Topic III Population – Study Notes/Test Practice

B. Human Population:

Immigration – people coming into a country; emigration – people moving out of a country

Crude birth rate (CBR) – the number of births per 1,000 individuals per year

Crude death rate (CDR) – the number of deaths per 1,000 individuals per year

Historical population sizes: the global human population has grown more rapidly in the last 400 years

than at any other time in history; every 5 days the global human population increase by roughly a

million lives: 1.8 million infants are born and 800,000 people die.

Distribution – (2012 data) China: 1.3 billion people, 20% of the world’s population, most populous

nation, population MAY begin to decline in 2040; United States: population 307 million people

Total fertility rate (TFR) – an *estimate* of the average number of children that each woman in a

population will bear throughout her childbearing years

Replacement level fertility – the TFR required to offset the average number of deaths in a population so

that the current population size remains stable

Developed countries – countries with relatively high levels of industrialization and income

Developing countries – relatively low levels of industrialization and incomes of less than $3.00 per

person per day are the norm; in these countries, mortality among young people tends to be higher

Life expectancy – the average number of years that an infant born in a particular year in a particular

country can be expected to live

Infant mortality – the number of deaths of children under 1 year of age per 1,000 live births

Child mortality – the number of deaths of children under age 5 per 1,000 live births

Growth rate formula – CBR-CDR / 10\* (\* since birth and death rate are expressed per 1,000 people,

divided by 10 in order to represent the value as a percentage)

National Population Growth rate – include immigration and emigration numbers … (CBR + Immigration)

minus (CDR + emigration) divided by 10

Doubling times – the number of years it takes a population to double (Formula – Called the *Rule of 70*:

Doubling Time = 70 / growth rate) { a population growing at a rate of 2 percent per year will double

every 35 years …. 70 / 2 = 35 }

Theory of Demographic Transition – as a country moves from a subsistence economy to industrialization

and increased affluence, it undergoes a predictable shift in population growth

Demographic transition – patterns of population growth; four phases:

(Phase 1) a country experiences slow growth or no growth, – high birth rates and high death

rates offset each other (CBR = CDR), high infant mortality, typical of countries before they begin

to modernize;

(Phase 2) period of rapid growth, many countries in Africa and some in Asia, such as China and

India; death rates decline while birth rates remain high; as a country modernizes, better

sanitation, clean drinking water, increased access to food and goods, and health care all reduce

infant mortality and CDR;

(Phase 3) population stabilization, birth rates and death rates decrease; United States, Canada,

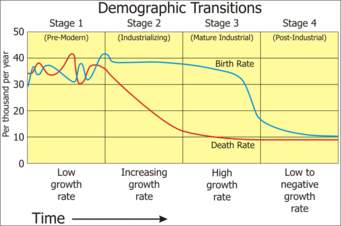
and Australia; economy and education system improve people have fewer children, and

(Phase 4) population declines, some western European nations are currently in this phase

(Japan, the United Kingdom, Germany, Russia, and Italy); characterized by a relatively high level

of affluence and economic development; CBR is well below CDR – fewer young people and a

higher proportion of elderly people

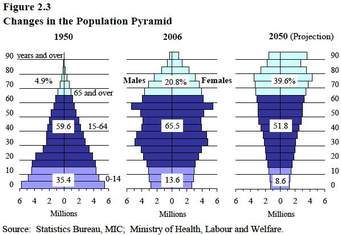


Age-structure – describes how a population is distributed across age ranges, usually in 5 year increments

Age-structure diagrams – visual representations of age structure within a country for males and females

Three categories of diagrams – (1) population pyramid, (2) column-shaped, and (3) inverted pyramid

1. more younger people than older, diagram wide at the bottom and small at the top; rapidly growing population; typical of developing countries (India and Venezuela)
2. a country with little difference between the number of individuals in younger age groups and in older age groups; population stability - slow population growth or approaching no growth (USA, Canada, Australia, Sweden, and many other developed countries)
3. a country with a greater number of older people than younger people; low total fertility rate and decreasing number of females within each younger age range; population will continue to shrink (Italy, Germany, Russia, and a few other developed countries show this pattern, China is in the very early stages of showing this pattern)



Affluence – money, goods, or property

Impacts of population growth – IPAT equation - Impact = Population X Affluence X Technology

Disease – an important regulator of human populations; infectious diseases (those caused by microbes

