UNIT 2
Population and Migration Patterns and Processes

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

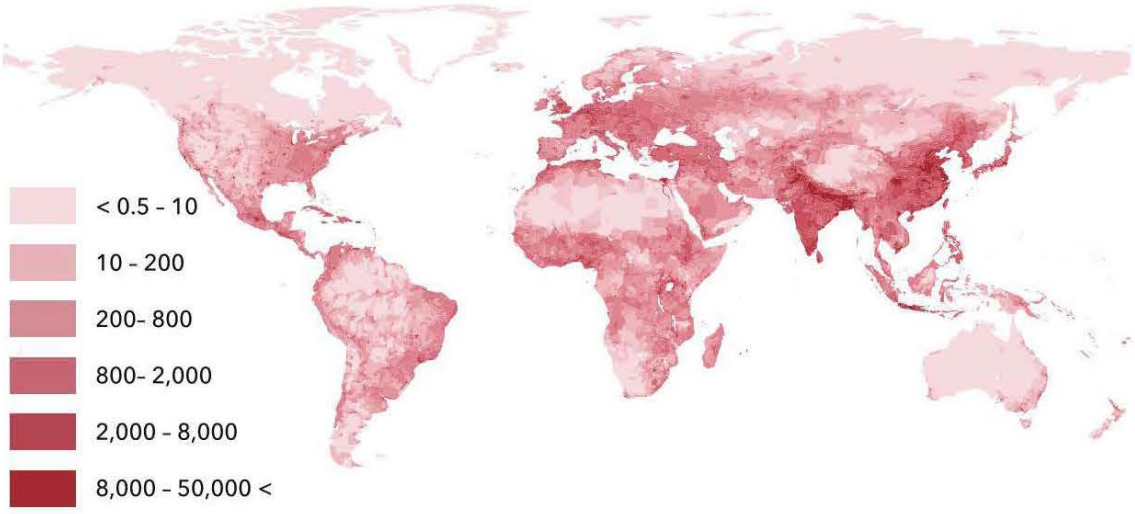
Survival for the earliest humans depended on food, water, and shelter. Thus, these hunter-gatherers settled where these features were most readily available. Similarly, people today have the same basic needs, which helps explain why the population distribution has remained so similar over time. The map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

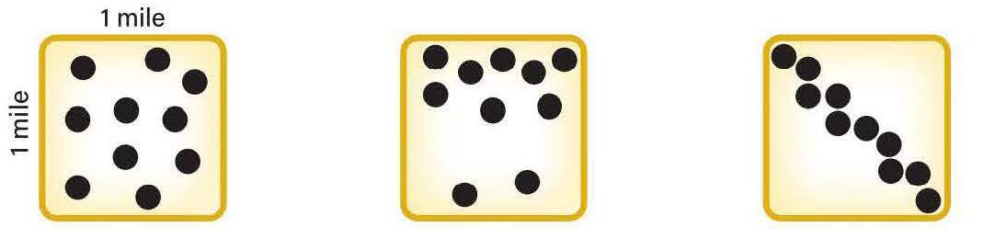
Population density is calculated by comparing the area's population to its size, and is expressed in the number of people per square mile or square kilometer. Demographers, people who study human populations, identify three types of population density: arithmetic, physiological, and agricultural.

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.



A Even Distribution B Cluster Distribution C Linear Distribution

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.

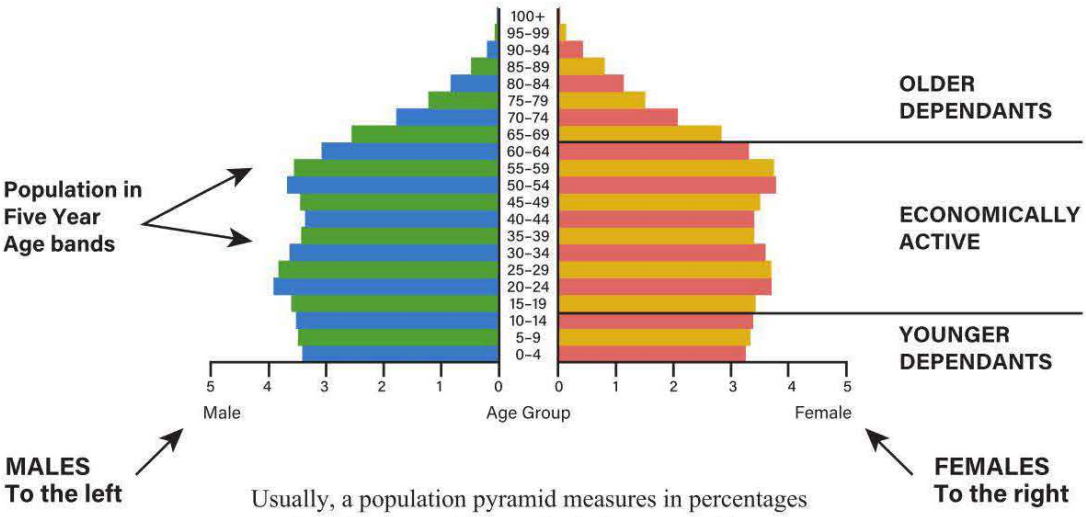
Reading a Pyramid

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

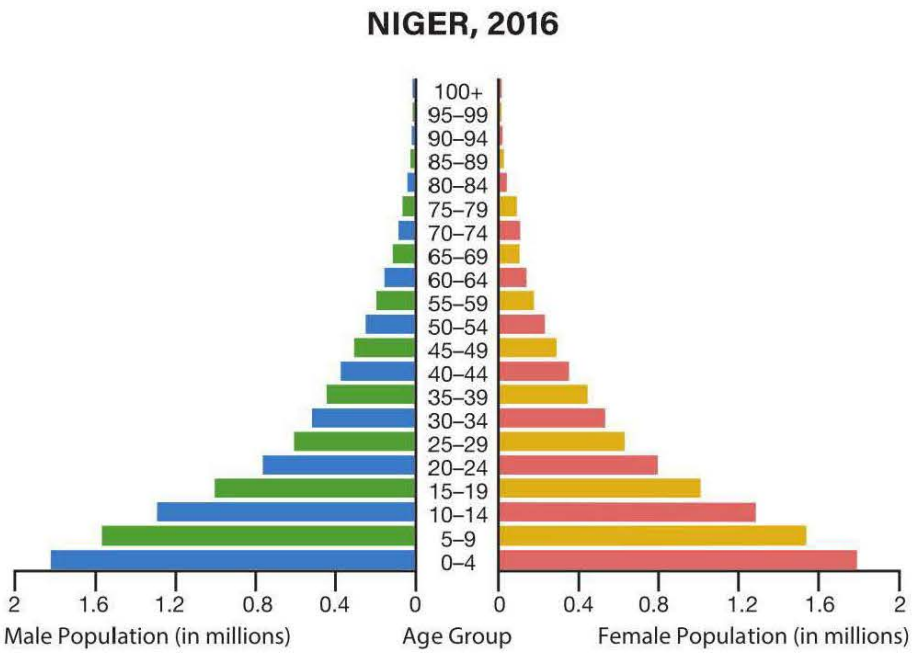
If a population pyramid has a wide base and tapers upward, the region's population is growing. The wide base indicates a large percentage of children (at the bottom of the pyramid) compared to the adults (in the middle) and the

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.

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.

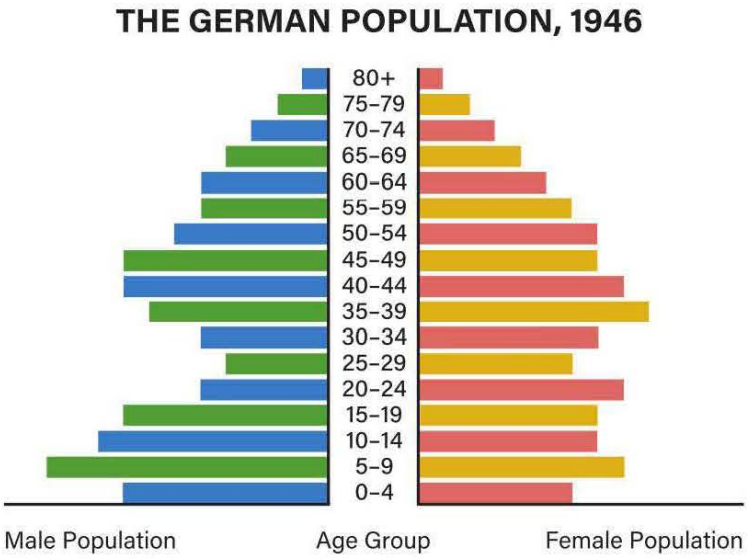


The population pyramid for the African nation of Niger is an example of a pyramid with a wide base. Notice that the three longest bars are at the bottom of the pyramid and represent ages 0 to 14. As these children age, there will be more people in the older categories. There will also likely be a greater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

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**.



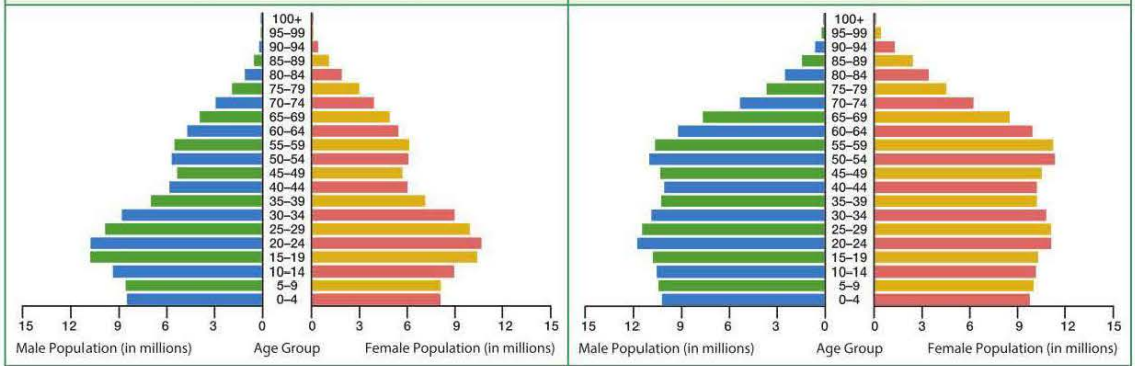
The post-World War II pyramid of Germany shows the loss of life of both males and females in the 20 to 40 age cohorts, with a greater loss of men than women. The birth deficit during war is evident in the 0–4 cohort.

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



- 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

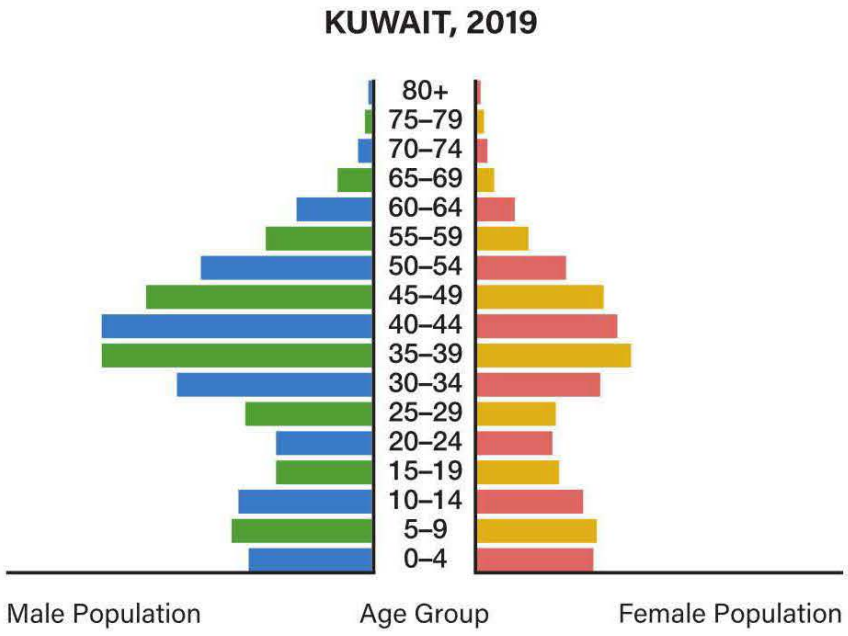
In 1980, the baby boomers in the United States were ages 16–34. Notice the bulge in the pyramid on the left. By 2015, the Baby Boomers large generation were in their 50s and their children—the "echo"—can be seen between the ages of 20–34 bulge in the pyramid on the right.

