11

Population Trends and Issues

GUIDING QUESTIONS

Economy & Human Geography

- What are the components of population change.
- What is the formula used to calculate population growth in a country?
- Explain the stages of the demographic transition model.
- What measures have countries adopted to try to control their population growth, and to what degree have they been effective?
- Identify the different types of population pyramids. What does each type represent?
- What is the dependency ratio and why is it important?
- What effect does an aging or young population have on a country?
- Why is immigration important to Canada’s population and economy?
- What problems are associated with population growth?
- What is the difference between population distribution and density?

TIMELINE

- 1804
  World population at 1 billion
- 1927
  World population at 2 billion
- 1960
  World population at 3 billion
- 1974
  World population at 4 billion
- 1979
  One-child policy established in China
- 1987
  World population at 5 billion
CHAPTER FOCUS QUESTION
What is the significance of changes in global population for Canada and the world?

The United Nations declared that the world’s population had reached 6 billion in 1999 and estimated it would number 7 billion by 2013. Some people see the growth in population as a contributor to shortages in energy, housing, and food, and to an increase in pollution, unemployment, global warming, and the destruction of the environment. The question such people pose is, At what point will the world’s resources fail to support its population?

Others scoff at such a doomsday scenario. According to these optimists, the world’s population will increase to 9 billion in 2054 and level off at 10 billion in 2200. By then, they predict, technology will have found ways to provide for the increased numbers of people. Both sides find hope and despair in the United Nations’ projections.

The uneven growth of population is also a concern. In some parts of the world the population is in decline, while in others it is increasing. In this chapter, you will learn about the impact population growth has on Canada and the world, and measures governments have taken to control it.

KEY TERMS
- demography
- developed country
- developing country
- birth rate
- death rate
- immigration rate
- emigration rate
- natural increase
- exponential rate
- rule of 70
- doubling time
- net migration
- population growth rate
- life expectancy
- demographic transition model
- mortality
- family planning
- total fertility rate
- one-child policy
- population pyramid
- age cohort
- dependency ratio
- carrying capacity
- population distribution
- population density
- nutritional density
World Population Growth

Two thousand years ago, there were about 300 million people on Earth. In 1804, there were 1 billion. From that point on, the rate of increase began to accelerate. The 20th century began with a world population under 2 billion people and ended with triple that number. Today, 76 million people are added to the Earth’s population every year. This rate of increase is of greater concern than the numbers themselves.

It is difficult to grasp the difference between large numbers like a million and a billion. How do we understand the difference in size of population between India at over 1 billion and Fiji at nearly 1 million? It might help to understand these numbers by noting that you had lived a million seconds when you were 11.6 days old. You won’t be a billion seconds old until you are 31.7 years of age.

Demography

Demography is the statistical study of the characteristics, trends, and issues of human populations. It helps us understand the causes and consequences of population change. Population change in your community, in Canada, and in the world is an ongoing concern to agencies such as government and business. All levels of government need accurate figures of population change so that they can plan for such things as the numbers of schools and hospitals that are needed. Businesses are interested in information about family size, incomes, and consumer habits as they plan their marketing strategies.

United Nations’ Estimates of Future Growth

<table>
<thead>
<tr>
<th>World Population</th>
<th>When reached?</th>
<th>How long to reach?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 billion</td>
<td>1804</td>
<td>Human history to this date</td>
</tr>
<tr>
<td>2 billion</td>
<td>1927</td>
<td>123 years</td>
</tr>
<tr>
<td>3 billion</td>
<td>1960</td>
<td>33 years</td>
</tr>
<tr>
<td>4 billion</td>
<td>1974</td>
<td>14 years</td>
</tr>
<tr>
<td>5 billion</td>
<td>1987</td>
<td>13 years</td>
</tr>
<tr>
<td>6 billion</td>
<td>1999</td>
<td>12 years</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>World Population</th>
<th>When reached?</th>
<th>How long to reach?</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 billion</td>
<td>2013</td>
<td>14 years</td>
</tr>
<tr>
<td>8 billion</td>
<td>2028</td>
<td>15 years</td>
</tr>
<tr>
<td>9 billion</td>
<td>2054</td>
<td>26 years</td>
</tr>
<tr>
<td>10 billion</td>
<td>2200</td>
<td>146 years</td>
</tr>
</tbody>
</table>

FIGURE 11–1 World population growth

Making a Graph Make a line graph of the actual growth in population from 1804 to 1999 and the four estimates for 2013 to 2200. Then, brainstorm reasons for (a) the rapid growth in the 20th century, (b) reasons for the different UN estimates, and (c) the possible consequences of rapid growth.

WEB LINK You can find population estimates on the Pearson Web site.

FIGURE 11–2 People fill the platforms of a rail station in Mumbai, India (left) and Vancouver’s SkyTrain (right).

Interpreting Photographs What differences do you see between these two photographs? How might these differences affect the lifestyles of people living in either place?
The Census: Counting People

The most complete way to gather information about population is to conduct a population census. Censuses go back to the ancient civilizations of Egypt and Rome, when rulers used them to determine the number of people under their rule and to identify taxpayers, labourers, and soldiers.

Since 1871, Canada has had a major census every 10 years. Currently, a less detailed one is also conducted every 5 years. A federal agency called Statistics Canada conducts the census, which provides a snapshot of a particular point in time of the Canadian population. All Canadians are required by law to be counted in the census. A random selection of people is chosen to give more detailed information, such as housing, household contents, income, and buying habits. In 2006, 98 percent of Canadians completed the census questionnaire, and, for the first time, they were able to do so online.

Deciphering Demographic Data

Demographic figures must be treated with caution. A developed country such as Canada has the resources to keep its data current, yet its figures will still have a margin for error. For example, it is difficult to ensure all homeless people are counted. In developing countries, the census data are usually much less accurate because the registration of births and deaths is not as complete as in developed countries. Census takers may not be able to reach remote areas. People in shantytowns are not counted because they are not considered permanent residents of cities. Some people may also avoid census takers out of fear of authorities, the wish to avoid taxation, or conflicts with governments over population policies.

Making comparisons between countries for such things as literacy or the size of an urban location can be difficult, as definitions may differ. Published numbers of people in fast-growing cities can often vary widely. Figures may be outdated, especially if a country does not have accurate birth rate and death rate statistics or has not held a recent census.

