UNIT 2
Population and Migration Patterns and Processes

Chapter 3 *Population Distribution and Composition*
Chapter 4 *Population Change*
Chapter 5 *Migration*

Unit Overview

The distribution of people influences all other elements of human geography. Where people live, whether spread out in small communities or concentrated in large cities, affects how they relate to one another, what demands they place on the environment, and what decisions they make as a community.

People decide where to live based on many factors. Some are physical: people want to be near sources of food and water and where the climate is not too extreme. Some factors are human: people might move to take a job or to be close to family.

Changes in Populations

For most of human history, women typically gave birth to many children, but so few children survived to adulthood that the total human population grew slowly. However, in the past two centuries, advances in public health, medical care, and the economy have enabled people to live longer. As a result of these new patterns, the global population has exploded. However, in recent decades, population growth has leveled off in many wealthy countries, such as Germany, South Korea, the United States.

Why People Move

People have always been on the move. Usually, they migrated by choice, wanting to leave a place of poverty or persecution or warfare in order to live in a place with economic opportunity, religious liberty, political freedom, and peace. In some cases, people had no choice. For example, for nearly four centuries, Africans were enslaved and brought to the Americas.

ENDURING UNDERSTANDINGS

PSO-2: Understanding where and how people live is essential to understanding global cultural, political, and economic patterns.

IMP-2: Changes in population are due to mortality, fertility, and migration, which are influenced by the interplay of environmental, economic, cultural, and political factors.

SPS-2: Changes in population have long- and short-term effects on a place's economy, culture, and politics.

Source: *AP® Human Geography Course and Exam Description*. Effective Fall 2020. (College Board).

CHAPTER 3

Population Distribution and Composition

Topics 2.1–2.3

Topic 2.1 Population Distribution

Learning Objectives: Identify the factors that influence the distribution of human populations at different scales. (PSO-2.A)

Define methods geographers use to calculate population density. (PSO-2.B)

Explain the differences between and the impact of methods used to calculate population density. (PSO-2.C)

Topic 2.2 Consequences of Population Distribution

Learning Objective: Explain how population distribution and density affect society and the environment. (PSO-2.D)

Topic 2.3 Population Composition

Learning Objectives: Describe elements of population composition used by geographers. (PSO-2.E)

Explain ways that geographers depict and analyze population composition. (PSO-2.F)

Half the world's population lives in just 1 percent of the land.

—Max Galka, *Metrocosm,* January 4, 2016

Source: Getty Images

The image shows city traffic in India. Rapid population growth and density impacts society and the environment. (See Topic 2.2 for the effects of population growth.)

2.1

Population Distribution

Essential Question: What are the factors that influence population distribution and what are the impacts of different methods used to calculate population density?

Humans live on a small percentage of the planet. The world contains seven times as many people today as it did two centuries ago. Population density has increased significantly. However, population distribution has not. The vast majority of growth has been in areas already settled. For example, eastern China was one of the most populated parts of the world in 1800—and it still is today. Why have people chosen to live in such crowded places?

Where People Live

People want to live in places where they can survive with relative ease and comfort—places where they can raise or obtain food and live in moderate climates. Around 1800, when the population was only one billion, people were dispersed throughout such desirable lands. As population increased, the amount of suitable land stayed about the same, so people chose to live in greater densities on that same land.

Human geography tries to explain why people live where they do. It includes the study of two distinct but related concepts:

- **Population distribution** is the pattern of human settlement—the spread of people across the earth. Representing it on a map highlights places that are crowded, sparsely settled, or even empty.
- **Population density** is a measure of the average population per square mile or kilometer of an area. It measures how crowded a place is.

Understanding both population distribution and density helps people make important decisions on issues such as where to set the boundaries of an electoral district or where to develop new housing. These are among the many issues influenced by the number, distribution, and density of current and projected populations.

Physical Factors Influencing Population Distribution

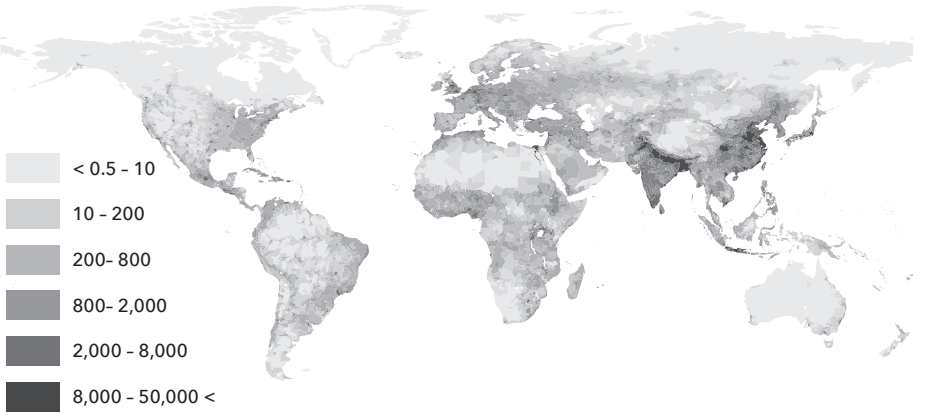
Survival for the earliest humans depended on food, water, and shelter. Thus, these hunter-gatherers settled where these features were most readily available. Similarly, people today have the same basic needs, which helps explain why the population distribution has remained so similar over time. The map of Earth's population distribution today below shows where the highest densities and largest numbers of people live today.

