Population Geography Class 2.1

Last Time

1) The Epidemiological Transition among LDCs

2) Examine other factors related to mortality (evolution, multi-nationals, socio-economic status, spatial patterns and ecology).

3) AIDS
Population Geography  Class 2.1

Today’s Objectives

1) Describe societal, economic, and gender-specific impact of AIDS

2) Summarize key mortality terms and concepts

3) Fertility Definitions & Measures: TFR; Gross + Natural Reproductive Rate; Child-woman ratio; CBR

4) Determinants of Fertility
Global Estimates for Adults and Children end 2004

- People living with HIV: 39.4 million [35.9 – 44.3 million]
- New HIV infections in 2004: 4.9 million [4.3 – 6.4 million]
- Deaths due to AIDS in 2004: 3.1 million [2.8 – 3.5 million]
About 14 000 New HIV Infections per Day in 2004

- More than 95% are in low and middle income countries
- Almost 2000 are in children under 15 years of age
- About 12 000 are in persons aged 15 to 49 years, of whom:
  - almost 50% are women
  - about 50% are 15–24 year olds

PRB 2005
What is the economic impact of AIDS?

- AIDS deaths are clustered around working-aged individuals
- Impacts the basic foundations of a development and living standards
  - Workforce fluxes
  - Weakening governance
  - Discourages investment
  - Loss of productivity
What is the social impact of AIDS?

- AIDS taxes social systems.
- Life expectancy has plummeted by 20 years in some countries.
- Unprecedented social welfare demands.
- Whole families dissolve.
- In education, teachers and students are dying or leaving school.
- Health care systems in many countries are stretched beyond their limits.
Impacts to Women

- Women, especially girls, are at higher risk of HIV/AIDS infection.
- Many shoulder the burden of caring for infected family members.
- School-aged girls are often removed from schools.
- Reduced education for women impedes national development.
Mortality Summary

1) Change over time and space

2) Societal and Technological Developments

3) Human-environment interactions

4) Socio-economic and political links to Mortality
End of Mortality
Fertility
Fertility

Population Change =
Mortality + **Fertility** + (net) Migration
FERTILITY vs. FECUNDITY

1) Fertility more complex than Mortality

2) Fertility: actual reproductive behavior
FERTILITY vs. FECUNDITY cont.

1) **Fecundity**: physiological capacity (potential) for reproduction

2) Varies by age, nutrition, and health
FECUNDITY Determinants

Age variables
Menarche vs. menopause
Changes in menarche and menopause
FECUNDITY Determinants

Other variables

Disease, breast feeding, nutrition, body fat

What about men?
FECUNDITY: What about men?

"Great news! Your sperm count is dangerously low!"
FERTILITY Determinants

To have births → four things:

1) exposure to intercourse (w/o) test-tube – no intercourse no fertility)
FERTILITY Determinants

2) conception
FERTILITY Determinants

3) successful gestation & birth
FERTILITY Determinants

4)
FERTILITY Determinants

Exposure

Age of marriage
Monogamy vs. Polygamy
Abstinence
Spousal Separation
Coital Frequency
FERTILITY Determinants

Conception

Sterility (natural or pathological)

Lactational amenorrhea

Contraceptive use

Yams

Papayas
FERTILITY Determinants

Gestation

Fetal mortality

Abortion

• Conception, exposure, and gestation influenced by what?
Crude Birth Rate

\[
\text{Number of Live Births} \times 1000 = \text{Total Mid-year Population}
\]
General Fertility Rate

<table>
<thead>
<tr>
<th>Number of Resident Live Births</th>
<th>\times 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Population (Ages 15-44)</td>
<td></td>
</tr>
</tbody>
</table>
## Age-Specific Fertility Rate

<table>
<thead>
<tr>
<th># of Births by women (Aged a)</th>
<th>X 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female Population (Aged a)</td>
<td></td>
</tr>
</tbody>
</table>
Total Fertility Rate (TFR)

\[ TFR = 5 \times \sum_{15-19}^{40-44} ASBR \]
of children a woman would have if the fertility rates for a given year applied to her throughout her reproductive life. (See box below showing how the TFR is calculated.)