KEY TERMS

demography: the study of population numbers, distribution, trends, and issues

census: the process of collecting, compiling, and publishing demographic, economic, and social data about all people living in a particular area

developed country: a country with a highly developed economy and infrastructure and high living standards

developing country: a country with a less sophisticated economy and lower standard of living than developed countries; may have extensive poverty

birth rate: the number of births per 1000 people in a country in a given year

death rate: the number of deaths per 1000 people in a country in a given year

WEB LINK
To read more about the Canadian census, visit the Pearson Web site.

FIGURE 11–3 A census taker fills in a questionnaire for Kenya’s 2009 census. Ethnic violence during the 2008 election made the 2009 census controversial due to one question that asked to which ethnic group people belonged.
Graphs are an effective way of analyzing and communicating information. Four purposes of graphs are to show quantities, make comparisons, describe trends, and observe relationships.

- **Showing quantities:** Graphs for this purpose show amounts or values at a specific time and are always expressed in a unit of measurement (number of people, or amount of production, or varying rates). The best graph type shows the amounts most clearly. Line graphs are not usually used for this purpose.

- **Making comparisons:** Graphs can effectively compare sets of data with the same units of measurement, for example comparing levels of foreign investment in Canada in a bar graph. The best graphs show the comparison most clearly.

- **Describing trends:** Graphs can effectively show how data changes over time. Line graphs are particularly good for this purpose. Trends is a term used to describe significant patterns in the data.

- **Observing relationships:** Relationships are links between variables. For example, to look at the levels of development in various countries, we might plot the two variables of income levels and birth rates on the same graph. Scatter graphs are particularly useful for observing relationships.

Try to select the type of graph that best fits your purpose. The following are some examples in this text:

- Line graph – Figure 7–20
- Simple bar graph – Figure 11–6
- Stacked or divided bar graph – Figure 8–6
- Divergent bar graph – Figure 13–27
- Pie or circle graph – Figure 11–25
- Scatter graph – Figure 12–41

**Making Graphs that Work**

1. Keep content simple and straightforward. Do not try to combine too many ideas in one graph.
2. Place time along the bottom, from left to right.
3. Data that is continuous, such as population growth, can be shown in a line graph.
4. Connect only related events. For example, a graph of life expectancy at birth for different countries should be a series of unrelated points, not a line graph.
5. Liven up charts by adding colour, illustrations, icons, different fonts, and varying types of lines.

**Applying the Skill**

1. **a)** Examine the data in Figures 11–4 and 11–5, and decide on the type of graph that will most effectively compare and contrast the birth and death rates for Canada and Cameroon in one graph.
   
   **b)** Construct an effective graph following the principles outlined above.
   
   **c)** Briefly describe why you chose this format and why it is effective.
2. Figure 11–6 is a simple bar graph showing immigrant arrivals in Canada.
   a) For which of the four purposes was this graph constructed?
   b) Does a simple bar graph show the values clearly? Explain your answer.
   c) Suggest one other type of graph that would show this data equally well or better. Explain why you decided on your choice of graph.
   d) Create the alternative graph.

3. Refer to the table in Figure 11–12. Choose an appropriate style of graph based on the data. You do not need to complete the graph. Simply sketch out how you would construct it for your purpose and explain why.
Calculating Population Change

Demographers are most interested in statistics that help them predict and explain changes or trends in society. At its most basic level, demography can determine whether a population is growing or shrinking. On another level, demographers study segments of the population. For instance, the number of working women in a society will affect the birth rate. It may also influence the diet of families, increasing the amount of packaged and prepared foods they eat.

The four basic components of population change are how many people are born (birth rate), how many die (death rate), how many move into a region (immigration rate), and how many move out of a region (emigration rate).

**Natural Increase**

It is not very useful to compare numbers of births and deaths between countries that have widely differing population sizes. To know that each day almost 1000 children are born in Canada, 73 778 in India, and 106 in Gabon is not very useful unless the total populations of the countries are considered. What really matters is comparing the relationship between the number of births and the size of the population in each country. Demographers do this by using birth rate and death rate statistics.

Birth rate is the number of children born in a region for every 1000 inhabitants. It is calculated by dividing the number of births in one year by the population and then multiplying the result by 1000. Canada’s birth rate is 10.6 children per 1000 Canadians.

Death rate is the number of people who die in a region for every 1000 inhabitants. Canada’s death rate is 7.4 deaths per 1000 Canadians. Subtracting death rate from birth rate gives the rate of **natural increase (NI)**.

### Table: Natural Increase of Selected Countries, 2005–2010

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (in millions)</th>
<th>Birth Rate per 1000</th>
<th>Death Rate per 1000</th>
<th>Natural Increase per 1000</th>
<th>% Natural Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1 214 464 000</td>
<td>23.0</td>
<td>8.5</td>
<td>14.5</td>
<td>1.45</td>
</tr>
<tr>
<td>Russia</td>
<td>140 367 000</td>
<td>10.8</td>
<td>15.1</td>
<td>–4.3</td>
<td>–0.43</td>
</tr>
<tr>
<td>Canada</td>
<td>34 086 245</td>
<td>10.6</td>
<td>7.4</td>
<td>3.2</td>
<td>0.32</td>
</tr>
<tr>
<td>Gabon</td>
<td>1 501 000</td>
<td>27.5</td>
<td>9.8</td>
<td>17.7</td>
<td>1.77</td>
</tr>
</tbody>
</table>

**FIGURE 11–7** Natural increase of selected countries, 2005–2010

This figure does not include the increase that comes from immigrants. In countries like Gabon, where there are few immigrants, the annual growth rate of 1.77 percent is made up entirely of natural increase. Canada would see its population growth increase by immigration.

**Interpreting Statistics** What factors might account for the wide variation in the natural increase of these populations?
**Exponential Growth**

Human populations have the potential to grow at an ever-increasing rate. Suppose that a couple has two children, and each of these grows up to produce two children. By the third generation, the couple will have 14 descendants. This is called an exponential rate of increase. A regular arithmetic rate of 1, 2, 3, 4, and so on is quickly overtaken by an exponential rate, which increases by 1, 2, 4, 8. Each generation builds on previous generations in a compound fashion.

A convenient way to express exponential population growth is to use the length of time it would take for a population to double in size. One way of calculating this is to apply the “rule of 70,” which states that doubling time is approximately equal to 70 divided by the growth rate (in percent) per year.

