

Introduction to Infectious Disease Epidemiology

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Plan

- Brief Intro to Epidemiology
- Intro to Infectious Disease Concepts
- Anthrax Case Study (partial?)
- Audience choice

References

- Gerstman, B. B. (1998). *Epidemiology Kept Simple*. New York: Wiley-Liss. A general text in epidemiology with broad coverage. About \$50.
- Chin, J. (Ed.). (2000). *Control of Communicable Disease Manual* (17th ed.). Washington, DC: American Public Health Association. About \$30 from www.apha.org

Epidemiology

- Based on:
 - Epi = upon
 - demi = the people (as in demography)
 - ology = the study of
- “the study of the distribution and determinants of disease and health-related states and events in specified populations, and the application of study results to control of health problems”
- One of the core disciplines of public health

Epidemiologist

- Anyone who studies disease on a population basis (no certification, *per se*)
- Many have medical backgrounds
- Classify themselves according to the type of **exposure** they study (e.g., infectious disease epidemiologist, occupational epidemiologist) or type of **disease** they study (e.g., cardiovascular disease epidemiologist).

Reasons I teach infectious disease epidemiology

- Provided the original model for the study of disease on a population basis
- Importance of infectious diseases in their own right, esp. emergent and re-emergent agents & bioterrorism

The Infectious Disease Process

- Agent
- Reservoir
- Portals
- Transmission
- Host factors

Agents

- Helminth
- Fungi & yeast
- Protozoan
- Bacteria
- Rickettsia
- Viruses
- Prions

Reservoirs

- Where the agent lives and reproduces in nature
- Types of reservoirs (agent specific)
 - Cases
 - Carriers
 - Animals
 - Inanimate objects (e.g., food & water)

Portals (entry and exit sites)

- Respiratory
- Conjunctiva
- Gastrointestinal
- Urogenital
- Skin
- Placental

Transmission

- How the agent gets from a portal of exit to a portal of entry
- Types
 - Contact (direct and indirect)
 - Vectors (animal or insect intermediary)
 - Vehicle (inanimate intermediary)

Host factors (immunity)

- Includes all host factors that alter the likelihood of infection and disease once the agent is encountered
- Innate immunity (immunity you are born with)
- Acquired immunity (immunity you develop after birth)
 - Natural exposure
 - Artificial exposure (vaccination)

Control of Communicable Disease Manual (CCDM)

- Section on Anthrax, as an example
- Elements: Identification, Agent, Occurrence, etc.

The Case Study

- Also posted on www.sjsu.edu/faculty/gerstman/eks
Chapter 3 Exercises
- Objectives
 - Use of the CCDM
 - Use of www.cdc.gov/mmwr
 - Illustrate infectious disease process