

DEMOGRAPHIC FACTS OF LIFE

Part 1: Doubling Time

Birth and death rates determine the rate of population growth. If the birth and death rates are similar, a population experiences little or no growth. When the birth rate far exceeds the death rate, the population soars. These rates are expressed as the number of births or deaths for every 1000 people in a given year. For instance, according to the 2012 Population Reference Bureau the world's birth rate is 20 per 1000 and the death rate is 8 per 1000. This information can be used to determine the % annual growth rate. These values can also be used to determine the number of years that it will take the population to double (the doubling time in years). The doubling time in years can be calculated by using the rule of 70. This rule states that the doubling time is equal to 70 divided by the % annual growth rate. Using the formulas below, we can calculate the world's annual growth rate and the number of years it will take the population to double if the growth rate remains constant.

$$\% \text{ annual growth rate} = \frac{\# \text{ of births} - \# \text{ of deaths}}{1000} \times 100$$

$$\frac{20 - 8}{1000} \times 100 = 1.2 \%$$

$$\text{Doubling Time (in years)} = \frac{70}{\% \text{ annual growth rate}} = \frac{70}{1.2 \%} = 58 \text{ years}$$

Using the following information, calculate the % annual growth rate and the doubling time for each of the countries listed. The first value is the birth rate for that country and the second value is the death rate for that country. Show your work.

China	12	7
India	20	8
Iraq	31	5
Italy	9	10
Japan	8	10
Kenya	35	8
Mexico	18	5
Russia	13	13
South Africa	21	13
United Kingdom	12	9
United States	13	8
Niger	50	11
Austria	9	9

Serbia	9	14
Senegal	38	9

Questions:

1. Why are some countries doubling much more rapidly than others? Be specific about your reasons. Are there any countries that have reached zero population growth (zpg)?
2. How would you explain the wide disparity in birth rates among different countries? Give specific reasons for your answer citing information that you know about these countries. Why are death rates relatively low in many countries with high birth rates? Be specific about your answer.
3. If you were a leader of any of those countries would you be concerned about the high growth for your countries? If so which ones? Why or why not? Similarly, if you were a national leader in Italy, or Austria would you be concerned that your country has no growth? Why or why not? Explain your reasoning using specific information about the countries in question.
4. The population of the U.S. is actually growing at the rate of about 1 % each year more than its rate of natural increase. Where is the additional population growth coming from?

Part 2: Grim Reaper’s Revenge

Below is a listing of some of the world’s worst disasters, along with an approximate death toll. At today’s present rate of growth, determine how many days, weeks, or months (depending on the time frame) it would take to replace those lost. Round off to one decimal place. We are currently adding to the world 212,970 people each day.

All U.S. unintentional injury deaths, 2009	118,021
Bangladeshi cyclone, 1991	140,000
American Deaths in military engagements	848,163
Great flood, Hwang Ho River, 1887	900,000
India Famine, 1769-70	3,000,000
Total AIDS deaths through 1996	6,400,000
China Famine, 1877-78	9,500,000
Influenza epidemic, 1918	21,000,000
Bubonic plague, 1347-51	75,000,000

Part 3: Population Statistics

To answer the following questions, 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. Answer the following questions.

1. Which is the most populous country in the world?
2. Of the *two* most populous countries, how much of the world’s population do these two most populous countries comprise if the world population is 7,289,804,728? Show your work.
3. What percentage of the world’s population belongs to the United States? Show your work.
4. Click on “Rankings” in the menu at the left. You will see under this title the words “Birth Rate” and “Death Rate”. Use the information provided under these terms to fill in Data Table 1 table.

Data Table 1: Birth Rates and Death Rates

Country	Birth Rate	Death Rate
Australia		
Canada		
Germany		
Iran		
Somalia		

5. Using the formula for calculating the percent annual growth rate and the information in Data Table 1, determine the percent change for the countries in the table. If the population has a higher death rate than birth rate, be sure to show a

negative value for population change. Show your work. Put your final answers in Data Table 2.

Data Table 2: Percent Annual Growth Rate

Country	% Annual Growth Rate
Australia	
Canada	
Germany	
Iran	
Somalia	

6. Go back to the list under the title “Rankings” and click where it says “All Ascending” next to Population Growth Rate. Find the listed population growth rate for Germany. How does this growth rate shown for Germany compare with Germany’s annual growth rate that you calculated in question 5? How much do they differ? Show your work.
7. Why do these numbers differ? In other words, what is taken into account when they calculated the population growth rate for Germany as opposed to the growth rate that you calculated for Germany just using the birth rate and death rate numbers? Without this factor(s), would Germany still be growing? Explain your answer.
8. 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”. Which country in the list comes closest to equaling the replacement level fertility rate of 2.1?
9. Which country has the fewest number of children born per woman?
10. Regarding the highly populated countries of India and China, find each country’s total fertility rate. Based on those figures, which of the two countries has been more effective in decreasing its total fertility rate?
11. Looking at the list of 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? Explain your answer

12. Which of these statements is true?

- The population explosion is continuing worldwide.
- A negative growth rate is being shown in approximately 95% of the countries in the world.
- The worldwide population is stable with total fertility rates equaling replacement-level fertility, neither growing nor shrinking significantly.
- Some countries are still growing at a high rate, but other countries have total fertility rates well below replacement level fertility.