

## KEY ISSUE 3

# Why Does Population Growth Vary among Regions?

- The Demographic Transition
- Malthus on Overpopulation
- Population Futures

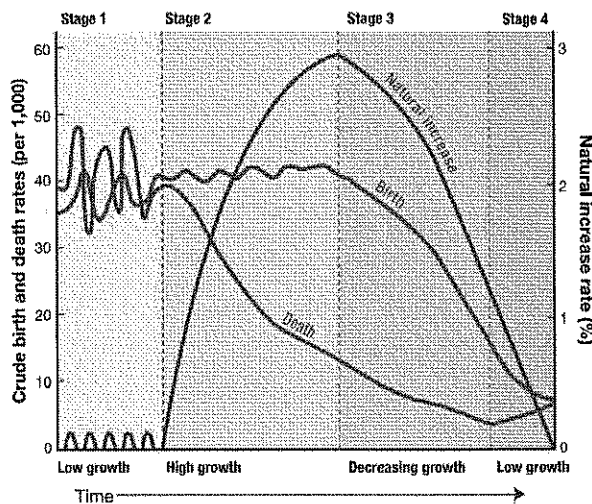
### Learning Outcome 2.3.1

Describe the four stages of the demographic transition.

All countries have experienced some changes in NIR, CBR, and CDR, but at different times and at different rates. Why does global growth matter? In view of the current size of Earth's population and the NIR, will there soon be too many of us?

## The Demographic Transition

The demographic transition is a process of change in a society's population from high crude birth and death rates and low rate of natural increase to a condition of low crude birth and death rates, low rate of natural increase, and higher total population. The process consists of four stages, and every country is in one of them (Figure 2-17).



▲ FIGURE 2-17 DEMOGRAPHIC TRANSITION MODEL The demographic transition model consists of four stages.

## STAGE 1: LOW GROWTH

Very high birth and death rates produce virtually no long-term natural increase.

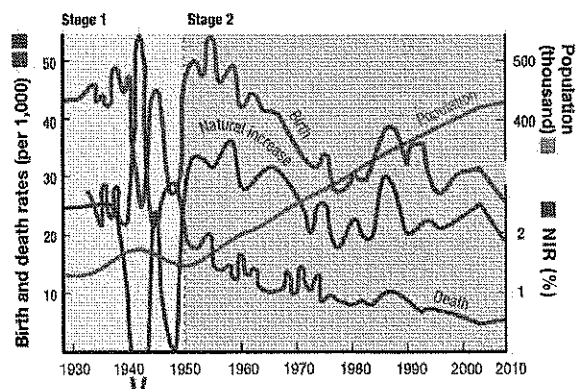
Most of human history was spent in stage 1 of the demographic transition, but today no country remains in stage 1. Every nation has moved on to at least stage 2 of the demographic transition, and, with that transition, has experienced profound changes in population. For most of this period, people depended on hunting and gathering for food (see Chapter 10). When food was easily obtained, a region's population increased, but it declined when people were unable to locate enough animals or vegetation nearby.

## STAGE 2: HIGH GROWTH

Rapidly declining death rates and very high birth rates produce very high natural increase.

Europe and North America entered stage 2 of the demographic transition after 1750, as a result of the **Industrial Revolution**, which began in the United Kingdom in the late eighteenth century and diffused to the European continent and North America (including the United States) during the nineteenth century. The Industrial Revolution was a conjunction of major improvements in manufacturing goods and delivering them to market (see Chapter 11). The result of this transformation was an unprecedented level of wealth, some of which was used to make communities healthier places to live.

Stage 2 of the demographic transition did not diffuse to Africa, Asia, and Latin America until around 1950 (Figure 2-18), and it made that transition for a different reason than in Europe and North America 200 years earlier. The late-twentieth-century push of developing countries into stage 2 was caused by the **medical revolution**. Medical technology invented in Europe and North America has diffused to developing countries. Improved medical practices have eliminated many of the traditional causes of death in developing countries and enabled more people to experience longer and healthier lives.



▲ FIGURE 2-18 STAGE 2: CAPE VERDE Cape Verde entered stage 2 of the demographic transition in approximately 1950, as indicated by the large gap between birth and death rates since then.

