Unit II: Population and Migration

• Chapter 2: Population and Health
Key Issues

• Where is the world’s population distributed?

• Why is global population increasing?

• Why does population growth vary among regions?

• Why do some regions face health threats?

• **Population Policies PowerPoint
• Where is the World’s population distributed?
Questions to answer by the end of class

• Describe regions where population is clustered and where it is sparse.

• Define three types of density used in population geography.

• Define demography.
If the World were 100 people

<table>
<thead>
<tr>
<th>60 would be female</th>
<th>There would be:</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 would be male</td>
<td>60 Asians</td>
</tr>
<tr>
<td>26 would be children</td>
<td>15 Africans</td>
</tr>
<tr>
<td>There would be 74 adults,</td>
<td>14 people from the Americas</td>
</tr>
<tr>
<td>8 of whom would be 65 and older</td>
<td>11 Europeans</td>
</tr>
<tr>
<td>83 would be able to read and write; 17 would not</td>
<td>33 Christians</td>
</tr>
<tr>
<td>62 would speak Chinese</td>
<td>22 Muslims</td>
</tr>
<tr>
<td>5 would speak Spanish</td>
<td>14 Hindus</td>
</tr>
<tr>
<td>5 would speak English</td>
<td>7 Buddhists</td>
</tr>
<tr>
<td>3 would speak Arabic</td>
<td>12 people who practice other religions</td>
</tr>
<tr>
<td>3 would speak Hindi</td>
<td>12 people who would not be aligned with a religion</td>
</tr>
<tr>
<td>3 would speak Bengali</td>
<td>7 would have a college degree</td>
</tr>
<tr>
<td>3 would speak Portuguese</td>
<td>22 would own or share a computer</td>
</tr>
<tr>
<td>2 would speak Russian</td>
<td>77 people would have a place to shelter them from the wind and the rain, but 23 would not</td>
</tr>
<tr>
<td>2 would speak Japanese</td>
<td>1 would be dying of starvation</td>
</tr>
<tr>
<td>62 would speak other languages</td>
<td>15 would be undernourished</td>
</tr>
<tr>
<td></td>
<td>21 would be overweight</td>
</tr>
<tr>
<td></td>
<td>87 would have access to safe drinking water</td>
</tr>
<tr>
<td></td>
<td>13 people would have no clean, safe water to drink</td>
</tr>
</tbody>
</table>
• IF THE WORLD WERE A 1000 PEOPLE
  • http://www.gdrc.org/uem/1000-village.html

• ONE HUNDRED PEOPLE: A WORLD PORTRAIT
  • http://100people.org/wp/
Family Size

- What is the average family size?
- Is this representative of the average family size in the community?
- When did most parents start having children?
- Do most Americans use contraceptives?

http://www.guttmacher.org/pubs/fb_contr_use.html

- How might these numbers vary elsewhere in the world?
Population Density:

The number of people living in an area measured in people per square mile or kilometer.
Where Is the World’s Population Distributed?

- **Population Concentrations**
  - 2/3 of the world’s inhabitants are clustered in four regions.
    - East Asia
    - South Asia
    - Southeast Asia
    - Europe

- **Site and Situation of Population Clusters**
  - Low-lying areas with fertile soil and temperate climate
  - Near an ocean or near a river with easy access to an ocean.
POPULATION CARTOGRAM In a cartogram, countries are displayed by size of population rather than land area.
People are not distributed uniformly across Earth’s surface.
Why is Demography Important to Population Density?

- Statistical study of human populations.
  - GDP (gross domestic product)
  - Crude Birth Rates
  - Crude Death Rates
  - Literacy Rates
  - Total Fertility Rates
  - Less Developed Countries
  - More Developed Countries
  - Population
  - Natural Increase Rates
GDP (Gross Domestic Product):

- The total market values of goods and services produced by workers and capital within a nation’s borders---**Per Capita**---per person
• **Life Expectancy**: Measures the average number of years a newborn can expect to live at current predicted rates.
Literacy Rate:
The number of people in a country who can read AND write
The world average is currently about 1.2 percent. The countries with the highest NIRs are concentrated in Africa and Southwest Asia.
The global distribution of CBRs parallels that of NIRs. The countries with the highest CBRs are concentrated in Africa and Southwest Asia.
As with NIRs and CBRs, the countries with the highest TFRs are concentrated in Africa and Southwest Asia.
The global pattern of CDRs varies from those for the other demographic variables already mapped in this chapter. The demographic transition helps to explain the distinctive distribution of CDRs.
Where Is the World’s Population Distributed?

