

Medical Sociology

Twelfth Edition

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Chapter 2 Epidemiology

Introduction

- Epidemiology is a multi-disciplinary field that studies the origin and distribution of health problems, whether infectious diseases, chronic ailments, or problems resulting from unhealthy behaviors

Epidemiological Measures

- Case: An episode of a disorder, illness, or injury involving a person
- Prevalence: The total number of cases of a health disorder that exist at any given time
 - Point prevalence (the number of cases at a certain point in time, usually a particular day or week)
 - Period prevalence (the total number of cases during a specified period of time, usually a month or year)
 - Lifetime prevalence (the number of people who have had the health problem at least once during their lifetime)
- Incidence: Refers to the number of new cases of a specific health disorder occurring within a given population during a stated period of time
 - Distinguished from prevalence as the rate at which cases first appear, while prevalence is the rate at which all cases exist

Epidemiological Measures

- Crude rate: The number of persons (cases) who have the characteristics being measured during a specific unit of time
 - Examples: Birth rates and mortality rates
- Age-adjusted rate: A more specific measure than crude rate and shows differences by age in the distribution of health problems
 - Example: Infant mortality rate, which measures the deaths of all infants in a geographical area under the age of one year
 - Often used as an approximate indicator of a society's standard of living

The Development of Epidemiology

- Epidemics only began to affect human populations as trade between regions increased and as humans began moving in greater proportions into cities
- Bubonic plague
 - Affected Europe between 1340 and 1750
 - Killed approximately one-third of the European population
 - Transmission of the disease was not understood initially but social patterning in the distribution of the disease was observed

The Development of Epidemiology

- John Snow's investigations into cholera outbreaks in London
 - He systematically mapped out cases of infection, interviewed victims, and traced their daily activities to a common source: contaminated well-pumps
 - Provided the foundation of modern epidemiological methods

The Development of Epidemiology

- *Causal agents* recognized today:
 - 1) Biological agents - bacteria, viruses, or insects
 - 2) Nutritional agents - fats and carbohydrates
 - 3) Chemical agents - gases and toxic chemicals that pollute the air, water, and land
 - 4) Physical agents - climate or vegetation
 - 5) Social agents - occupation, social class, location of residence, or lifestyle

The Development of Epidemiology

- *Social environment* refers to actual living conditions, such as poverty or crowding, and also the norms, values, and attitudes that reflect a particular social and cultural context of living
 - i.e., what a person does, who a person is, and where a person lives influences what health hazards are most likely to exist in that individual's life

The Development of Epidemiology

- Stages in the field of epidemiology:
 - *Sanitary era* (early 19th century) - focus was largely on sewage and drainage systems, and the major preventive measure was the introduction of sanitation programs
 - *Infectious disease era* (late 19th to mid-20th century) - principal preventive approach was to break the chain of transmission between the agent and the host
 - *Chronic disease era* (mid- to late 20th century) - focus was on controlling risk factors by modifying lifestyles, agents, or the environment
 - *Eco-epidemiology* (21st century) - preventive measures are multidisciplinary as scientists from many fields use their techniques to deal with a variety of health problems at the molecular, social behavioral, population, and global levels

Disease and Modernization

- The health profiles of industrialized societies are different from that of developing countries
- Modernizing countries experience:
 - Reduced mortality from infectious diseases and parasitic disorders
 - Declines in other diseases of the digestive and respiratory systems with a communicable component
 - Increases in life expectancy
 - Declines in infant mortality
 - Increases in mortality from heart disease, cancer, and other physical ailments associated with modern living

The Complexity of Modern Ills: Heart Disease

- Heart disease represents an example of the complexity of modern health problems
 - Multiple factors contribute to the risk of developing heart disease by pathways not yet fully understood
 - Significant risk factors include:
 - Sex (specifically male)
 - Advancing age
 - High blood pressure
 - Cigarette smoking
 - Diabetes
 - Obesity

Pandemics: HIV/AIDS and Influenza

- Distinguished from epidemics by their widespread nature
- Affect not only the countries of one region but multiple regions and continents in the world

Pandemics: HIV/AIDS

- HIV/AIDS has a widespread social impact
 - Transmission is firmly rooted in social behaviors
 - Has influenced changing norms, values, sex habits, and lifestyles throughout the world
- Appeared in the U.S. in 1979
 - Represented a significant epidemiological puzzle: first in determining what the new disease was, then in how it was transmitted and where it originated

Pandemics: HIV/AIDS – U.S.

- Primary mode of transmission (CDC 2007):
 - Among adult and adolescent males:
 - 64 percent of all cases reported were homosexual and bisexual men
 - 16 percent were IV drug users
 - 7 percent were homosexuals and IV drug users
 - 12 percent resulted from heterosexual contacts
 - 1 percent from other causes like blood transfusions
 - Among adult and adolescent females:
 - 72 percent are from heterosexual contact with infected males
 - 26 percent are infected from IV drug use
 - 2 percent from other sources

Pandemics: HIV/AIDS – U.S.

TABLE 2-2 Mortality Rates for AIDS, United States, 1987, 1995, and 2006.

	<i>(Deaths Per 100,000 Resident Population)</i>		
	1987	1995	2006
<i>Males</i>			
Non-Hispanic White	8.7	20.4	3.8
Black	26.2	89.0	29.8
American Indian/Native Alaskan	*	10.5	5.4
Asian/Pacific Islander	2.5	6.0	1.3
Hispanic	18.8	40.8	9.3
<i>Females</i>			
Non-Hispanic White	0.5	2.5	0.7
Black	4.6	24.4	14.1
American Indian/Native Alaskan	*	*	1.6
Asian/Pacific Islander	*	0.6	0.3
Hispanic	2.1	8.8	3.1

*Less than 20 deaths.

Source: National Center for Health Statistics, 2009.

Pandemics: HIV/AIDS – Worldwide

- Africa (33.4 million cases)
 - South of the Sahara the hardest hit
 - Primary mode of transmission: heterosexual contact
 - Migrant labor system plays a vital role in transmission, spreading disease from urban to rural areas
 - Women account for 60 percent of cases

Pandemics: HIV/AIDS – Worldwide

- Western Europe (850,000 cases) and Eastern Europe (1.5 million cases)
 - Primary mode of transmission: Homosexual activity and IV drug use
- Asia (South/Southeast Asia, 3.8 million cases; East Asia and China, 850,000 cases)
 - Primary mode of transmission: Heterosexual activity (especially through migrant labor systems and prostitution)
- Latin America (2.0 million cases) and Caribbean (230,000 cases)
 - Originally spread through homosexual activity and IV drug use
 - Now spreading to women through bisexual activity by men

Pandemics: Influenza

- Past outbreaks, such as 1918 “Spanish flu,” have killed millions worldwide
- Recent outbreaks of H1N1 (“Swine flu”) and H5N1 (“Avian flu”) have the potential to become especially serious pandemics
- Predicting outbreaks of influenza and controlling the spread of infection remains challenging for epidemiologists