Midlatitudes Most people live in the **midlatitudes**, the regions between 30 degrees and 60 degrees, north and south of the equator. These areas have more moderate climates and better soils than do regions at higher or lower latitudes. This pattern is particularly noticeable in the northern hemisphere because it includes more land than the southern hemisphere.

Low-Lying Areas Most people live in low-lying areas rather than high-alititude areas, such as mountains. Low-lying areas typically have better soils for raising crops than do upland or high-altitude areas. In addition, these areas are often close to oceans, which facilitate transportation, provide a source of food, and have a moderating effect on temperature. Oceans keep the land warmer in the winter and cooler in the summer.

Other Factors Most people live near lakes or rivers. People need fresh water to drink, and they can use it for irrigation, transportation, and to provide food. Regions of the world where it is difficult for humans to live typically have low population numbers and densities. These include mountainous areas, deserts, and high latitude/cold climates where agriculture is challenging. Lower population densities are also found in the tropics where disease is more prevalent and poor soils make farming difficult. Polar regions have no permanent human populations.

WORLD POPULATION DISTRIBUTION



Source: Wikimedia Commons

Human Factors Influencing Population Distribution

The places humans first settled included natural features that attracted them. However, then people themselves became an attraction. Newcomers moved in for safety, to find a job, or to be with friends or relatives. The populations and densities of cities have continued to grow, often to extreme levels.

Where people place transportation networks also has a significant impact on population distribution. People prefer to live close to trade routes. Roads, train lines, and rivers often produce a linear settlement pattern in which houses and communities stretch out in a line.

Political decisions sometimes bring clusters of populations to isolated locations where physical attributes would not normally attract settlement. For example, in 1950, Canada wanted a military base that could monitor possibly hostile actions by the country then known as the Soviet Union. So, it established a military base named Alert on the northern edge of its territory, in a land of ice, snow, and bitterly cold temperatures. Alert remains the most northerly community in the world.

Scale of Analysis and Physical Factors

The basic principle that people want to live on the most desirable land applies at any scale, or level of analysis by size. (See Topic 1.6 for more on scales of analysis.) As the scale of analysis changes, the relevance of certain factors such as climate, elevation, and industrialization changes as well.

At the global scale, regions with very high elevations—mountainous regions such as in the Himalayas, the Andes, and the Rocky Mountains—have cold climates, so such places usually have limited populations. However, elevation is sometimes important at the city level. People might prefer living at the highest elevations in a city because these spots offer cool breezes, safety from floods, and inspiring views of the landscape. At a regional scale, climate can also explain population distribution of a state such as California, where climate varies greatly within the state. For example, coastal California has a very large population compared to the desert and mountain regions of the interior. On a larger or local scale, such as a city, the spatial climate variation is usually too small to affect settlement.

Scale of Analysis and Human Factors

Polluted air is a health hazard, yet it may signal industrialization, economic development, and employment opportunities. On a global or national scale, millions of people are attracted to cities in search of economic opportunities and they might knowingly move to a polluted area. At a local scale, few people intentionally choose to settle near a pollution source unless they have to live there because lower property values make it more affordable.

Governments also have a significant influence on population distribution at different scales. A national government might increase the population of an area by building a new military base. A state might reduce population in an area by creating a new state park. A city government might affect population distribution by allowing high-rise apartment buildings in some areas and reserving other areas for single-family homes. (See Topic 6.6.)

Factors influencing a city's population distribution such as elevation, proximity to desirable land, and land use laws commonly result in a population distribution that reflects **social stratification**—the hierarchical division of people into groups based on factors such as economic status, power, and/or ethnicity. Cities are characterized by regions and neighborhoods where the local population shares a characteristic that distinguishes it from other neighborhoods. For example, a neighborhood with large homes and parks

would be likely to have families with children and an industrial zone might have few residences. In most countries, stratification is largely based on wealth, but sometimes policies and cultural beliefs have limited the areas where certain groups of people can live.

Population Density

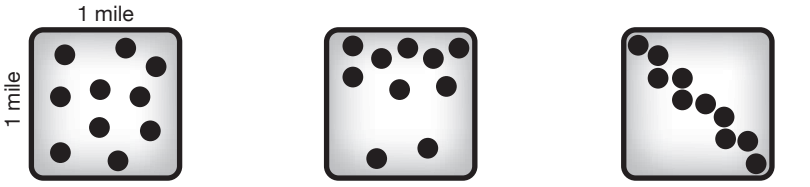
Population density is calculated by comparing the area's population to its size, and is expressed in the number of people per square mile or square kilometer. Demographers, people who study human populations, identify three types of population density: arithmetic, physiological, and agricultural.

Arithmetic Population Density

The most commonly used population density is the **arithmetic population density**, calculated by dividing a region's population by its total area. In 2019, the United States had a population of approximately 328,239,523 in a total area of 3,841,999 square miles. Therefore, its arithmetic population density was 85.4 people per square mile, or 35.9 people per square kilometer. These figures are given in various styles. Two common styles are 85.4/sq. mi. and 85.4/mi^2.

But arithmetic density says little about population distribution. Population density is simply an average number of people overall in an area. It does not indicate where in the total area they live. The diagram below shows three areas with ten people per square mile, but with different distributions:

- In A, people are evenly dispersed throughout the area. This pattern is common in areas where each person or household lives on a large plot of land. At different scales and with different numbers, this basic pattern appears in many suburbs and many farming and ranching areas.
- In B, people are clustered, or nucleated, in one part of an area. This is a common pattern when people live near a central feature, such as a church, or are concerned about defense.
- In C, people are spread out in a line, known as a linear pattern. This pattern is common for people who live along a river or transit route.