**Sparsely Populated Regions**

- Humans avoid clustering in certain physical environments.
  - Dry Lands
  - Wet Lands
  - Cold Lands
  - High Lands

- Places considered too harsh for occupancy have diminished over time.
  - Places of permanent human settlement are termed the *ecumene*. 
Seven thousand years ago humans occupied only a small percentage of Earth’s land area, primarily in Southwest Asia, Eastern Europe, and East Asia. Even 500 years ago much of North America and Asia lay outside the ecumene. Still, approximately three-fourths of the world’s population live on only 5 percent of Earth’s surface. The balance of Earth’s surface consists of oceans (about 71 percent) and less intensively inhabited land.
Used to examine the amount of population growth & available resources in an area
The areas are classified as one of two (sometimes three) categories:

MORE DEVELOPED COUNTRIES (MDC)
OR
LESS DEVELOPED COUNTRIES (LDC)

Sometimes the areas are classified as:

More Developed
Developing
Less Developed
MDCs: More Developed Countries
Characteristics of MDCs

- High gross domestic product (GDP)
- High income per capita
- High energy consumption
- High literacy rate
- Longer life expectancy
- Low infant mortality rate
- Developed infrastructure
LDC: Less Developed Countries
Characteristics of LDCs

- Low Gross Domestic Product (GDP)
- Low Literacy Rate
- Lower Life Expectancy
- High Infant Mortality Rate
- Little infrastructure
Least Developed Countries (LDCs) of the World

- **Africa**: Angola, Benin, Burkina-Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, São Tomé and Principe, Senegal, Sierra Leone, Somalia, Togo, Uganda, United Republic of Tanzania and Zambia

- **Arab States**: Mauritania, Sudan and Yemen

- **Asia and the Pacific**: Afghanistan, Bangladesh, Bhutan, Cambodia, Kiribati, Laos, Maldives, Myanmar, Nepal, Samoa, Solomon Islands, Tuvalu and Vanuatu

- **Latin America and the Caribbean**: Haiti
Population Density

Density can be computed in up to three ways for a place.

1. **Arithmetic Density**
   - Total number of objects in an area
   - **Computation**: Divide the population by the land area

2. **Physiological Density**
   - Number of people supported by a unit area of arable land
   - **Computation**: Divide the population by the arable land area

3. **Agricultural Density**
   - Ratio of the number of farmers to amount of arable land
   - **Computation**: Divide the population of farmers by the arable land area
   - Developed countries = lower density b/c of technology
Comparisons conditions in different countries because the two pieces of information—total population and total land area—are easy to obtain.

Highest arithmetic densities = Asia, Europe, and Central America. The Lowest arithmetic densities = North and South America and South Pacific.
Large physiological densities of Egypt & the Netherlands demonstrates that crops grown on a hectare of land in these two countries must feed far more people than in the USA or Canada, which have much lower physiological densities. Highest physiological densities=Asia, sub-Saharan Africa, and South America. Lowest=North America, Europe, and South Pacific.
Agricultural Density: Ratio of farmers to arable land

The highest agricultural densities are found in Asia and sub-Saharan Africa. The lowest are in North America, Europe, and South Pacific.
Can you answer these questions?

• Describe regions where population is clustered and where it is sparse.

• Define three types of density used in population geography.

• Define Demography
TODAY’S TOPIC

• WHY IS GLOBAL POPULATION INCREASING?

• **Life Expectancy Presentation
Questions to answer by the end of class

• Understand how to measure population growth through the nature increase rate.

• Understand how to measure births and deaths through CBR and CDR.

• Understand how to read a population pyramid.
Why Is Global Population Increasing?

