



## Lesson 4: Virus Transmission

### OBJECTIVES

1. Explain how some influenza viruses in animals have the potential to cause disease in humans, and how some influenza viruses in humans can infect animals.
2. Differentiate between direct and indirect transmission and explain the different modes of transmission through which influenza viruses can spread between hosts, such as humans and animals.

### RESOURCES

You will want to review these suggested items:

1. Lesson 4 [Handout](#)
  - This is the handout that students will use
  - This [Story Map](#) is the 'teacher's version' of the Lesson 4 Handout with examples
2. L4 Virus Transmission PPT Slides
3. The Junior Disease Detectives, Operation: Outbreak graphic novel: <https://www.cdc.gov/flu/resource-center/freeresources/graphic-novel/junior-detectives-print-web.pdf>
4. COVID-19 and Animals: [Animals and COVID-19 | CDC](#)

### PREPARATION

1. **Download an image** of a place you would like to travel to. It should be something you can use as a **virtual background** during the meeting.
2. The week prior to this activity, each member should be **emailed** the graphic novel and instructions to read CDC links for each subgroup.
  - a. You will need to divide the group into three smaller groups the week prior and assign them to either: Pig-Pig-Pig, Pig-Human-Human, or Human-Human-Human. The links for each group's pre-reading are on the Disease Detectives website and are as follows:
    - Pig-Pig-Pig: [https://www.cdc.gov/flu/swineflu/variant/h3n2v-basics.htm?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fflu%2Fswineflu%2Fh3n2v-basics.htm](https://www.cdc.gov/flu/swineflu/variant/h3n2v-basics.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fflu%2Fswineflu%2Fh3n2v-basics.htm)
    - Pig-Human-Human: [https://www.cdc.gov/flu/swineflu/variant/h3n2v-basics.htm?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fflu%2Fswineflu%2Fh3n2v-basics.htm](https://www.cdc.gov/flu/swineflu/variant/h3n2v-basics.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fflu%2Fswineflu%2Fh3n2v-basics.htm)

- <https://www.cdc.gov/flu/pdf/swineflu/transmission-between-pigs-people.pdf>
  - Human-Human-Human: <https://www.cdc.gov/flu/about/disease/spread.htm>
3. **Create polls (this is done on the 'backend' of where you create your Zoom meetings)** with definitions of words used: "Disease Detective Terms".
- a. Demographics
    - the style of photos in the novel
    - characteristics of a person
    - to break down into smaller parts
    - a type of virus
  - b. Probable case
    - a case classification for a person who has signs and symptoms of the disease and has been in contact with a confirmed case of the disease
    - a case classification for a person testing positive for the disease
    - a case classification for a person testing negative for the disease
    - a case classification for a person without symptoms or reason to suspect the person has the disease
  - c. Epidemiology
    - the way a virus spreads from person to person
    - your ability to fight off a disease when exposed
  - d. Zoonotic
    - the way diseases are named and classified
    - the study of diseases and how they spread
    - Infections spread between animals and humans.
    - Infections that happen at the zoo.
    - Animal quarantine
    - Human-Human-Human transmission of disease
  - e. Fomite
    - Direct transmission of a disease
    - A type of disinfectant
    - Objects which carry disease/infection
    - The medication given to pigs for influenza treatment
  - f. Initial reservoir
    - A lake
    - The habitat in which an infectious agent normally lives
    - The first water source discovered
    - Funding that supports national disease research
4. Review the technology functions used (noted in red).



## INSTRUCTIONS

1. **Welcome everyone back and check in with the youth. (3 minutes) Slide 1**
2. **Review the group agreements (2 minutes)**
  - You can either **screen share** and show the image you took from last week, or you can create a new image using a **Google or Powerpoint slide**, and display it as your **background image**.
3. **Ice Breaker: Oh the Places We Will Go! (20 minutes) Slide 2**
  - a. Open the slide deck to the image of the world map.
  - b. Give everyone 3 minutes to go find something that represents a place they would like to travel to.
  - c. Have each participant use the stamp feature to “annotate” one place they would like to travel to, as represented by their item.
  - d. Then give them turns to display their item on screen.
  - e. Have the group guess from the map which of the places they had selected.
  - f. Put up your virtual background image. Encourage participants to **put up a virtual background** of their chosen location once it is guessed.
  - g. Wrap up the activity by stating “As humans, we are vectors of disease, and as we move about the world, we may potentially transmit diseases. Look at all of the places we could have contaminated in a single days flight away.”
4. **Setting the Stage (15 minutes) Slide 3**
  - Give a mini presentation that covers the following points (**use the slide deck** if desired):
    - Recap last lesson – Ask members: What do you remember about case definition and classifications (suspected, probable, and confirmed)?
    - Overview of direct and indirect transmission
    - **Launch Polls**
5. **Story Map Activity (15 minutes) An example is shown on Slide 4, and Slide 5 is the prompt to breakout participants into their three groups**
  - a. Have participants **download** the Lesson 3 Handout: Story Map. Post the link in the chat.  
<https://ucanr.edu/sites/DiseaseDetectives/files/327813.pdf>
  - b. Then have them **open it in Adobe** so that they can type into text boxes while they discuss with others and share their screen. Only one person per group will need to download the document. Their are different pages for each group.



**STORY MAP OUTLINE: BIRD-BIRD-BIRD**

Virus	Avian influenza A (H7N9) virus
Initial Setting	
Initial Reservoir	
Method of Transmission A	
Host A	
Method of Transmission B	
Host B	

- c. Instruct each group to create a story map outline of how the disease spread.
  - i. Encourage participants to be creative with this and have fun! Characters can have fun names, and stories to go along with the Story Map.
- d. Divide participants into their preassigned groups of three.
- e. Give an exact time to return (about 10 minutes) and **type it into the chat** box.
- f. Have members review materials for the case they were assigned:
  - i. Pig-Pig-Pig;
  - ii. Pig-Human-Human;
  - iii. Human-Human-Human.
- g. **Send a broadcast message** when one minute remains.
- h. **Close the rooms** and bring everyone back to the large group to share the stories they created.

**6. Discussion Questions (10 minutes) Slide 6**

- a. Facilitate a group discussion with the following questions:
  - i. How might Hamlet have been infected?
  - ii. How is COVID-19 transmitted?
    - Animal-Human-Human
    - Human-Human-Human
    - Human-Human-Animal
- b. Encourage members to research the story map outline for COVID-19 on their own.

Activity adapted from [CDC Activity 3 - Hamlet's Story: https://www.cdc.gov/flu/resource-center/freeresources/graphic-novel/HamletsStory\\_v1.pdf](https://www.cdc.gov/flu/resource-center/freeresources/graphic-novel/HamletsStory_v1.pdf)

