Buzz Buzz Bite!
Disease Transmission Simulation Game
Part 1: Direct Transmission—Human to Human

Direct human-to-human disease transmission can result from direct contact (touching, bodily fluids), or indirect contact (touching an infected surface). Diseases spread through direct transmission include the common cold, influenza (flu), and acquired immune deficiency syndrome (AIDS).

Instructions
Each cup of liquid represents human bodily fluids. Someone will receive fluids “infected” with a disease. You do not know who is “infected” and who is not, but this investigation will allow you to figure out who introduced the disease into the population. That person is the index patient, or Patient Zero.

Materials (for each student)
- One disposable cup (numbered) with unknown liquid
- One disposable plastic pipet

**Caution:** Some of the liquids are poisonous to taste or touch. Do not drink any fluids in this lab. If a liquid spills on your skin, wash it off immediately with plenty of cold water.

Procedure
1. Choose a cup and pipet.
2. Record your cup number below.
3. Students with odd-numbered cups form an inner circle.
4. Students with even-numbered cups walk around the outside of the circle.
5. Only exchange once per round.
6. Do not exchange with the same person twice.

Round 1
1. When instructed, students in the outer circle will begin to walk around the inner circle. When the teacher gives the signal, stop and stand in front of someone in the inner circle.
2. Once everyone has a partner, squirt two pipets full of fluid from your cup into the cup of the person in front of you. Your partner will do the same. Stir with the pipet.
3. Record your partner’s cup number below. Wait for everyone else to finish.

Round 2
1. When instructed, the outer circle will walk around the inner circle again and each student will find a new partner.
2. Repeat the fluid exchanges just as in Round 1. Do not exchange with the same person twice.
3. Record your new partner’s cup number below. Wait for everyone else to finish.
Round 3
1. Repeat this procedure one more time. Be sure to find a new partner and do not exchange with the same person twice.
2. Return to your seat.

Final Step
Your teacher will add an indicator solution to each cup. “Infected” students will see a color change.

Data Collection
Your Cup Number _____
Partner Cup Numbers
- Round 1 _____
- Round 2 _____
- Round 3 _____

Conclusion
Complete the Direct Transmission Data Chart to track disease transmission.

Who is Patient Zero? What is your evidence?

Did any errors occur in this lab? If so, how do you think these errors will affect the results?

Do you think that this lab accurately depicts how an epidemiologist would look for a Patient Zero? Explain.
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Disease Transmission Simulation Game
Part 2: Indirect Transmission—Human to Vector to Human

The second part of this activity simulates indirect vector-borne disease transmission. Transmission is indirect when humans transmit the disease to other humans, but not directly person-to-person.

A vector, such as a mosquito, picks up the pathogen (disease-causing organism) from an infected human and passes it to an uninfected human. One person transmits disease to another person, even though there is no direct contact. Examples of vector-borne diseases: chikungunya, dengue fever, and malaria.

Materials (for each student)
- One disposable cup (numbered) with unknown liquid
- One disposable plastic pipet (Mosquitoes only!)

Caution: Some of the liquids are poisonous to taste or touch. Do not drink any fluids in this lab. If a liquid spills on your skin, wash it off immediately with plenty of cold water.

Procedure
1. Each student chooses a cup, but only Mosquitoes choose a pipet.
2. Record your cup number below.
3. Humans form an inner circle.
4. Mosquitoes move around the outside of the circle.
5. Only exchange once per round.
6. Do not exchange with the same person twice.

Round 1
4. When instructed, Mosquitoes in the outer circle will begin to move around Humans in the inner circle. When the teacher gives the signal, stop and stand in front of someone in the inner circle.
5. Once everyone has a partner, each Mosquito will “bite” a Human and squirt two pipets full of fluid from his or her cup into the Human cup. (Infected mosquitoes can transmit virus in saliva.) Stir with the pipet.
6. Mosquitoes then take two pipets full of fluid from the Human’s cup. (When taking a blood meal, a mosquito can consume virus in the human’s blood.)
7. Record your partner’s cup number below. Wait for everyone else to finish.

Round 2
4. When instructed, the outer circle will move around the inner circle again and each student will find a new partner.
5. Repeat the fluid exchange just as in Round 1. Do not exchange with the same person twice.
6. Record your new partner’s cup number below. Wait for everyone else to finish.
Round 3
3. Repeat this procedure one more time. Be sure to find a new partner and do not exchange with the same person twice.
4. Return to your seat.

Final Step
Your teacher will add an indicator solution to each cup. “Infected” students will see a color change.

Data Collection
Your Cup Number _____
Partner Cup Numbers
• Round 1 _____
• Round 2 _____
• Round 3 _____

Conclusion
Complete the Indirect Transmission Data Chart to track disease transmission.

Who is Patient Zero? What is your evidence?

Did any errors occur in this lab? If so, how do you think these errors will affect the results?

Do you think that this lab accurately depicts how an epidemiologist would look for a Patient Zero? Explain.