Physiological Population Density

Another measure is **physiological population density**, calculated by dividing population by the amount of **arable** land, or land suitable for growing crops. Egypt (with 2.8 percent arable land), for example, recently had a physiological

density of 8,078/sq. mile (3,156/sq. kilometer) compared to an arithmetic density of 226/sq. mile (88/sq. kilometer).

Such a large difference between the arithmetic and physiological densities indicates that a small percentage of a region's land is capable of growing crops. Egypt's high physiological density suggests a need for greater crop yields or for other food sources. The physiological population density is a much more useful measure than the arithmetic density to determine a region's *carrying capacity*—the population it can support without significant environmental deterioration. (See Topic 2.2 for more about carrying capacity.)

A country with a high physiological density indicates that it needs high crop yields, but higher yields are not always possible. Many regions rely on imported food. Egypt and Japan both have physiological densities greater than 8,000 people/sq. mile of arable land. In both countries, growing enough food to feed the nation's population is not practical with current technology. Both supplement crops through the fishing industry and with imported food. Paying for imported food is easier for a developed country, such as Japan, than it is for a less-developed country, such as Egypt.

In the table below, notice the relationship between the percent of arable land in a country and the difference between the arithmetic and physiological densities.

ARITHMETIC AND PHYSIOLOGICAL POPULATION DENSITIES

Country	Arithmetic Density (people/sq. mi.)	Physiological Density (people/sq. mi.)	Arable Land
Iceland	8	687	1.2%
United States	85	498	16.8%
Egypt	226	8,078	2.8%
Japan	962	8,218	11.7%
Netherlands	1,044	3,505	31.0%
Bangladesh	2,914	4,938	59.0%
Singapore	19,982	2,498,197	0.8%

Egypt is mostly covered by desert with most of its fertile land near the Nile River, while nearly 70 percent of Japan's topography is mountainous. What advantages does the United States have compared to Egypt and Japan in its ability to produce enough food for the nation's population?

Agricultural Population Density

The third type of population density, **agricultural population density**, compares the number of farmers to the area of arable land. This value gives an indication of the efficiency of the region's farmers. Developed countries have lower agricultural densities because farmers have resources and technology to produce large quantities of food with few workers. The agricultural densities in less-developed countries are higher because farmers often cannot afford modern technology, so they depend more upon labor. As a result, farmers in these areas are not able to produce as much food per farm worker.

Compare all three types of population density for Bangladesh and the Netherlands, for example. Both had high arithmetic densities—Bangladesh had 2,914/sq. mi. and the Netherlands had 1,044/sq. mi. Also, both had high physiological densities, with Bangladesh at 4,938/sq. mi. and the Netherlands at 3,505/sq. mi. Yet the countries' agricultural densities are drastically different, as might be expected because of their different levels of economic development. The more economically developed Netherlands has a low agricultural density of 31/sq. mi. This indicates that Dutch farmers can afford technology and produce food more efficiently than farmers in Bangladesh, which has an agricultural population density of 431/sq. mi. Additionally, the Netherlands is highly developed and can import food not be produced by local farmers.

Population Density and Time

Density also varies by time of year and at different scales of analysis. At one scale, the population of warm-weather states, such as Arizona and Florida, become more dense each winter as "snowbirds" from northern states flee the cold weather.

Time also influences population density at a local scale. For example, the population density of the New York City borough of Manhattan changes greatly throughout the day. About 1.5 million people reside there but each weekday when commuters enter the city to work, the population rises to about 3 million. Such variation is a challenge for Manhattan, which provides water, sewer, fire protection, and other services for 3 million people—even though most return home at night. These commuters often live outside of Manhattan and pay taxes that fund public services in other communities.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the factors that influence population distribution and what are the impacts of different methods used to calculate population density?*

Factors Influencing Population Distribution	Methods Used to Calculate Population Density

KEY TERMS

population distribution
population density
midlatitudes
social stratification
arithmetic population density
physiological population density
arable
agricultural population density

2.2

Consequences of Population Distribution

Essential Question: How do population distribution and density affect society and the environment?

Population density is linked to population distribution. At different scales— a country, province, or even city—an uneven distribution results in lower densities in some regions and higher densities in others. Areas with high population densities are referred to as densely settled, and regions with low densities are known as sparsely settled. Whether a place is densely or sparsely inhabited has profound effects on it. In locations with high densities of human population, the impact on the natural environment is usually also high. Conversely, the effects of human activities affect the environment to a lesser degree in areas that are sparsely inhabited.

Implications of Distribution and Density

The distribution of a region's population and its density reflect choices people make. These choices, in turn, reflect their values, such as whether they choose to live in densely settled urban areas and cities or rural areas that are characterized by the presence of farming and agricultural activities.

Economic, Political, and Social Processes

Most economic decisions are based, at least partly, on population distribution and density. Businesses are more likely to earn profits when they are near a large customer base. For manufacturing plants, being close to a large labor force is important. Towns and cities have large concentrated populations that provide customers and workers for businesses, so that is where most businesses locate. People live in cities to take advantage of the economic, social, and educational opportunies found there.

