

Read the following definitions:

Outbreak - when a disease occurs in greater numbers than expected in a community or region or during a season. An outbreak may occur in one community or even extend to several countries. It can last from days to years.

Sometimes a single case of a contagious disease is considered an outbreak. This may be true if it is an unknown disease, is new to a community, or has been absent from a population for a long time.

✓ **Sometimes outbreaks evolve into epidemics or even pandemics**

Epidemic - an occurrence of a group of illnesses of similar nature and derived from a common source, in excess of what would be normally expected in a community or region

Pandemic – an epidemic that has spread over several continents or around the world

Directions: For each example below, decide if it is epidemic, pandemic or outbreak and then give your reason for why you made that decision.

Examples:	Outbreak, epidemic or pandemic	Why?
SARS: Severe Acute Respiratory Syndrome (SARS) killed about 774 people out of 8,098 that were infected. It started in Asia and then spread to two dozen countries.		
HIV: First identified in 1984, HIV/AIDS has killed more than 25 million people worldwide.		
Ebola: In 2014, the number of Ebola cases increased dramatically. Symptoms include fever, muscle pain, diarrhea, vomiting and internal bleeding. Ebola is fatal if left untreated. It is transmitted through direct contact with body fluid of an infected person. Almost 30 000 cases were reported about 12 0000 people died in six countries.		
Measles: In 2015, several people from different states contracted measles after visiting an amusement park in California. The cases were linked to a traveler who became infected overseas with measles, then visited the amusement park while infectious.		
Zika Virus: In 2016, the disease which is spread by Mosquitoes from South America into North America.		
H1N1: In 2009, H1N1 flu virus started in Mexico but then spread to different continents		

Examples of other pandemics:

- Spanish influenza killed 40-50 million people in 1918.
- Asian influenza killed 2 million people in 1957.
- Hong Kong influenza killed 1 million people in 1968.

Modelling the Spread of Disease

1. Take your cup (with liquid) and dropper
2. Walk around until told to stop
3. Pull some liquid from each of your cups and then exchange at the same time
4. Record your exchanges in the table below:

Your Name	Contact 1	Contact 2	Cup 3

5. Repeat step 2 and 3 – twice more
6. The teacher will put a drop of infection indicator in each cup
7. If you are infected your cup will turn pink
8. Dispose of the cup and liquid according to your teacher’s direction

Was I infected?	
Yes	No

Who is patient zero?

1. Use the following chart to fill in the full class data.

Names							
Contact 1							
Contact 2							
Contact 3							
Names							
Contact 1							
Contact 2							
Contact 3							
Names							
Contact 1							
Contact 2							
Contact 3							
Names							
Contact 1							
Contact 2							
Contact 3							

2. Highlight the names of the people who were infected
3. Track the names of the infected people and who they came in contact with. Try to figure out patient zero.
4. If needed, make a diagram to help you solve the mystery

Who is Patient zero?

Questions: (answer on a separate piece of paper)

1. At first, only one person in the class was infected. By the end of the investigation, how many people in the class were infected?
2. Explain how this investigation models the spread of disease.
3. Were you able to determine the patient zero? Why or why not?

Outbreaks, Epidemics and Pandemics

Block: _____

4. How do you think tracking the spread of disease during an outbreak and determining patient zero help public health authorities stop the spread of disease?