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
population pyramid
cohorts
birth deficit
baby boom
baby bust
echo
potential workforce
dependent population
dependency ratio

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.

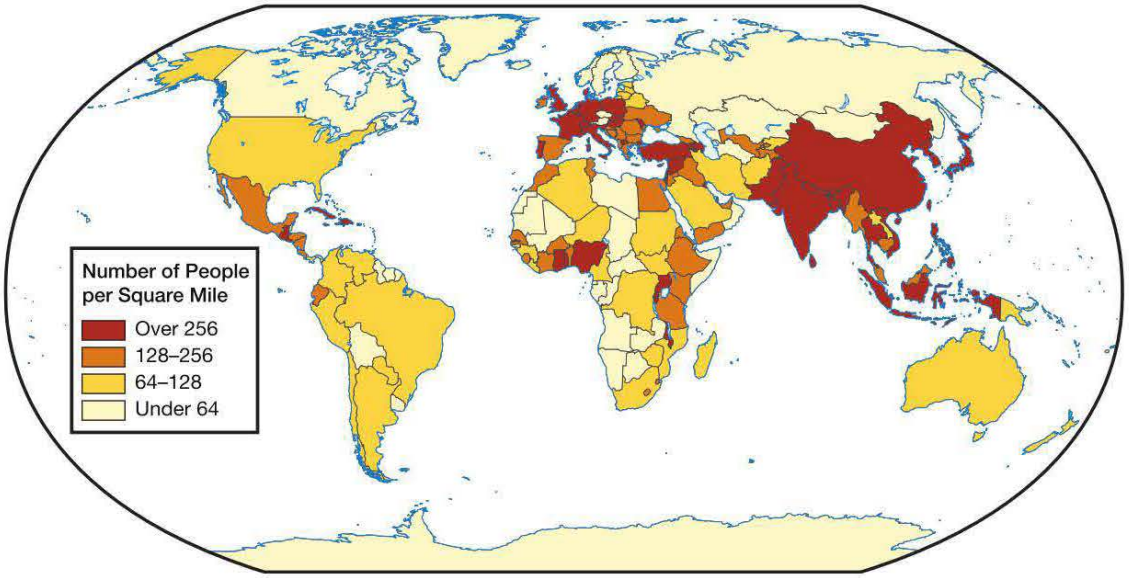
1. What does the difference in density between the United States and the world suggest about the United States?
2. Explain why a Salt Lake City, Utah, resident could claim to live in a place of both high and low population density.

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

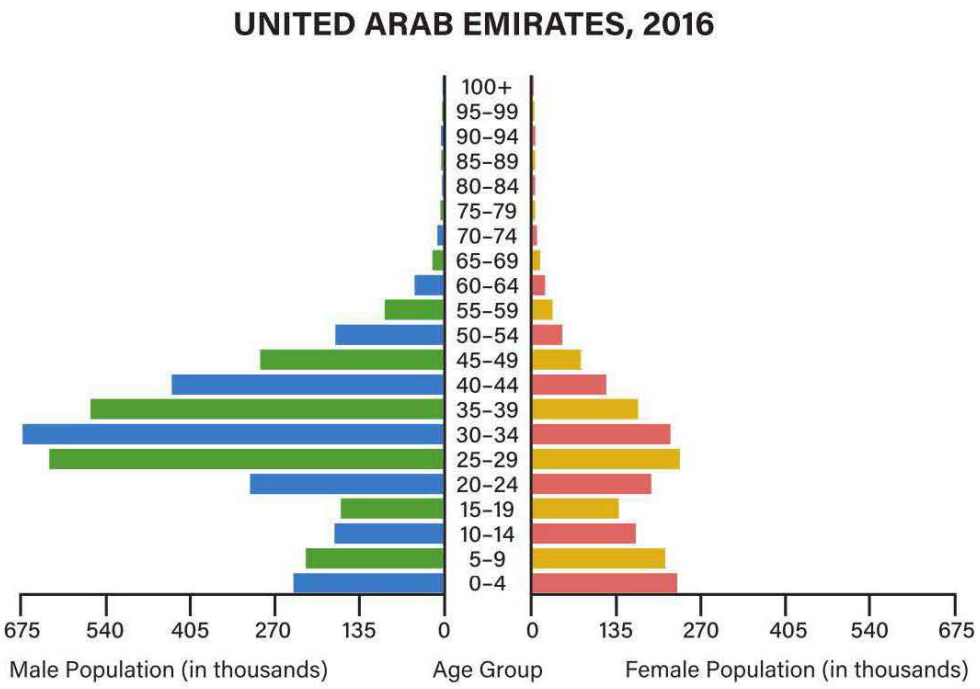
(B) United States

(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.

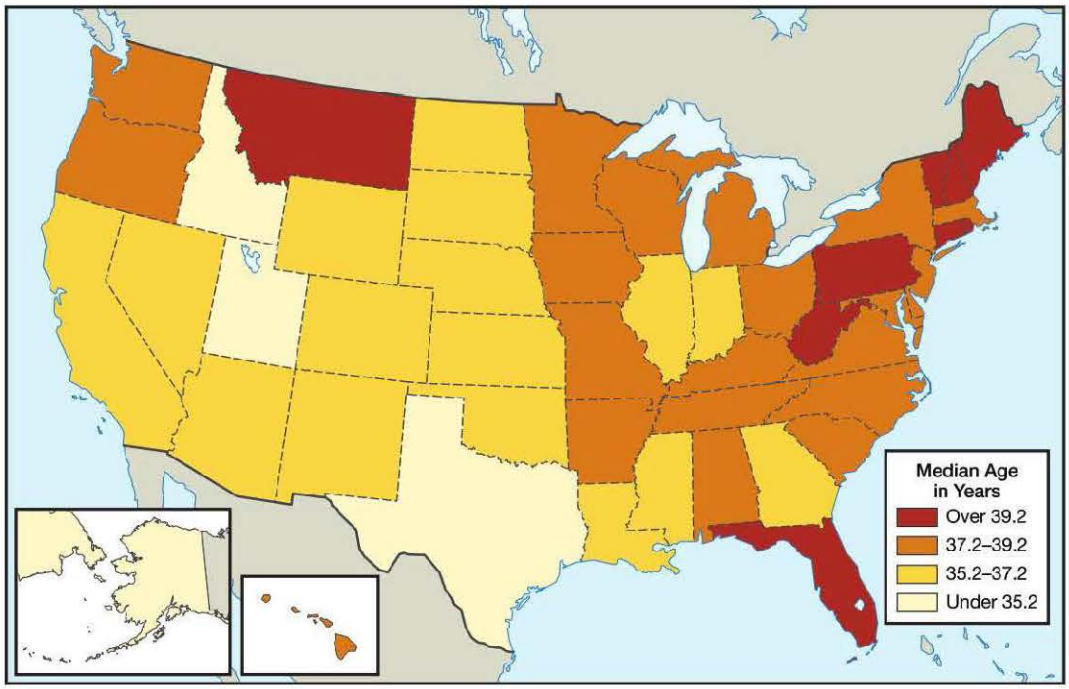
(C) The number steadily increased between 1956 and 2016.

(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.

CHAPTER 4

Population Change

Topics 2.4–2.9

Topic 2.4 Population Dynamics

Learning Objective: Explain factors that account for contemporary and historical trends in population growth and decline. (IMP-2.A)

Topic 2.5 The Demographic Transition Model

Learning Objective: Explain theories of population growth and decline. (IMP-2.B)

Topic 2.6 Malthusian Theory

Learning Objective: Explain theories of population growth and decline. (IMP-2.B)

Topic 2.7 Population Policies

Learning Objective: Explain the intent and effects of various population and immigrant policies on population size and composition. (SPS-2.A)

Topic 2.8 Women and Demographic Change

Learning Objective: Explain how the changing role of females has demographic consequences in different parts of the world. (SPS-2.B)

Topic 2.9 Aging Populations

Learning Objective: Explain the causes and consequences of an aging population. (SPS-2.C)

A finite world can support only a finite population; therefore, population growth must eventually equal zero.

—Garrett Hardin, "The Tragedy of the Commons," 1968

Source: Getty Images

Educating women and children plays an important role in population dynamics. (See Topic 2.8 for the changing role of women.)

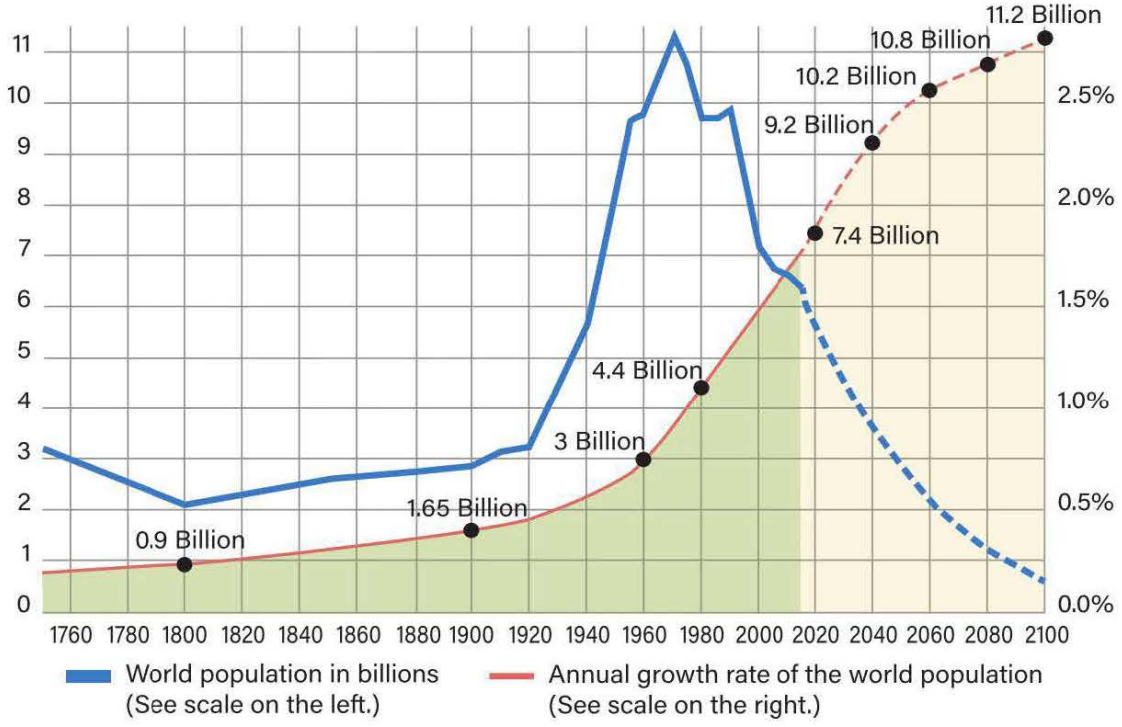
2.4

Population Dynamics

Essential Question: What are the factors that account for contemporary and historical trends in population growth and decline?

Before the 19th century, the total human population grew very slowly. By making small improvements in farming techniques, clearing forested areas to expand land for crops, and finding new regions of the ocean dense in fish, people became more efficient at extracting energy from the environment. Around 1800, the population reached 1 billion. In the 200-plus years since then, world population has exploded—it is around 7.4 billion today. The United Nations predicts it will reach nearly 11 billion by 2100. What problems—and what opportunities—will this growth present?

WORLD POPULATION GROWTH SINCE 1760



Source: Population projections come from "World Population Prospects: The 2015 Revision," UN Department of Economic and Social Affairs, 2015.

Compare the relationship between the population growth rate and the total population. What does the line representing the total population do when the growth rate line spikes? What is the relationship between the two dotted (predicted) lines after 2060?

Population Change

Populations always change—sometimes they shrink, but more often than not, they grow. For example, the population of the United States has grown steadily since the first census was taken in 1790.

UNITED STATES POPULATION GROWTH	
Year	**Population (in millions)**
1790	3.9
1900	76.2
2020	332.6

Prior to 1910, U.S. population grew 20 percent to 40 percent per decade, even during the 1860s, which included the American Civil War. Since 1980, it has increased 7 percent to 14 percent per decade.

