

Could You Be An Epidemiologist?

When an outbreak happens, epidemiologists do two things: 1) They make recommendations about how to keep the disease from spreading, and 2) they try to trace where the disease began. If they can do both of these things, they may be able to stop further infection.



Catching a sneeze with a tissue is smart. But, it is important to wash hands even after using a tissue.

To understand the causes of an outbreak, epidemiologists trace the spread of an infection backwards. They start with who is sick, ask questions, and try to determine what the infected people have in common. In the food examples you read about, sick people had eaten at the same restaurant, or had bought one of the same foods at the grocery store. By making connections, epidemiologists try to trace the source of a communicable disease.

In this short investigation, you are going to trace the path of a disease as an epidemiologist might. You will not be able to do everything an epidemiologist does, but this activity will help you understand the kind of work epidemiologists do. You might also get some ideas about how to prevent the spread of disease in your school.

Procedure 1: Try Tacking a Disease!

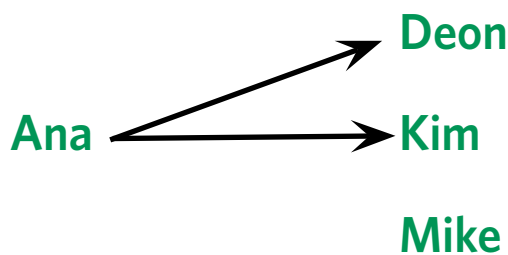
Follow the interactions of the people who are described below to determine who first made the other people sick.

1. To trace the interactions, a diagram can help. The diagram here shows you the first set of interactions:
 - a) Ana had breakfast with Kim and Deon. Arrows show the interaction.
2. Now add arrows for the next two interactions to the diagram.
 - a) Next, Ana went to class with Mike. Draw an arrow from Ana to Mike.
 - b) Later, Mike and Deon went to the movies. Draw an arrow to connect Mike and Deon.
3. The next day, Ana, Deon and Mike were sick. Circle the names of the people who got sick.
4. The first person to get sick in a population is the initial carrier. Use your diagram to figure out who the initial carrier was. Who is the person who got the others sick?

Ana was thintial carrier and had contact with everybody else.

5. What information did you use to figure this out?
6. Did you make any mistakes? If you did, what helped you to change your mind?

Used the diagram and sequence of events, to figure out who was the initial carrier.

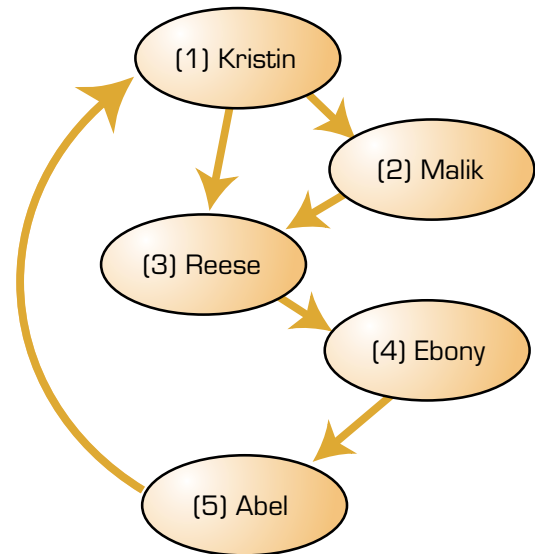


Procedure 2: Tacking More Complex Interactions

The interactions you just investigated involved only four friends. There were only three interactions: breakfast, class, and a movie. In the real world, you interact with many people.

People can have a hard time remembering all of their interactions. You interact with some people directly. You interact with some people indirectly. An indirect interaction is something like touching a doorknob, book, or another object that other people have touched. Also, when you are the one who is sick, you can spread germs in the same two ways: directly and indirectly.

Trace the interactions again, but this time with a more complicated case. In this case, Kristin starts the interactions. The last interaction is from Abel to Kristin. Look at the diagram of interactions. Your job is to imagine how interactions might have happened. To start: How might Kristin have interacted with Malik and Reese?



1. Write one sentence at a time to describe each interaction. Be sure to describe **all** of the interactions in the diagram. You may use the same ideas that are in the first activity if they help you write a simple story.

Abel and Kristin went to a movie during the evening

Kristen had breakfast with Malik the next morning

Kristen was in class with Reese, but sits on the other side of the room from her.

Malik also has a class with Reese, but doesn't sit near her

Reese was also in class with Ebony, who sits next to her

Abel, Kristen and Malik all got sick with hours of each other.

2. Kristin, Ebony, and Abel all got sick within a few hours of each other. (Circle their names.)
3. Reese and Malik did not get sick.

4. Now, try to figure out who the initial carrier is. Your answer needs to explain a) who got sick **and** b) who did not get sick.

- Who was the initial carrier?
- How do you know?
- Why do you suppose that Reese or Malik did not get sick?

Abel was the initial carrier and got both Kristen sick directly, then Kristen had breakfast the next morning with Malik who also got sick. Reese and Ebony did not get sick because they did not get in close enough contact with Abel, Kristen or Malik to get the disease.

5. What made this investigation more challenging than the first one?

There were more people involved in the spread of disease, although not everyone had direct contact with the people who got ill.

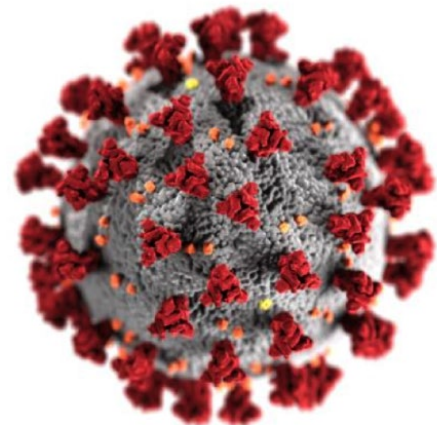
Stop and Think

This problem was more difficult to solve. Have someone else do this activity, too. Compare your ideas, and share the evidence for your claim. Use good reasoning as you make an argument for the evidence that supports your claim. But, also be ready to listen to other ideas, and to decide which evidence is best.

What's the Point?

When an outbreak of a disease occurs, epidemiologists need to trace where the disease began. They also make recommendations to stop the disease from spreading. Tracing where a disease began can be tricky. It requires tracing the spread of the disease backwards from people who are sick, through all of their interactions, to figure out what caused the disease. Epidemiologists also work to be able to explain why some people got sick and others did not.

Extension: You may be interested in using the internet to learn more or talk with an adult about how epidemiologists traced the beginning of COVID-19. It did not start in the U.S. But, once the disease entered the U.S., scientists needed to trace the origin here, too. You might also want to learn more about being an epidemiologist! Can you imagine yourself being that type of scientist one day?



COVID-19 virus molecule