### STAGE 3: DECREASING GROWTH

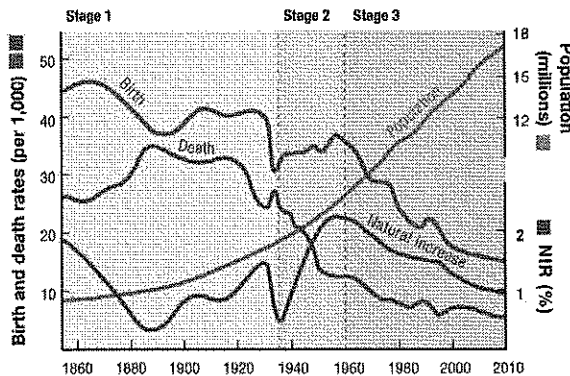
Birth rates rapidly decline, death rates continue to decline, and natural increase rates begin to moderate.

A country moves from stage 2 to stage 3 of the demographic transition when the CBR begins to drop sharply. The CDR continues to fall in stage 3 but at a much slower rate than in stage 2. The population continues to grow because the CBR is still greater than the CDR. But the rate of natural increase is more modest in countries in stage 3 than in those in stage 2 because the gap between the CBR and the CDR narrows.

A society enters stage 3 when people have fewer children. The decision to have fewer children is partly a delayed reaction to a decline in mortality.

Economic changes in stage 3 societies also induce people to have fewer offspring. People in stage 3 societies are more likely to live in cities than in the countryside and to work in offices, shops, or factories rather than on farms. Farmers often consider a large family to be an asset because children can do some of the chores. Urban homes are relatively small and may not have space to accommodate large families.

Most countries in Europe and North America (including the United States) moved from stage 2 to stage 3 of the demographic transition during the first half of the twentieth century. The movement took place during the second half of the twentieth century in many countries of Asia and Latin America, including Chile (Figure 2-19).



▲ FIGURE 2-19 STAGE 3: CHILE Chile entered stage 2 of the demographic transition in the 1930s, when death rates declined sharply, and stage 3 in the 1960s, when birth rates declined sharply.

### STAGE 4: LOW GROWTH

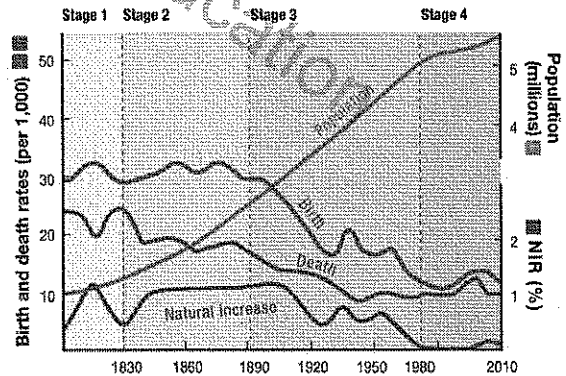
Very low birth and death rates produce virtually no long-term natural increase and possibly a decrease.

A country reaches stage 4 of the demographic transition when the CBR declines to the point where it equals the CDR and the NIR approaches zero. This condition is called **zero population growth (ZPG)**, a term often applied to stage 4 countries.

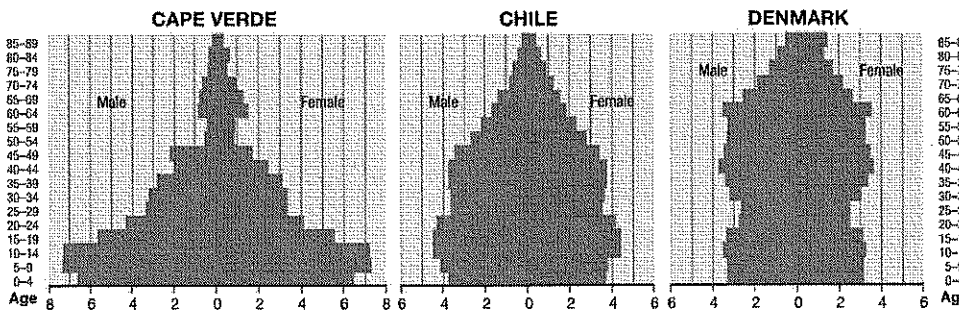
ZPG may occur when the CBR is still slightly higher than the CDR because some females die before reaching childbearing years, and the number of females in their childbearing years can vary. To account for these discrepancies, demographers more precisely define ZPG as the TFR that results in a lack of change in the total population over a long term. A TFR of approximately 2.1 produces ZPG.