Measuring and predicting population change over time is key to understanding the world. Geographers use a simple equation, the **demographic balancing equation**, to describe the future population of a region of any scale:

Future population = Current population + (number of births – number of deaths) + (number of immigrants – number of emigrants)

Figuring the demographic balancing equation takes several variables into account. The number of births and deaths are only part of a country's total population change. Migration also plays a part. To calculate a country's total population change, the number of **immigrants**—people who moved into the country—and the number of **emigrants**—people who moved out of the country—must be added to the equation.

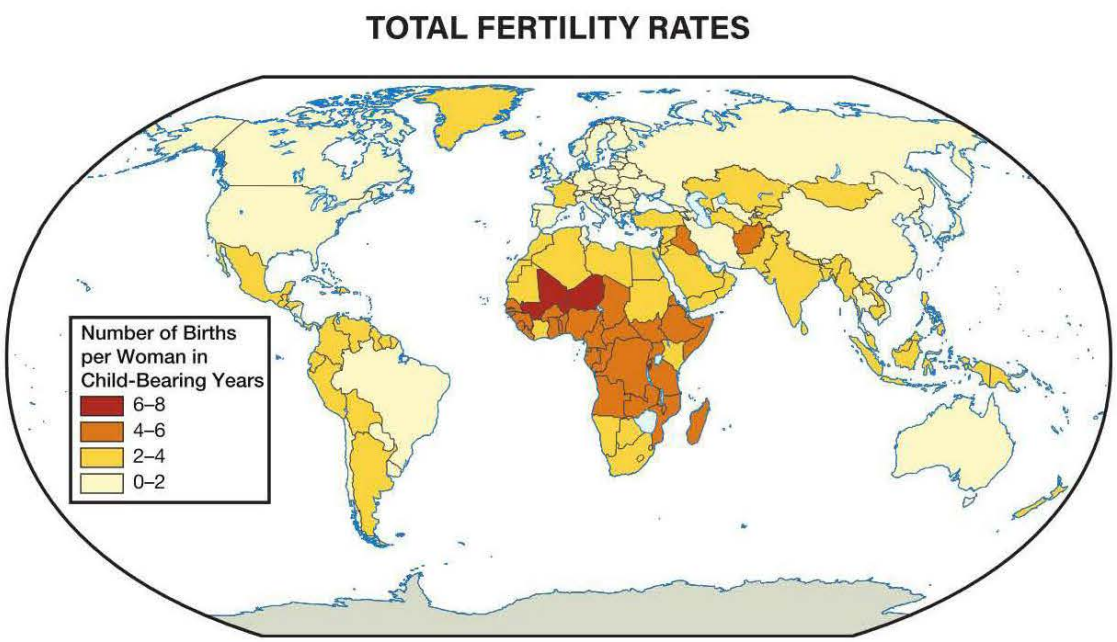
The challenge for geographers is to understand and predict births, deaths, immigration, and emigration accurately. This chapter and the next will examine the concepts associated with population change and explore the ways that geographers use them to understand human populations.

Measuring the Number of Births

Geographers commonly use two different statistics to describe the rate at which children are born:

- The **crude birth rate (CBR)** is the number of live births per year for each 1,000 people.
- In contrast, the **total fertility rate (TFR)** focuses on women in their childbearing years of ages 15 to 49. TFR is the average number of children who would be born per woman of that group in a country, assuming every woman lived through her childbearing years.

Of the two statistics, the TFR more accurately reflects cultural norms—such as how people weigh the costs and benefits of having a child and how people perceive the role of women in society. The CBR is simpler to calculate and clearly relects the total population change within a country.



The total fertility rates (TFR) vary widely among different regions of the world. TFR varies among countries and it generally declines as countries become wealthier.

In most of the world, the TFR was higher in the past than it is today. In parts of Europe before 1800, the TFR averaged 6.2 children. In those days, most people lived on farms and having more children meant more people to work the land. However, because so many children died as infants, the average life span was only about 40 years. Despite the high TFR, population growth was slow.

Life Expectancy

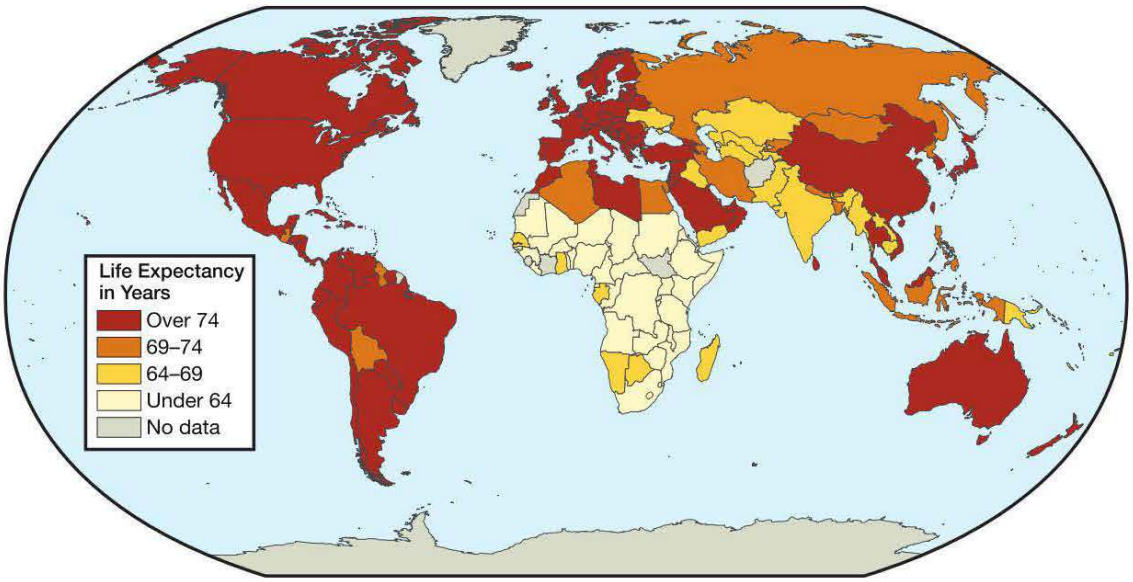
Even though the total fertility rate worldwide has been decreasing, the world's population continues to grow. This growth reflects a decrease in the death rate and an increase in how long people live.

Global Population Increase

The most important factor in the increase in global population is the rise in **life expectancy**, the average number of years people live. It is commonly expressed from the time of a person's birth, but it can be calculated at any point in his or her lifetime. A century ago, the global life expectancy was about 34 years at birth; today it is nearly 70 years. In most of Europe, life expectancy at birth is more than 80 years. However, in less-developed areas, such as many sub-Saharan African countries, life expectancy at birth is less than 50 years.

One of the most important factors that affects increasing life expectancy is the drop in the **infant mortality rate**, the number of children who die before their first birthday. For example, in Massachusetts, the infant mortality rate per 1,000 live births dropped from 130 in 1850, to about 4 today.

LIFE EXPECTANCY BY COUNTRY, 2015



What regions of the world have the highest and lowest life expectancies? What is the scale of analysis used on the map? Note: Some regions on the map have no data because of political instability.

The decrease in infant mortality rate and increase in life expectancy can be explained by economic, political, and technological changes. Economic development has increased wealth and increased the amount and quality of food available to millions of people. Political stability has allowed for improved sanitation infrastructure, and advances in technology have greatly improved healthcare.

Better Food Production and Nutrition

Over the past 250 years, several advances in agriculture have helped increase life expectancy:

- mechanizing food production, such as replacing horses with tractors
- improving seeds, fertilizers, and farming techniques through research by state universities and private companies
- transporting products more efficiently in trucks, trains, and ships, often on roads, rail lines, or canals built with government support

In the United States in 1800, most of the population farmed. Today farmers make up less than 3 percent of the population, yet they produce enough food to feed everyone in the country and export vast quantities. Advances in agriculture such as the following had effects that rippled through society:

- Greater farming efficiency freed people to work in nonfarm industries, easing the transition to industrialization.
- Food security improved around the world. Hunger and famines still occurred because people were too poor to purchase food or because of political issues or distribution problems, not because of food shortage.
- As farms depended less on manual labor, farm families became smaller.

- The use of machinery meant that one person could farm more acres. Many small farms were consolidated into larger farms, and the former owners of those farms moved to urban areas.
- As the population of rural areas decreased, and cars and better roads allowed people to travel farther and more easily, many small towns that had served farmers disappeared.

Advances in Public Sanitation

As early industrial cities grew, so did the problems of large concentrated populations. One problem was the spread of disease. Cholera, for example, was spread through water contaminated by human waste, and the plague was carried by fleas that live on rodents.

Sewer Systems One of the most important advances in reducing mortality was the creation of public sewer systems. Before the Industrial Revolution and in its early years, people in cities dumped human waste into streets and rivers. The waste often reached the water supply, which contaminated the drinking water and made people sick. Children and the elderly were especially vulnerable to disease. Then cities began to install sewer systems, protecting water supplies from contamination and thus increasing life expectancy.

Water and Waste Systems People also learned that boiling water before they used it could prevent transmission of waterborne illnesses. That worked before citizens decided to pay for systems that provide clean water through taxes. Communities began to install water treatment plants that transported clean water to the homes in the cities. Cities also created departments of public sanitation and started to collect garbage and other waste produced by city residents. By doing this, cities reduced the number of rodents that fed on the waste and often carried disease.

Improvements in Healthcare

Improved medical care coincided with improvements in food production and sanitation. The development of vaccines to prevent diseases, antibiotics to cure diseases, and improved medical procedures boosted life expectancy.

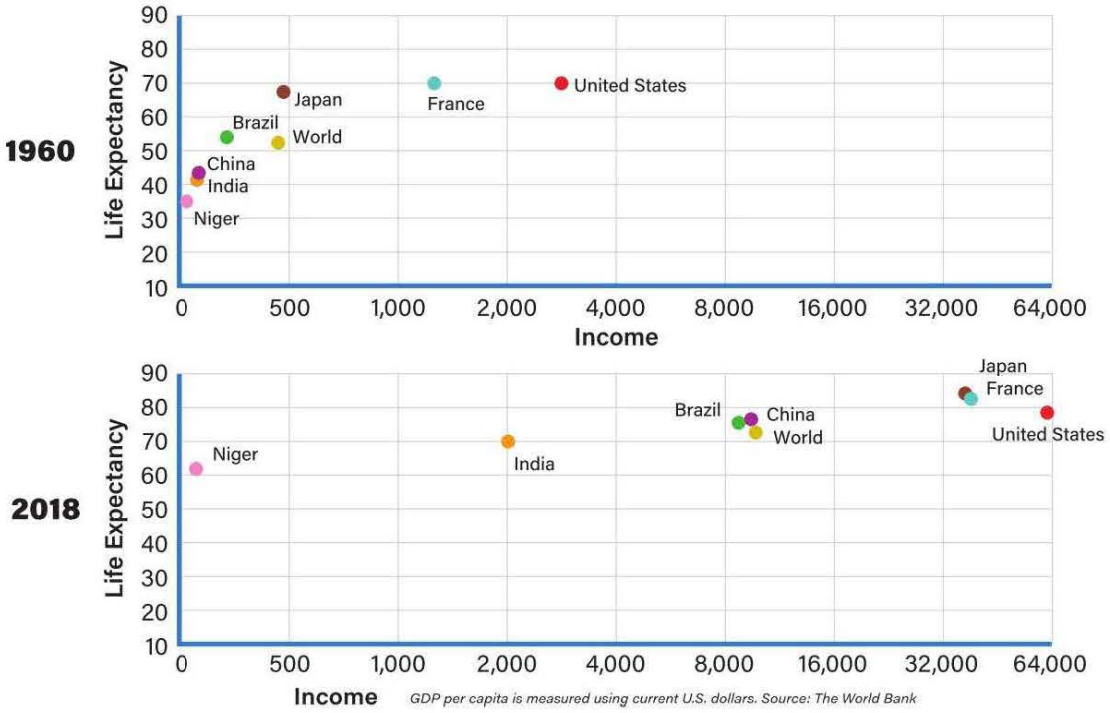
Vaccines Prior to the 1800s, smallpox killed as many as 400,000 people each year. However, in the 1700s, British doctor Edward Jenner figured out that if he infected people with cowpox, a much milder disease related to smallpox, those people would be immune to smallpox. Jenner's work led to a smallpox vaccine. Today, efforts by the United Nations, national governments, and private organizations to vaccinate people around the world have been so successful that no case of smallpox has been reported since 1977. Jenner's work was also the basis for vaccines against other serious diseases, such as polio, tuberculosis, and rabies.