• Components of Population Growth
  – Population is measure three ways:
    • **Crude Birth Rate (CBR)** – total number of live births in a year for every 1,000 people alive in society.
    • **Crude Death Rate (CDR)** – total number of deaths in a year for every 1,000 people alive in society.
    • **Natural Increase Rate (NIR)** – *percentage* by which a population grows in a year.

  —Computation: \( \text{CBR} - \frac{\text{CDR}}{10} = \text{NIR} \ (%) \)
Through most of human history population growth was virtually nil.

Population increased rapidly beginning in the eighteenth century.
Why Is Global Population Increasing?

- **Components of Population Growth**
  - **Natural Increase**
    - About 82 million people are added to the population of the world annually.
    - Rate of natural increase affects the *doubling time*—# of years needed to double the population, assuming a constant rate of natural increase.
      - **Twenty-First Century Rate** (1.2 percent): 54 years
        » Global population in 2100 would reach 24 billion.
      - **1963 (2.2): 35 years**
        » Global population in 2010 would have been 10 billion instead of nearly 7 billion.
    - More than 95 percent of the natural increase is clustered in developing countries.
Why Is Global Population Increasing?

• Components of Population Growth
  – **Fertility**
    • *Total Fertility Rate (TFR)*
      – Measure number of births in a society.
      – Defined as the average number of children a woman will have throughout her childbearing years (15–49)
      – TFR for world is 2.5.
      – TFR exceeds 5 in sub-Saharan Africa, while 2 or less in nearly all European countries.
Why Is Global Population Increasing?

• Components of Population Growth

  – **Mortality**

    • *Infant Mortality Rate (IMR)*
      – Understand death rates in a society
      – Defined as the annual number of deaths of infants under one year of age, compared with total live births
      – Usually expressed per 1,000 births rather than a percentage
      – IMR is 5 in developed countries and 80 in sub-Saharan Africa.
Why Is Global Population Increasing?

• Summary of Spatial Patterns
  – **Developed Countries**
    • *Lower rates of...*
      – Natural increase
      – Crude birth
      – Total fertility
      – Infant mortality
  – **Developing Countries**
    • *Higher rates of...*
      – Natural increase
      – Crude birth
      – Total fertility
      – Infant mortality
Why Is Global Population Increasing?

• **Population Structure**
  – Fertility and mortality vary not only spatially but also temporally within a country.
  – A special bar graph known as a *population pyramid* can visually display a country’s distinctive population structure.

  • **X-axis**
    – Percent *male* displayed to the **left of zero**
    – Percent *female* displayed to the **right of zero**

  • **Y-axis**
    – Age cohorts typically grouped in 5-year intervals
    – Youngest displayed at bottom
    – Oldest at top
Lawrence has a high percentage of people in their twenties because it is the home of the University of Kansas.

Naples has a high percentage of elderly people, especially women, so its pyramid is upside down.

Laredo has a broad pyramid, indicating higher percentages of young people and fertility rates.
Why Is Global Population Increasing?

• Population Structure
  – **Dependency Ratio**
    • The number of people who are too young or too old to work, compared to the number of people in their productive years.
      – **Dependents**: People *aged 0 to 14* and *over 65* years old
      – Larger dependency ratios imply greater financial burden on the working class.
Why Is Global Population Increasing?

• Population Structure
  – **Sex Ratio**
    • Defined as the number of males per 100 females in the population
      – Developed countries have more females than males, because they tend to live 7 years longer.
A map of the percentage of people over age 65 would show a reverse pattern, with the highest percentages in Europe and the lowest in Africa and Southwest Asia.
Can you answer these questions?

• Understand how to measure population growth through the nature increase rate.

• Understand how to measure births and deaths through CBR and CDR.

• Understand how to read a population pyramid.
• Why Does Population Growth Vary among Regions?
Questions to answer by the end of class

• Describe the four stages of the demographic transition.

• Summarize two approaches to reducing birth rates.

• Summarize Malthus’s argument about the relationship between population and resources.

• Summarize the possible stage 5 of the demographic transition.
Why Does Population Growth Vary among Regions?