**Calculating Doubling Time for Gabon**

70 divided by 1.77 (% natural increase) = 39.5 years

**Net Migration**

Population increase in some countries, particularly Canada, depends on immigrants. Emigrants leave the country each year, which also affects the demography. A country’s net migration rate is the difference between its immigration and emigration rates. A combination of the birth rate, the death rate, and the net migration rate gives a complete picture of a country’s annual population change.

Canada, the United States, and Australia are among the few countries in which immigration is a significant factor in the growth of their populations. Most immigrants to Canada come as economic migrants from developing nations, wanting to better their standard of living. Others come as refugees seeking to escape persecution in their home country. In Canada’s 2006 Census, nearly 6.2 million people were immigrants. Between 2001 and 2006, Canada averaged 222,000 international migrants per year.

**FIGURE 11–8** Population growth rate and doubling times

**Reading a Graph**

Canada’s rate of natural increase is 0.32. How many years would it take Canada’s population to double if we did not take in immigrants? Use the equation on the left to calculate your answer.

**FIGURE 11–9** Food aid is distributed to Bhutanese refugees who have been living in camps in Nepal since the early 1990s. More than 850 Bhutanese refugees have been resettled in Canada to date.
Large-Scale Migrations

Large-scale migrations affect the structure of population by age and gender. Most immigrants are young and generally single males. This gives the host countries a younger population that will eventually result in a higher birth rate. The country losing population experiences the reverse effect. For instance, the migration from Communist-controlled East Germany to the West after the Second World War gave East Germany a population with a disproportionate number of older people.

The multicultural populations of Canada and the United States are the result of migrations. During the last decades of the 20th century, visible minorities in Canada increased dramatically with immigration from Asia and the Caribbean. Canada and the United States have also become home to many Spanish-speaking migrants from Latin America.

Population Growth Rate

Population growth rate is the rate at which a country’s population changes per year. It is a country’s rate of natural increase plus its net migration, usually expressed as a percentage.
The Demographic Revolution

For most of human history, birth rates have been high. Yet the population grew slowly before the 1700s because death rates were also very high, particularly among infants and young children. People had a **life expectancy** of little more than 30 years. Disease, poor medical care, poor nutrition, and unsanitary living conditions contributed to the high death rate. Families needed to have many children to ensure a few survived. Larger families were also needed to help farm the land and to provide security for parents in old age. This situation is still common today in many developing countries.

The rapid population growth after 1750 was mainly due to falling death rates. Beginning in Europe, then spreading to North America, and then to developing countries, death rates fell much more rapidly than birth rates. The agricultural revolution increased food production so that people had better diets. Clean drinking water, a more varied and nutritious diet, and vaccination against infectious diseases meant that far more children survived to become parents themselves. Birth rates remained high for a number of years, producing a wide gap between birth and death rates and a rapid growth in population.

The Great Depression of the 1930s and the Second World War kept birth rates low in most Western countries. After 1945, there was a rapid and prolonged rise in birth rates, and today Western countries are experiencing lower birth rates and longer life expectancy.

After the Second World War, the World Health Organization (WHO), aid programs, and improved transportation and communications made better health measures available to most countries. The developing world experienced the same changes as the developed world had in the 19th and early 20th centuries. Death rates fell in developing countries, but birth rates have not dropped as rapidly.

<table>
<thead>
<tr>
<th>Country</th>
<th>1900 Males</th>
<th>1900 Females</th>
<th>1950 Males</th>
<th>1950 Females</th>
<th>2010 Males</th>
<th>2010 Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portugal</td>
<td>33.3</td>
<td>35.2</td>
<td>56.9</td>
<td>61.9</td>
<td>75.4</td>
<td>81.9</td>
</tr>
<tr>
<td>Japan</td>
<td>42.8</td>
<td>44.3</td>
<td>60.4</td>
<td>63.9</td>
<td>79</td>
<td>86</td>
</tr>
<tr>
<td>Mali</td>
<td>n/a</td>
<td>n/a</td>
<td>35</td>
<td>36</td>
<td>47.6</td>
<td>49</td>
</tr>
<tr>
<td>Canada</td>
<td>47</td>
<td>50</td>
<td>66.8</td>
<td>71.7</td>
<td>78</td>
<td>83</td>
</tr>
<tr>
<td>Afghanistan</td>
<td>n/a</td>
<td>n/a</td>
<td>29</td>
<td>28</td>
<td>44</td>
<td>44</td>
</tr>
</tbody>
</table>

*FIGURE 11–12* Life expectancy at birth in selected countries for 1900, 1950, and 2010

**Interpreting Statistics** Why has there been an increase in life expectancy in all these countries? Suggest why there are differences in life expectancy. How could a demographer use the statistics for Japan and Canada in 1900 to argue that these were developing countries at that time?
The Demographic Transition Model

Geographers sometimes use models to represent reality or a theory. A model simplifies information to make it understandable. Models must strike a balance between detail and useful generalization.

One useful way of explaining population change is the demographic transition model. It shows changes over a period of time in three elements: birth rates, death rates, and trends in overall population numbers. The model assumes that, in any country, high birth rates and high death rates (Stage 1) will gradually fall (Stages 2 and 3) as a result of economic and social development. Because the model is based on what has happened in developed countries, it assumes that countries will pass through periods of industrialization and urbanization on the way to reduced birth and death rates. The model is useful in showing how the population growth rates of countries that are industrializing are in a state of transition. It seems that this transition period is unlikely in some countries, particularly in Africa, and so the model must be used with caution.

**KEY TERMS**

**demographic transition model** a model that shows changes in a population’s birth and death rates and growth based on technological development

**industrialization** the overall change in a society from farm production and craftsmanship to mechanized manufacturing production

**urbanization** the move of people from farms to cities where jobs are available

**mortality** deaths in a population

**FIGURE 11–13** The demographic transition model showing examples of countries in various stages of demographic transition

**Stage 1: Pre-transition:** High birth rates and high fluctuating death rates result in small population growth. Plagues, diseases, and poor nutrition keep mortality high.

**Stage 2: Early Transition:** Improved health care, sanitation, and increased food supplies lead to a rapid fall in death rates. Birth rates are still high, so there is a rapid increase in population numbers.

**Stage 3: Late Transition:** Birth rates begin to fall, so population growth begins to decline. Industrialization, urbanization, and improved living standards lead to less desire for large families.

