What is Epidemiology? (1)

Epidemiology is that field of medical science which is concerned with the relationship of various factors and conditions which determine the frequencies and distributions of an infectious process, a disease, or a physiologic state in a human community. (Maxcy)
What is Epidemiology? (2)

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 control of health problems (Last)
What is Epidemiology? (3)

Epidemiology is a strategy for the study of factors relating to the etiology, prevention, and control of disease; to promote health; and to efficiently allocate efforts and resources for health promotion, maintenance and medical care in human populations.  

(Detels)
Epidemiology is a philosophy, a strategy, a methodology, a way of studying a health problem. Epidemiology is not a body of knowledge.
Two Holy Trinities of Epidemiology

Disease characteristics: agent, host, environment

Health is a state of equilibrium between:

Agent __________________________ Host

Environment
Two Holy Trinities of Epidemiology (2)

Disease descriptors: Time
Place
Person

Epidemiologists describe disease/states in terms of time, place and person
Ultimate truth = denominator
Incidence =

\[ \frac{\text{Number of New Cases Occurring in a Given Population in a Specified Time Period}}{\text{Population at Risk in That Time Period}} \] (Speedometer)
Prevalence =

\[\frac{\text{# of Cases Existing in a Given Population at a Single Point in Time}}{\text{Population at That Time}}\] (odometer)
An example of the use of time, place, and person to describe disease characteristics:

- Gathering evidence
- Ordering hypotheses by probability
- Observing place, time (trend), and person characteristics
Reported incidence of disease X 1925-1962, Los Angeles
Public health is concerned with health of the public; i.e., populations. Epidemiology is the method/strategy of studying disease/health in human populations. Epidemiology is therefore the core science of public health.
Uses of Epidemiology (1)

a. Community diagnosis; i.e., what are the major health problems occurring in a community

b. Establishing the history of a disease in a population; e.g., identifying the periodicity of an infectious disease

c. Describing the natural history of disease in the individual; e.g., natural history of HIV infection in the individual (infection-acute syndrome-asymptomatic phase-clinical disease-death)
Uses of Epidemiology (2)

d. Describing the clinical picture of disease; i.e., who gets the disease, who dies from the disease, and what the outcome of the disease is.
e. Estimating risk; e.g., what factors increase the risk of heart disease, automobile accidents, and violence.
f. Identifying syndromes and precursors; e.g., the relationship of high blood pressure to stroke, kidney disease, and heart disease.
Uses of Epidemiology (3)

g. Evaluating prevention/intervention programs; e.g., vaccine and clinical trials

h. Investigating epidemics/diseases of unknown etiology

i. Assessing the cost-effectiveness of interventions

j. Assessing strategies to translate science to action ("implementation science")