Social customs again explain the movement to stage 4. Increasingly, women in stage 4 societies enter the labor force rather than remain at home as full-time homemakers. People who have access to a wider variety of birth-control methods are more likely to use some of them.

Denmark, like most other European countries, has reached stage 4 of the demographic transition (Figure 2-20). Denmark's population pyramid shows the impact of the demographic transition. Instead of a classic pyramid shape, Denmark has a column, demonstrating that the percentages of young and elderly people are nearly the same (Figure 2-21).



▲ FIGURE 2-20 STAGE 4: DENMARK Denmark has been in stage 4 of the demographic transition and has experienced virtually no change in total population since the 1970s.



▲ FIGURE 2-21 POPULATION PYRAMIDS As a country moves through the demographic transition, the shape of the pyramid flattens. (left) Cape Verde's pyramid has a broad base, as is typical of a stage 2 country. (center) Chile's graph still resembles a pyramid. (right) Denmark's pyramid is flat, an indication of the aging of the population.

## DECLINING BIRTH RATES

### Learning Outcome 2.3.2

#### Summarize two approaches to reducing birth rates.

The CBR has declined rapidly since 1990, from 27 to 20 in the world as a whole and from 31 to 22 in developing countries (Figure 2-22). Two strategies have been successful in reducing birth rates:

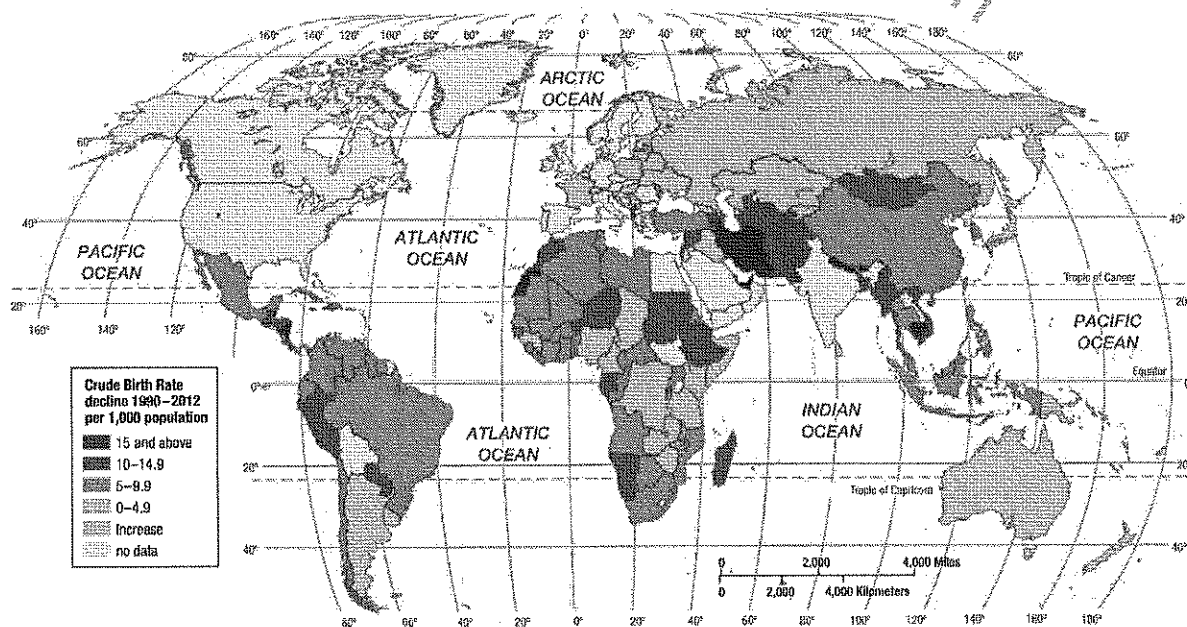
1. **Lowering birth rates through education and health care.** One approach to lowering birth rates emphasizes the importance of improving local economic conditions (Figure 2-23). A wealthier community has more money to spend on education and health-care programs that promote lower birth rates. According to this approach:
  - With more women able to attend school and to remain in school longer, they would be more likely to learn employment skills and gain more economic control over their lives.
  - With better education, women would better understand their reproductive rights, make more informed reproductive choices, and select more effective methods of contraception.
  - With improved health-care programs, IMRs would decline through such programs as improved prenatal care, counseling about sexually transmitted diseases, and child immunization.
  - With the survival of more infants ensured, women would be more likely to choose to make more