Antibiotics While vaccines helped prevent people from getting ill, antibiotics helped cure people who had bacterial infections. The first widely used antibiotic was penicillin, which came into use in the mid-1900s. Before

penicillin, deadly bacterial infections killed many people. The deadliest epidemic in history was the plague, which was spread by flea bites. During the mid-1300s, the plague killed about 20 million people in Europe alone—about one-third of the continent's total population. Other common bacterial infections include parasitic infections, strep, and staph—which commonly killed people who got wounded in battle or suffered a deep cut.

Better Medical Care Improved medical procedures have also extended life expectancy. Among these procedures was advancements in surgery, which was often deadly before antibiotics. Now surgery is safe enough that it can help an individual suffering from a heart attack, stroke, cancer, or other ailments. Doctors have also saved the lives of pregnant women and their newborn children through the use of caesarean section surgeries.

RELATIONSHIP BETWEEN INCOME AND LIFE EXPECTANCY
(of selected countries)



GDP per capita is measured using current U.S. dollars. Source: The World Bank

Rate of Population Increase

The natural increase or natural decrease in a population is measured by subtracting the number of deaths from the number of births. To compare countries of different sizes, demographers use rates rather than total numbers. The crude birth rate (CBR) and the **crude death rate** (CDR) of an area are measured per 1,000 population. The percentage at which a country's population is growing or declining, without the impact of migration, is the **rate of natural increase** (RNI).

Calculate it with this formula: *RNI = (CBR – CDR) ÷ 10*, and then add a percent sign. For the entire world, the CBR is about 20 and the CDR is about 8. Since (20 – 8) ÷ 10 equals 1.2, the RNI for the world is about 1.2 percent. RNI

tends to be less than 1.0 percent in more-developed countries and greater than 1.0 percent in less-developed countries.

Population Doubling Time

Demographers describe population growth in two ways:

- Arithmetic growth is when the increase is a constant number each period. Arithmetic growth by the addition of 1 would be 1, 2, 3, 4, etc. Arithmetic growth by 5 would be 1, 6, 11, 16, etc.
- Exponential growth is when the increase is a constant factor each period. If the factor is 2, then the number doubles each period: 1, 2, 4, 8, etc. Exponential growth by 5 would be 1, 5, 25, 125, etc.

Since the early 1800s, global population has been growing exponentially. For any quantity growing exponentially, the time it takes to double in size, or **population doubling time**, can be estimated using an equation known as the Rule of 70 (some people use the Rule of 72). Assuming the growth rate remains steady, the approximate doubling time in years will be 70 divided by the growth rate per year.

For example, in 2014, the West African country of Ivory Coast had a population growth rate of about 2.0. Since 70 divided by 2 equals 35, and assuming the growth rate remains about 2.0, the population of Ivory Coast will double in 35 years. The United States had a much lower growth rate: 0.77. If the U.S. growth rate remains at 0.77, the U.S. population will double in about 91 years.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the factors that account for contemporary and historical trends in population growth and decline?*

Current Trends in Population Growth and Decline	Historic Trends in Population Growth and Decline

KEY TERMS

demographic balancing equation
immigrants
emigrants
crude birth rate (CBR)
total fertility rate (TFR)
life expectancy
infant mortality rate
crude death rate (CDR)
rate of natural increase (RNI)
population doubling time

2.5

The Demographic Transition Model

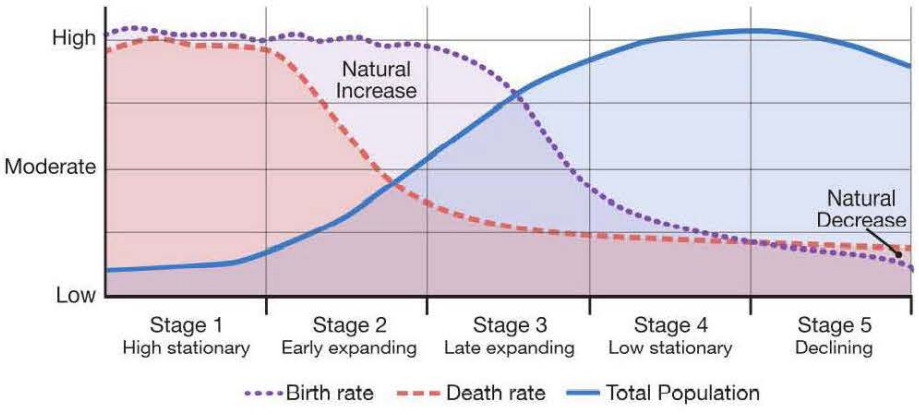
Essential Question: How does the demographic transition model explain population growth and decline?

Populations change over time. One way they change is in size, usually growing but sometimes shrinking. Recall that a population pyramid is a type of graph used by geographers to represent the composition of a population. Geographers use another specific tool—a model—to represent and calculate, analyze, and display the change in total population size over time. This is the demographic transition model, which shows how the decline in death rates produced a growth in population and eventually a decline in birth rates.

The Demographic Transition Model

Changes in the birth rate and death rate in a country are shaped by how a country changes from an agrarian to an industrial society. The **demographic transition model** (DTM) shows five typical stages of population change that countries experience as they modernize. Each stage lasts for a period of indeterminate length. The developed countries of the world passed through these stages first, while the underdeveloped areas of the world are still passing through the early and middle stages.

THE DEMOGRAPHIC TRANSITION MODEL AND POPULATION DYNAMICS



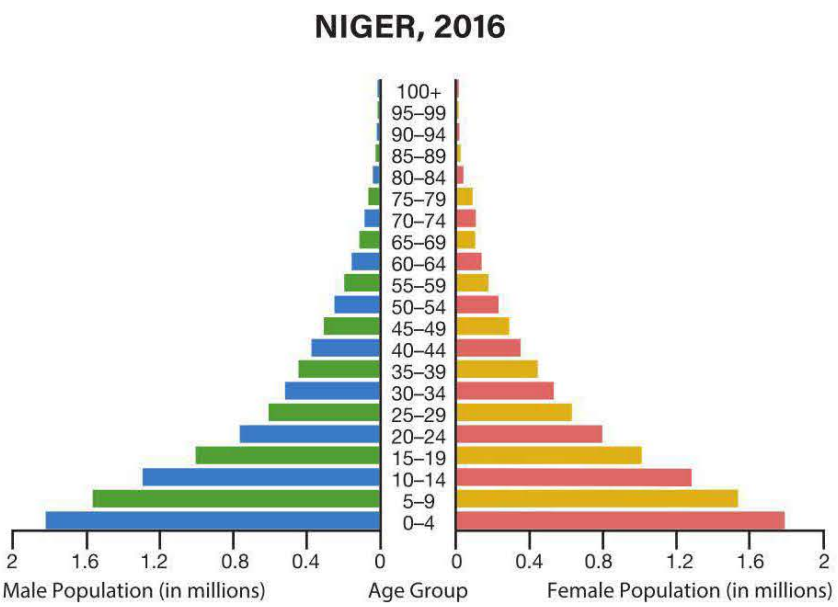
As a country passes through the stages, its total population increases. A country's death rate begins to decrease when it moves into Stage 2. Also, when a country reaches Stage 3, its birth rate starts to drop.

CHARACTERISTICS OF THE DTM STAGES					
Factor	**1. High Stationary**	**2. Early Expanding**	**3. Late Expanding**	**4. Low Stationary**	**5. Declining**
Birth Rate	High but fluctuating as need for farm labor changes	High but fluctuating to reflect desires for big families	Declining as urbanization decreases the need for child labor	Low but enough to keep the population stable	So low it falls below the death rate
Death Rate	High but fluctuating to reflect diseases and poor sanitation	Rapidly declining as nutrition, sanitation, and medicine improve	Declining but not as fast as in previous stage	Low and stable	Low, sometimes increasing as the population ages
Natural Increase (yearly rate)	0 to .5%	.5 to 4%	4 to .8%	.8 to 0%	0% to (-1%)
Population Change	Very low growth because births and deaths are both high	Rapid growth as death rates fall faster than birth rates	Rapid but slowing growth as birth rates decline	Very low growth because births and deaths are both low	Very low decline as births fall below deaths
Population Structure	Very young	Very young	Young, with rising life expectancy	Balanced, with more aging	Very old
Examples Today	▪ Scattered isolated groups	▪ Mali ▪ South Sudan	▪ Mexico ▪ Turkey ▪ Indonesia	▪ United States ▪ China	▪ Japan ▪ Germany
Economy and Society	▪ Subsistence agriculture ▪ Hunter gathering	▪ Rural agricultural society ▪ Less developed	▪ Large movement of people from farms to cities ▪ Emerging/ industrializing economies	▪ Urbanized service economy ▪ Highly developed ▪ Rising gender equity	▪ Urbanized service economy ▪ Highly developed

Demographic Transition and Population Pyramids

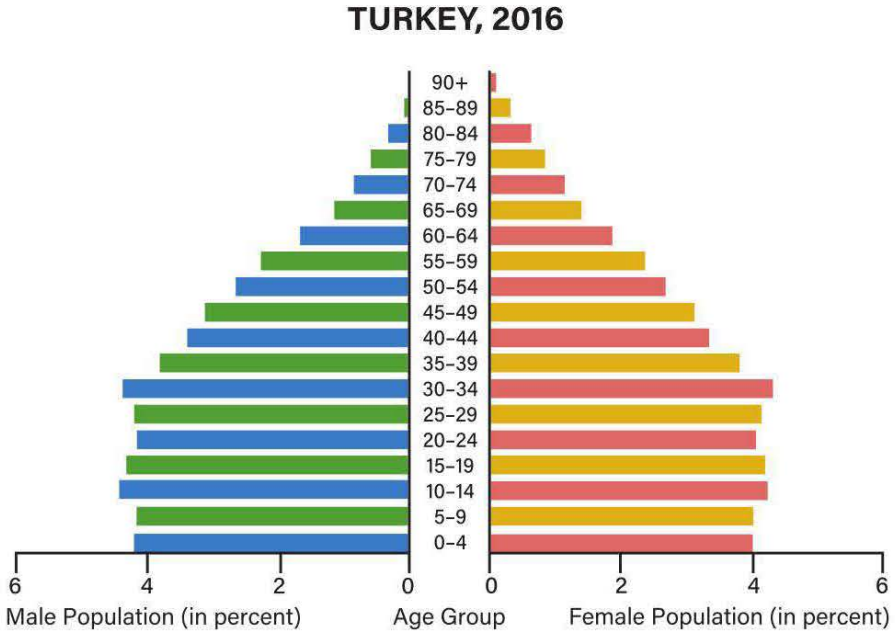
Only a few isolated groups are in Stage 1 and they are typically subsistence farmers or hunters and gathers. Societies in this stage have high birth rates and high fluctuating death rates based on Stages 2 to 5 of the Demographic Transition Model. Each tend to produce a different-shaped population pyramid.

Stage 2 Niger represents a Stage 2 country with an expansive population pyramid, one with a high birth rate—which produces a wide base—and a low life expectancy—which leads to narrowing in the upper years. Because the younger generations are larger than the older ones, the result is rapid population growth. This is typical of a less-developed region.

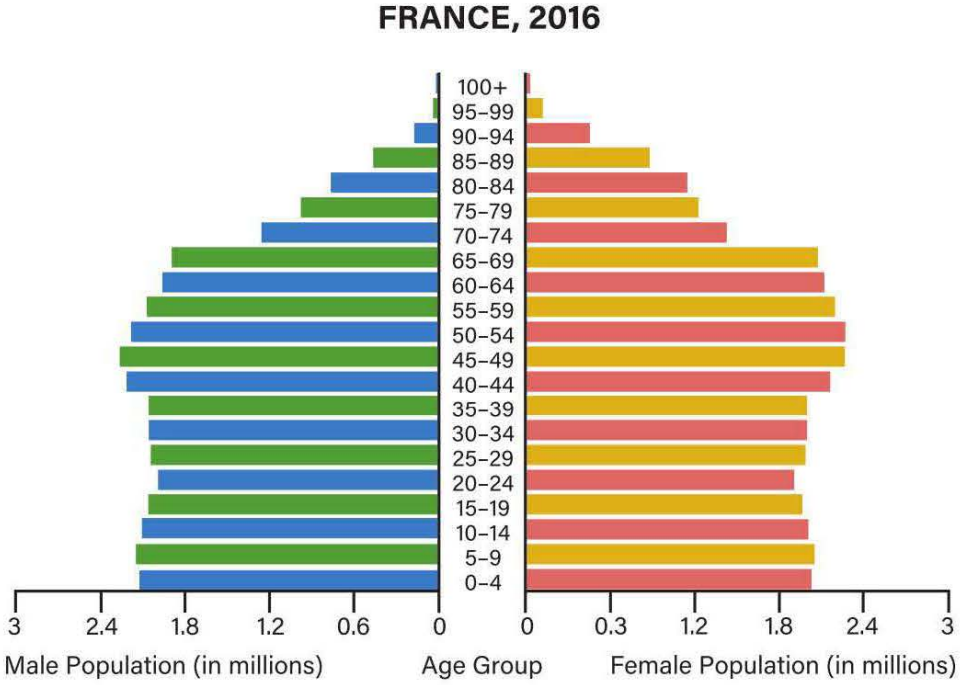


It is common to see population pyramids with either percentages or total population as above. Using percentages makes it easier to see differences between cohorts while using total population allows a better understanding of the number of people in a cohort of a certain age group.