The TFR is a synthetic measure; no individual woman is very likely to pass through three decades conforming to the age-specific fertility rates of any single year. In reality, age-specific rates change and fluctuate from year to year, even if only gradually. For example, women who were ages 15-19 in 2003 may delay childbearing longer than women ages 15-19 in, say, 1990. They would lower the TFR a bit in 2003 but then raise it several years later when they begin their childbearing. Thus, year-to-year fluctuations in the TFR may reflect changes in the timing of births rather than changes in the average number of children women bear. The TFR is one of the most useful indicators of fertility because it gives the best picture of how many children women are currently having.

<table>
<thead>
<tr>
<th>Age of women</th>
<th>(1) Number of women</th>
<th>(2) Number of births to that age group</th>
<th>(3) Birth rate (2)/(1)</th>
<th>(4) Age-specific birth rate(3)x5</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-19</td>
<td>244,000</td>
<td>4,474</td>
<td>.018</td>
<td>.090</td>
</tr>
<tr>
<td>20-24</td>
<td>225,800</td>
<td>28,013</td>
<td>.124</td>
<td>.620</td>
</tr>
<tr>
<td>25-29</td>
<td>194,200</td>
<td>36,440</td>
<td>.188</td>
<td>.940</td>
</tr>
<tr>
<td>30-34</td>
<td>162,300</td>
<td>27,402</td>
<td>.150</td>
<td>.750</td>
</tr>
<tr>
<td>35-39</td>
<td>181,400</td>
<td>14,044</td>
<td>.077</td>
<td>.385</td>
</tr>
<tr>
<td>40-44</td>
<td>177,600</td>
<td>3,176</td>
<td>.018</td>
<td>.090</td>
</tr>
<tr>
<td>45-49</td>
<td>151,100</td>
<td>182</td>
<td>.001</td>
<td>.005</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td></td>
<td></td>
<td><strong>2.88</strong></td>
<td></td>
</tr>
</tbody>
</table>

The rates in column (3) simulate the likelihood of a woman giving birth during each year of her childbearing years—that is, they approximate the “risk” of having a birth. Multiplying each of these rates by five provides the number of children she would have for each five-year period. Each woman is subject to the annual “risk” of a birth five times in each age group; for example, 0.124 when she is 20, 0.124 when she is 21, and so on. Summing the rates for all age categories results in the number of children she would have by age 49—the total fertility rate.
Gross Reproductive Rate (GRR)

Same as TFR but counts only female births
Net Reproductive Rate (NRR)

Like the GRR but accounts for female mortality.
Child/Woman Ratio

# of Births by women (Aged a)  
---------------------------------------------- X 1000  
Female Population (Aged a)
# Fertility Interrelations

<table>
<thead>
<tr>
<th>CBR</th>
<th>TFR</th>
<th>NRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-49</td>
<td>5.6-6.9</td>
<td>3-3.6</td>
</tr>
<tr>
<td>30-39</td>
<td>4.2-5.5</td>
<td>2.2-2.6</td>
</tr>
<tr>
<td>20-29</td>
<td>2.9-4.1</td>
<td>1.5-2.1</td>
</tr>
<tr>
<td>&lt;20</td>
<td>&lt;2.7</td>
<td>1-1.4</td>
</tr>
</tbody>
</table>
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Review

1) Describe societal, economic, and gender-specific impact of AIDS

2) Summarize key mortality terms and concepts

3) Fertility Definitions & Measures: TFR; Gross + Natural Reproductive Rate; Child-woman ratio; CBR

4) Determinants of Fertility
Once upon a time there was a stork family - papa stork, mama stork and baby stork. One evening papa stork didn't show up for dinner. Mama stork and baby stork left the food out for him but he didn't come home at all that night. When papa stork finally did come home the next day, baby stork asked "Papa stork, where were you last night?" "Out making a young couple very happy," replied papa stork. Several weeks later, mama stork was late making dinner. Baby stork and papa stork waited a while, and then gave up and ordered pizza. Mama stork didn't come home until late the next morning. When mama stork did come in, baby stork asked "Mama stork, where were you last night?" "Out making a young couple very happy," replied mama stork. Later in the fall, baby stork was late for dinner. Papa stork and mama stork were worried. Their anxiety increased when baby stork still wasn't home by sunset. They both waited up late for baby stork but he didn't come in until early in the morning. His feathers were rumpled and unkempt. Papa stork barked, "Where the $%&!@# were you baby stork?" as his tired son dragged himself over the threshold. "Out scaring the $%&!@# out of college students," replied baby stork.