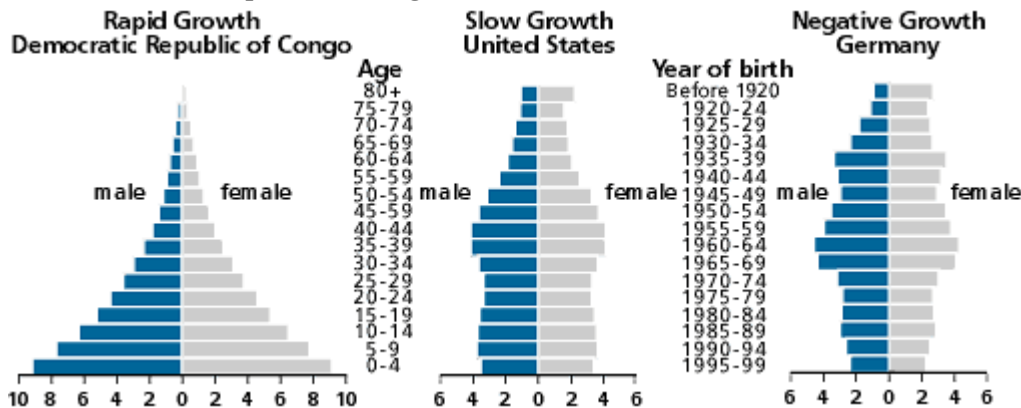


## Human Population: Fundamentals of Growth

### Three Patterns of Population Change

#### Three Patterns of Population Change, 2000



Source: United Nations, *World Population Prospects, The 1998 Revision*.

Aside from the total size, the most important demographic characteristic of a population is its age and sex structure, or the proportion of people at each age, by sex. The [age-sex structure](#) determines potential for future growth of specific age groups, as well as the total population. For these reasons, the age structure has significant government policy implications. A population of young people needs a sufficient number of schools and, later, enough jobs to accommodate them. Countries with a large proportion of older people must develop retirement systems and medical facilities to serve them. Therefore, as a population ages, needs change from childcare and schools to jobs, housing, and medical care.

**Q&A:** Why does it take so long to slow or stop population growth?

[find out answer](#)

PDF of Graphic

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### Population Pyramids

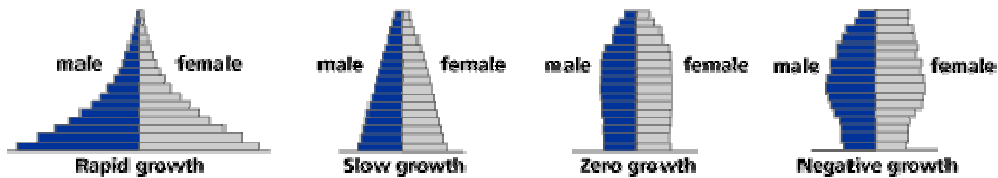
The age-sex structure of a country can be studied through [population pyramids](#). The overall shape of the pyramid indicates the potential for future growth. The four representations of population age-sex structure provide an overall example of what a pyramid for different levels of population growth would look like — rapid growth, slow growth, [zero growth](#), and negative growth. The horizontal bars show the percentage (or in some cases the actual numbers) of males and females in each age group.

The country pyramids shown on the chart "Three patterns of population change" also represent different stages of population growth going on today. The first pyramid, representing the population of the Democratic Republic of Congo, with its wide base and narrow top, is typical of a young population. This shape is the result of high [birth rates](#) that feed more and more people into the lowest bars and in turn shrink the relative proportion at the oldest ages. As the [death rate](#) declines, more people survive to the reproductive ages and beyond. The births they have further widen the base of the pyramid. This shape is common in many [less developed](#)

[countries](#) that have experienced improvements in [life expectancy](#) but continue to have high birth rates. It reflects both a history of rapid population growth and the potential for future rapid growth.