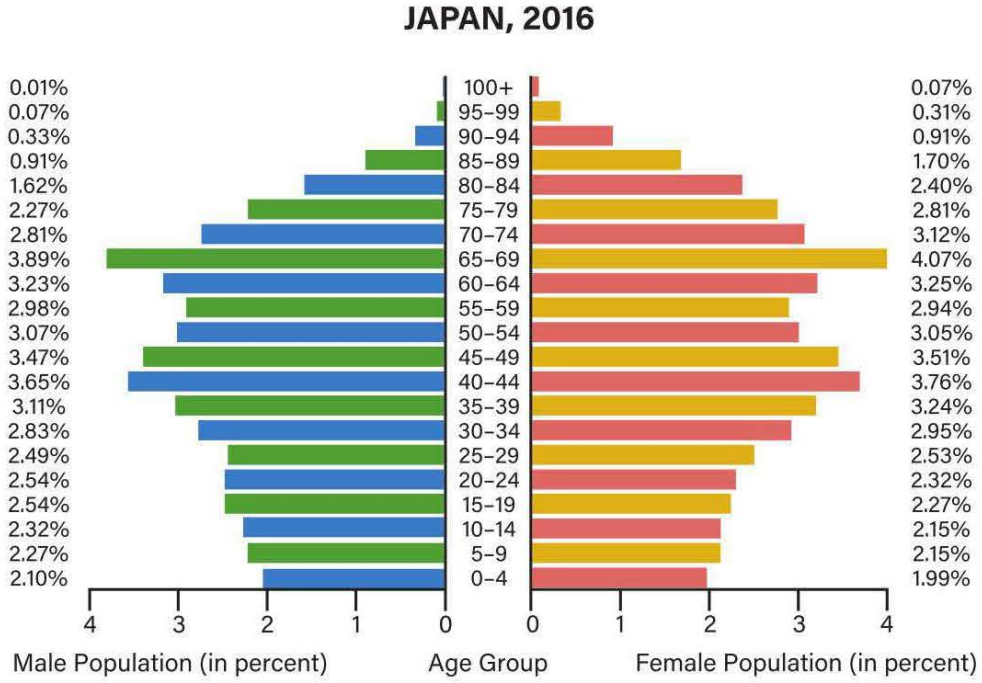
Stage 3 Turkey represents an urbanizing Stage 3 nation with a declining birth rate and a more slowly declining death rate. Notice that the majority of the population is under the age of 34. The society is still young, but the percentage of elderly is increasing as life expectancy goes up. The transition from Stage 2 to Stage 3 has the fastest population growth. Countries attempt to navigate through Stage 3 as quickly as possible to avoid long-term exponential population growth. As countries transition from early Stage 3 into Stage 4, population will continue to grow for at least one generation because of **demographic momentum**. This process occurs because even though fertility rates have declined, people are living longer, and this results in population continuing to grow for another 20–40 years.



Stage 4 France's pyramid, representing Stage 4, is typical of the shape known as a stationary population pyramid. It indicates a population that is not significantly growing or shrinking. The birth rate is low but steady. The death rate is also low, indicating a high life expectancy and an increased percentage of older people. This graph shape is usually associated with more-developed countries.



Stage 5 Japan's pyramid represents Stage 5. The narrow base reflects a decreasing birth rate. The population is aging and declining slightly overall. The largest age group is 65–69.



Policy Implications

As countries move from stage to stage, they face different challenges. A country in Stage 2 or 3, with a relatively high percentage of young people, often lacks the resources to educate all children. A country in Stage 4 or 5, with a relatively high percentage of old people, often faces problems funding healthcare. However, since the elderly can vote while children cannot, the elderly often have more political influence.

DTM at Different Scales of Analysis

Just as population pyramids can be created to illustrate the population of an entire country or a smaller portion of the population (like a province, state, or city), the demographic transition model can be used to analyze changes at a smaller scale. For example, birth rates and death rates of a particular region or subregion within a country, can differ from that of the larger society. They can also change at a different rate or in a different way. This will indicate a stage of demographic transition for the region that is different from that of the total population of the country.

Evaluation of the Demographic Transition Model

The demographic transition model helps explain, describe, and predict spatial activity and phenomena related to population increase and decline. It explains well the experiences of Western Europe, the United States, and Japan, mostly because it is based on these countries' experiences. However, it is less useful in explaining the experiences of all countries, particularly the less-developed countries of the world today:

- Citizens of countries in Stage 2 and 3 do not have as many options to migrate out of the country to help release some of the population pressure.
- Governments often place severe restrictions and limitations on migration.
- Today, birth control and government policies play a much larger role in reducing birth rates than previously.
- Economic changes in less-developed countries today are much different than the experiences of the United States and Western Europe in the past.

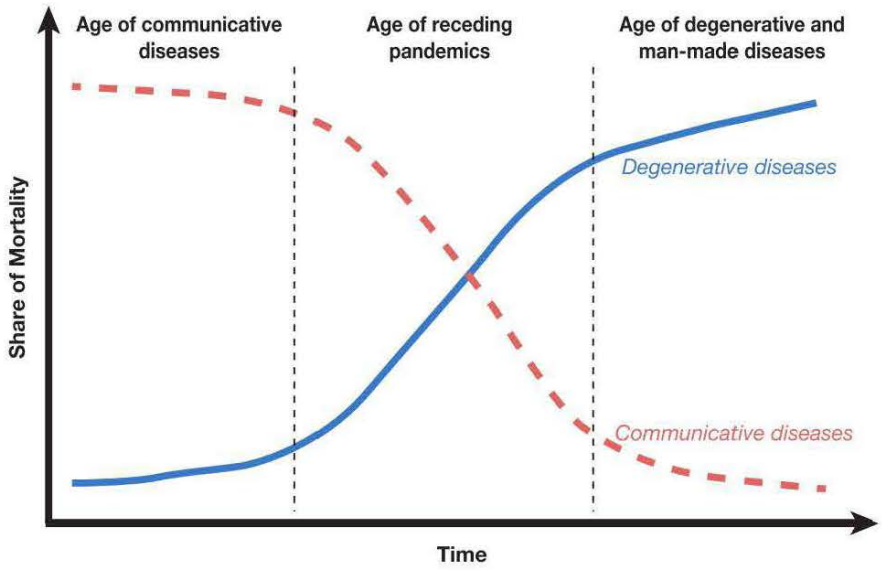
The DTM is a population change model and changes in the economy or society can have multiple reasons that cause the changes to occur. Just because changes in demographics and the economy occur at similar stages does not mean that they necessarily are the cause of the change. However, the DTM does assume that urbanization and industrial development help propel countries through each stage.

Each stage has demographic challenges and benefits, and the model is designed to help gain insight to those. Countries in later stages of the model are not necessarily more successful than countries in earlier stages; they simply have different demographic characteristics.

Epidemiological Transition Model

The world's countries develop industrially and economically at their own pace, so there is a large discrepancy in the types of diseases found across the world. In the early 1970s, epidemiologist Abdel Omran identified predictable stages in disease and life expectancy that countries experience as they develop. Omran's work is known as the **epidemiological transition model**. This model is an extension of the demographic transition model and explains the changing death rates and more common causes of death within societies.

EPIDEMIOLOGICAL TRANSITION MODEL



EPIDEMIOLOGICAL TRANSITION MODEL STAGES		
Stage	**Description**	**Effects on Population**
1. Disease and Famine	Parasitic or infectious diseases, accidents, animal attacks, or human conflicts cause most deaths. Food insecurity makes famine more common and more devastating.	A high death rate and low life expectancy.
2. Receding Pandemics	The number of pandemics (widespread diseases that affect large populations) declines as a result of improved sanitation, nutrition, and medicine.	A decreasing death rate and increasing life expectancy.
3. Degenerative and Human-Created Diseases	Infectious and parasitic diseases continue to decrease, but diseases associated with aging—such as heart disease and types of cancer—increase as people live longer.	Death rate stabilizes at a low level and life expectancy increases.
4. Delayed Degenerative Diseases	Stage 4 is an extension of Stage 3, but the age-related diseases are put off as medical procedures delay the onset of these diseases through advanced procedures. Diseases such as Alzheimer's and dementia increase.	Death rate reaches its lowest level and life expectancy reaches a peak.

EPIDEMIOLOGICAL TRANSITION MODEL STAGES		
Stage	**Description**	**Effects on Population**
5. Reemergence of Infectious and Parasitic Diseases	Infectious and parasitic diseases increase as some bacteria and parasites become resistant to antibiotics and vaccines.	Life expectancy decreases.

The COVID-19 pandemic in 2020 challenged some of the theories of the epidemiological transition model. Pandemics are usually a part of Stage 1 or 2, but as the world becomes more urbanized and globally connected, the threat of pandemics seems to be increasing. The model assumes that pandemics will decrease as countries develop economically. The extensive consequences of the virus illustrate the importance of studying and understanding the spread of diseases. According to Johns Hopkins University, by March 2021, approximately 120 million people were infected and more than 2.6 million people worldwide died from COVID-19. A factor supporting the effectiveness of the model is that advanced medicine and science limited the impacts as compared to historic pandemics, such as the 1918 influenza outbreak.

One criticism of the model is that it does not take into account the impact of lifestyle choices nor local environmental factors in extending or shortening life expectancy. Eating healthier food, drinking less alcohol, and exercising more have enabled many people to live longer and more active lives. One of the biggest lifestyle changes has been in smoking. In the United States, the percentage of adults who smoke has declined in the last five decades from approximately 40 percent to under 15 percent, which partly explains an increase in life expectancy in the United States. In some regions of the world, high levels of industrial pollution or exposure to pesticides and chemicals has resulted in localized higher death rates that are not captured in the model.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How does the demographic transition model explain population growth and decline?*

Demographic Transition Model's Explanation of Population Change	Epidemiological Transition Model's Explanation of Changing Death Rates

KEY TERMS

demographic transition model
demographic momentum
epidemiological transition model

2.6

Malthusian Theory

Essential Question: How does Malthusian theory explain population growth and decline?

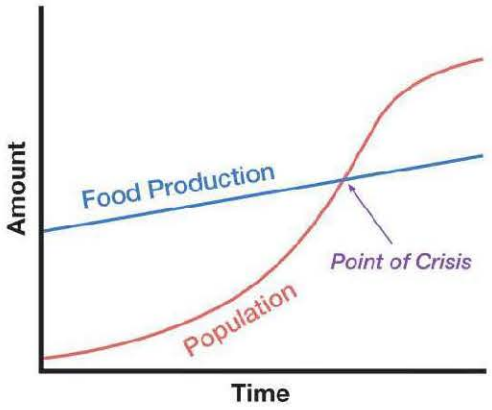
In 1798, Thomas Malthus published one of the most provocative books on population growth ever written, *An Essay on the Principle of Population*. Malthus, a member of the clergy and an early economist, focused on one of the underlying concerns of geography: the relationship between people and the earth.

Food Production and Population Growth

Malthus lived during a period when people were optimistic that new technology would make life better—but Malthus feared it would not. He analyzed the relationship between natural resource use, particularly agricultural output, and the growing population and concluded that society was on a path toward massive starvation. Geographers and other social scientists have debated the usefulness of Malthus's ideas about population growth, known as **Malthusian theory**, since he first published them.

