Examination of Human Population

Assignment

Create a coherent and complete report that explores significant aspects of human population growth by following guided questions. Your report should flow nicely from one topic to another and should NOT contain a question and answer format. Answer all questions in the form of descriptive or explanatory paragraphs. Be sure to cite information within the body of the report and to list references at the end in the form of a bibliography. You may use any widely accepted method for citation (APA, MLA, CBE, etc) or the abbreviated method described on the course website.

Your report should include the following sections (with section headings): title (and your name), Introduction, World and Regional Population Trends, Total Fertility Rate and Replacement Fertility, Trends in the United States, Conclusion and Bibliography.

Several resources are provided in this lab assignment, you are encourage to use these and to find additional information on the web, in your textbook, or other sources. REMEMBER to cite information. Citation provides an indication of your research into the topic and provides the reader with a way to further explore a topic by going to your references.

Tables and figures should each have a caption that describes the information within. If the table or figure is taken from another document, be sure to provide citation information.

Resources

Population Reference Bureau's *2012 World Population Data Sheet*. Other valuable resource materials:

- Interactive Map for the *2012 World Population Data Sheet*.
- Video: "Noncommunicable Diseases and Youth in Developing Countries."
- Video, "The World at 7 Billion."
- 2012 Population Clock
- Fact sheets describing world population trends, noncommunicable diseases, unmet need for family planning, and the decline in U.S. fertility.
- Graphics from the *2012 World Population Data Sheet*.
- PRB's *Population Handbook*, 6th edition (2011)
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These lessons may also be used with PRB's online DataFinder, a searchable database that includes all the data from the most recent PRB World Population Data Sheet. Data can be displayed as a map, chart, or table, and downloaded into Excel.

Demographic Basics

Demographers are researchers who study population and its changes. Some terms that they use are birthrate, death rate, replacement-level fertility, and total fertility rate. We will discuss them here:

Birth rate: Commonly used as the crude birth rate, this is the number of births per 1,000 people within a certain population.

Death rate: Commonly used as the crude death rate, this is the number of deaths per 1,000 people within a certain population.

The formulae for determining crude birth rate and crude death rate for a given time interval, such as a year, are as follows:

$$\frac{\text{total number of births in a population}}{\text{total population}} \times 1,000 = \text{crude birth rate}$$

$$\frac{\text{total number of deaths in a population}}{\text{total population}} \times 1,000 = \text{crude death rate}$$

Replacement-level fertility: This is the average number of births couples in a population must have in order to keep the population stable at a certain number. In more developed countries, this number is approximately 2.1. In any human population, the replacement-level fertility always exceeds 2.0 because some offspring do not make it to the age of 15, which is the age demographers define as the beginning of the reproductive years; therefore, more offspring are needed to cover for the shortfall. In less developed countries, the replacement-level fertility is higher than 2.1 because of harsher conditions and increased childhood mortality.

Total fertility rate: This is the average number of children a woman in a population has in her lifetime.

Excluding immigration and emigration from the equation, if the total fertility rate exceeds the replacement-level fertility in a population, then the population is growing. If the total fertility rate is below the replacement-level fertility, then the population is reducing. Germany, for example, is a growing in population only because of immigration because its total fertility rate is well below replacement-level fertility.

An excellent web site for finding statistics related to population is the following:

http://www.geographyiq.com

When you arrive at the site, click on where it says "Rankings" on the menu at the upper left. At the next web page, scroll down until you see the "Population" topic heading. You will see categories related to population such as birth rate, death rate, and total fertility rate listed. Statistics for each country in the world are provided.

Determining in Percentage Terms How Fast a Population is Growing or Declining

Here is the formula for determining how fast a population is growing or shrinking annually:

| Annual Rate of Population Change | = | Births - Deaths | x | 100 | = | X% |

$$\text{Annual Rate of Population Change} = \frac{\text{Births} - \text{Deaths}}{1,000} \times 100 = X\%$$

We all learned at one time or another that we can simply a formula by crossing out zeroes in the numerator and denominator, so we are left with the following version:

$$\text{Annual Rate of Population Change} = \frac{\text{Births} - \text{Deaths}}{10} = X\%$$

Example: Let us say that a certain population has 28 births and 8 deaths per 1,000 people in that population for a certain year. How fast is that population growing or shrinking for that year?

$$\text{Annual Rate of Population Change} = \frac{28 - 8}{10} = 2\%$$

The population is growing at 2% per year.

Doubling Time and the Rule of 70

Mathematicians are very clever. In economics, they found that if one divides an annual percentage rate into a certain number, then the number of years for that amount to double could be determined. Likewise for population, if the growth rate is divided into the number 70, then the number of years it would take for the population to double could be precisely determined if the growth rate stays the same from year to year; hence, a population growing at 1% per year would take 70 years to double.