**Stage 4: Post-transition:** The transition is complete. There is a stable or slow population increase with low birth and death rates. The birth rate may fluctuate in special circumstances, such as the post-war baby boom.

**Stage 5: Declining Population:** Birth rates drop below death rates. Many older people are in the population. This is happening increasingly in European countries and in Japan. It is not known whether this trend will extend to other regions.
Chapter 11
Population Trends and Issues

1. a) Why was world population growth so slow before the 1800s?
   b) What improvements in living conditions led to population growth?

2. How do declines in birth rates differ between the developed and the developing world?

3. What is the most important factor in starting a country to move from one stage of the demographic transition model to the next? Suggest ways to influence this factor.

4. What is the second factor in starting a country to move from one stage of the demographic transition model to the next? Suggest ways to influence this factor.

FIGURE 11–14 The population of Canada and India, 1900–2010
1. In which years was the natural increase greatest of each country?
2. Based on the demographic transition model, in what stage is (a) Canada and (b) India at present?
3. Predict what will likely happen to India and Canada in the next five decades. Explain your answer.
4. Use a three-column organizer to compare Canada and India using the information from the graph. In the centre column, note problems that will be common to both countries. In the outside columns, note problems that will be unique to each country.
In 2008, China and India had a combined population of more than 2.5 billion—nearly 37 percent of the world’s population. Experts estimate that this figure will increase to 3 billion by 2050. The issues of population size and growth rate have figured prominently in the development policies of each country since 1950.

The years following the Second World War brought profound changes to China and India. Since then, the government of each country has dealt with its increasing population in very different ways and with dramatically different consequences. Politics played a role in these two countries’ approaches to population control, with India being a democracy and China being a communist country. Cultural traditions, especially the strong preference for sons, have also affected the demographic profile of both countries.

**KEY TERMS**
- **family planning** the concept of limiting the size of families
- **rhythm method** a method of birth control in which a couple does not have intercourse during the time when a woman is likely to ovulate
- **sterilization** a procedure by which a person’s ability to reproduce is destroyed
- **vasectomy** a form of male sterilization in which the tube carrying sperm from each testis is cut and tied
- **coercion** the use of force
- **contraception** birth control
- **total fertility rate** the average number of children born over the lifetime of a typical woman in a particular country
- **one-child policy** a policy adopted by China to control population growth
- **infanticide** the act of killing an infant
- **gender selection** the choice of whether to keep a fetus based on its gender

**TIMELINE**

**Timeline of India’s Policies on Population Control**

- **1952** India became the first developing country to launch a family-planning program, focusing on abstinence and the rhythm method. Rural India was targeted with little success.

- **1962** The government launched awareness-building campaigns: “Small family” songs on the radio and posters on walls and buses. The fertility rate remained high while infant mortality and death rates fell rapidly, leading to high population growth.

- **1970** Sterilization programs and targets were established. Vasectomy clinics were located in strategic locations, including railway stations. The effort failed, since the poor wanted the economic security of children, especially sons.

- **1975** Prime Minister Indira Gandhi suspended democratic rights and elections. The Nasbandi program used coercion and rewards to promote male sterilization. Children of parents with more than three children were refused schooling, prisoners were not granted parole, and government workers were threatened with firing or demotion if they did not have a vasectomy. More than 8 million sterilizations were performed in 1975.

- **1977** An election called by Gandhi led to the defeat of her party, the end of coercive policies, and a backlash against family planning. The new government changed the focus to family welfare, with an emphasis on education, voluntary contraception, and child-survival programs.

- **1983** The National Health Policy stated that replacement levels of total fertility rate (TFR) would be reached by 2000. The program did not meet targets.

- **2000** A new National Population Policy was established to slow population growth. The emphasis was on female sterilization following the UN’s urging to reduce the TFR to 2.1 by 2010. India’s population passes the 1-billion mark.

- **2010** The UN estimates India’s TFR is at 2.5, down from 5.9 in 1950 but shy of the 2.1 target. The population continues to increase.
TIMELINE
Timeline of China’s Policies on Population Control

1949
Population increase was encouraged as a way to make China a great power. When asked how China would feed the growing population, communist leader Mao Zedong responded that “every stomach comes with two hands attached.”

1958–1960
A program called “The Great Leap Forward” brought massive instability to food supplies as agricultural land was organized into large collective farms. Famine and food shortages reduced birth rates and increased death rates, which led to population decline.

1970
The growth rate reached 2.61 percent and the population was 816 million. The government reacted with a publicity campaign that encouraged people to have only two children.

1979
The Chinese government launched a population planning policy after Mao Zedong’s death in 1976. With just 7 percent of the world’s arable land and two thirds of the population entering their reproductive years, the one-child policy was established. Cash, free medical care, and improved educational and housing opportunities were offered as rewards. People who did not cooperate were fined for having more than one child, and lost medical and educational privileges.

1980s/1990s
Pressure to be sterilized and have abortions was common in the mid-1980s. Birth rates were less than half of what they had been in the mid-1960s. The one-child policy was more successful in urban than in rural areas. Sons were valued as farm labourers, and they were expected to look after their aging parents. Reports of forced abortions and infanticide if the first-born was a girl led the government to relax the policy in the late 1980s. A second child was allowed in rural areas if the first-born was a girl or was born with a disability.

2002
The 2000 census put the population at 1.27 billion. An increasing gender imbalance in favour of males led family planning to focus on education, health, and economic opportunities for women. Gender selection was banned and discrimination against female infants forbidden.

2008
The Chinese government estimated that the one-child policy resulted in 400 million fewer people. The population still increased by 800,000 every five weeks.

2009
Concern about an aging population and a shrinking labour force led to relaxing restrictions in many provinces and cities, such as Shanghai and Beijing, allowing two “only-child” parents to have two children.

2011
Many Chinese demographers expect changes in the population policy during the 12th five-year plan for the development of the country from 2011 to 2016.
1. Use a Venn diagram or another organizer to compare and contrast the methods and effectiveness of population control programs in China and India. Explain why China has been more successful in reducing population growth than India.

2. To what extent do you agree or disagree with the following statement: The coercion associated with the Nasbandi program was justified in the face of India’s runaway population growth.

3. In the case of China and India, would you agree or disagree with those who claim that the rise from poverty to affluence is the most effective population control? Explain.

4. How accurate do you think the projections are of future populations of China and India? Explain.

5. Imagine that you are either a Chinese or an Indian government official in charge of a billion dollar program to reduce population growth. Identify the two most effective uses of your economic resources to reach this goal. Justify your choices.

