

Exercise 1.2 – Night on the Town

LEARNING OUTCOMES

1. Describe the relationship between epidemiology and public health.
 2. Identify public health agencies at the local, national, and international levels.
 3. Discuss the role of contact tracing in the prevention of disease transmission.
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The science of *epidemiology* is the study of disease occurrence and distribution in a defined population. Epidemiologists investigate the etiology (cause), incidence (number of new cases), prevalence (number of infected persons), and transmission of diseases with the goal of understanding and controlling transmission. The population that is at risk may be geographically defined or may be identified by other parameters such as susceptibility due to age, environment, health or nutritional status, lifestyle choices, or other related factors.

Many agencies and organizations participate in reporting and analyzing epidemiological data to keep the public safe. At the local and state level, public health officials work closely with hospitals, clinics, and medical providers when a new disease or outbreak occurs. In the United States, the Centers for Disease Control and Prevention (CDC) and the National Institutes of Health (NIH) provide information and public health guidance at the national level. Internationally, the World Health Organization (WHO) is responsible for research and oversight of health and disease on a global scale.

One essential way in which health authorities monitor disease transmission is through *contact tracing*. Contact tracing is the identification, assessment, and monitoring of infected individuals to break the chain of transmission and control the spread of disease. Contact tracing relies on information provided by infected persons regarding where they have been and with whom they had close contact. This information is kept confidential and shared only as necessary to prevent further infection.

In this exercise, the spread of disease among a population (the class) and the challenges of contact tracing are simulated. Each student will receive a test tube with water, with one tube containing the “pathogen” (sodium hydroxide solution [NaOH]; only the instructor will know who was given this tube). Students will be asked to mingle and talk for brief periods, exchanging solutions with at least two other students. At the end of the exercise, each sample will be tested for the presence of NaOH and those students who receive positive tests will be asked to recall who they exchanged solutions with and in what order. Students will then have the task of determining the original source of the outbreak from the contact tracing information.

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OBJECTIVE

Determine the source of a simulated disease outbreak.

MATERIALS

- ☒ SOLUTIONS: 0.1M NaOH (1 tube); sterile water (remaining tubes); phenolphthalein
- ☒ EQUIPMENT: Disposable plastic Pasteur pipets

PROCEDURE – STUDENTS WORK AS A CLASS

1. Each student receives a solution tube and pipet. Only the instructor will know which student receives the tube of NaOH.
2. The mingling period begins as students move about the room, socializing with others and exchanging fluids with at least two other students using the pipet. When the mingling period is over, pipets are placed in the disinfectant beaker.
3. Students bring their tubes to the “clinic” (instructor) for testing with phenolphthalein, which will react with the “pathogen” (NaOH) to turn the solution pink. Those who receive positive tests record who they exchanged solutions with, and in what order, for contact tracing data.
4. Data is analyzed to determine which student received the contaminated tube.