effective use of contraceptives to limit the number of children.

2. **Lowering birth rates through contraception.** The other approach to lowering birth rates emphasizes the importance of rapidly diffusing modern contraceptive methods (Figure 2-24). Economic development may promote lower birth rates in the long run, but the world cannot wait around for that alternative to take effect. Putting resources into family-planning programs can reduce birth rates much more rapidly. In developing countries, demand for contraceptive devices is greater than the available supply. Therefore, the most effective way to increase their use is to distribute more of them cheaply and quickly. According to this approach, contraceptives are the best method for lowering the birth rate.

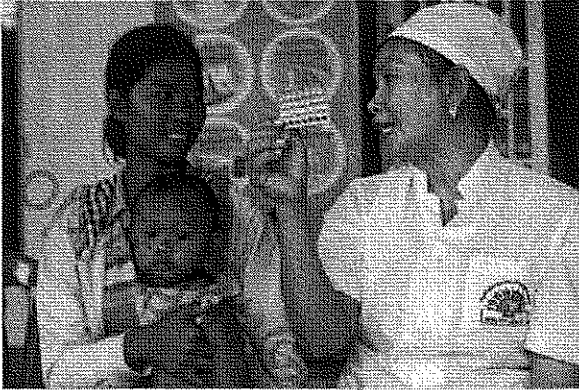
Bangladesh is an example of a country that has had little improvement in the wealth and literacy of its people, but 56 percent of the women in the country used contraceptives in 2011 compared to 6 percent three decades earlier. Similar growth in the use of contraceptives has occurred in other developing countries, including Colombia, Morocco, and Thailand. Rapid growth in the acceptance of family planning is evidence that in the modern world, ideas can diffuse rapidly, even to places where people have limited access to education and modern communications.

The percentage of women using contraceptives is especially low in sub-Saharan Africa, so the alternative of distributing contraceptives could have an especially strong impact there. Fewer than one-fourth of women in sub-Saharan Africa employ contraceptives, compared to more



▲ FIGURE 2-22 CBR CHANGE 1980–2012 The crude birth rate has declined in all but a handful of countries. Declines have been most rapid in Latin America and South and Southwest Asia.