FIGURE 11–15 Birth and death rates for China and India, 1950–2050

FIGURE 11–16 Poster promoting the one-child policy in China
Population Profiles
Demographers use various tools to analyze population information. The population pyramid is a powerful tool that reveals the age and gender structure of a population, and can provide valuable insight into the types of government services that are and will be needed in a region or country.

Population Pyramids
A population pyramid is a graph that shows the age and gender structure of a population. A series of horizontal bar graphs for the male and female populations are placed back to back at age intervals of five years, called age cohorts. Population pyramids make it easier to see the structure of a population. They are also useful in comparing the population structures of different countries. As the examples in Figure 11–17 show, countries with high birth rates have many children and an expanding population. A stable population will have birth rates and death rates in balance, and a contracting population will have a growth rate below replacement level. In general, the expanding pyramids are representative of developing countries, while the stable and contracting pyramids represent developed countries.

**Pyramid Models**

<table>
<thead>
<tr>
<th>Early expanding:</th>
<th>Expanding:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• high birth and death rates</td>
<td>• rapid increase in population</td>
</tr>
<tr>
<td>• short life expectancy</td>
<td>• high birth rate</td>
</tr>
</tbody>
</table>

- **Developing countries**

<table>
<thead>
<tr>
<th>Stable:</th>
<th>Contracting:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• stable or slow population increase</td>
<td>• extremely low birth rate and low death rate</td>
</tr>
<tr>
<td>• declining birth and death rates</td>
<td>• higher dependency ratio</td>
</tr>
<tr>
<td>• more elderly people</td>
<td>• longer life expectancy</td>
</tr>
</tbody>
</table>

- **Developed countries**

**FIGURE 11–17** Model pyramids of populations at different stages of development

**Interpreting a Graph** Match these models with the population pyramids shown in Figure 11–18.
FIGURE 11–18 Population pyramids for selected countries

Thinking Critically
1. What evidence is there that the pyramid for Chad has a very high birth rate? What percentage of the population would you estimate is under the age of 15?
2. What does the shape of the pyramid for India tell you about trends in infant mortality in that country? How does India compare with Chad and Iceland in this regard?
3. What does the pyramid for Iceland tell you about the future population numbers in that country?
4. Suggest a number of problems Japan will face as a result of the age structure of its population.
5. In what state of the demographic transition model is each of the pyramids? Explain.

FIGURE 11–19 Population pyramids for Canada, 1911 and 2006

Reading a Graph
1. Refer to Figure 11–17. At what stage of development—early expanding, expanding, stable, or contracting—would you place each of these pyramids?
2. What impact will the increasing number of older people in 2006 have on the population?
3. What other information can be learned by analyzing these pyramids? Give examples of how government and business might use these pyramids to deal with present and future trends.
The Age Structure of Populations

The age structure of a population helps us understand the reasons for changes in population. Demographers divide populations into three age groups: children up to the age of 15, working people from ages 15 to 64, and adults 65 years and older. This gives the dependency ratio, which is the proportion of the population that is being supported by the working-age group.

Children and older people put pressure on society for medical, education, housing, and other services. In the 2006 Census, Canada’s population included 17.7 percent children and 13.7 percent adults 65 years and older, giving it a dependency load of 31.4 percent. A country like Bangladesh has a dependency load of 38.6 percent, made up of 34.6 percent children and 4 percent adults aged 65 years and older. The age structure can give us insights into problems that could arise in the future resulting from a predominantly old or young population.

Too Many Men

China’s gender imbalance is getting worse. According to a 2009 article, “China has 32 [million] more men aged under 20 than women.... [and] 119 male births for every 100 girls, compared with 107 to 100 in industrialised countries.... The gap is greater in provinces that allow couples to have a second child if the first is a girl. Among second-born children, boys outnumbered girls by 143 to 100.”

The gender imbalance is beginning to be recognized as a problem for the future. Many male children will not be able to marry when they are older. These men are referred to as “bare branches.” The article also notes that the “[Chinese] government has expressed concerns that too many men could lead to social instability and is expanding programs that encourage people to have female children.”

1. What types of social problems may occur in China as a result of the gender imbalance?

2. Perspectives Do you think that female children will become more valued in the future in China? Why or why not?
Dependency: Too Young or Too Old

There has been a major change in the age structure of the world’s population as the numbers of people have increased. There have never been so many people in the dependant category. This change will put increasing pressure on the financial resources of countries. In Japan, for example, the life expectancy is 79 for males and 86 for females—the highest in the world. The government has declared the aging population to be its greatest future challenge. If present trends continue, close to one third of the Japanese population will be over 65 by 2025. Years of exceptionally low birth rates mean there are fewer workers to care for them. How and whether Japan can maintain its economic position in the face of these problems remains to be seen.

At the other end of the scale, some developing countries have young dependants under the age of 15 making up almost half of their population. Any fall in birth rates in these areas has been offset by a greater number of women who can bear children, even if families are smaller. These countries remain in a cycle of poverty, as their limited resources and attempts to improve development are swallowed up by young populations. India and sub-Saharan Africa, with a combined population of more than 2 billion people, face a daunting task of providing employment for the increasing numbers of young people entering the labour market. Young men in particular grow restless as they reach working age and find few opportunities to improve their standard of living. This results in an underemployed generation that could threaten the stability of entire regions.

FASTFORWARD

An Aging World

The average age of the world’s population is rapidly increasing. By mid-2008, the total number of people 65 and older was approximately 506 million, and will reach 1.3 billion by 2040. A U.S. Census Bureau report on aging states that in just over 30 years, the proportion of older people in the world will double from 7 percent to 14 percent.

1. What parts of the world will be able to deal more effectively with the problem of an aging population? Explain.
2. List the three most likely consequences that Canada’s aging population will have for you. Justify your answers.

PRACTICE QUESTIONS

1. What information does a population pyramid show about a population?
2. Name the population pyramids that are typical of developing countries.
3. Name the population pyramids that are typical of developed countries.
4. Refer back to Figure 11–14. With which stage of the demographic transition model would each population pyramid be associated? Explain.
5. What is the dependency ratio? Why is it important for a country to know this figure for future planning?
6. Why does an aging population present a serious problem in the developed world?
Canada’s Population: Past and Future

Canada’s birth and death rates have been dropping steadily in the past 30 years. This means the population is getting older. In 1951, 1 in 13 Canadians was over 65 years of age. In 2020, 1 in 5 will be over that age. Life expectancy in Canada increased from an average of 45 years in 1900 to 65 years by 1950 and to 81 years by the year 2010. This trend is the same for most developed countries.