• **The Demographic Transition Model**
  – Consists of four stages that helps to explain the rising and falling of natural increase over time in a country. Warren Thompson--1929
  – Historically, no country has ever reverted back to a previous stage.
  • Thus, the model can be thought to have a beginning, middle, and an end.
Demographic Transition Model

Stage 1
- Low growth
- Death

Stage 2
- High growth
- Birth
- Natural Increase

Stage 3
- Decreasing growth
- Natural Increase

Stage 4
- Low growth
- Birth
- Death

Crude birth and death rates (per 1,000)

Natural increase rate (%)

Time

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• DTM only predicts changes in birth/death rates over time

• Observed changes in NIR correlate to changes in economic development

• Thus, DTM implies… the greater the wealth, the lower the NIR. BUT use caution describing this relationship.
Why Does Population Growth Vary among Regions?

• The Demographic Transition Model
  – **Stage 1: Low Growth**
    • Marked by very high birth and death rates.
      – No long-term natural increase
      – No country presently is in Stage 1
  – **Stage 2: High Growth**
    • Marked by rapidly declining death rates and very high birth rates
      – High natural increase
      – Europe and North America entered stage 2, as a result of the *industrial revolution* (~1750).
      – Africa, Asia, and Latin America entered stage 2 around 1950, as a result of *medical revolution*-improved medical care.
More Detailed Look at Stage 1

Stage 1: “Pre-Industrial”

- High birth rates and high death rates (both about 40)
- Very slow population growth
- Agrarian society
- High rates of communicable diseases
- Population increases in good growing years; declines in bad years (famine, diseases etc.)

No country or world region is still in Stage One
Stage 2: “Early Industrial”

- High birth rates (over 30) **but death rates decline** (to about 20)
- Population explosion; growth rate increases throughout Stage Two
- Growth not from increase in births, but from decline in deaths

MDCs = starts early 1800s
LDCs = starts after 1950s
Stage 2 in DTM: Industrial Revolution (MDCs)

- Began in Europe in the 1750s
- Provided drastic improvements in industrial technology
- Promoted urbanization
- Allowed people to focus on the growth of other professional areas (medicine, technology, infrastructure)
- Allowed societies to gradually absorb population growth
Transition to Stage 2 in DTM

- **Agricultural Technology**
  - Improvements in food supply: high yields as agricultural practices improved—Second Agricultural Revolution (18th century)
  - Food quality improved as new foods were introduced to Europe from the Americas

- **Medical Technology (leads to Stage 2 in LCDs in 1950s)**
  - Better medical understanding: causes of diseases and how they spread

- **Public Sanitation Technologies**
  - Improved water supply: safe drinking water
  - Better sewage treatment, food handling, and general personal hygiene

  **Improvements in public health especially reduced childhood mortality**
Demographic Transition Model

- No clean water
- No medicine
- No sewage treatment
- Lots of sickness

- High Birth Rate—don’t know how many will survive
  
  > Infant mortality

- High Death Rate

- Red Cross comes in to give aid and help country become better off 😊

- High Birth Rate—still don’t know how many will survive

  > Infant mortality decreasing

- Lowering Death Rate

- Changing culture
  
  > Becoming used to better resources

- Number of Children/family become a liability—they’re expensive

- Low Birth Rate

- Low Death Rate
Why Does Population Growth Vary among Regions?

• The Demographic Transition Model
  – **Stage 3: Moderate Growth “Later Industrial”**
    • Marked by rapid decline in birth rates and steady decline in death rates
    • Natural increase is moderate.
      » Gap between CBR and CDR is narrower in stage 3 countries than stage 2 countries.
    • Population grows, because CBR is still greater than CDR.
  • MDCs=starts late 1800s
  • LDCs=starts after 1980s*
Stage 3: “Later Industrial”

- Birth rates decline sharply (to about 15)
- Death rates decline a bit more (to about 10 or less)
- Growth still occurs, but at a reduced and declining rate

MDCs = starts late 1800s
LDCs = starts after 1980s*
* Or hasn’t started yet
• **Societies become more urban, less rural**
  – Declining childhood death: specifically rural areas (fewer kids needed)
  – Increasing urbanization: changes traditional values about having children
  – City living raises cost of having dependents

• **Women are more influential in childbearing decisions**
  – Increasing female literacy: changes value place on motherhood as sole measure of women’s status
  – Women enter workforce: life extends beyond family, changes attitude toward childbearing

• **Improved contraceptive technology and availability of birth control**
  – Contraceptive not widely available in 19\textsuperscript{th} century
  – Contributed little to fertility decline in Europe
  – *Fertility decline relates more to change in values than to availability of any specific technology*
Why Does Population Growth Vary among Regions?