Political processes can be influenced by population distribution and density too. Since population distribution and densities continually change, the Constitution requires adjustments to boundaries every ten years based on census data to maintain similar numbers of voters per district. Rulings by the Supreme Court require state legislatures to create electoral districts of reasonably equal population sizes so each representative serves approximately the same number of people. Because urban areas are continuing to increase in population and the population of rural areas is usually shrinking, these boundary adjustments, called **redistricting** (see Topic 4.6), usually result in physically smaller urban districts and larger rural districts.

The population characteristics of a region can also affect the number of government and private services and the location of these services. Facilities such as schools, police stations, fire stations, social assistance offices, and hospitals are usually positioned close to concentrations of population. Each of these facilities acts as a node, or point of central intersection for the areas they serve. In other words, each of the nodes is surrounded by a functional region. Towns and cities have greater and more concentrated populations than rural areas. Therefore, urban areas have many more of these facilities and their associated and overlapping functional regions than rural areas. Often remote rural areas lack basic services, such as medical care, and residents have to travel long distances or do without the service.

Infrastructure and Urban Services

The term **infrastructure** refers to the facilities and structures that allows people to carry out their typical activities. Included are things such as sewer systems, electrical grids, roads and bridges, etc. The larger a city grows, the more demands it will have on its infrastructure. (See Topic 6.7 for more on infrastructure.)

When people want to live in a particular region—from a country to a neighborhood—they can increase the population density. They can live in high-density housing units rather than single-family homes. Since many people enjoy living in the centers of big cities, these neighborhoods usually feature apartment and condominium buildings that include many households. In Chicago, the population of the central part of downtown, known as the Loop, is about 21,000 people/sq. mi., more than double what it is for many surrounding neighborhoods.

Providing services such as sewer, water, snow removal, and policing is more cost-effective in high-density areas. The cost of installing a mile of sewer pipe is mostly based on the labor required to dig up the land and connect the pipe. Whether it is a large pipe to serve tens of thousands of people in high-rise buildings or a small pipe to several dozen people in single-family houses is not that significant.

However, high-density areas have challenges. For example, contamination of the water supply for a downtown area can make thousands of people ill, and disease that spreads through casual contact is much harder to manage in crowded settings. Similar problems in a rural or suburban area with lower population density would be much less severe.

Environment and Natural Resources

Whether a region experiences **overpopulation**—having more people than it can support—is partially dependent on its population distribution and density. Another factor is the region's **carrying capacity**, the number of people a region can support without damaging the environment. The higher the population density, usually the greater the strain on the environment. A region with good soil, climate, and other resources might be able support many people. Another with less favorable attributes will be unable to support as many people.

The Influence of Time The carrying capacity of a region can change over time. For example, technological changes in agriculture—such as plants that require less water or improved irrigation methods—can increase the carrying capacity of a region.

Changes in climate may also limit or increase the agricultural potential of locations. Locations with variable or marginal climates, such as the Sahel in Africa (the southern fringe of the Sahara), have seen changes in carrying capacity. Areas that were once wetter and had successfully supported the population have experienced drought and exceeded their carrying capacity without help from outside regions.

Influence on Cities Cities could be built on land with low carrying capacity, such as where the soil is not ideal for farming. However, for historical reasons, most of these cities are located on land with the greatest carrying capacity. Throughout history, the original settlers have chosen sites for their settlements on or near land that could support a large population and have remained there.

Signficance of Density In addition to agriculture, many other aspects of the environment are affected as population density increases. High population density can result in environmental problems such as air and water pollution or depletion of resources. Because of factors such as sewage and industrial wastes, many lakes and rivers no longer provide drinkable water. In some areas, water must be purified or piped in from hundreds of miles away. Large cities that face serious water shortages include Cairo, Egypt; Cape Town, South Africa; Moscow, Russia; Bangalore India; Beijing, China; and Jakarta, Indonesia. In the United States, cities such as Los Angeles, Houston, Atlanta, and Miami are among those where too little fresh water threatens economic and population growth.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How do population distribution and density affect society and the environment?*

Population Density's Effects on Social, Political, and Economic Processes	Population Density's Effects on Environment and Natural Resources

KEY TERMS

redistricting
infrastructure
overpopulation
carrying capacity

2.3

Population Composition

Essential Question: What are elements of population composition, and how are those elements used by geographers to depict and analyze population composition?

Populations have distinct demographic characteristics. A population may be called "young" if it is comprised of an especially large proportion of younger people. The reverse is true if a society has many older people. Most places, especially at larger scales, have approximately the same number of males as females, but this is not always the case. There are places in the world, especially at smaller scales, that have many more females than males and vice versa. The makeup of ages and sexes in a population is known as its composition, and geographers use a unique type of graph to examine it. The composition of a population influences its culture and economic potential.

Population Composition

Identifying the composition of a region's population is crucial to understanding the population of the region's past, present, and future. Understanding a population's composition requires an examination and analysis of the age and sex of the region's people.

Age and Sex

Distribution patterns are related to age and sex of the population. Some regions of a country may have a younger or older average population than others:

- In 2018, Utah had the youngest average age in the United States at 31.0,
- The oldest average age was in Maine at 44.9.

This difference is so significant that it shapes public policy. Officials in Utah have a higher percentage of school-age children for which to provide services. Officials in Maine might be more concerned with the needs of seniors. Similar distinctive patterns and the resulting issues also exist at the scale of cities and towns of all sizes.

Differences in the gender balance can result from wars, migrations, and government policies. At the level of entire communities, mining towns and military training bases often have significantly more males than females. Within a city, a gender imbalance might appear if one neighborhood has a post-secondary institution offering courses that tend to attract more students of one gender.