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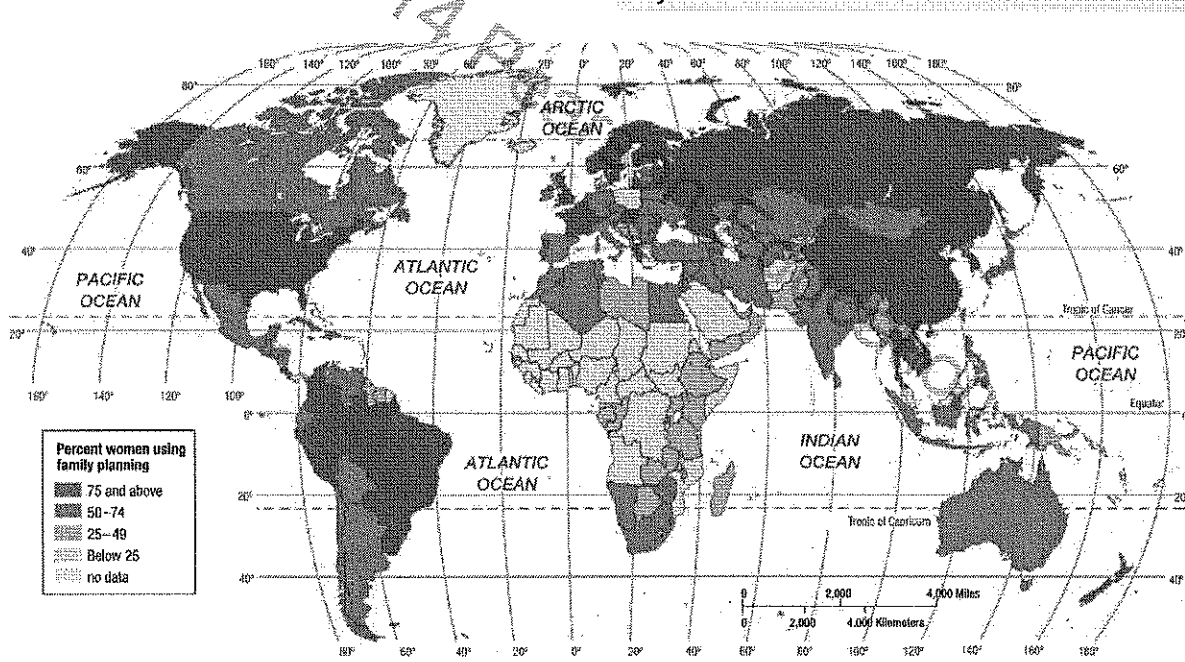
**▲ FIGURE 2-23 PROMOTING FEWER CHILDREN** Women talk about birth control at a health clinic in Kampong Cham, Cambodia.

than two-thirds in Asia and three-fourths in Latin America (Figure 2-25).

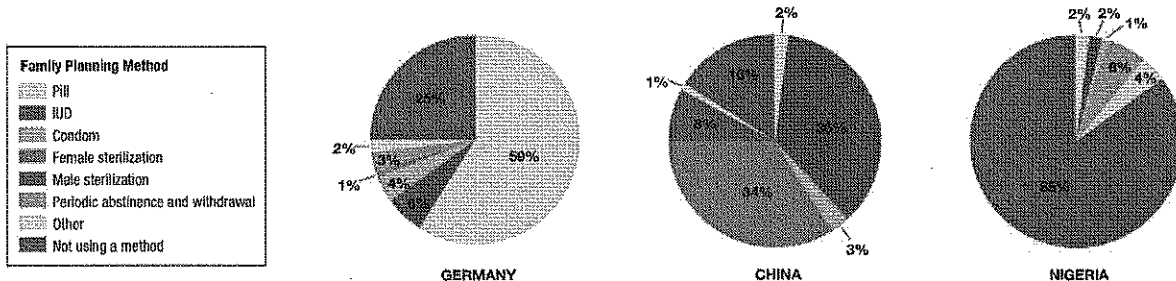
Regardless of which alternative is more successful, many oppose birth-control programs for religious and political reasons. Adherents of several religions, including Roman Catholics, fundamentalist Protestants, Muslims, and Hindus, have religious convictions that prevent them from using some or all birth-control methods. In the United States opposition is strong to terminating pregnancy by abortion, and the U.S. government has at times withheld aid to countries and family-planning organizations that advise abortion, even when such advice is only a small part of the overall aid program.

**Pause and Reflect 2.3.2**

**Why have countries in Northern Europe had little if any decline in CBR since 1990?**



**▲ FIGURE 2-24 WOMEN USING FAMILY PLANNING** More than two-thirds of couples in developed countries use a family-planning method. Family-planning varies widely in developing countries. China reports the world's highest rate of family planning; the lowest rates are in sub-Saharan Africa.



**▲ FIGURE 2-25 FAMILY PLANNING METHODS** The principal family-planning methods in developed countries like Germany are condoms and birth-control pills. The principal methods in China are intrauterine devices (IUDs) and female sterilization. People in sub-Saharan African countries such as Nigeria make minimal use of family planning.

## Population Futures

### Learning Outcome 2.3.4

Summarize the possible stage 5 of the demographic transition.

