Foundations of Global Health

Introduction to Global Health

Part 2: Health Determinants, Measurements & Trends

The People Paradox

"Health is not valued till sickness comes." Dr. Thomas Fuller

Learning Objectives

- Describe the determinants of health & define important health indicators
- Discuss the differences between morbidity, disability, and mortality
- Discuss the concepts of, Health Adjusted Life Expectancy (HALE), Disability Adjusted Life Years (DALYs), and the burden of disease
- Describe the leading causes of death in low-, middle-, and high-income countries
- Describe demographic transition (People Paradox)

FIGURE 2-2 Key Determinants of Health

Policies and Determinants

Health Education

Individual
• Dietary intake
• Age
• Ethnicity

Social Environment
• Income
• Education
• Access to health services

Physical Environment
• Climate
• Water supply
• Air pollution

Measuring the Burden of Disease

- HALE (Health-Adjusted Life Expectancy) - Number of years to be lived in the equivalent of good health
- DALY (Disability Adjusted Life Year) - Measure of premature deaths and losses due to illness and disabilities in a population

TABLE 2-1 Key Health Status Indicators

- Infant Mortality Rate — The number of deaths of infants under age 1 per 1000 live births in a given year
- Life Expectancy at Birth — The average number of years a newborn baby could expect to live if current mortality trends were to continue for the rest of the newborn’s life
- Maternal Mortality Ratio — The number of women who die as a result of pregnancy and childbirth complications per 100,000 live births in a given year
- Neonatal Mortality Rate — The number of deaths to infants under 28 days of age as a given year per 1000 live births in that year
- Under-Five Mortality Rate (Child Mortality Rate) — The probability that a newborn baby will die before reaching age five, expressed as a number per 1000 live births.


TABLE 2-4 Top 10 Leading Causes of the Burden of Disease in Low- and Middle-Income Countries by Region, 2002

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage of Total Burden</th>
<th>Percentage of Total Burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-income</td>
<td>1. Respiratory disease</td>
<td>1. Injuries</td>
</tr>
<tr>
<td>Middle-income</td>
<td>2. Digestive disease</td>
<td>2. Infectious disease</td>
</tr>
<tr>
<td>High-income</td>
<td>3. Neoplastic disease</td>
<td>3. CVD</td>
</tr>
<tr>
<td></td>
<td>disorders</td>
<td>health</td>
</tr>
</tbody>
</table>

The Global Burden of Disease

- Low- and middle-income countries:
  - Non-communicable diseases (54%)
  - Communicable diseases (36%)
  - Injuries (10%)
- High-income countries:
  - Non-communicable diseases (87%)
  - Injuries (7.5%)
  - Communicable diseases (5.7%)

Deaths and Disease within Countries Vary By

- Gender
- Ethnicity
- Socioeconomic Status

Trends

- Life expectancy has improved in all regions of the world since 1990, except in Europe and Central Asia and in Sub-Saharan Africa
- Communicable diseases will continue to be very important to the burden of disease in South Asia and Sub-Saharan Africa

World Population Growth

- In 1804, population first reached the 1 billion mark
- Within 200 years, world’s pop increased again 6 fold!
  - In 1999, population passed 6 billion
  - Population expected to double (11-12 billion) again within 50 years
- Population explosion is unprecedented
- Raises concerns about the carrying capacity of the earth
  - Heightened demands for energy, food, & water

Rate of growth has slowed...

- Population growth slowing
  - Influenced by fertility rates
  - family planning services
  - increased mortality due to infectious diseases (especially HIV/AIDS)
  - military conflicts
- Annual birth rates at 132 million
  - 97% occur in the developing world (middle to low-income nations)
- Net gain of 2.4 people per sec (+ 206,000 per day)

People Paradox: Impact on the World

- Humans are dominant species on planet
- 3 Dimensions:
  - Absolute population count
  - Population density
  - Level of industrial & technological organization
- Greater level of development = more impact on environment (global warming, acid rains)
Population Size

- Influenced by 4 factors
  - Births
  - Deaths
  - Immigration
  - Emigration

Check out the link below for a daily update on the US census!
http://www.census.gov/population/www/popclockus.html

Replacement Births

- Strive for magical 2 child family
  - Higher standard of living
  - Affordable education
  - Improved nutrition
  - Improved access to health care

- Replacement births only

Population Momentum

- Population continues to grow even with less than replacement births
- Due to large proportion of young people entering reproductive years
- Absolute number of people increases

Demographic Transition

- Oldest population theory (1930s)
- Changes in fertility based on economic development
  - Stage 1: high mortality & birth rates
  - Stage 2: lower mortality rates, high birth rates (societal conditions improve)
  - Stage 3: birth rates decline & become close to mortality rates
  - Stage 4: mortality & birth rates oscillate in close proximity to each other (population in balance!)
People’s Republic of China
- 22% of world’s population in China
- Strict family planning policies
  – Promote late marriage, healthy births
  – One couple, one child rule
  – Rural families to have 2 children, with spacing
- Likely to experience growth because of population momentum (30% of pop under 15 years old)

China: Population Momentum
- Population pyramid change from 1950-2050
- Family planning (one child) policy implemented
- Population growth will stabilize
- BUT large aging population

Son Preference
- Sex-selective abortion (female)
- Female infanticide

Sex ratio in total population
More women (blue) vs more men (red)

China’s Missing Girls
- Population pyramid of female minus male population by age
  – Almost all age groups (except those over 64) have larger male than female population
  – Especially of concern is the substantial “surplus” of males
  – Phenomenon is known as “missing girls”
- Strong preference for male births in the Chinese and most other Asian societies

People Paradox
- Young vs. Old countries
  – Most developed nations have a large elderly population
  – Most developing nations will experience a large population increase, as substantial proportion entering reproductive years
- Age of a country will influence health systems, resource management, and energy use
- Population management is extremely important to maintain political stability
- Family planning & education is critical

Practice Questions
- Name 4 determinants that impact individual health
- Define infant mortality rate, life expectancy at birth, maternal mortality rate, under 5 mortality rate. Which indicator measures overall quality of life?
- Name 4 specific examples of why population growth has slowed. What factors affect population growth?
- Define replacement births & population momentum.
- Describe the 4 demographic transition stages.
- Why are missing girls linked to cultural beliefs?
In Summary...

- A number of factors influence health status
- Risk factors are central to health and to addressing health concerns
- Cardiovascular disease is now the leading cause of death worldwide
- The poorest countries have a relatively larger burden from communicable diseases than from non-communicable diseases
- Demographic & epidemiological transition important to predict health challenges in a population
- Population growth, aging populations, sex ratio/son preference will influence health outcomes in future