Population Pyramids

One of the most useful tools to study population is the **age-sex composition graph**, which is commonly called a **population pyramid**. Although this tool is based only on age and gender data, it can provide information on birth rates, death rates, how long people live on average, and economic development. Population pyramids can also give evidence of past events such as environmental hazards, wars, political changes, and epidemics.

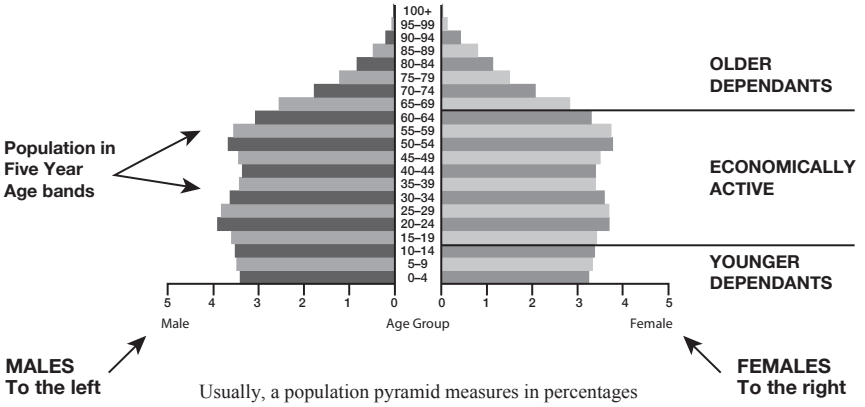
Reading a Pyramid

Most pyramids follow the same fundamental structure. However, as with most types of graphics, the format can vary:

- The vertical axis shows age groups, known as **cohorts**. They are often listed in the middle but are sometimes shown on the left or right side.
- Pyramids usually show the male population on the left and the female population on the right.
- The values on the horizontal axis may be percentages or absolute numbers of males and females and amounts increase as one moves further from the center.
- Pyramids are most commonly constructed at a country scale, but they can also be constructed for cities, states, or multicountry regions.

POPULATION PYRAMID STRUCTURE

The population pyramid displays the age and sex structure of a country or given area.

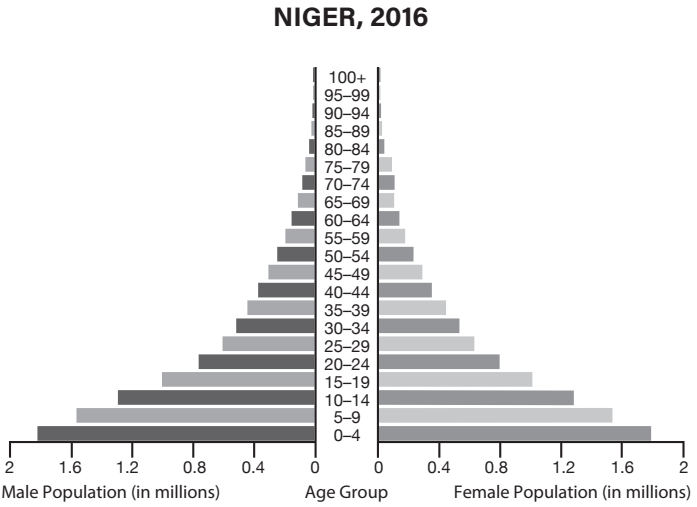


Usually, a population pyramid measures in percentages to make comparisons easier between countries. A pyramid can also have the total population of a group based on age or sex.

Determining Population Trends

If a population pyramid has a wide base and tapers upward, the region's population is growing. The wide base indicates a large percentage of children (at the bottom of the pyramid) compared to the adults (in the middle) and the

older people (at the top). A wide base indicates large families. Populations with a high percentage of large families will grow as the children mature into adults and begin to produce their own families.



The population pyramid for the African nation of Niger is an example of a pyramid with a wide base. Notice that the three longest bars are at the bottom of the pyramid and represent ages 0 to 14. As these children age, there will be more people in the older categories. There will also likely be a greater number of children born as these people reach childbearing age.

Common Patterns

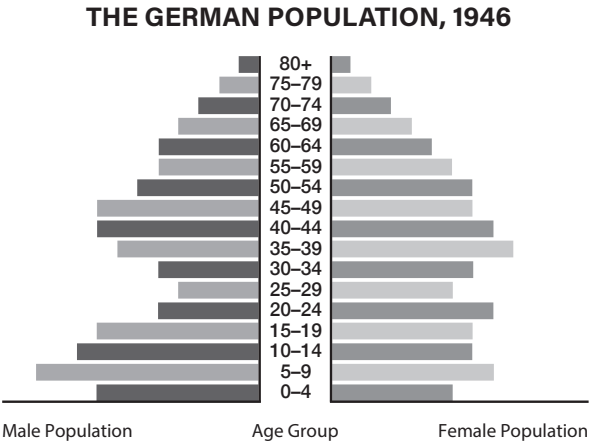
The Niger pyramid is nearly symmetrical, or balanced, left to right, indicating a balance of males and females until approximately age 65. Since women as a group live longer than men, the lack of symmetry in the upper part of the pyramid is typical of many countries.

Another notable trait on the Niger pyramid is that the changes in the size of the bars from one cohort to the next are gradual. There are no sudden indentations or bulges. Assuming there have been no circumstances such as war, natural disaster, epidemics, or government interference, a population pyramid will be symmetrical and show gradual change between cohorts.