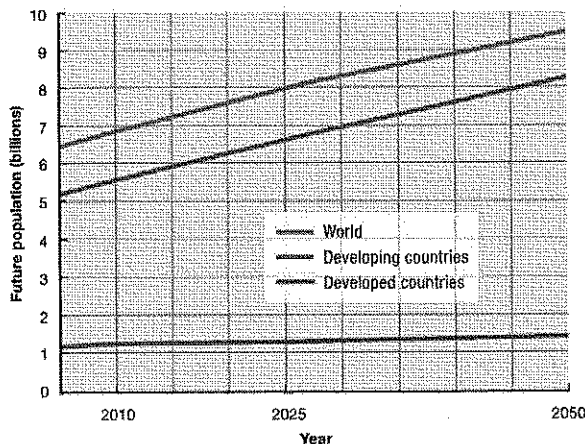
NIR is forecast to be much slower in the twenty-first century than in the twentieth, but world population will continue to grow. The Population Reference Bureau forecasts that world population will increase from 7 billion in 2011 to 9.5 billion in 2050 (Figure 2-29). Around 97 percent of this increase is forecast to be in developing countries, whereas many developed countries may move into a possible stage 5 of the demographic transition.

Future population depends primarily on fertility. The United Nations forecasts that if the current TFR of 2.5 remains unchanged, world population would reach 12 billion in 2050. On the other hand, if TFR declines in the next few years to 1.5, world population would actually decline to 8 billion in 2050.

### DEMOGRAPHIC TRANSITION POSSIBLE STAGE 5: DECLINE

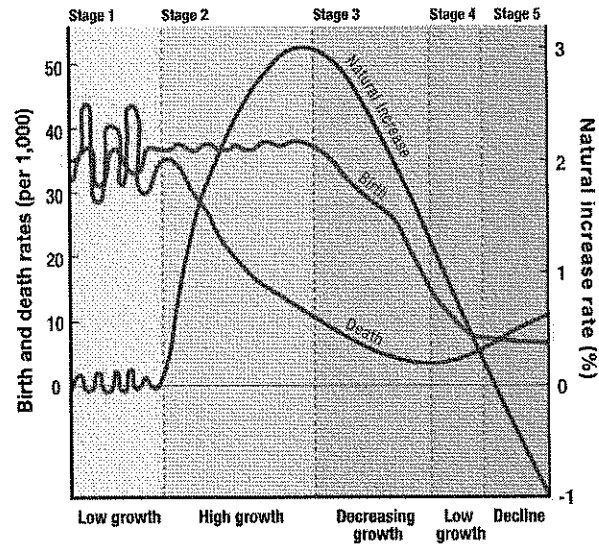
A country that has passed through the four stages of the demographic transition has in some ways completed a cycle—from little or no natural increase in stage 1 to little or no natural increase in stage 4. Two crucial demographic differences underlie this process:

- The total population of the country is much higher in stage 4 than in stage 1.
- At the beginning of the demographic transition, the CBRs and CDRs are high—35 to 40 per 1,000—whereas at the end of the process the rates are very low, approximately 10 per 1,000.



▲ FIGURE 2-29 FUTURE POPULATION GROWTH Nearly all of the world's population growth is forecast to be in developing countries.

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▲ FIGURE 2-30 POSSIBLE DEMOGRAPHIC TRANSITION STAGE 5 Stage 5 of the demographic transition would be characterized by a negative NIR, because the CDR would be greater than the CBR.

The four-stage demographic transition is characterized by two big breaks with the past. The first break—the sudden drop in the death rate that comes from technological innovation—has been accomplished everywhere. The second break—the sudden drop in the birth rate that comes from changing social customs—has yet to be achieved in many countries.

Meanwhile, a possible stage 5 of the demographic transition is predicted by demographers for some developed countries. Stage 5 would be characterized by a very low CBR, an increasing CDR, and therefore a negative NIR (Figure 2-31). After several decades of very low birth rates, a stage 5 country would have relatively few young women aging into child-bearing years. As the smaller pool of women each chooses to have fewer children, birth rates would continue to fall even more than in stage 4.

The world's future population will definitely be older. The elderly support ratio is the number of working-age people (ages 15 to 64) divided by the number of persons 65 and older (Figure 2-30). A small number means that relatively few workers must contribute to pensions, health care, and other support that older people need. With more elderly people than children, a stage 5 country would experience an increased CDR because of high mortality among the relatively large number of elderly people.