The second age-sex pyramid is typical of a slowly growing population. The United States is an example of a country in slow growth. The United States has had declining fertility and mortality rates for most of this century. With lower fertility, fewer people have entered the lowest bars of the pyramid, and as life expectancy has increased, a greater percentage of the "births" have survived until old age. As a result, the population has been aging, meaning that the proportion of older persons in the population has been growing. This trend was interrupted by the postwar [baby boom](#), 1946–1964, when birth rates climbed again. (The bulge of the baby-boom generation can be seen in the pyramid for ages 35–54 in 2000.) After 1964, birth rates continued their downward trend until the late 1970s. As the last members of the baby boom approached their childbearing years during the 1980s, the number of births rose again, peaking in 1990. These children, the youngest generation, are represented by the slightly widening base of the pyramid. Even though the number of births per woman is lower than ever before, the population continues to grow because of the children and grandchildren of the huge baby-boom generation.

#### Age-Sex Structures in Transition



A few countries have reached zero population growth or are experiencing negative growth because of low birth rates and an old age structure coupled with minimal [net migration](#). While Germany's death rate exceeds its birth rate, its population continues to grow because of net migration. Pyramids in which the proportions of the population are fairly evenly distributed among all age groups are representative of many highly industrialized societies. Germany's old population reflects an extended period of low birth and death rates. While fewer children have been born, most of those born survive through to old age. The net effect is zero growth or no [natural increase](#). Germany's pyramid also shows the effect of higher [mortality](#) among males. In an industrialized society, females generally outnumber males after age 40. This trend is particularly evident in Germany's oldest age group.

While birth and death rates usually determine the basic pyramid shape, migration also affects it. Typically, most migrants are in the working ages, and often more males than females migrate across national borders. In some Middle Eastern countries a large number of men migrated to work in the oil fields, which caused a bulge in one side of the pyramid, while it took a "bite" out of the pyramid of some of the countries from which they came.

Short-term fluctuations in birth and death rates that produce unusual bites or bulges in population pyramids, such as the baby boom, often can be traced to such historical events as wars, epidemics, economic booms, or depressions. The decline in the birth rate during the Great Depression caused a small bite in the U.S. pyramid for the group born between 1930 and 1934. World Wars I and II caused a deficit of older men in Germany. The impact of these events emphasizes the interrelationships among population change and economic, social,

political, and health factors.

### **Terms**

**Age-sex structure:** The composition of a population as determined by the number or proportion of males and females in each age category. The age-sex structure of a population is the cumulative result of past trends in fertility, mortality, and migration. Information on age-sex composition is essential for the description and analysis of many other types of demographic data.

**Baby boom:** A dramatic increase in fertility rates and in the absolute number of births. In the United States this occurred during the period following World War II (1946-1964).

**Birth rate (or crude birth rate):** The number of live births per 1,000 population in a given year. Not to be confused with the growth rate.

**Death rate (or crude death rate):** The number of deaths per 1,000 population in a given year.

**Growth rate:** The number of persons added to (or subtracted from) a population in a year due to natural increase and net migration; expressed as a percentage of the population at the beginning of the time period.

**Less developed countries:** Less developed countries include all countries in Africa, Asia (excluding Japan), and Latin America and the Caribbean, and the regions of Melanesia, Micronesia, and Polynesia.

**Life expectancy:** The average number of additional years a person of a given age could expect to live if current mortality trends were to continue for the rest of that person's life. Most commonly cited as life expectancy at birth.

**More developed countries:** More developed countries include all countries in Europe, North America, Australia, New Zealand, and Japan.

**Mortality:** Deaths as a component of population change.

**Net migration:** The net effect of immigration and emigration on an area's population in a given time period, expressed as an increase or decrease.

**Population pyramid:** A bar chart, arranged vertically, that shows the distribution of a population by age and sex. By convention, the younger ages are at the bottom, with males on the left and females on the right.

**Rate of natural increase:** The rate at which a population is increasing (or decreasing) in a given year due to a surplus (or deficit) of births over deaths, expressed as a percentage of the base population.

**Zero population growth:** A population in equilibrium, with a growth rate of zero, achieved when births plus immigration equal deaths plus emigration. Zero growth is not to be confused with replacement level fertility.