



The Epidemiological Process



Epidemiologists use a systematic approach to disease outbreak investigations. Unlike some other scientific investigations, epidemiologists working a disease outbreak know that speedy solution of the outbreak means fewer lives lost or fewer people who get sick. However, they can't sacrifice accuracy for speed; getting the wrong answer at any step in the investigation would mean the outbreak continues and probably spreads to a larger area.

As you read below about the steps in the epidemiological process of investigating disease, think about the reason for each step. Each is essential. They may just seem like logical steps to you (and they are), but disease was not always investigated in such logical ways. We needed a much better understanding of infectious disease pathogens and disease transmission methods before we could define a better way of solving outbreaks.

Objectives

To understand the steps in an outbreak investigation, you should be able to:

- Explain the steps for conducting an epidemiological investigation of an outbreak.
- Describe the importance of each step within the process and the consequences of not implementing each step.



Vocabulary

case definition - in epidemiology, a description of specific conditions and details that must be met in order for the person to be identified as having a particular disease or other health condition.

epi-curve - a graph that plots the number of cases during an outbreak according to time of onset.

epidemic - numbers of disease cases, injuries, or other negative health conditions greater than expected in an area or population during a particular period.

epidemiology - the branch of medicine that studies patterns and causes of health-related conditions and uses those studies and results to control a health problem.

histogram - a graph using bars or columns to represent values in a statistical study; in epidemiology, time is usually plotted on the x-axis with number of cases on the y-axis.

line listing - in epidemiology, a spreadsheet list of cases or patients with information about each patient, including gender, age, and date of onset of symptoms.

outbreak - the sudden rise in the occurrence of a disease or injury in a given area during a given time period; more localized than an epidemic.

Steps for Conducting An Epidemiological Investigation

1. Review case reports to list prevalent patient symptoms.
2. Use case report data to construct histograms of patient demographics, such as age and gender.



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3. Use case report data to construct an epi-curve of number of patient cases by time of onset.
4. Review patient interviews to identify clues to the cause of disease, transmission, and possible contacts who may have been infected.
5. Write a case definition for the outbreak disease.
6. Review disease symptoms to make an initial diagnosis.
7. Perform tests for final diagnosis results.
8. Using line listing data, construct histograms of patient demographics, such as age and gender.
9. Using line listing data, construct an epi-curve of number of patient cases by time on onset.
10. Make a final diagnosis.
11. Recommend treatment.
12. Perform epidemiological modeling for a possible vaccination program.