Several European countries, notably Russia and other former Communist countries, already have negative NIRs. Russia's high CDR and low CBR are a legacy of a half-century of Communist rule. The low CBR may stem from a long tradition of strong family-planning programs and a deep-seated pessimism about having children in an uncertain world. The high CDR may be a legacy of inadequate pollution controls and inaccurate reporting by the Communists.

## CHINA AND INDIA

The world's two most populous countries, China and India, will heavily influence future prospects for global overpopulation. These two countries—together encompassing more than one-third of the world's population—have adopted different family-planning programs. As a result of less effective policies, India adds 12 million more people each year than does China. Current projections show that India could surpass China as the world's most populous country around 2030.

**INDIA'S POPULATION POLICIES.** India, like most countries in Africa, Asia, and Latin America, remained in stage 1 of the demographic transition until the late 1940s. During the first half of the twentieth century, the Indian population increased modestly—less than 1 percent per year—and even decreased in some years because of malaria, famines, plagues, and cholera epidemics.

Immediately after gaining independence from England in 1947, India saw a sharp decline in death rate (to 20 per 1,000 in 1951), whereas the CBR remained relatively high (about 40). Consequently, the NIR jumped to 2 percent per year. In response to this rapid growth, India became the first country to embark on a national family-planning program, in 1952. The government has established clinics and has provided information about alternative methods of birth control. Birth-control devices have been distributed free or at subsidized prices. Abortions, legalized in 1972, have been performed at a rate of several million per year. All together, the government spends several hundred million dollars annually on various family-planning programs.

India's most controversial family-planning program was the establishment of camps in 1971 to perform sterilizations—surgical procedures in which people were made incapable of reproduction. A sterilized person was entitled to a payment, which has been adjusted several times but generally has been equivalent to the average monthly income in India. At the height of the program, in 1976, 8.3 million sterilizations were performed during a 6-month period, mostly on women.

The birth-control drive declined in India after 1976. Widespread opposition to the sterilization program grew in the country because people feared that they would be forcibly sterilized. The prime minister, Indira Gandhi, was defeated in 1977, and the new government emphasized the voluntary nature of birth-control programs. The term *family planning*, which the Indian people associated with the forced sterilization policy, was replaced by the term *family welfare* to indicate that compulsory birth-control programs had been terminated. Although Mrs. Gandhi served again as prime minister from 1980 until she was assassinated in 1984, she did not emphasize family planning during that time because of the opposition during her previous administration.

In the past several decades, government-sponsored family-planning programs in India have emphasized

education, including advertisements on national radio and television networks and information distributed through local health centers. Given the cultural diversity of the Indian people, the national campaign has had only limited success. The dominant form of birth control continues to be sterilization of women, in many cases after the women have already borne several children.

**CHINA'S POPULATION POLICIES.** In contrast to India, China has made substantial progress in reducing its rate of growth. Since 2000, China has actually had a lower CBR than the United States.

The core of the Chinese government's family-planning program has been the One Child Policy, adopted in 1980. Under the One Child Policy, a couple needs a permit to have a child. Couples receive financial subsidies, a long maternity leave, better housing, and (in rural areas) more land if they agree to have just one child. The government prohibits marriage for men until they are age 22 and women until they are 20. To further discourage births, people receive free contraceptives, abortions, and sterilizations. Rules are enforced by a government agency, the State Family Planning Commission.

As China moves toward a market economy in the twenty-first century and as Chinese families become wealthier, the harsh rules in the One Child Policy have been relaxed, especially in urban areas. Clinics provide counseling on a wider range of family-planning options. Instead of fines, Chinese couples wishing a second child pay a "family-planning fee" to cover the cost to the government of supporting the additional person. Fears that relaxing the One Child Policy would produce a large increase in the birth rate have been unfounded.

### Pause and Reflect 2.3.4

Why might China's One Child Policy result in many more male than female children?

### CHECK-IN: KEY ISSUE 3

#### Why Does Population Growth Vary Among Regions?

- ✓ The demographic transition has four stages characterized by varying rates of births, deaths, and natural increase.
- ✓ The CBR has declined since 1990 in all but a handful of countries.
- ✓ Malthus believed that population would outstrip resources, but critics argue that that hasn't been the case in the world as a whole.