Epidemiology 101
Data and Additional Measures of Disease Occurrence

Sources for Retrieval of Epidemiologic Data
- Google search - www.google.com
  - Wealth of information available but it is difficult to judge the quality of the information
- CDC home page - www.cdc.gov
  - High quality information, includes Morbidity and Mortality Weekly Reports
- Medline search - Go to USF Shinberg library and follow directions to search OVID

Sources for Retrieval of Epidemiologic Data (2)
- Web sites of organizations
  - American Cancer Society
  - American Public Health Association
  - March of Dimes
- World Health Organization
- Florida Department of Health
- U.S. Census Bureau

Factors that affect the quality of Epidemiologic Data
- What is the nature of the data including the sources and content?
- How available are the data?
- How complete is the population coverage?
  - Representativeness, external validity
- What are the appropriate and inappropriate uses of the data?
- How accurate are the data?
  - Validity, Internal validity

US Bureau of the Census
- Excellent source of information on the underlying population of the United States.
- Provides clarification on denominators used in epidemiological research.
- See Exhibit 3-1

Vital Registration System
- Vital events
  - Deaths, births, marriages, divorces, and fetal deaths
  - The legal authority is held by the states
Deaths

- Data are collected routinely on all deaths in the U.S.
  - Demographic characteristics
    - Age, sex, race
  - Date and place of death – hospital or elsewhere
  - Cause of death
    - Immediate cause
    - Underlying cause

Births

- Includes live births and fetal deaths
- Nearly complete in their coverage of the general population
- See table 3-2 for information collected
- Collects information on demographics plus pregnancy and newborn complications
- Recently revised birth certificate

Public Health Surveillance

- Systematic and continuous gathering of information about the occurrence of disease and other health phenomena
  - Active
  - Passive
  - Sentinel
- Bioterrorism detection
  - Syndromic surveillance - using health-related data to signal sufficient probability of a case or outbreak to warrant further public health response.

Examples of surveillance systems

- Communicable and infectious disease
  - Notifiable and reportable conditions
- Non-infectious disease
  - Cancer registries
- Risk factor surveillance
  - Behavioral Risk Factor Surveillance System (BRFSS)

Reportable and Notifiable Disease Statistics

- Physicians and other health care providers must report cases of certain diseases
  - Generally infectious
  - Listed on the CDC website
  - Some limitations
    - Individuals not diagnosed will not be reported
    - Some will not be reported to protect confidentiality

Chronic Disease Surveillance

- Some states have set up surveillance systems for chronic diseases
  - E.g., CA and asthma registry
- Registries centralized database for collecting information about a disease
  - Cancer registries
Behavioral Risk factor Surveillance System

- Operated at the state level
- Self reported data
- Telephone health survey
  - Risky behaviors, smoking, alcohol, sex, etc.

Data from the National Center for Health Statistics

- National Health Interview Survey
- National Health and Nutrition Examination Survey (NHANES)
- Morbidity surveys of the population using a weighted randomized sample

Life Expectancy

- Number of years that a person is expected to live at any particular year
- Life expectancy at birth
- U.S. 2005
  - 77.8 overall
  - 80.4 females
  - 75.2 males

Maternal Child Health Measures

- Maternal mortality
- Infant mortality
- Fetal mortality
- Perinatal mortality
- General fertility rate

Maternal mortality

- Maternal deaths that result from causes associated with pregnancy divided by the number of live births x 100,000 births per year

Infant mortality rates

- Number of infant deaths among infants aged 0-365 days divided by the number of births during the same year (per 1,000 births)
Fetal Mortality Rate
- Death of a fetus in utero and before it has been delivered
- Stillbirth
- Fetal death rate is the number of fetal deaths after 20 weeks or more gestation divided by the number of live births plus the number of fetal deaths after 20 weeks or more gestation x 1,000

Perinatal mortality
- Takes into account late fetal deaths and deaths among newborns
- The number of late fetal deaths after 28 weeks or more gestation plus infant deaths within 7 days of birth divided by the number of live births plus the number of late fetal deaths per year x 1,000

Birth rates
- Crude birth rate is the number of live births during a specified time divided by the population size at the middle of that period x 1,000

General fertility rate
- The number of live births reported in an area divided by the number of women ages 15-44 (women of childbearing age) in the area x 1,000

Data from international organizations
- World Health Organization
  - Global infectious disease surveillance
  - Mortality data - levels and causes of mortality for children and adults
- Pan American Health Organization
  - Focus in Latin American countries

Late Fetal Mortality Rate
- Fetal death rate is the number of fetal deaths after 28 weeks or more gestation divided by the number of live births plus the number of fetal deaths after 28 weeks or more gestation x 1,000