

Excellence in Exhibition: Preventing Disease in Animals and People



Disease Transmission and Outbreak Investigation Activity

Mucus Swap – Participant Guide

The following has been adapted from an activity of the same name published on [Bring Home the Blue, Not the Flu!](#)

LEARNING OBJECTIVES

- Explain ways zoonotic diseases might be spread to you or your animals on the farm and at exhibitions.
- Explain the connection between exposure and risk for becoming ill from a disease.
- Describe measures to prevent zoonotic disease spread to you and your animals on the farm and at exhibitions.
- Practice basic epidemiologic methods to solve the outbreak.

EXPLANATION OF ACTIVITY

Some people are carriers of disease. Initially, these carriers may appear healthy or show only mild signs of disease. At some point they may eventually get sick, but they may not be recognized as having the disease until they've exposed and infected others. This is one reason why some pathogens can spread so quickly.

This activity is designed to simulate the uncontrolled spread of a disease through a population. Cups have been half-filled with water, except for one or two which contain baking soda water. The one or two people with the baking soda cups will be the original carriers of the “disease,” but they will carry this disease in a cup rather than in their body—and appear healthy on the outside. The original carrier(s) will make contact with other participants who will then make contact with others. At the end of the activity, everyone will be tested to see who has become infected, and we'll discuss how to trace the infection back to its source.

NOTE: We will be wearing nitrile gloves for this activity, but you still need to be careful with your cup and solution as we work through this portion of the activity. If you spill any on yourself, immediately go to a bathroom to wash it off. It may stain clothing.

MUCUS SWAP ACTIVITY INSTRUCTIONS

- 1) Pick up and put on a pair of gloves.
- 2) Pick up a cup containing a clear liquid, a behavior card, and a number sticker. The cup represents your (or your animal's) body and the liquid your bodily fluids. One or two of you has a cup that has been "infected" with an infectious disease.
- 3) Put on your numbered sticker and review your behavior card.
- 4) The instructor will announce when to start the activity. You will swap fluids as many times as outlined on your behavior card.
 - a. To exchange fluids, one person will dump all of the contents of their cup into the other person's cup.
 - b. Return half of the solution back to the empty cup.
 - c. Record the cup number of the person you exchanged with in *Table 1. Mucus Swap Record* below.
- 5) Repeat the "mucus swap" described in step 4 as many times as specified on your behavior card. Each swap should be with someone you haven't already swapped with. You should only swap as many times as your behavior card indicates.
- 6) When you have finished swapping, return to your seat with your cup. Remember to be careful and not spill any liquid.
- 7) The instructor will come around and add "testing" drops to your cup.
 - a. A color change to pink/red (either bright or faint) indicates a positive result – you are considered "infected." No color change or faint yellow/orange is "uninfected."
- 8) **Record your outcome:** _____
- 9) Return your cup to the instructor to be disposed of.

Fluid Swap Record

- Complete *Table 1 during Mucus Swap Activity.*

Table 1. Mucus Swap Record

Exchange #	Partner's Cup Number
1	
2	
3	

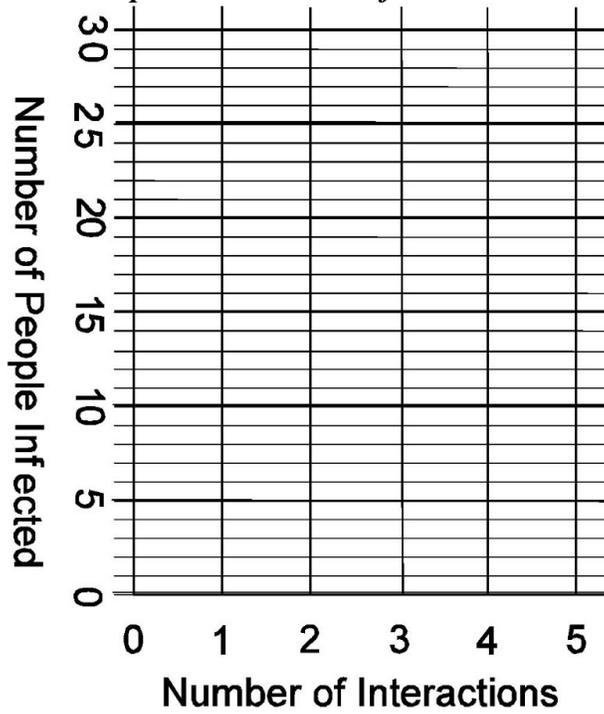
Modeling Disease Outbreak Infection Rate

- Assuming one person was initially infected, fill out Table 3.
- Graph the data from Table 3 on Graph 3a.

Table 3. Outbreak Infection Rate

Number of interactions	Previously Infected	Newly Infected	Total # of Infections
0	Student #1	0	1
1	Student #1	Student #2	2
2			
3			
4			
5			

Graph 3a. Outbreak Infection Rate



4. What do you notice about the rate of increase in the number of infections? Does the graph show linear or exponential growth?

5. If we did this activity long enough, would everyone become infected? Why or why not?

Determining the Original Source

- *Discuss as a class what methodology could determine who the original source of the infection was.*
 - *Follow educator's instructions to determine who was the original source of the infection.*
6. Who was the original source of the infection? _____
 7. In a real investigation, how would we distinguish between who was the original source and who they infected? Why can't we do that here?

 8. How would this investigation be different if you hadn't kept notes about whom you swapped fluids with and in what order? Do you think you would have remembered clearly after the activity was over? How about tomorrow or a week from now? A month?

 9. Based on your thinking in question 8, in a true outbreak investigation, what challenges would epidemiologists face?

10. What preventative measures could have been taken to avoid exposure to the disease?

11. How would an airborne disease spread differently?