Example: A population of 10 million is growing 3.5% per year. If it stays at this rate from year to year, how many years would it take for the population to reach 20 million?

$$\frac{70}{3.5} = 20 \text{ years}$$

Yes, it is that simple to figure. If the population grows consistently at 3.5% per year, then 20 years is all the time it takes for the population to double.

Go to http://www.geographyiq.com and click on "Rankings" that you see in the menu on the left. Look at the list under the title Rankings and find Population. Look to the right of the word Population and click on the link labeled "All Descending". You will then see a list of the countries of the world and their populations.

World and Regional Population Trends

Answer the following questions without using a question and answer format, rather place the information into a paragraph format. Rank the ten countries with the largest population (from largest to smallest) and list these countries in table. Which is the most populous country in the world? What are the most populous countries in North America, South America, Central America, Europe, Africa, Asia?

Can you draw any conclusions based upon the economy and population of these countries?

Country	Birth Rate	Death Rate
Germany		
Somalia		
United States		
Mexico		
China		

Table 1: This is an example of how you might display the information on birth and death rates.

Return to http://www.geographyiq.com web site (or another website). Click on "Rankings" in the menu at the left of the page. You will see under the title Rankings "Birth Rate" and "Death Rate". Go to those web pages to get the following information (include this table in your report).

Briefly describe each of these nations. What are they like economically, geographically, and socially? Describe the trends you see in these data. What conclusions can you draw from a comparison of birth rates and death rates among these countries? After examining the data, can you make any statements regarding birth rate, death rate, lifestyles, economic status, and social structure?

Based on what you've noticed from observing the population statistics for countries of the world, what can you say about what is happening with population in general around the world? Is world population growth uniform around the globe?

Use the current World Population Data Sheet to complete the following:

1. Choose four countries whose populations are growing at a 1.0 percent rate of natural increase or less (some with negative rates of natural increase are decreasing).
2. Choose four countries whose populations are growing at 3.0 percent or more. Do not include the countries of Western Asia or the Middle East because they represent special cases and will be discussed later in item #5.
3. Calculate, display, and explain the doubling time for at least one of each of the countries examined in steps 1 and 2.
4. Create a table which includes the following data for each of the above selected countries: infant mortality rate, total fertility rate, population under age 15, life expectancy, percent of urban population, and Gross National Income in purchasing power parity per capita (GNI PPP). Examine the table created above for important differences, and note what you observe for each variable by group. For example (obviously, your table does not need to look exactly like this one):

	High-Growth Countries	Low-Growth Countries
Infant Mortality	High infant mortality	Low infant mortality
Total Fertility		
Population Under 15		
Life Expectancy		
Urban Population		
Per Capita GNI PPP		

Table 2: Another example of a table format. In this case the information pertains to demographic parameters within high and low growth nations.

4. Compare the characteristics for the above groups with countries that have a moderate rate of population growth.
5. Describe how some countries such as Saudi Arabia and some of the oil-rich countries are exceptions to the generalizations you have made about fast-growing countries. Why are they different?

Total Fertility Rate and Replacement-Level Fertility

Once again return to the www.geographyiq.com web site. On the "Rankings" find Total Fertility Rate in the list under Rankings. Click on the link "All Ascending" that you see to the right of Total Fertility Rate. Again without using a Q&A format, which country in the list comes closest to equaling the replacement-level fertility of 2.1? Which country has the fewest number of children born per woman? Regarding the highly populated countries of India and China, find the total fertility rates of the two countries. Based on those figures, which of the two countries has been more effective in decreasing its total fertility rate? 2. Looking at the list of the countries and their total fertility rates, which countries can you generalize to be less stable politically: those with low total fertility rates or those with high total fertility rates?

Search the web and/or examine the Census Bureau webpage to find the following information: Which country has the "youngest" population, that is, the highest proportion of population under age 15? Which country has the "oldest" population, that is, the highest proportion of population over age 64? In which country are people expected to live the longest? Which country has the lowest life expectancy?

Trends in the United States

Use the US Census Bureau or the PBR website to determine: What is the current US population? (Give date you recorded this). How much has it increased?How many men and how many women are in the US population? What percentage?
What are the five most populous states? Do these five populous states also contain large cities or metropolitan areas?

Use the US Census data to describe the US population: what percentage are: White, Black, American, Indian, Asian, Hispanic or Latino origin, etc?

Using the report found at: http://www.census.gov/prod/2008pubs/p20-558.pdf   or information found elsewhere, describe the major fertility trends in the US population. What impacts might these trends have on future population growth and composition?

Conclusion

In a paragraph or two explain your important findings. Describe your reactions to the laboratory exercise and aspects you found interesting, troubling, or surprising. Finally, do you think, human population is an issue deserving of concern?

 Bibliography

http://esa21.kennesaw.edu/activities/populationstats

http://www.prb.org/Educators/LessonPlans/2012

Census.gov