Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Simulating an Epidemic of an Infectious Disease

**Purpose**

The purpose of this exercise is to simulate an epidemic of an infectious disease.[[1]](#endnote-1)

**Background**

Epidemiologists study the causes and the spread of diseases through populations. By doing this, they can help to control and prevent diseases. Though epidemiologists may study diseases not caused by microbes, the simulation you will be doing is a simple model of a microbial epidemic. 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.

**Procedure**

 **Materials**

1. Test tubes (1 per student)
2. Water
3. Table salt
4. Silver nitrate

**Sequence of Steps**

1. Obtain a covered test tube of water from the supply area. 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. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()Go around the room and exchange liquids from your test tube with three other people. To do this, pour ½ the volume of the 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.
4. After you are finished with the exchanges, go to the instructor who will add a chemical to the liquid in your test tube. If the liquid remains clear, then you are not infected. If a white cloudiness appears in the liquid, then you are infected.
5. ![C:\Users\Angela\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\DRP2N1IJ\MCj04242300000[1].wmf]()The problem the class must solve now is the identity of the person who started the infection. It will be like solving a puzzle. You will have to use the lists of contacts to see where each person might have picked up the infection and work backwards until you have determined who the original reservoir of infection is. This is much like the process that the epidemiologist uses to trace the outbreak of a disease.
6. When you have finished your work, answer the discussion questions.

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**Observations**

|  |  |
| --- | --- |
| Order | People with whom I exchanged liquid |
| 1 |  |
| 2 |  |
| 3 |  |
|  My ResultInfected Not Infected |

**Discussion Questions**

1. Did you find the source of the infection? If so, who was it?
2. Describe briefly the process you used to trace the infection back to its source.
3. Was the epidemic a common-source epidemic or was it a propagated epidemic? Explain.
4. In this simulation, what represented the infectious agent?
5. What is the morbidity rate for the infection in this simulation? How did you calculate it?

**Teacher Notes:**

The chemical used to represent the infection is salt (sodium chloride) and the test chemical is silver nitrate.

To set up this lab, fill one test tube per student with water. Add a teaspoon full of salt to one test tube and dissolve by stirring. Distribute the test tubes without telling students whose sample has salt.

When students bring their test tube to you, add 10-20 drops of silver nitrate. If the sample becomes cloudy, salt is present.

1. Lord, Richard (2008).Simulating an epidemic of an infectious disease. *Presque Isle High School, Maine.* [↑](#endnote-ref-1)