- The Demographic Transition Model
  - **Stage 4: Low Growth “Post Industrial”**
    - Marked by very low birth and death rates
      - No long-term natural increase and possibly a decrease
    - Country reaches stage 4 when population gains by CBR are diminished by losses because of CDR.
      - Condition known as zero population growth (ZPG)
        » Demographers more precisely define ZPG as the TFR that produces no population change.
    - Population change results from immigration.
  - MDCs=starts after 1970s
  - LDCs=hasn’t started yet
  - Much of Europe now or soon in population decline as birth rates drop far below replacement level
Stage 4: “Post-Industrial”

- Birth rates and death rates both low (about 10)
- Population growth very low or zero

MDCs = starts after 1970s

LDCs = hasn’t started yet

Stage 5 (?): Hypothesized (not in classic DTM)

Much of Europe now or soon in population decline as birth rates drop far below replacement level
Why Does Population Growth Vary among Regions?

• Declining Birth Rates
  – Two Successful Strategies for Lowering Birth Rates
    1. **Improving Education and Health Care**
       – Emphasizes improving local economic conditions so that increased wealth is allocated to education and health programs seeking to lower birth rates.
    2. **Contraception**
       – More immediate results reaped than previous approach
       – Met with greater resistance, because it goes against cultural or religious beliefs of some.
         » Roman Catholics, fundamentalist Protestants, Muslims, and Hindus.
More than two-thirds of couples in developed countries use a family-planning method. Family-planning varies widely in developing countries. China reports the world’s highest rate of family planning; the lowest rates are in sub-Saharan Africa.
Japan’s population pyramid has shifted from a broad base in 1950 to a rectangular shape. In the future, the bottom of the pyramid is expected to contract and the top to expand.
Why Does Population Growth Vary among Regions?

- **Malthus on Overpopulation (1798)**
  - Claimed the population was growing faster than the increase in food supply.

- **Malthus’ Critics**
  - Many geographers consider his beliefs too pessimistic.
    - Malthus’s theory based on idea that world’s supply of resources is fixed rather than expanding.
  - Many disagree that population increase is not a problem.
    - Larger populations could stimulate economic growth, and therefore, production of more food.
Why Does Population Growth Vary among Regions?

- **Malthus on Overpopulation**
  - Theory and Reality
    - Food production has increased over last 50 years faster than Malthus predicted.
    - His model predicted world population to quadruple over the course of 50 years.
    - Not even in India has population growth outpaced food production.
Production of wheat and rice has increased more rapidly than has population.
Why Does Population Growth Vary among Regions?

• **Population Futures**
  – Demographic Transition Possible Stage 5: *Decline*
    • Characterized by…
      – Very low CBR
      – Increasing CDR
        » More elderly people than young persons
      – Negative NIR
      – Over time, few young women in child-bearing years
        » Contributing to ever falling CBR
    • Several European countries already have negative NIR.
      – Russia is most notable hosting a negative NIR for 50 years.
Can you answer these questions?

• Describe the four stages of the demographic transition.

• Summarize two approaches to reducing birth rates.

• Summarize Malthus’s argument about the relationship between population and resources.

• Summarize the possible stage 5 of the demographic transition.
• Why Do Some Regions Face Health Threats?
Can you answer these questions by the end of class?

• Summarize the four stages of the epidemiologic transition.

• Summarize the reasons for a possible stage 5 of the epidemiologic transition.

• Understand reasons for variations in health care.
Why Do Some Regions Face Health Threats?

