaths and 17,397 hospitalizations. At the national level, 80,000 people have been hospitalized and 3468 have died.

### Question Prompts

**Question 1:** With the lack of availability of Tamiflu® or an effective vaccine, there has been a rise in panic within the region. What strategies should your unified response team consider to mitigate public distress? What strategies should the team employ to protect healthcare assets and personnel?

**Question 2:** How would the team determine who should receive Tamiflu® given the national shortage of this product? What alternative therapeutic options might be considered for prophylaxis and treatment of patients with HPAI?

## T3 – Group Presentations (10 minutes)

Facilitators will call on five (5) teams at random to deliver their group presentations.

*Each team will be randomly called upon to present their findings to the room.*

## T3 – Debriefing (15 minutes)

### Ask the students:

1. If there have been this many hospitalizations and deaths at this point in the year, prior to the traditional influenza season, how should this inform your approach to the upcoming flu season?
2. What were the biggest interprofessional challenges to addressing this situation?
3. Which social determinant of health created the greatest challenge for your team as you planned an equitable response? Why?
4. What techniques could be used to overcome communication barriers? How might this differ for communicating with healthcare professionals versus the public?