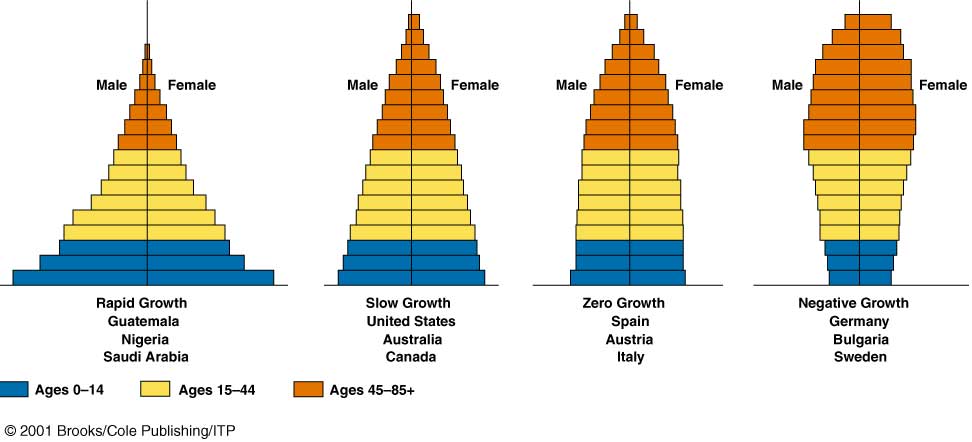
transmissible from one person to another) are the second biggest killer worldwide after heart

disease

Economics effects – the most commonly used measure of a nation’s weather is its Gross Domestic Product (GDP) or the value of all products and services produced in a year in that country;

Test Practice: Preparing for the Exam…..Multiple Choice Questions

1. A metropolitan region of 100,000 people has 2,000 births, 500 deaths, 200 emigrants, and 100 immigrants over a 10year period. Its population growth rate is
   1. 1.2 percent
   2. 1.4 percent
   3. 1.6 percent
   4. 1.8 percent
   5. 2.0 percent
2. Which of the following pairs of indicators *best* reflects the availability of health care in a country?
   1. Crude death rate and growth rate
   2. Crude death rate and crude birth rate
   3. Growth rate and life expectancy
   4. Infant mortality rate and crude death rate
   5. Infant mortality rate and life expectancy
3. Which of the following characteristics are typical of developed countries?
4. High technology use
5. Low GDP
6. Small-scale sustainable agriculture
   1. I only
   2. II only
   3. I and III only
   4. II and III only
   5. I, II, and III
7. In 2010, the population of Earth was about \_\_\_ billion, with about \_\_\_ billion living in China.
   1. 6.1 , 1.1
   2. 6.1 , 1.2
   3. 6.3 , 1.3
   4. 6.8 , 1.2
   5. 6.8 , 1.3
8. A country with an age structure diagram like the one below is most likely experiencing
   1. A high life expectancy
   2. Slow population growth
   3. A short doubling time
   4. A low infant mortality rate
   5. Replacement-level fertility