The increasing number of elderly people puts immense strains on social and medical services. There are fewer children to look after aging parents. This has put pressure on the health care system to provide more long-term care for the elderly. The cost of health services for the aged continues to rise as medical technology becomes more complex.

Canada’s Immigrant Population

The age structure of Canada’s population is one of the main factors the federal government considers when deciding on the number of immigrants Canada will accept each year. Today, immigrants account for a large and increasing proportion of labour force growth in Canada. According to Statistics Canada, “immigrants who arrived during the 1990s accounted for about 70 percent of net labour force growth between 1991 and 2001.” This percentage will likely grow substantially over the next decade, partly as a result of low rates of natural increase in the Canadian-born population.

The 2006 census indicates that 1.1 million of the 1.6 million growth in the Canadian population since 2001 was due to immigration. By 2012, all
net growth in Canada's labour force is expected to come from immigration. Without these levels of immigration, the average age of the Canadian population would increase rapidly.

The number of immigrants entering Canada fluctuates above or below the 200,000 level. This is far from the federal government’s goal, which is to have annual immigration equal 1 percent of the population. The difference between planned and actual immigration levels is shown in Figure 11–22. Immigration numbers have never come near the record level of 400,870 immigrants in 1913, which represented 5.5 percent of a population of 7.3 million.

**Canada Looks to Immigrants**

As Canada’s birth rate remains low and the population ages, the workforce will decline as the number of retirees increases. This will increase demands for government services while the tax base will be shrinking. Immigration provides the only source of replacement workers, ensuring continued economic growth and a sustainable tax base. The main difficulty the government faces is in attracting young, skilled workers and entrepreneurs to offset the aging workforce. Many skilled immigrants, such as those in health care and other professions, find it difficult to get professional **accreditation** in Canada. There is also fierce competition among countries for highly skilled labour. As Industry Canada noted in a 2008 report, “In recent decades, highly skilled workers have become more mobile internationally. Furthermore, high demand for skills in industrialized countries has led to intense international competition for these mobile workers.”

---

**KEY TERM**

**accreditation** recognition of meeting an official standard

---

**FIGURE 11–22**

Immigration admission levels, 1995–2005. Over the years, there have been many reports and alleged promises of a one-percent immigration intake target for Canada. However, government statistics show that not once in the past 13 years has Canada’s immigration intake met a target of one percent of the population.
Canada accepts approximately 25,000 refugees a year, but increasing numbers of refugees from Eastern Europe and Mexico led the government to impose visa restrictions on those countries in 2009. More money is now spent on handling refugee claims than on processing regular immigration. Critics have claimed budget cuts and the time spent processing refugees are the reasons Canada has not reached its immigration targets.

**Canada’s Aboriginal People Pass One Million**

Data from the 2006 Canadian census shows that the number of people who identified themselves as an Aboriginal person surpassed the 1-million mark. Aboriginal people’s share of Canada’s total population is on the rise. In 2006, they accounted for 3.8 percent of the total population of Canada enumerated in the census, up from 3.3 percent in 2001 and 2.8 percent in 1996.

**Factors Accounting for Growth**

Several factors may account for the growth of the Aboriginal population. These include demographic factors, such as high birth rates. In addition, more individuals are identifying themselves as Aboriginal, and population data for Indian reserves has been more complete since 1996. Other highlights from the 2006 census include the following:

- The number of status Indians living off reserves has increased since 1996, from 50 percent to 51 percent.
- Eighty percent of Aboriginal peoples lived either in Ontario or in the four Western provinces in 2006.
- The average age of the Aboriginal population in Canada is 27, compared to 40 for the non-Aboriginal population. Almost half (48 percent) of the Aboriginal population is under the age of 25.

**PRACTICE QUESTIONS**

1. What information can you discover about a country’s past and future by analyzing a population pyramid?

2. a) What effects do migrations have on the structure of the receiving country’s population?
   b) How would the age structure of the population in Canada be different if there had been no immigration?

3. What factors have accounted for the growth of Canada’s Aboriginal population since 1996?
Counterpoints

Optimists versus pessimists: Are there limits to population growth?

With a United Nations projected world population of 9 billion by 2054, the debate continues as to whether there are limits to the number of people Earth can support. Optimists have focused on humankind's ability to adapt to a growing population, while pessimists highlight the problems that population growth has caused or will cause.

The Pessimists

Thomas Malthus was a British economist who began writing about the risks of population growth in the late 1700s. He claimed that population would soon outstrip food supply, leading to famine, disease, and social disorder. Malthus's predictions were not realized, since he did not foresee the improvements in agriculture, hygiene, and medicine. Also, millions of people migrated to British colonies to cultivate farmlands there, which eased population pressure.

Neo-Malthusians

Some thinkers, called neo-Malthusians, predict that disaster will overtake populations in the world's poorest developing countries in the next 50 years due to increasing global warming, shortages of arable land, conflicts over fresh water, declining fish stocks, and the spread of AIDS or other diseases. Africa will be most vulnerable to these threats.

Neo-Malthusians claim that migrations, technology, and new farming lands cannot solve the problems in these countries. A leading neo-Malthusian, Lester Brown of the Worldwatch Institute, says that millions of people will die while the population in the developing world tries to return to a balance with the environment's ability to provide food. By 2050, the populations of many poor countries are projected to double in size. Ethiopia, with 85 million people, will reach a population of 174 million, and the Democratic Republic of the Congo's population will rise to 147 million. Unless there are profound changes, the population in these countries will be checked by famine, disease, and war.

In the 1980s, William Catton modernized and expanded the views of Malthus. He coined the term carrying capacity and claimed that Earth has been exceeding its carrying capacity for many years, at the expense of environmental damage. In his book Overshoot, he states:

"If, having overshot carrying capacity, we cannot avoid crash, perhaps with ecological understanding of its real causes, we can remain human in circumstances that could otherwise tempt us to turn beastly."

--William Catton, Overshoot, 1982

In 1996, William Rees and Mathis Wackernagel from the University of British Columbia published a book in which the term ecological footprint was introduced. They pointed out that if all the world's population lived by North American standards, the resources of three Earths would be required.