He believed that food production would increase arithmetically—growing steadily by a similar amount each generation. In contrast, he believed that people would not limit the number of children they had, so the population would increase exponentially—growing steadily by a similar percentage each generation. Since population would grow faster than food production, the world's population would soon be unsupportable or referred to by Malthus as **overpopulation**. If people could not limit population growth voluntarily, Malthus believed famine, or widespread and massive starvation, would limit population growth. Additionally, he argued that the likelihood of war, plagues, and economic struggles would increase.

MALTHUSIAN THEORY



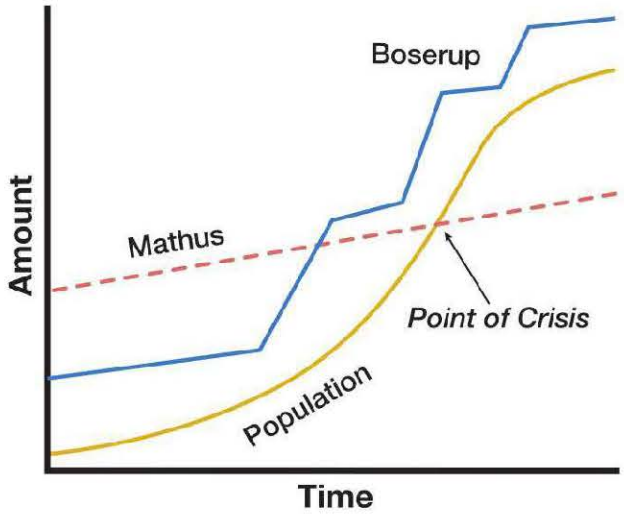
The j-shaped population curve grows faster than resources. At the point of crisis, the population exceeds carrying capacity. What types of challenges does exceeding carrying capacity create for a region?

Alternative Views

The famines predicted by Malthus did not and have not occurred for several reasons. The first is that food production increased dramatically faster than he predicted. Malthus did not live to see the dramatic improvements in agricultural technologies that have revolutionized food production. Also, Malthus was incorrect in his prediction that population would continue on its steady growth path. In the years since he wrote his essay, fertility rates have dropped in all regions of the world.

Additionally, some scientists believed that an increasing population could improve the situation. In contrast to Malthus, Ester Boserup (1910–1999), a Danish economist, emphasized the positive aspects of a large population. In simple terms, the **Boserup theory** suggested that the more people there are, the more hands there are to work, rather than just more mouths to feed. Boserup also argued that as population increases, more pressure is placed on the existing agricultural system, which stimulates invention resulting in more food production.

BOSERUP AND MALTHUSIAN THEORIES

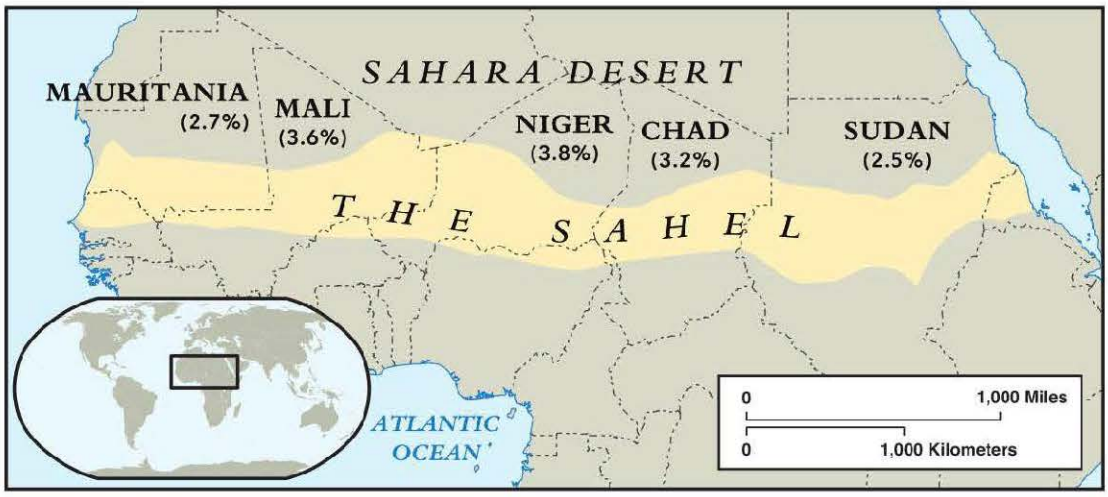


Malthusian Theory Today

The widespread starvation that Malthus feared has not happened. Yet, there are those who still accept his fundamental premise as correct today, they are known as **neo-Malthusians**. They argue that population growth is a serious problem currently and an even greater threat for the future. On a regional scale, places like the Sahel region in Africa, the transition between the Sahara and the grasslands, could represent a Malthusian scenario. The region's population is expected to triple over the next 30 years and is suffering with political instability, poverty, food shortages, and dramatic climate change.

Neo-Malthusians point out continued population growth will lead to the depletion of nonrenewable resources such as petroleum and metals, pollution of air and water, and shortages of food. These issues could lead to social, political, economic, and environmental catastrophe.

SAHEL REGION OF AFRICA WITH NATURAL INCREASE RATES, 2020



Source: PRB.org

The natural increase rates of the countries of the Sahel indicate what stage of the demographic transition model? How could countries of the Sahel region avoid a Malthusian crisis?

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How does Malthusian theory explain population growth and decline?*

Malthus's Concerns About Population Growth	Checks or Impacts at the Point of Crisis

KEY TERMS

Malthusian theory
overpopulation
Boserup theory
neo-Malthusians

2.7

Population Policies

Essential Question: What are the intent and the effects of population and immigration policies on population size and composition?

Population growth rates can also be influenced by political factors. Many countries in the world today have adopted national policies intended to either slow the growth of their populations or to increase it.

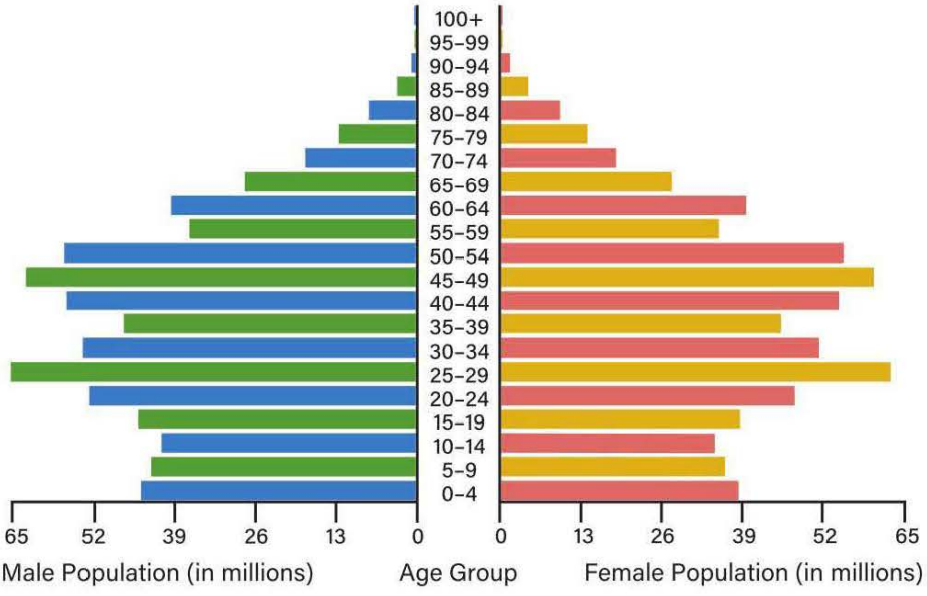
Government Programs to Reduce Population Growth

Concerns about population growth have led to **antinatalist policies**. These policies attempt to decrease the number of births in a country and are often used by developing countries.

The Chinese government introduced two different antinatalist policies in the 1970s. The first, known as "later, longer, fewer," was introduced in 1972. It encouraged parents to get married later in life, wait longer between children, and as a result, have fewer children.

The impact of the "later, longer, fewer" policy can be seen in China's pyramid for 2016 in the relatively shorter bars for the 40–44 and 35–39 cohorts. The expansion in births in the 25–29 and 30–34 cohorts is the result of the large number of women who entered childbearing age in the mid-1980s.

CHINA, 2016



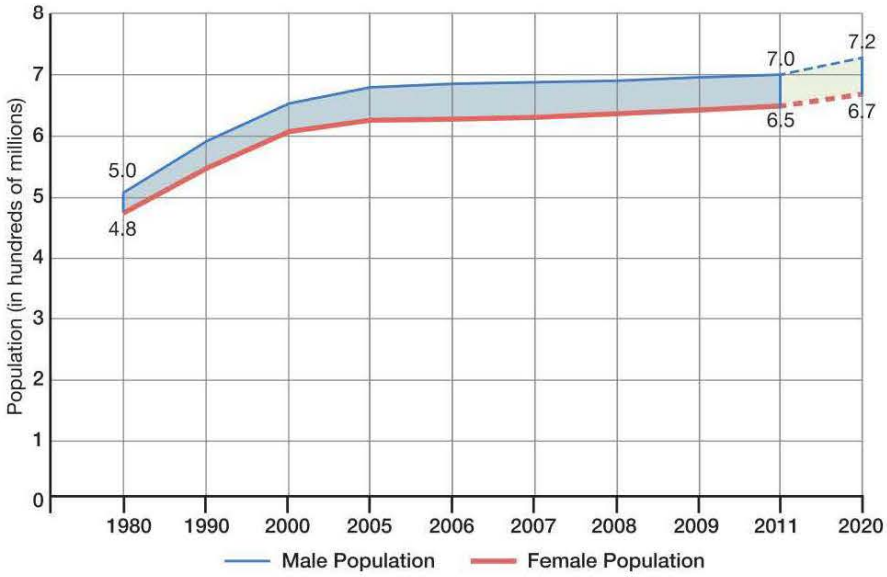
Review the 5-year cohorts for 24 years and under. Describe the pattern of boys compared to girls using quantitative data.

"Later, longer, fewer" resulted in reduced fertility but not as quickly as officials wanted. In response, China instituted its One-child policy in 1979. Parents who had more than one child were subject to fines, although the law made exceptions for rural couples and ethnic minorities. The policy remained in effect until 2016. During that period, China's fertility rate decreased. However, researchers disagree on how much of the decline resulted from the policy and how much from other factors, such as increased education for women.

Gender Preference Chinese culture has long preferred male children over females, so the One-child policy contributed to an unbalanced gender ratio. By 2010, China had 118 males born for every 100 females. The gender imbalance was so great that Chinese leaders feared it would lead to greater crime and civil unrest among young men who felt they had no prospects to get married and have children.

Gender preference is not unique to just China. Many countries have unbalanced gender ratios at birth, such as India, which has a similar sex ratio to China. Demographers estimate that upwards of 100 million Indian girls are missing from the population because of a gender preference for males. Sons are required economically to care for their elderly parents, while girls are viewed as a financial burden with less economic potential than boys. According to the World Health Organization changing structural elements of gender inequality by promoting equal education and pay, allowing women to own property, and changing attitudes about gender roles are essential to increase the perceived value of girls.

CHINA'S MALE AND FEMALE POPULATIONS



Source: United Nations Development Programme

Males outnumber females in the total world population. China's antinatalist policy is the reason for about half of these "extra" males. Why might a couple have had a preference for a male child to be their first?

Revision of One-Child Policy One effect of China's One-child policy was a change in the dependency ratio. Chinese government officials reevaluated the policy because of concerns that, in the future, the economically active workforce will not be large enough to sustain economic growth and support the

elderly. In 2016, the Chinese government modified the controversial program and allowed families to have two children.

While China's One-child policy was the most comprehensive population-control plan, other countries used more targeted programs. In European nations, birth-education decreased teenage pregnancy. In parts of Africa and South Asia, laws banning child marriage raised the average marriage age and the average age that a woman had her first child.

Policies to Encourage Population Growth

Throughout history, some governments have encouraged large families. Those governments believed that a growing population stimulated economic growth and increased military power.

In recent decades, a variation of this reasoning has emerged in some highly developed countries. As fertility rates dropped but people lived longer, the percentage of elderly people increased. To keep the economy vibrant, countries such as France, Sweden, and Japan instituted **pronatalist policies**, or programs designed to increase the fertility rate. For example, they have provided paid time off from jobs held by mothers, free childcare, and family discounts on government services. Other countries like Denmark, Singapore, Russia, and Italy have advertising campaigns to encourage families to have more children and express family and national pride. These campaigns have had mixed results.

