

SPREADING DISEASES



The way in which a disease spreads through a population demands the careful collection and analysis of data. When an outbreak of a serious disease occurs, scientists must track down the disease and determine its origin. In this investigation, you will simulate the spread of an infectious disease and determine the original carrier of the disease.

MATERIALS

- Beaker with fluid
- Pipette

PROCEDURE

1. Obtain a cup with fluid from your teacher.
2. To simulate the possible spread of infection through sneezing or coughing, you will exchange a small amount of fluid with a classmate by doing the following:
 - A. Place the pipette in your cup and fill it with solution.
 - B. Place your pipette OVER (not in) the cup of the person you are exchanging with and squirt your solution into the other cup.
 - C. Record the name of the person with whom you exchanged fluids in the table below.
3. Repeat step 2 with two other students.

VIDEOS

- “Ebola: The Deadliest Outbreak Explained” [7:12]
- “The Ebola Virus Explained – How Your Body Fights for Survival” [5:31]
- “The Story of Ebola” [7:25]

VOCABULARY

Virus:

Immunity:

Disease:

Bacteria:

YOUR NAME	CONTACT 1	CONTACT 2	CONTACT 3

Class Contact:

STUDENT NAME	CONTACT 1	CONTACT 2	CONTACT 3

HOW MANY WERE INFECTED? _____

HOW MANY WERE "SAFE"? _____

WHO WAS INITIALLY INFECTED?? _____

[5 PTs]

Have you ever caught a cold? Do you know where it came from? How did you 'catch' it? Did everyone in your family have the cold or just you? The disease that we call 'the common cold' is caused by a virus that gets into the cells in our noses and throats. Other diseases that we can 'catch' from other people include measles, mumps, chickenpox, influenza, tuberculosis and meningitis. These are all caused by microscopic organisms getting into our bodies and infecting our cells.

Sometimes we breathe in the organism if it is floating in the air, but many times we put bacteria or viruses into our own mouths. Why would we do that? Because we don't know we're doing it. If you have a cold and sneeze into your hand, your hand gets covered in viruses. Whatever you touch in the next hour or two could get covered in viruses from your hands. (Imagine if you had sticky glitter on your hands – where would you find it in a few hours from now?) The next person to touch that object might get viruses on to their hands. If they then eat their sandwiches or scratch their nose, the viruses could then get into their body.

Scientists call the objects that can carry infectious organisms from one person to another "fomites" (e.g. pencils, telephones, door handles, books). Rather than trying to disinfect the whole of your house and school, there is a much easier way to protect yourself from these infectious organisms put there by your family and friends: wash your hands before you eat!

1. What would be the outcome if we had all shared contact with 5 people instead of 3?
2. How would the outcome of this activity change if we had 100 people in our class?
3. What is a fomite? How can we safely interact with these objects?
4. How do diseases such as influenza infect humans?
5. What are a few ways we encounter bacteria?

Ebola is a virus that is currently known to be spread by bodily fluids:

- Blood, saliva, urine, sweat, feces, vomit, semen

The virus was originally contracted by humans through blood or ingestion of wild animals. The virus is now being transmitted from human to human despite methods to contain the outbreak. Some methods to contain the virus include: Quarantining people, protective methods for those working with individuals who have the virus, regulating the travels of individuals who have possibly been exposed to the virus. There was recently great concern with the spread and containment of Ebola across the globe. Once the virus is contracted, it may take up to 21 days for an infected individual to show symptoms. The virus is not likely to be transmitted until an infected individual is showing symptoms.

Example: A doctor from New York returned from West Africa. He was living freely in New York for 17 days. He monitored his temperature everyday, and one day he had a fever. Prior to this day he felt tired, but did not experience any other symptoms. He immediately called the hospital and he was diagnosed that day with Ebola. Before this day he was interacting with friends and family. He had not infected anyone else. This is possibly due to Ebola not being contagious until an individual is experiencing symptoms.

6. The Ebola outbreak began in West Africa, however some cases occurred in the United States and Europe. Do you think a travel ban to and from West Africa would have been a good or a bad idea? Why or why not?
7. In your opinion, should doctors or nurses (who worked with Ebola patients) returning from West Africa be quarantined upon arrival in the U.S. or Canada? Explain your answer.
8. How could the world have acted differently to the Ebola outbreak? Did we do a good job being as safe and proactive as possible? Why or why not?