Impact of War

The clearest effect of war on population is that people are killed. Often, half or more of deaths in wartime are civilians, and those deaths affect people of all ages. However, the loss of fighting-age people, traditionally males between the ages of 18 and 40, is most noticeable.

During war, men and women are often separated. Even if they remain together, they may decide to delay a family until the war ends. The bars of the pyramid representing children born during the conflict are often significantly shorter than the bars immediately above and below them. This slowdown of births is called a **birth deficit**.



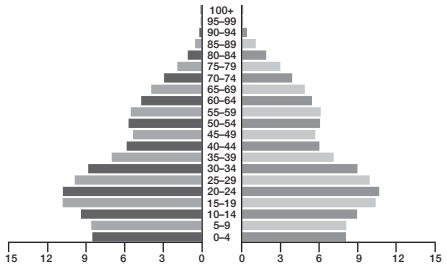
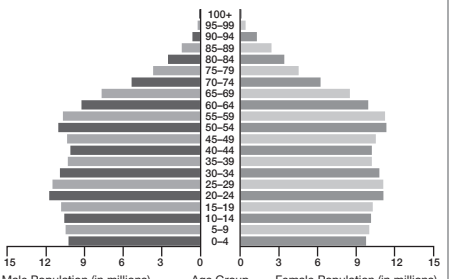
The post-World War II pyramid of Germany shows the loss of life of both males and females in the 20 to 40 age cohorts, with a greater loss of men than women. The birth deficit during war is evident in the 0–4 cohort.

Baby Booms, Busts, and Echoes

Once hostilities end and peace resumes, the birth rate often spikes, causing what is known as a **baby boom**. This increase might last a few years or stretch over many years. After World War II, the United States baby boom lasted from 1946 to 1965. Baby booms are usually associated with the end of a war, but booms also occur for other reasons, such as times of economic abundance.

Once the boom ends, birth rates are lower for a number of years. This **baby bust** continues until the boomers reach childbearing age. With a high number of boomers in the population having children, there can be a significant increase in births that shows up as a bulge on a pyramid. Since this increase reflects an earlier baby boom, it is called an **echo**. As of 2015, children in high school were the last of the echo cohorts, and their parents were the last baby boomers.

BOOMS AND ECHOES IN POPULATION PYRAMIDS

United States, 1980	United States, 2015
	
▪ Baby boomers are ages 16–34. ▪ No echo is apparent.	▪ Baby boomers are ages 51–69. ▪ An echo appears in the 20–34 cohort.

Source: U.S. Census Bureau

In 1980, the baby boomers in the United States were ages 16–34. Notice the bulge in the pyramid on the left. By 2015, the Baby Boomers large generation were in their 50s and their children—the "echo"—can be seen between the ages of 20–34 bulge in the pyramid on the right.

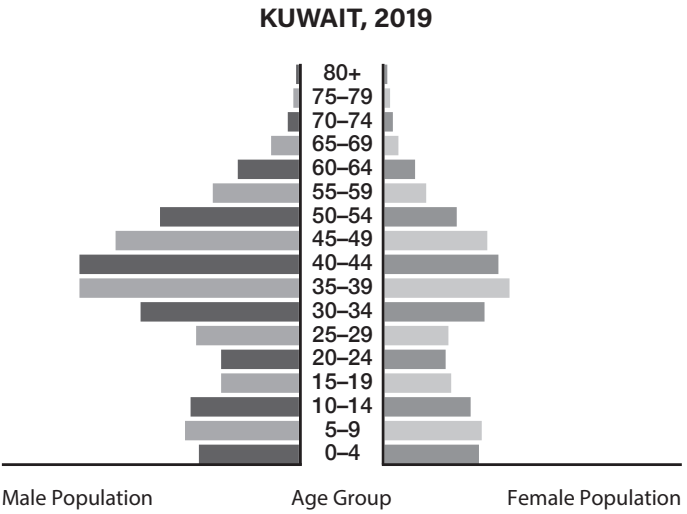
Once any anomaly, or unexpected occurrence, appears in a pyramid, it will remain there, moving upward over time until the affected cohort or cohorts disappear from the top of the graph due to death. Notice the upward movement of the baby boom and the echo resulting from World War II in the two U.S. pyramids on the previous page.

Migration and Other Anomalies

Many factors can affect a population pyramid. An asymmetrical pyramid, one with significant differences between cohorts, suggests that something notable happened in the population. The viewer of the pyramid then determines what historical event caused the irregularity. Several anomalies are described in the table below, along with possible explanations. Pyramids with atypical shapes most often represent smaller geographic areas, such as states, cities, or even neighborhoods, where local age-sex differences are more pronounced.

ANOMALIES IN POPULATION PYRAMIDS

Pyramid Feature	Possible Reason
Bars are longer for people ages 18 to 25 than for people younger or older.	▪ A small city with a large university causes an increase of this age group. ▪ A shortage of school funding causes families to move away when they have children.
Bars are longer for people ages 25 to 50 than for children.	▪ An economic crisis causes people to decide to have fewer children. ▪ A government policy to slow population growth discourages births. ▪ An epidemic causes many infants to die.
Bars are longer for people over the age of 65.	▪ A community in a warm climate attracts retirees. ▪ A lack of jobs causes young people to move away.
Bars are longer for males than females.	▪ An oil boom or fishing industry attracts people for jobs that are traditionally done by men. ▪ A region contains a military base or prison that may have a larger percentage of men.
Bars are longer for females than males.	▪ A neighborhood contains a large assisted living home with a high percentage of females who typically outlive males.