The island city-state of Singapore has engaged in both pronatalist and antinatalist policies. In 1966, the official policy was "Stop at Two" and "Boy or Girl, Two is Enough," and by 1987, the policy changed to "Have Three or More, If You Can Afford It." In 2000, "Work-Life Harmony" and "Family-Friendly Work" were added as new policies. Policies included paid leave, cash bonuses, and tax rebates for working mothers who had a baby.

Restricting or encouraging immigration through national policies is another political tool that a country can use to promote or discourage population growth. Remember that the **demographic balancing equation** includes both immigration and emigration when predicting future populations.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the intent and the effects of population and immigration policies on population size and composition?*

Policies Encouraging Population Growth	Policies Discouraging Population Growth

KEY TERMS

antinatalist policies

pronatalist policies

2.8

Women and Demographic Change

Essential Question: What are the demographic consequences due to the changing role of women in different parts of the world?

The changing roles of females has had profound effects on the demographics worldwide. The goals, responsibilities, and opportunities of women are different today than in the past. The effects of these changes can be seen in both the developing and the developed world.

Changes in Fertility

Beginning in the mid-18th century, Europeans began having fewer children. Part of the lower fertility rate was unintentional. During this time, countries began keeping larger standing armies, so more men were away from home for longer periods.

However, most of it was intentional. With the Industrial Revolution (see Topic 7.1), people began to rely more on machines than on human labor to produce goods, so couples felt they needed fewer children to support their families. Additionally, people were migrating from rural agricultural regions into more urban city centers where an increasing number of jobs were located. In cities, raising children was often more expensive, further reducing the fertility rate. Yet, industrialization contributed to a lower death rate and also enabled people to live longer. So even though total fertility rate (TFR) declined, population growth increased. **Total fertility rate** is the average number of children who would be born per woman of that group in a country, assuming every woman lived through her childbearing years.

Role of Women in Society

Cultural, economic, political, and environmental realities have always shaped decisions about whether to have children. Since these conditions have varied across time and cultures, so have birth rates. The changing way that people view the role of women in a society has been a particularly important factor influencing TFR.

Over the past 250 years, as countries industrialized, people moved from rural areas to urban areas and found work in factories. Many women found work in textile mills, so they often began families later and sometimes not at all. Families lived in small apartments or small houses in cities, which were more suitable for small families.

As the number of factories grew in the early 19th century, children worked there alongside adults. Later that century, governments passed laws prohibiting child labor and began opening public schools. As young women obtained more schooling, they began to expand their work opportunities. The longer they stayed in school, the fewer children they had—a trend that continues to the present day, as the chart on Ghana shows.

TFR AND SCHOOLING FOR GIRLS IN GHANA		
Years of Schooling	**TFR, 1990**	**TFR, 2007**
0	7.0	6.1
4	6.4	5.0
8	5.6	3.7
12	2.7	2.0

Source: worldbank.org

What are the differences in the trends of TFR and schooling for girls from 1990 and 2007? What are some possible causes for the differences?

In Ghana, between 1990 and 2007, as young women gained more education, the number of children they had decreased. This suggests that young women who spent more time in school chose to delay marriage and childbirth.

The United States showed a similar pattern of delayed marriage. As educational opportunities increased for women between 1950 and 2010, the median marriage age of women increased from just over 20 years of age to nearly 27. As a result, the average age at which women gave birth to their first child increased as well.

Family Planning

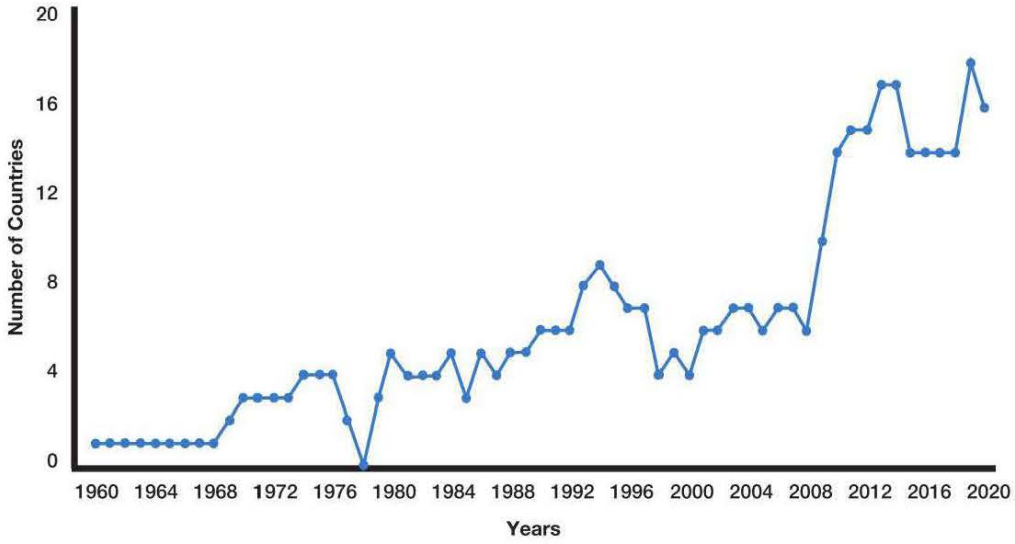
Throughout the 20th century, the spread of family planning information and changes in technology aided people who wanted to choose the number of children they had. In countries with wide access to family planning methods, including the United States and many countries in Europe, couples gave birth to their first child later in life, had fewer children, had fewer unintended pregnancies, and had larger intervals between having children. In these places, the total fertility rate continued a decline that began with the Industrial Revolution.

Religious and cultural values also shape attitudes toward having children. Some religious traditions oppose certain forms of family planning. Women who follow traditional religious beliefs have higher fertility rates than those who do not. These women are less likely to use birth control and less likely to be employed outside the home. The combination of access to family planning, educational attainment of girls, and the resulting gains in economic wealth for women, is powerful in reducing total fertility rates.

Political Changes

Women have been expanding their participation in politics and government across the world in the last 50 years. Although females are still underrepresented in government positions, their presence and involvement there has never been greater. These political changes have coincided with the expanded opportunities for women to gain education, access jobs and leadership roles, and make decisions about family size. Family planning is a political topic in many countries, including the United States, and the voice of women in prominent political and cultural positions can have significant influence.

NUMBER OF COUNTRIES WITH A WOMAN IN THE HIGHEST GOVERNMENT POSITION, 1960 TO 2020



Source: statista.com

The graph shows changes from 1960 to 2020. In 2021, only 12 of the 193 countries (6 percent) in the United Nations had a woman as leader.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the demographic consequences due to the changing role of women in different parts of the world?*

Reasons for Reduced Fertility Rates	Effect of Social, Economic, and Political Roles for Women

KEY TERM

total fertility rate (TFR)

2.9

Aging Populations

Essential Question: What are the causes and consequences of an aging population?

Across the world, the populations are getting older. This is most evident in highly seveloped countries such as Japan and much of Europe. However, the processes that cause the average age of a population to increase are occurring in all parts of the world. There are numerous significant effects on a society with an aging population.

Causes of Aging Populations

There are two primary reasons for the increasing average ages in populations: longer life expectancy and lower crude birth rates.

Improvements in healthcare and eldercare have allowed for life expectancies to increase in developed countries. In many of these countries, people routinely live well into retirement.

In less-developed societies, life expectancies have also been increasing due to much simpler, but effective, improvements. Building better sewage treatment facilities and improving drinking water quality have helped tremendously. Mitigation of diseases such as malaria, dysentery, AIDS, and influenza have greatly improved chances of living not only to adulthood but into old age. The presence of basic medical services, trained midwives, and available antibiotics are now much more common in many countries and have resulted in increasing life expectancies worldwide.

Crude birth rates are also dropping as a result of changes attitudes about family size. (See Topic 2.4.) When fewer children are born, there will eventually be fewer adults to create families. In many places, this process has tended to reinforce itself with each successive generation becoming slightly smaller than the one that proceeded it. Consequently, as the percentage of younger people in a population decreases and the number of people living into old age increases, the average age of a population increases.

Effects of Aging Populations

As populations age, their needs change. Japan's population has an average age of 49 years and has different priorities than Iraq where the average age is 21 years. The average age in the United States in 2020 was 40 years, but in 2000, it was only 35.

Political Impacts

Older people may vote differently than younger people. Many older people are on a fixed income and may not support tax increases for things such as parks that they won't likely use and may not be able to afford the taxes to support. Potentially political tensions can rise over differing political issues and age-specific viewpoints, such as increasing the retirement age or changing funding levels for education or Social Security.

Retirees are very likely to vote, and as the percentage of elderly rise, they have become a powerful voting bloc. The importance of the senior voting bloc is partly because of the number of seniors, but even more because of the willingness to vote. Between 1986 and 2018, voter turnout among people over the age of 60 was consistently about 30 percent higher than among people 18 to 29 years old.

Social Impacts

Traditionally, in many countries, families lived in multigenerational homes with children and aging parents. Increasingly, married couples have moved away from the region where they were raised to seek jobs and opportunities. As people live longer, families face increasing social and economic challenges to care for elderly members. Positive impacts include retired grandparents assisting in raising grandchildren and maintaining a strong family unit for working parents.

Economic Impacts

An aging country will often invest in additional services for the elderly, which might result in a reduction of spending in other areas or tax increases. One of the great challenges is the increased economic expense of caring for the elderly, especially the cost of medical care and retirement income. Increasingly as a society ages, these costs are being incurred by the government and paid for by the younger generation who are working. In Stage 4 and 5 countries, like the United States and Japan, there are decreasing numbers of young people compared to retirees.

The economic benefits of a graying society are numerous. If the aging population stays healthy, they often will volunteer, continue working, and spend money in the economy, resulting in increased jobs and services for other workers. Additionally, many jobs are created in healthcare and caring for the elderly.

Dependency Ratio

Another result of an aging population is a change in the **dependency ratio** (DR), a value comparing the working to the nonworking parts of a population. 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—are the **dependent population**, because they are considered too young or too old to work full-time. Put simply, the dependency ratio is a consideration

of the number of people in a population who are economically supporting the rest of the population. Dividing the potential workforce by the dependent population results in the dependency ratio. Remember, however, that because many people who are 15 to 64 do not work for pay and since many people under 15 and over 64 do work, this number is only a rough estimate. Nevertheless, it is an important reality for aging populations that fewer people will inevitably be supporting more people. (See Geographic Perspectives on page 70 for more on interpreting dependency ratio.)

CALCULATING DEPENDENCY RATIO

Country	Population by Age Group	Dependent Population (under 15 + over 64)	Dependency Ratio Calculation
United States	▪ under 15: 19% ▪ 15 to 64: 66% ▪ over 64: 15%	34%	$\frac{19 + 15}{66} = 0.52$
Niger	▪ under 15: 49% ▪ 15 to 64: 48% ▪ over 64: 3%	52%	$\frac{49 + 3}{48} = 1.08$

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the causes and consequences of an aging population?*

Causes for Population Aging	Political, Economic, and Social Consequences of an Aging Population

KEY TERMS

dependency ratio

dependent population

GEOGRAPHIC PERSPECTIVES: *CHANGING THE PERCEPTION OF GIRLS*

Many countries have engaged in policies to decrease population growth and to highlight the value of a having a girl. As discussed in Topic 2.7, many countries have a gender gap in their overall population primarily because some cultures believe that boys are more valuable than girls. One of the strategies that countries employ to counter this belief is to use advertisement campaigns and create posters that illustrate the benefits of girls. The images often have visuals and symbols that represent the benefits of girls to society and to families. Visually showing people the benefits and the potential opportunities of girls is a necessity in many communities to change the perception that many people have about girls. Use the photos below to complete the directions that follow.

China

Jordan

India

Sources: pbs.org, Wikimedia Commons

China-English translation: "It's better to marry and have children at a mature age." The poster is from the Shanghai Center of Communication and Education for Family Planning.

Jordan-A photo of young girls reading at a government primary school in Amman, Jordan, from 2011.

India-English translation: "Why only a boy? Are these not girls?" The image was created by India Directorate of Family Welfare in 1993.