• **Epidemiologic Transition**
  - Medical researches have identified distinct health threats in each stage of the demographic transition.
  
  - **Stage 1: Pestilence and Famine (High CDR)**
    - Principal cause of death: infectious and parasitic diseases
      - Ex. black plague (bubonic plague)
Why Do Some Regions Face Health Threats?

- **Epidemiologic Transition**
  - *Stage 2: Receding Pandemic (Rapidly Declining CDR).*
    - Factors that reduced spread of disease, during the industrial revolution
      - Improved sanitation
      - Improved nutrition
      - Improved medicine
    - Famous cholera pandemic in London in mid nineteenth century.
In 1854, Dr. John Snow mapped the distribution of cholera victims and water pumps to prove that the cause of the infection was contamination of the pump near the corner of Broad and Lexington streets.
Why Do Some Regions Face Health Threats?

• **Epidemiologic Transition**
  – *Stage 3: Degenerative Diseases (Moderately Declining CDR)*
    • Characterized by…
      – Decrease in deaths from infectious diseases.
      – Increase in chronic disorders associated with aging.
        » Cardiovascular diseases
        » Cancer
Why Do Some Regions Face Health Threats?

- **Epidemiologic Transition**
  - *Stage 4: Delayed Degenerative Diseases (Low but Increasing CDR)*
  - Characterized by…
    - Deaths caused by cardiovascular diseases and cancer delayed because of modern medicine treatments.
Why Do Some Regions Face Health Threats?

• Infectious Diseases
  – **Reasons for Possible Stage 5**
    • *Evolution*
      – Infectious disease microbes evolve and establish a resistance to drugs and insecticides.
      – Antibiotics and genetic engineering contributes to the emergence of new strains of viruses and bacteria.
    • *Poverty*
      – Infectious diseases are more prevalent in poor areas because of presence of unsanitary conditions and inability to afford drugs needed for treatment.
    • *Increased Connections*
      – Advancements in modes of transportation, especially air travel, makes it easier for an individual infected in one country to be in another country before exhibiting symptoms.
Why Do Some Regions Face Health Threats?

• **Health Care**
  – Health conditions vary around the world, primarily, because countries possess different resources to care for people who are sick.

• Expenditures on Health Care
  – More than 15 percent of total government expenditures in Europe and North America.
  – Less than 5 percent in sub-Saharan Africa and South Asia.
Why Do Some Regions Face Health Threats?

• **Health Care**
  – *Health Care Systems*
    • **Developed Countries**
      – Public service available at little or no cost.
      – Government pays more than 70 percent of health-care costs in most European countries, and private individuals pay about 30 percent of the expense.
    • **Developing Countries**
      – Private individuals must pay more than half of the cost of health care.
  » *U.S. is an exception to these generalizations, because private individuals are required to pay about 55 percent of health care costs making it more closely resemble a developing country, in regards to health care.*
Summary

• Global population is concentrated in a few places that are not too wet, too dry, too cold, or too mountainous.

• Nearly all NIR is concentrated in developing countries.

• Developed countries have a stable population, if not slightly declining.

• Population growth varies among regions, because not all countries are in the same stage of the demographic transition model.
Summary

• Intimately connected to the demographic transition model is the epidemiologic transition model that helps to explain why different regions face varying health threats.
The lowest levels of per capita health care expenditure are in sub-Saharan Africa and South Asia.
HOSPITAL BEDS PER 10,000 PEOPLE

The lowest rates are in sub-Saharan Africa and South Asia
The lowest rates are in sub-Saharan Africa.
Because AIDS arrived in the United States primarily through air travelers, the pattern of diffusion of AIDS closely matches the distribution of international air passenger arrivals.
The lowest levels of government expenditures are in Africa and Asia
Cancer is an example of a cause of death for men that is higher in developed countries than in developing ones.
Obesity is a health problem in the United States and in Southwest Asia.
The highest percentages are in Europe.
Can you answer these questions?

• Summarize the four stages of the epidemiologic transition.

• Summarize the reasons for a possible stage 5 of the epidemiologic transition.

• Understand reasons for variations in health care.