"Indeed, we believe that confronting together the reality of ecological overshoot will force us to discover and exercise those special qualities that distinguish humans from other sentient species, to become truly human. In this sense, global ecological change may well represent our last great opportunity to prove that there really is intelligent life on Earth."

--Mathis Wackernagel and William E. Rees, Our Ecological Footprint, 1996

The Optimists

Those with an optimistic outlook on population growth are called cornucopians. They have faith in mankind's ability to find innovations, such as solar and wind energy, that will increase Earth's carrying capacity.

In the 1960s, American demographer D.J. Bogue identified his theory of demographic regulation, meaning that as living standards around the world improve, population growth will naturally level off. Many countries, such as Sweden, illustrate this levelling off of population growth. Bogue's theory of demographic regulation is also
supported by the demographic transition model, as well as the measures adopted by China and India to limit population growth (see Case Study on pages 368–370). Organizations such as the United Nations, the World Bank, and most international aid agencies are also positive in their outlook on population growth. They claim technological developments, increased trade, and more efficient ways of sharing Earth's resources will ease the problems of developing nations. They point to the rapid increases in population in the 20th century that were always matched by increased food production—26 percent since the 1960s. New developments in genetic engineering of crops and animals could repeat this success. Famines in large parts of the world predicted by the pessimists have not happened. Educational programs will increase awareness of the benefits of population control. The programs show that enough food is produced to feed everyone adequately, and it is the distribution system that causes malnutrition in some countries. Increased globalization, optimists believe, will create a more equal distribution of food and resources.

**KEY TERMS**

- neo-Malthusians: people who share Malthus' pessimistic views regarding population growth
- carrying capacity: the maximum number of people that can be sustained by an environment
- ecological footprint: the impact of humans on the environment
- cornucopians: people who have optimistic views on population growth due to advances in science and technology
- demographic regulation: the theory that population growth will level off as living standards improve

---

**Analyzing the Issue**

1. Explain the concept of carrying capacity.
2. What technological changes in the 20th century increased the carrying capacity of farmland in Canada? Can the example of Canada be duplicated in the developing world in the 20th century? Why or why not?
3. Summarize the viewpoint of each of the following people on world population trends: Malthus, Brown, Catton, Rees and Wackernagel, and Bogue. Which do you find most credible? Why?
4. Use a two-column organizer to compare and contrast the views of optimists and pessimists on the effects of future population growth. Then use the information to determine your viewpoint. Explain why you are an optimist or a pessimist regarding the growth of world population.
5. In what ways might a 16-year-old from the slums of Mumbai, India have a different perspective on the future from you?
Where Do Six Billion–Plus People Live?

Population distribution refers to the way people are spaced over Earth’s surface. The Greek fathers of geography studied population distribution. They called their part of the world ecumene, and we now use this word to describe permanently inhabited places. As Figure 11–24 indicates, global population is unevenly distributed. The majority of the world’s population lives north of the equator in mid-latitudes, with most living close to the world’s oceans.

KEY TERMS

population distribution  the pattern of where people live in an area
ecumene  the populated area of the world
population density  the number of people living in a given area; calculated by dividing the population by its area

FIGURE 11–24 World population distribution

Reading a Map

1. Why do you think the dot method is used for distribution maps rather than other methods, such as shading?
2. Are the most densely populated areas north or south of the equator?
3. Compare this map with a map showing landforms or relief. What relationship do you see between
   a) densely populated areas and lowlands?
   b) sparsely populated areas and highlands? Identify two highland areas that are densely populated.
4. Compare this map with a map showing climate. What is the relationship between population distribution and areas that are
   a) very cold throughout the year?
   b) very dry?
5. Identify two very dry areas that are densely populated. Refer again to the relief map, and give an explanation for this population density.
6. Which two continents are most densely populated? Make a list of reasons that might account for the density in these two continents.
Population density measures the number of people in a given area. Population densities for the countries of the world are shown in Figure 11–26. These are crude densities. They are calculated by dividing the population of a country by its area. These figures are useful for general comparisons, but do not take into account the wide variations that exist within larger countries. For example, the Canadian population density of 3.5 persons per square kilometre is one of the lowest in the world. Yet with an 80-percent urban population, most Canadians live at far higher densities than those indicated for Canada by calculating the small population against its large size. Rural and urban densities also differ dramatically in most countries. There are many explanations for the different population densities found in countries. The web in Figure 11–27 shows some of the major physical and human factors affecting population density.
PHYSICAL FACTORS

**Climate** – Areas that are very dry or very cold generally have lower densities.

**Landscape** – Lowlands near the rims of continents have the highest densities.

**Resources** – Areas rich in a variety of resources will attract higher densities.

**Soils** – Rich river valley and lowland soils result in higher densities.

**Vegetation** – Areas of very dense vegetation, such as rainforests, have low densities. In temperate zones, former forested areas and grasslands have high densities.

**Water** – A reliable water supply from rainfall or rivers is necessary for higher densities.

**Accessibility** – Areas that are easier to reach by land or sea will increase in population.

HUMAN FACTORS

**Communications** – Areas that are easier to reach by land or sea will increase in population.

**Culture** – Nomadic or agricultural cultures may determine the level of density.

**Development** – Areas with a highly developed economy will have much higher densities.

**Disease** – Areas with a high incidence of disease will have low densities.

**Government policies** – May encourage settlement in remote areas, as in the case of Brazil and the Amazon basin, the Soviet Union moving workers to new cities in Siberia, or in Canada’s eastern Arctic where Innu settlement was forced.

*FIGURE 11–27* Major factors affecting population density

**Interpreting a Diagram**

1. The density of most countries is determined by a combination of some factors shown in the ideas web. Which factors apply best to Canada? Which factors apply best to British Columbia? For each area, rank the factors in order, starting with those having the greatest effect.

2. Working alone or with a partner, choose a country from each of the categories in the legend of Figure 11–26. Use the ideas web to give reasons for each country’s inclusion in the category.
Nutritional Density

There are great differences in the productivity of farmlands in different parts of the world. For example, the Fraser Valley in southern British Columbia has exceptionally rich agricultural soils, but its output is restricted by a short growing season. Canadian farms cannot match the output of areas like southern China, where rich soils and ideal climate produce three crops a year. This means that a square kilometre of farmland in southern China can produce far more food for people than a similar area in the Fraser Valley. **Nutritional density** of land is a measure of how much nutrition in calories can be produced from the land. The nutritional density column in Figure 11–28 shows the average nutritional densities for the countries listed.

