

Chapter 11-14: Human Population Ecology

An important aspect of ecology is the study of the dynamics of the human population. The human population consists of individuals of a species living together in an environment. To understand the dynamics of the human population, ecologists study its density, the distribution of its individuals, and its growth rate. The density of the population is influenced by factors such as natality (birth into a population), immigration, mortality (the death of individuals), and emigration (movement out of an area).

Population biologists study the age-sex structure of a population to help them predict future changes in it. They construct bar graphs using five-year age categories and sexes, as shown in this plate. The result is a population pyramid that can be broad-based, inverted, or thin at the margins. We will use the population pyramid to study three populations and their future potentials.

This plate displays the population pyramids associated with three countries in 1980: Mexico, the United States, and Sweden. We will see how the age-sex distributions of the three countries have an effect on their structures.

Five-year categories are displayed in the three population pyramids shown in this plate. Ecologists place males to the left of the central, vertical axis, and females to the right (shaded region). The rate of population growth is influenced by the number of individuals that are of reproductive age.

Begin your work by focusing on the pyramid to the left, which represents **Mexico (A)**. A darker color can be used to color the box at the top, and variations of that color can be used to denote **Mexican males (A₁)** to the left of the axis, and **Mexican females (A₂)** to the right of the axis.

The population pyramid for Mexico is broad at the base and narrow at the top, which is typical of a developing country. Note that the majority of individuals are under the age of five. Ecologists predict that in the future, the population of Mexico will increase dramatically, because the country has more people yet to reproduce than people who have already reproduced or are presently reproducing. The population of Mexico is potentially explosive and will probably grow faster than that of other countries. Here the number of children that are less than fifteen years old exceeds 40% of the total population.

We now move to the second pyramid, which represents the United States of America. Continue your coloring as you read about this country in the paragraphs below. Three new colors should be used for this pyramid.

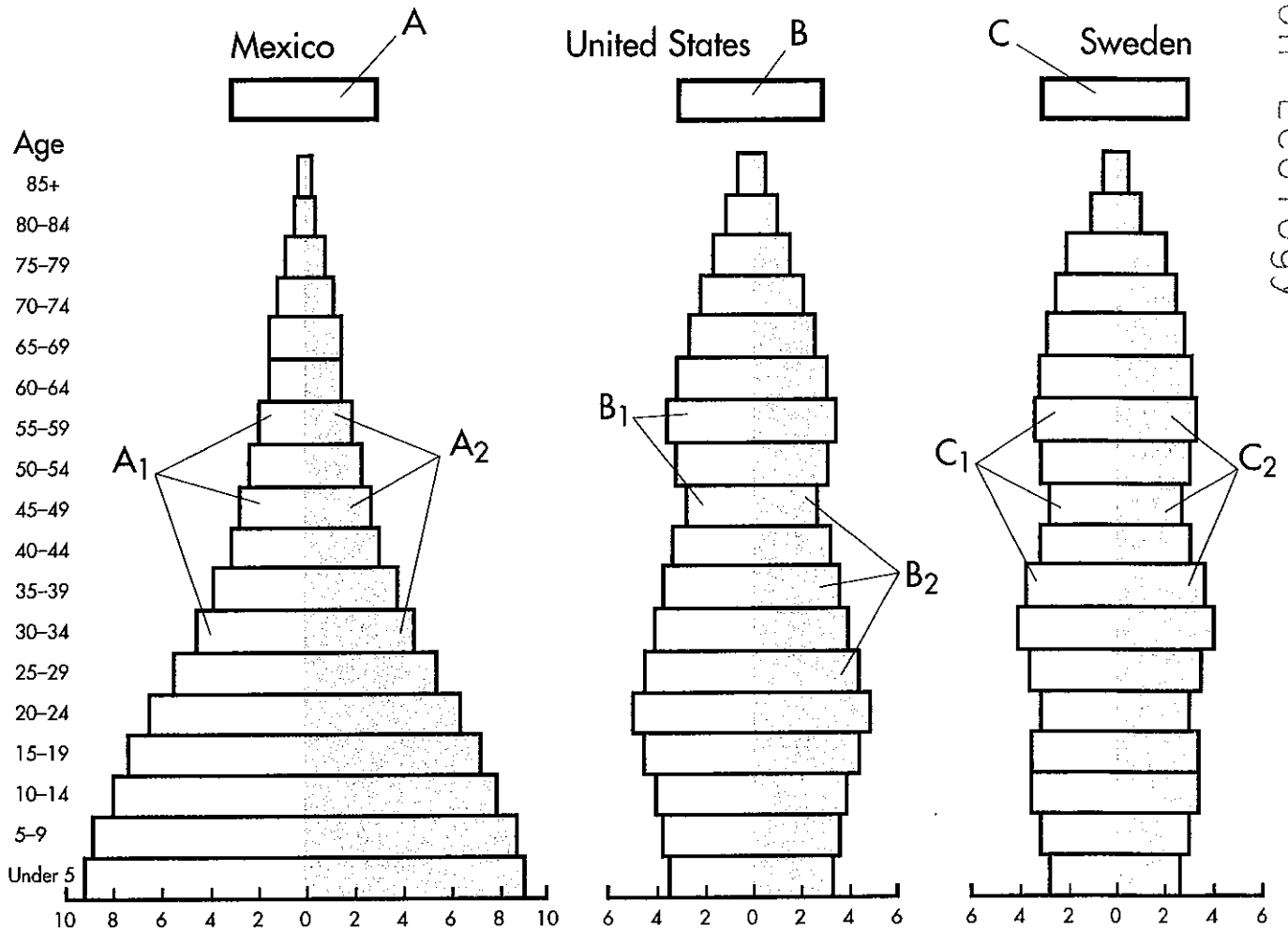
In the second pyramid, we see the age-sex structure for the **United States of America (B)** as of 1980. **American males (B₁)** are shown to the left of the axis, and **American females (B₂)** to the right. This is an example of a relatively stable population, the number of prereproductive individuals nearly balances the number of postreproductive individuals.

Several items in the United States 1980 bar graph are notable. Note that in the age group 45-49, the number of individuals is much smaller than in the group 20-24. The former represents the small number of children born in the Depression era, while the latter represents the large number of children born during the post-World War II "baby boom." The forecast is that our population will not expand rapidly in the decades ahead, because similar numbers of reproductive and prereproductive individuals exist.

Having contrasted the populations of developing and developed countries, we now examine the age-sex structure of a population that is declining. This is the population of Sweden. Continue your coloring as before, using three new colors to represent the third example of population ecology.

A declining population is represented by the third population pyramid. This bar graph represents the population of **Sweden (C)**. **Swedish males (C₁)** are at the left, and **Swedish females (C₂)** are at the right. In declining populations, the pyramids are tapered at the bottom. They show that more individuals who have reproduced exist than do individuals of prereproductive age. Recent population increases have been comparatively slow in Sweden, so that the base of the bar graph is narrow. People tend to live longer in the developed countries, so the bar graph tends to be wider toward the top of the pyramid. Predictors of population fluctuations forecast a continued decline in the population of this country.

It should be noted that in recent years, the birth rate in Mexico has declined. However, a large number of individuals have entered their reproductive years, so that a great population increase is anticipated. By contrast, the birth rates of the United States and Sweden remain low, and fewer individuals are entering their reproductive years.



- Human Population Ecology
- MexicoA
 - Mexican MalesA₁
 - Mexican FemalesA₂
 - United States of America.....B
 - American Males.....B₁
 - American Females.....B₂
 - SwedenC
 - Swedish MalesC₁
 - Swedish FemalesC₂