Source: populationpyramid.net

Kuwait is an oil-rich country in the Middle East. Many working-age males migrate to Kuwait to work in the oil fields and related industries.

Dependency Ratio

Demographers, consider people ages 15–64 the **potential workforce**, the group expected to be the society's labor force. Everyone else—people under 15 or over 64—is the **dependent population**, because they are considered too young or too old to work full-time and, therefore, are assumed to rely on the economically active workforce to keep the society running. The comparison between the size of these two groups is called the **dependency ratio**. (See Topic 2.9 for more on dependency ratio.)

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are elements of population composition, and how are those elements used by geographers to depict and analyze population composition?*

Elements of Population Composition	Information Taken from Population Pyramids

KEY TERMS

age-sex composition graph	baby boom	dependent population
population pyramid	baby bust	dependency ratio
cohorts	echo	
birth deficit	potential workforce	

GEOGRAPHIC PERSPECTIVES: *INTERPRETING DEPENDENCY NUMBERS*

Comparing the dependency ratios of any two countries suggests differences in how people live in each place. For example, each worker in the United States supports 1.52 people—himself or herself plus an additional .52 people. In Niger, each worker supports 2.08 people—himself or herself plus an additional 1.08 people. (See Topic 2.9 for more on dependency ratio.)

Composition of Dependent Groups

Part of interpreting dependency ratios is knowing more about the dependent groups. The United States includes more seniors than children. This composition reflects that families have relatively few children and that people live relatively long lives. In contrast, families in Niger have more children and people live shorter lives. As a result, Niger has more children than senior citizens. Geographers often specify whether the dependents are younger or older than the working-age population.

Spatial Distribution

The composition of the dependency groups shapes the spatial distribution of the population in each country. In the United States, senior citizens who have retired often choose to move to warm climates, so the populations of Arizona and Florida and other warm-weather states have grown rapidly. In Niger, the high ratio of children means that school density should be high to provide education for them. However, Niger's poverty makes that difficult to achieve.

1. Since Niger has a large youth dependent population (under age 15), describe a potential economic benefit and problem that country could face.
2. Countries like the United States have large dependent population over age 65. Describe a potential economic benefit and problem these countries could face.
3. Why do you think age 65 is used as the age of elderly dependency? Is it an appropriate age for elderly dependency? Explain your response.

THINK AS A GEOGRAPHER: *ONE PLACE MANY DENSITIES*

The concept of population density applies at many scales. A resident of Salt Lake City, Utah, lives in areas with these numbers of people per square mile:

- Salt Lake City—1,387/sq. mi.
- State of Utah—34/sq. mi.
- United States—87/sq. mi.
- the world—130/sq. mi.

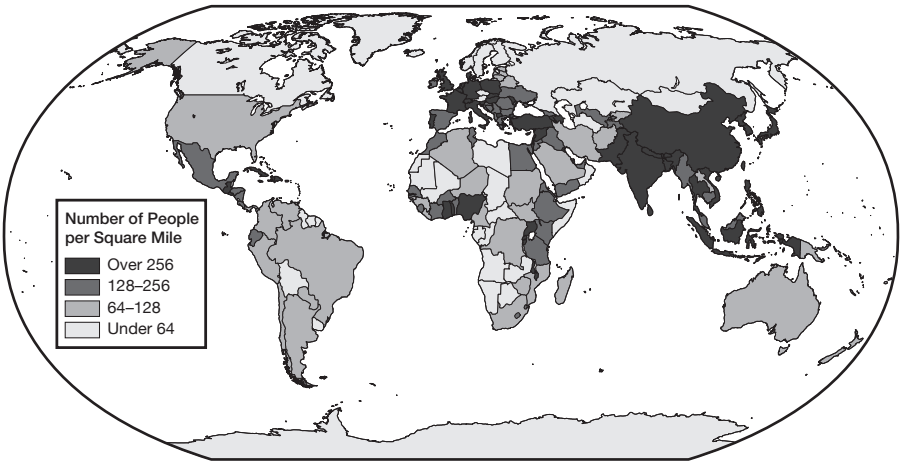
1. What does the difference in density between the United States and the world suggest about the United States?
2. Explain why a Salt Lake City, Utah, resident could claim to live in a place of both high and low population density.

CHAPTER 3 REVIEW:
Population Distribution and Composition

Topics 2.1–2.3

MULTIPLE-CHOICE QUESTIONS

Questions 1 and 2 refer to the map below.



1. Which generalization is best illustrated by the world map above?

(A) Climate is the primary factor influencing population distribution.

(B) People are spread out evenly throughout the world.

(C) The majority of the world's population lives between 20° N and 60° N latitude.

(D) More people live in the Western Hemisphere than in the Eastern Hemisphere.

(E) People have preserved fertile land for farming by choosing to settle heavily in areas with poor farmland.

2. Based on the map, which area is most densely populated?

(A) Eastern Asia

(B) Northern Europe

(C) Western North America

(D) Central South America

(E) Southern Africa

Questions 3 and 4 refer to the table below.

	Arithmetic Density	Physiological Density	Arable Land Percentage
Country A	226 people/sq. mi.	8,078 people/sq. mi.	2.8
Country B	84 people/sq. mi.	498 people/sq. mi.	16.8

3. According to the table, which country has a greater need for increased crop yields and imported foods and why?

(A) Country A: Its physiological density indicates that its farmers do not have the technological resources to grow crops efficiently.