Earth’s Crowded Future

The world’s population will continue to grow in the 21st century. What is not certain is how fast it will grow. Given the large populations of China and India, the attempts and varying success of these countries at bringing their population growth under control are important considerations in the overall world population.

Age structure is an important factor in determining how fast a population will increase. Developing countries with high numbers of young dependants will likely experience greater population growth than developed countries. The number of developing countries that will improve their standards of living to a point at which birth rates begin to fall cannot be predicted. Changes in birth rates in the developed world also cannot be foretold. For example, it is possible that a major cultural change in Canada and the United States could change fertility rates and bring about another baby boom.

Birth rates will continue to decline worldwide, but the large base in countries such as India means increases will continue to be too high for their population to be sustained without environmental damage. The future will be determined by the youth of developing nations. The age at which they choose to marry, and the number of children they have, may be the most important deciding factors of the 21st century.

<table>
<thead>
<tr>
<th>Country</th>
<th>Densities in km²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude</td>
</tr>
<tr>
<td>Australia</td>
<td>3</td>
</tr>
<tr>
<td>Canada</td>
<td>3</td>
</tr>
<tr>
<td>Egypt</td>
<td>84</td>
</tr>
<tr>
<td>Japan</td>
<td>336</td>
</tr>
</tbody>
</table>

FIGURE 11–28 Crude population densities and nutritional densities for selected countries

**Interpreting Statistics** Why are the differences between crude and nutritional densities for Canada and Australia lower than for the other two countries? Use a climate map from an atlas to help explain why the nutritional density of Egypt and Japan is so much higher than the crude density.

**KEY TERM**

**Nutritional density** a measure of how much nutrition in calories can be produced from a certain area; an area with fertile soil and adequate temperatures and precipitation will have a higher nutritional density than an area such as Canada’s North.

**PRACTICE QUESTIONS**

1. Define population distribution and population density.
2. How useful are crude densities in giving a picture of how many people could live in Canada?
3. Why is nutritional density a more accurate measure of density in the developing world?
CHAPTER REVIEW

CHAPTER FOCUS QUESTION What is the significance of changes in global population for Canada and the world?

Significant changes in world population have occurred in the past 50 years. As you read in this chapter, this has brought benefits to some and problems for others. As the world’s population moves toward 7 billion and beyond, a number of issues must be addressed.

1. Use the organizer below to list the five most pressing population issues for the present and future. Beside each issue, note a country or region of the world in which it is a problem or concern and a country or region in which it is not a problem or concern. For each, briefly describe why this is the case.

<table>
<thead>
<tr>
<th>Issue</th>
<th>A concern or problem</th>
<th>Not a concern or problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Example of a country or region and explanation</td>
<td>Example of a country or region and explanation</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a) Which of the issues should be of greatest concern to the world? To Canada? Explain.
b) Which issue should be of least concern to the world? To Canada? Explain.
c) If these issues are not dealt with effectively by 2050, what might be the consequences for the world and Canada? What impact might these consequences have on your life?

Vocabulary Focus

2. Define the following terms using an example from the chapter to explain how each provides insights into changes in world and regional populations.

demography
developed country
developing country
demographic transition model
population pyramid
life expectancy
one-child policy
dependency ratio
carrying capacity
birth rate
death rate
net migration
population distribution
population density
nutritional density

Knowledge and Understanding

3. How do each of the following influence populations?
   a) fertility
   b) mortality
   c) migration

4. What role do population structures and characteristics play in population change?

5. How do present rates of world population growth affect the future of people in developing and developed countries?

6. Sketch imaginary population pyramids for the following populations:
   a) expanding rapidly following a lengthy war
   b) expanding after experiencing a devastating famine
   c) stable with an aging population
   d) experiencing a negative growth rate
7. Using three countries from different regions of the world as examples, explain how population density figures for countries can often be deceiving.

**Critical Thinking**

8. Compare the typical shapes of population pyramids for developing nations and developed nations. Describe the differing dependency problems for these nations.

9. Use Figure 11–23 as a model to draw a cartoon about population growth that might appear in a future year based on the UN estimates of future growth given in Figure 11–1.

10. With a partner, discuss the effects the aging population will have on the workforce in Canada. Prepare to discuss the measures the government should take to deal with this problem. Suggest career choices that they might consider as a result of your discussions.

11. Reviewing all you have studied in this chapter, identify the country you feel has the best prospects of successfully coping with problems that will result from world population growth in the next 50 years. Provide evidence to support your choice.

**Document Analysis**

12. Examine the following images and respond to the questions below.
   a) Describe the methods or techniques used in each poster to encourage people to limit the size of their family. Be specific.
   b) What are some of the similarities or differences between the two posters?
   c) Who is the target audience for each poster? Be specific.
   d) Which poster is more effective in your opinion? Justify your choice.

**Evidence**

10. With a partner, discuss the effects the aging population will have on the workforce in Canada. Prepare to discuss the measures the government should take to deal with this problem. Suggest career choices that they might consider as a result of your discussions.

11. Reviewing all you have studied in this chapter, identify the country you feel has the best prospects of successfully coping with problems that will result from world population growth in the next 50 years. Provide evidence to support your choice.

**Document Analysis**

12. Examine the following images and respond to the questions below.
   a) Describe the methods or techniques used in each poster to encourage people to limit the size of their family. Be specific.
   b) What are some of the similarities or differences between the two posters?
   c) Who is the target audience for each poster? Be specific.
   d) Which poster is more effective in your opinion? Justify your choice.

**Evidence**

10. With a partner, discuss the effects the aging population will have on the workforce in Canada. Prepare to discuss the measures the government should take to deal with this problem. Suggest career choices that they might consider as a result of your discussions.

11. Reviewing all you have studied in this chapter, identify the country you feel has the best prospects of successfully coping with problems that will result from world population growth in the next 50 years. Provide evidence to support your choice.

**Document Analysis**

12. Examine the following images and respond to the questions below.
   a) Describe the methods or techniques used in each poster to encourage people to limit the size of their family. Be specific.
   b) What are some of the similarities or differences between the two posters?
   c) Who is the target audience for each poster? Be specific.
   d) Which poster is more effective in your opinion? Justify your choice.