Epidemiology 101

Introduction to the Science of Public Health

September 23, 2020
Epidemiology Defined

Greek etymology

\( Epi = \) among

\( Demos = \) people

\( Logos = \) study

“The study of what is among the people”

Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.
Uses of Epidemiology

- Assessing population health (disease frequency and patterns)
- Making individual medical recommendations
- Completing the clinical picture
- Searching for causes
Need to Know

Epidemiologists ask:
- Who is getting ill?
- What is the illness?
- When do people get ill?
- Where are people getting ill?
- Why are people getting ill?
- How can we stop people from getting ill?
Who

What segment of the population is ill?

Define the population:
- Entire population vs. representative sample

Describe who getting is ill:
- Age, race, sex
- Education level
- Socioeconomic status
What is the illness?

Case definition:
- Exposure, symptoms, signs, laboratory tests
- Limitation on place, time, population
- May be different from a clinical case
When are people sick and for how long?

- Incubation period
- Infectious period
- Seasonality
Where

Where is the illness occurring?

- Elevation
- Proximity to transmission source
- Urban or rural

Reported Cases of Lyme Disease -- United States, 2014

1 dot placed randomly within county of residence for each confirmed case
Why

Why are people getting ill?

Risk factors:

▪ Consuming raw or undercooked food
▪ Poor hand hygiene
▪ Smoking

Modes of transmission:

▪ Insect bites
▪ Particles in air
▪ Sharing injection drug equipment

Genetic susceptibility:

▪ Family history of cancer
▪ Family history of heart disease
Epidemiologic Approach

An epidemiologist systematically:

- Counts
- Divides
- Compares
Epidemiology is the study of what is among the people in relation to their health

Epidemiologists must ask Who, What, When, Where, and Why

- Who is affected?
- What is the illness?
- When are people becoming ill?
- Where are the ill persons/exposures?
- Why are people becoming ill?

Count, Divide, and Compare

- Identify outbreaks, trends