(B) Country A: The large difference between its arithmetic and physiological densities indicates that it has only a little good farmland.

(C) Country A: Its high arithmetic and physiological densities indicate that it needs to use a high percentage of its land to grow crops.

(D) Country B: It has an arable land percentage of 16.8, which is not sufficient for growing enough food to feed everyone.

(E) Country B: The small difference between its arithmetic and physiological densities indicates it has ample good farmland.

4. Which of the following can be concluded from the data in the table?

(A) Country A has a larger total population than Country B.

(B) Country B has a larger total population than Country A.

(C) Country A has a larger total amount of arable land than Country B.

(D) Country B has a larger total amount of arable land than Country A.

(E) None of the above can be concluded using information in the table.

5. Which country has the lowest arithmetic population density?

(A) Egypt

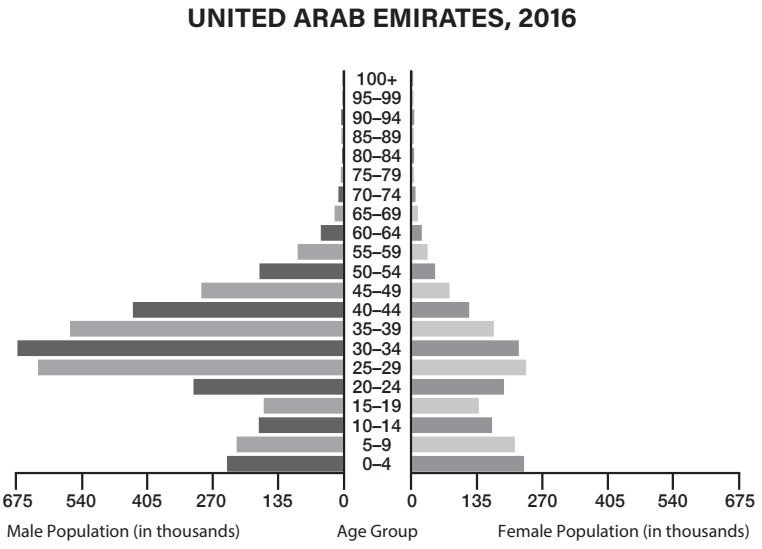
(B) United States

(C) Australia

(D) India

(E) France

Questions 6 and 7 refer to the population pyramid below.



6. Which might explain the asymmetrical aspect of the population pyramid?

(A) A high death rate among men ages 25–50

(B) A large guest-worker population

(C) An overcounting of children during the census

(D) An epidemic with a high rate of mortality among the elderly

(E) A major war fought in the years 2006 to 2010

7. Which statement about birth is best supported by the pyramid?

(A) More occurred in 1956 than in 1966.

(B) More occurred in 1986 than in 2006.

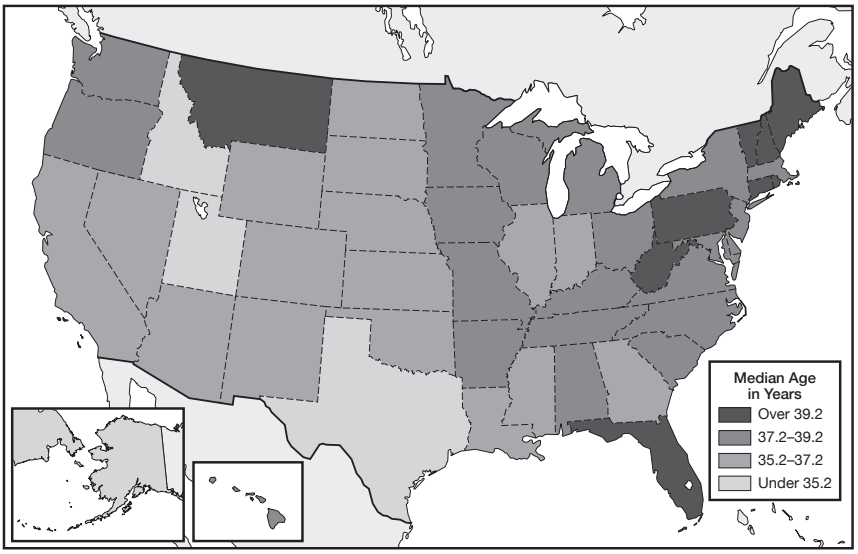
(C) The number steadily increased between 1956 and 2016.

(D) The number steadily decreased between 1956 and 2016.

(E) Fewer occurred in 2016 than in 2011.

FREE-RESPONSE QUESTION

1. The median age is the age at which half of all people are older and half of all people are younger. Changing scale is also an important tool for geographers to use to better understand patterns and processes. Use the map below to answer the questions that follow it.



(A) Describe the regional distribution of U.S. residents by median age.

(B) Explain why Florida has a relatively high median age compared to other states and its economic impact on the state of Florida.

(C) Explain ONE age-related issue that affects Texas more than Florida.

(D) Identify the scale in which the data on the map is aggregated.

(E) Using a specific location on the map, describe how changing the aggregated scale of the data could impact the patterns on the map.

(F) Describe ONE additional specific quantitative data source, not shown on the map, that would help explain the patterns on it.

(G) Describe ONE additional specific qualitative data source, not shown on the map, that would help explain the patterns on it.