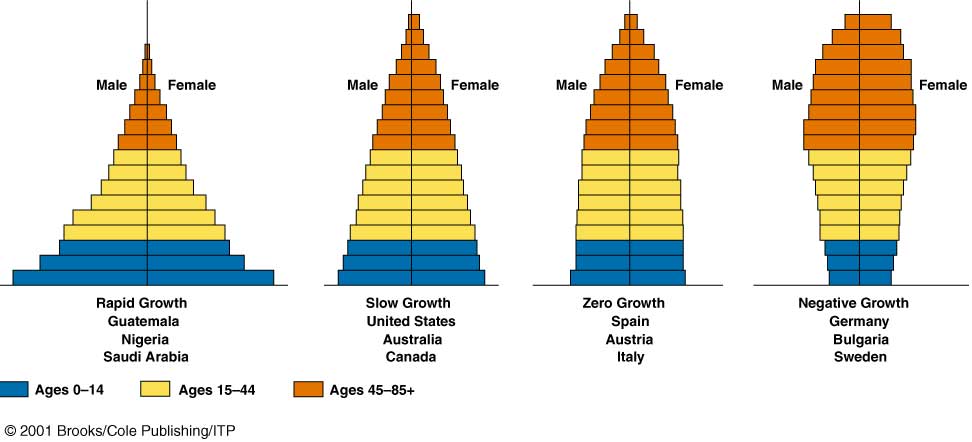
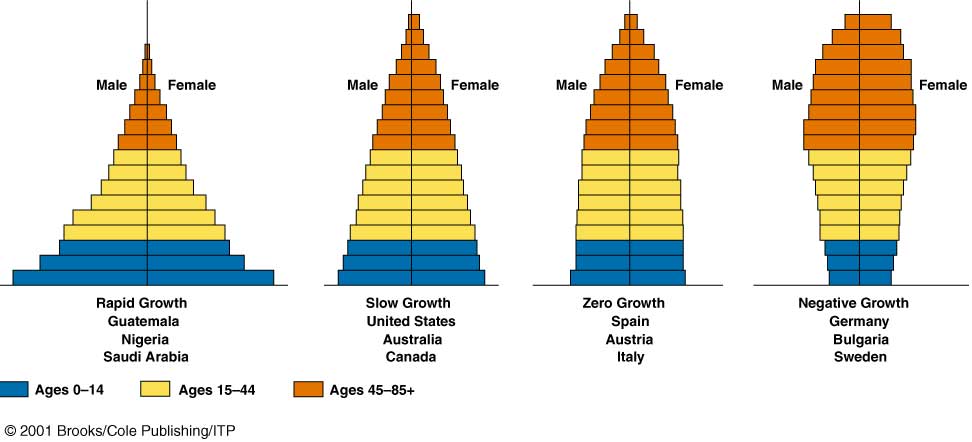


1. Which of the following statements about total fertility rate is *correct*?
   1. TFR is equal to the crude birth rate minus the crude death rate.
   2. TFR is the average number of children each woman must have to replace the current population.
   3. TFR is generally higher in developed countries than in developing countries.
   4. TFR is equal to the growth rate of a country.
   5. TFR is the average number of children each woman will give birth to during her childbearing years.
2. Even if a country reduces its birth rate and maintains replacement-level fertility, its population will still continue to grow for several decades because of
   1. Lower death rates
   2. Increased income
   3. Population momentum
   4. Better health care
   5. Increased life expectancy
3. At current growth rates, which country will probably be the most populous in the world after 2050?
   1. China
   2. Brazil
   3. India
   4. Indonesia
   5. United States
4. What percentage of the world population lives in developing countries?
   1. 34
   2. 50
   3. 66
   4. 82
   5. 98
5. Which of the following countries best exemplifies phase 4 of a demographic transition?
   1. Argentina
   2. China
   3. India
   4. Japan
   5. Mexico

Test Practice: Preparing for the Exam - Free Response Questions

1. Answer the following questions about the theory of demographic transition.
   1. Draw a fully labeled diagram that shows how birth and death rates change as a country undergoes the four phases of a demographic transition. (3 points)
   2. For each of the phases labeled in your diagram, explain the changes occurring in each phase and describe what is causing them. (3 points)
   3. Describe a strategy that a government might implement to slow its population growth that could be utilized by a country undergoing a demographic transition. Explain how your proposed strategy would work, and describe one potential drawback to its implementation. (4 points)
2. Look at the age structure diagrams from country A and country B below and answer the following questions.

Country A Country B

* 1. What observations and educated predictions can you make about the following characteristics of country A?
     1. The age structure of its population (1 point)
     2. The total fertility rate of the country (1 point)
     3. The life expectancy of the population (1 point)
     4. The growth rate and doubling time of the population (2 points)
  2. Describe one socioeconomic feature of country A. (2 points)
  3. Explain how country B differs from country A in terms of
     1. The age structure of its population (1 point)
     2. Its infant mortality rate (1 point)
     3. Its rate of population growth (1 point)

Do the Math……..

*Formula: Growth rate = (Crude birth rate + immigration) – (Crude death rate + emigration)*

*10*

*Formula: Doubling time (in years) = 70*

*Growth rate*

1. Using the growth rate formula calculate the growth rate of a country with a CBR of 15, a CDR of 10, an immigration rate of 5, and an emigration rate of 2.
2. Calculate the doubling time of the country in problem # 1.
3. If a population of 10,000 has 300 births, 200 deaths, 50 immigrants, and 60 emigrants, what is the population growth rate?
4. If a country’s population growth rate is 5%, what is the country’s doubling time?