

Activity: Disease Transmission

Introduction: A disease can be caused by a virus, or microorganisms such as bacteria, fungi, and parasites. The human body becomes “sick” when it is unable to fend off a disease-causing organism or a pathogen.

Note: You will be simulating the spread of a microbial disease by using water and a chemical whose presence in the water can be easily shown. This “fluid” is clear, and can represent the aerosol droplets from a cough or sneeze, the bodily fluids exchanged in the transmission of a disease. You will simulate the exchange of bodily fluid with three other students. After three exchanges have taken place, you will then test your sample for the disease. Once the testing is complete, you will find out which student’s samples, in your entire class, turned out to be positive. Using this information, you will then trace the route of transmission by using a flow chart to find the original carrier.

Materials: distilled water, test tubes, unknown chemical, sodium chloride

Procedure:

1. Obtain a covered test tube of water. All the test tubes for the class have water in them. One of them appears to be water but there is a chemical dissolved in it.
2. Go around the room and exchange liquids from your test tube with three other people. To do this, pour one-third the volume of liquid in your test tube into the test tube of a classmate. Then that person should pour the same amount of liquid back into your test tube. These actions represent the transfer of microbes between persons.
3. Record the names of the persons with whom you interchange liquid in the order in which you made the exchanges on the bottom of this page.
4. After you are finished with the exchanges, go to the instructor who will add a chemical to the liquid in your tube. If the liquid turns blue, then you are not infected. If your tube turns pink or purple, then you are infected.
5. All students who have tested positive for the disease will record their names and their contacts in the Class Data Table on page 2. We will compile the results together as a class.
6. Once the entire class results are recorded, students will use this data to identify the original disease carrier in the class population, and trace the route of transmission.

Persons Exchanged “body fluid” with:

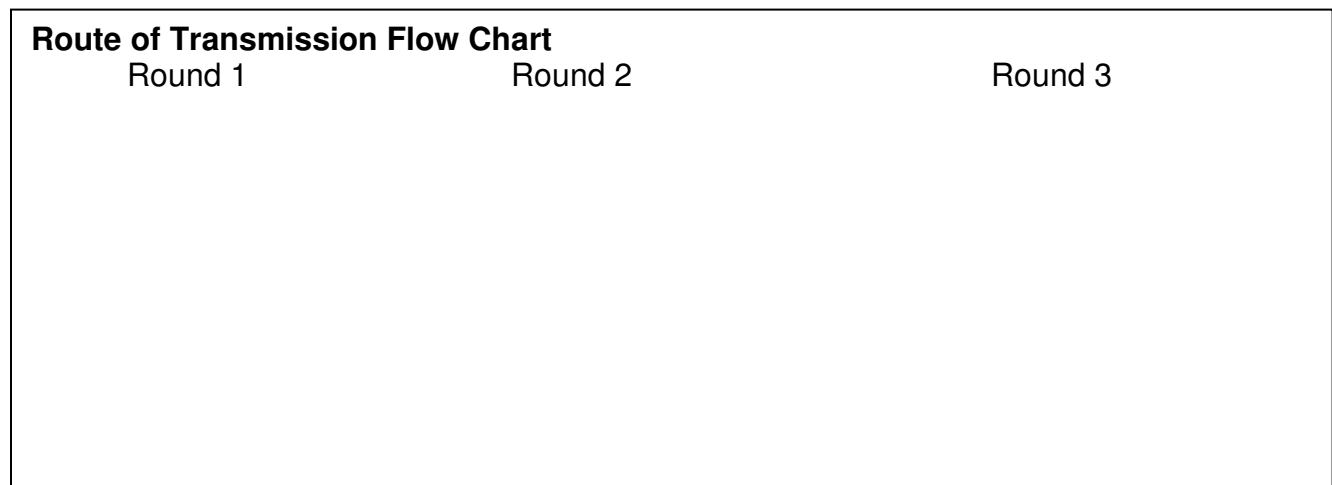
Round 1. _____
Round 2. _____
Round 3. _____

Class Data Table

Color of your tube after test : Blue
Clear/Pink

(Negative)
(positive)

Infected Persons	Contacts of Infected People		
	Round 1	Round 2	Round 3



Original Carriers:

Conclusion: In an actual epidemic situation, one can not trace a disease as easily as in this simulation. In an open system, it is almost impossible to trace a disease back to an original carrier. Because the class is a closed system, with a small population, we can trace back an original exchange. With each round of transmission the number of infected people doubles.

Questions:

1. How is disease caused? And explain how one person can spread disease to many others?
2. Describe briefly the process you used to trace the infection back to its source.
3. List three steps can be taken to prevent infections from spreading?
4. How many people tested positive in the class? What was the percentage of positive to negative?