Epidemiologic Transition Model

APHG

Unit 2
What is the epidemiologic transition?

• Distinctive cases of death in each stage of the demographic trans. model

• Comes from epidemiology (branch of medical science concerned with the incidence, distribution and control of diseases that affect large numbers of people)
Continue…

• Epidemiologists rely heavily on geographic concepts like scale and connectivity because control of an epidemic comes from understanding distinctive distribution and method of diffusion
<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Birth and Death Rates (per 1000 people per year)</th>
<th>Examples</th>
<th>Birth Rate</th>
<th>Death Rate</th>
<th>Natural Increase</th>
<th>Reasons for Changes in Birth Rate</th>
<th>Reasons for Changes in Death Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High stationary</td>
<td>40</td>
<td>A few remote groups</td>
<td>High</td>
<td>High</td>
<td>Stable or slow increase</td>
<td>Many children needed for farming. Many children die at an early age. Religious/social encouragement. No family planning.</td>
<td>Disease, famine. Poor medical knowledge so many children die.</td>
</tr>
<tr>
<td>2</td>
<td>Early expanding</td>
<td>30</td>
<td>Egypt, Kenya, India</td>
<td>High</td>
<td>Falls rapidly</td>
<td>Very rapid increase</td>
<td>Improved medical care and diet. Fewer children needed.</td>
<td>Improvements in medical care, water supply and sanitation. Fewer children die.</td>
</tr>
<tr>
<td>3</td>
<td>Late expanding</td>
<td>20</td>
<td>Brazil</td>
<td>Falling</td>
<td>Falls more slowly</td>
<td>Increase slows down</td>
<td>Family planning. Good health. Improving status of women. Later marriages.</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Low stationary</td>
<td>10</td>
<td>USA, Japan, France, UK</td>
<td>Low</td>
<td>Low</td>
<td>Stable or slow increase</td>
<td></td>
<td>Good health care. Reliable food supply.</td>
</tr>
<tr>
<td>5</td>
<td>Declining?</td>
<td>0</td>
<td>Germany</td>
<td>Very low</td>
<td>Low</td>
<td>Slow decrease</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Figure 3  Demographic/ Epidemiologic Transition Framework

Stage of Epidemiologic Transition

- Pestilence and Famine
- Receding Pandemics
- Degenerative and Man-Made Diseases
- Delayed Degenerative Diseases and Emerging Infections (Hybristic)

Stage of Demographic Transition

- Pre-
- Early
- Late
- Post-

Vital rates

- Natural increase
- Crude birth rate
- Crude death rate

Graph showing the transition stages with corresponding vital rates.
What is stage 1 of the ETM?

- Defined by Abel Omran in 1971
- Known as stage of pestilence and famine
- Infections, parasitic diseases, accidents, animal and human attacks were principal causes of human death
- T. Malthus called these “natural checks” on the growth of human population in stage 1 of the demographic transition model
Continue Stage 1…

• The Black Plague is stage 1
• Example of disease diffusion
• Said to have started in Kyrgyzstan and brought by a Tatar army when it attacked an Italian trade outpost in present day Ukraine
• Retreating Italians brought the infected rats on their ships to other European coastal cities
What is in Stage 2?

• Called stage of receding pandemics (disease that occurs over a wide geographic area and affects a very high proportion of the population)
• I.E. Outbreak of cholera in crowded poor sanitized cities of the Industrial Rev.
• 1832: NYC lost 500,000 to cholera
• John Snow is known for mapping out and linking cholera source during a Great Britain outbreak to contaminated drinking water and showed that the poor were not being punished for “their sins”
Continued…

• Cholera was eradicated in the late 19th century however it reappeared a century later in growing cities of less developed countries as they moved into stage 2 of the DTM
What is Stage 3 & 4?

- Stage of degenerative diseases and human created diseases
- Characterized by a decrease in deaths from infectious diseases and an increase in chronic disorders associated with aging
- Two most important in this stage are heart disease (cardiovascular) and cancer
Continued…

• Stage 4 is an extension of stage 3
• Delay of degenerative diseases because of operations, medicine, better/preventive diets, etc.
Is there a Stage 5?

• Some argue that infectious and parasitic diseases are reemerging; others just see it as a setback

• Reasons for this emergence:
  1. Evolution - microbes are immune to antibiotics, etc.
  2. Poverty - disease like TB are largely controlled in countries like US but still causing many deaths in less-developed countries
  3. Travel - disease diffusion (ex. SARS from China)
Vocabulary:

• **Chronic diseases:**

• **Infectious diseases:**

• **Genetic diseases:**