1. Using the images from China, describe three benefits of having a girl.
2. Using the image from Jordan, describe why showing young girls reading is an effective strategy to improve the value of girls in society.
3. Using the image from India, explain the main point that the poster conveys about girls.
4. Explain the social factors that make it necessary to show the value of girls.

THINK AS A GEOGRAPHER: *PREDICTING POPULATION CHANGE*

Geographers study patterns and trends to help them make predictions about the future. This often has very practical uses. For example, knowing where people will be living in 30 years helps communities plan their investments in roads and schools. But making predictions is very difficult because they are always based on assumptions about how much the future will look like the past.

Use data from this unit and from this chart to answer the questions that follow about how much the world population will grow.

EXAMPLES OF POPULATION GROWTH AND DECLINE

Region	Time Period	Important Event or Trend	Population Change
World	1800 to 2000	Industrialization	Total increase of about 600 percent
Europe	Late 14th century	Disease epidemic	Total decrease of about 25 percent
Americas	1492 to late 1800s	Disease epidemic	Total decrease among indigenous population of 70 to 90 percent
Russia	1987 to 1999	Political turmoil	Birthrate decrease of about 45 percent
United States	1929 to 1941	Economic depression	Birthrate decrease of about 30 percent
World	2000 to 2019	Globalization	Birthrate decrease

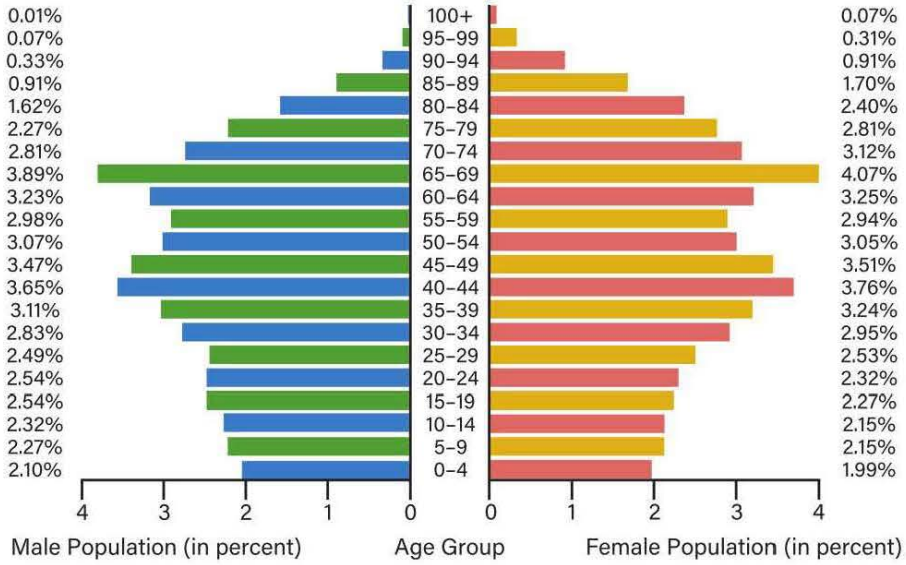
1. What evidence from this unit supports a prediction that the world population will increase at a decreasing rate for the next 100 years and then level out?
2. What evidence from the chart above supports a prediction that the growth of the world population will slow in the future?
3. How does evidence in the chart both support and disprove Malthus's theory?

CHAPTER 4 REVIEW:
Population Change

Topics 2.4–2.9

MULTIPLE-CHOICE QUESTIONS

Questions 1 through 3 refer to the population pyramid below.



1. Which stage of the demographic transition model does the population pyramid represent?

(A) Stage 1

(B) Stage 2

(C) Stage 3

(D) Stage 4

(E) Stage 5

2. Which is most likely a bigger concern for the country represented in the pyramid than for countries in other DTM stages?

(A) A greater demand for government spending on pensions and healthcare for the elderly

(B) A greater demand for government spending on education and daycare for children

(C) A higher rate of unemployment among people of working age

(D) A higher rate of emigration by people in search of jobs

(E) A faster overall population growth than in previous decades

3. What concept is illustrated by the graph's "peaks" at ages 40–44 and 65–69?
   (A) An unbalanced dependency ratio
   (B) Increasing crude birth rates over time
   (C) Increasing life expectancy
   (D) A baby boom and echo
   (E) A need for more effective family planning in certain years

4. Which change most reduced fertility rates in less-developed countries?
   (A) Building hospitals and healthcare facilities
   (B) Providing more education for girls
   (C) Implementing pronatalist policies
   (D) Discouraging the use of birth control
   (E) Promoting fundamentalist religious values

5. How do the concerns of an aging population differ from those of a population with a younger average age?
   (A) Increased concern with childcare
   (B) Increased need for pharmacies and care facilities
   (C) Less worry about a higher dependency ratio
   (D) Less worry about the need for health services
   (E) Increased need for family planning

Questions 6 and 7 refer to the chart below.

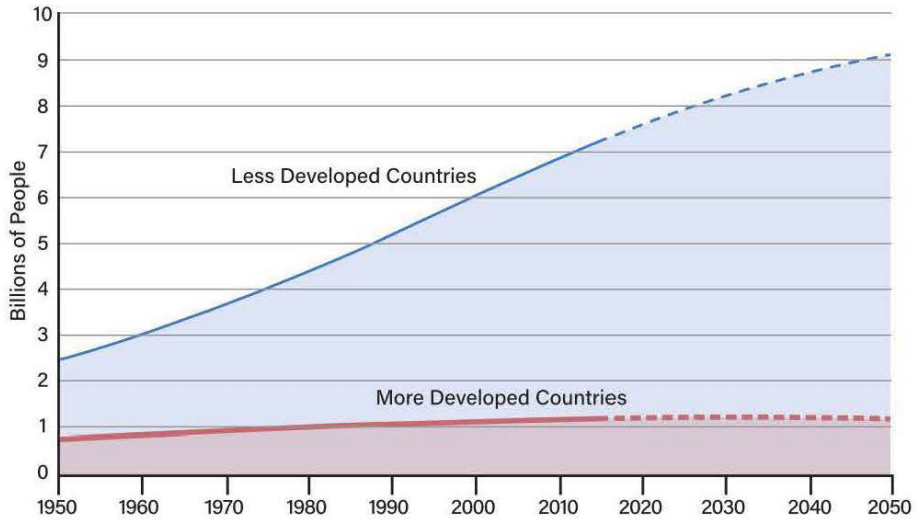
BIRTH RATES AND DEATH RATES BY LEVEL OF DEVELOPMENT			
Country	**Level of Development**	**Crude Birth Rate/ 1,000 People**	**Crude Death Rate/ 1,000 People**
Niger	Less developed	45.5	12.4
Bangladesh	Less developed	20.0	5.7
Mexico	Developing	18.8	5.3
Australia	More developed	13.2	6.4
France	More developed	12.4	9.2

6. Which country's population has the highest rate of natural increase?
   (A) Niger
   (B) Bangladesh
   (C) Mexico
   (D) Australia
   (E) France

7. France's crude death rate is higher than Bangladesh's because
   (A) France is involved in more wars
   (B) France has more natural disasters
   (C) France has a higher percentage of elderly people
   (D) Bangladesh has a better healthcare system
   (E) Bangladesh has a higher life expectancy

FREE-RESPONSE QUESTION

POPULATION GROWTH AND DEVELOPMENT, 1950–2050



Source: Population Reference Bureau

1. Since 1950, population has grown fastest in less-developed countries, and the total fertility rate is an important indicator of population growth. Use the graph above and the map about total fertility rates on page 78 to answer the following questions.
   (A) Describe the population growth patterns of more-developed countries shown on the graph.
   (B) Explain ONE reason why the pattern in A is occurring.
   (C) Using both sources, explain ONE reason why population is growing faster in less-developed countries than in more-developed countries.
   (D) Explain ONE social consequence of uneven population growth between less- and more-developed countries.
   (E) Explain ONE economic consequences of uneven population growth between less- and more-developed countries.
   (F) Explain ONE political way that countries have attempted to lower their total fertility rate.
   (G) Describe ONE unintended consequence of the political policy in F.

CHAPTER 5

Migration

Topics 2.10–2.12

Topic 2.10 Causes of Migration

Learning Objective: Explain how different causal factors encourage migration. (IMP-2.C)

Topic 2.11 Forced and Voluntary Migration

Learning Objective: Describe types of forced and voluntary migration. (IMP-2.D)

Topic 2.12 Effects of Migration

Learning Objective: Explain historical and contemporary geographic effects of migration. (IMP-2.E)

More than any other nation on Earth, America has constantly drawn strength and spirit from wave after wave of immigrants. In each generation, they have proved to be the most restless, the most adventurous, the most innovative, the most industrious of people.

—President Bill Clinton, speech at Portland State University, 1998

Source: Wikimedia Commons

Somalian refugees fled to Kenya to escape drought and conflict in 2011. (See Topic 2.11 for more on forced migration and refugees.)

2.10

Causes of Migration

Essential Question: How have different causal factors encouraged migration?

In his 1998 commencement address at Portland State University (see previous page), President Bill Clinton highlighted the ongoing impact of immigrants coming to the United States. The United States is the most populous immigrant country in the world. Like many countries in the Americas and Australia, most residents are either immigrants or descendants of immigrants. United States culture, institutions, and population are the products of five centuries of immigration.

Migration's Push and Pull Factors

World history is a story of constant movement. **Migration** is the permanent or semipermanent relocation of people from one place to another. Since the first humans lived in eastern Africa, people have been on the move. Early humans were very mobile, searching for nuts, seeds, and fruits, and hunting for animals to eat. As agriculture developed, people moved less in search of food and urban settlements began. However, people continued to move, from rural to urban areas, and from settlement to settlement.

Most people who move do so in search of a better life. They are part of a **voluntary migration**, or a movement made by choice. The choice usually combines a decision to move away from someplace with a decision to move toward someplace else:

- Geographers classify the reasons that people migrate *to* a specific location. People generally decide to move because of **push factors**, which are negative circumstances, events, or conditions present where they live that compels a person to leave.
- Once migrants decide to leave, they usually choose a destination based on its positive conditions and circumstances, or **pull factors**.
- From the perspective of a receiving country, an **immigrant** is a person who migrates across an international border with the intention of staying permanently.
- From the perspective of the country the migrant is leaving, the person is viewed as an **emigrant**. When people migrate away from somewhere, they **emigrate**.

Economic Push and Pull Factors

The most common reason people migrate is that they lack jobs and economic opportunities. These migrants go to areas offering greater chances for economic prosperity.

EXAMPLES OF ECONOMIC PUSH AND PULL FACTORS		
Group and Place of Origin	**Push Factors**	**Pull Factors**
Factory workers in the U.S. Rust Belt states, beginning in the 1970s	Unemployment rose among factory workers, particularly in traditional manufacturing states such as Michigan and Pennsylvania.	Many factory workers moved to southern states such as Kentucky and Tennessee, as manufacturers opened new factories there.
Farmers in rural China, beginning around 1950	Increased use of machines and consolidation of small farms into fewer large farms reduced the number of farmers needed to raise crops.	Farmers moved to China's large cities, increasing the urban population from 64 million in 1950 to 850 million by 2020.

Social Push and Pull Factors

People will often migrate when they experience discrimination and persecution because of their ethnicity, race, gender, or religion. They move to locations where they can practice their culture safely. People are often influenced by kinship links, or ties with relatives who have already settled in a place.

EXAMPLES OF SOCIAL PUSH AND PULL FACTORS		
Group and Place of Origin	**Push Factors**	**Pull Factors**
Mormon migration, 1845–1857	Anti-Mormon violence in Illinois and Missouri resulted in dozens of deaths, including that of leader Joseph Smith.	Approximately 70,000 Mormons migrated to the Great Salt Lake area, a place chosen for its isolation and agricultural opportunities.
Hindus and Muslims during and after the partition of India, 1947–1957	Violence resulted in around 1 million deaths.	More than 14 million people migrated in hopes of finding safety in a new country.

Political Push and Pull Factors

People who oppose the policies of a government often migrate because they face discrimination, arrest, and persecution. Such political migrants move to countries where they feel safe and have protection from the danger they faced in their home country.

EXAMPLES OF POLITICAL PUSH AND PULL FACTORS		
Group and Place of Origin	**Push Factors**	**Pull Factors**
Anti-communist Cubans after Fidel Castro's Communist takeover in 1959	Opponents of Castro were jailed or killed if they spoke out against Castro's government.	Opponents of Castro fled to the United States, where they were protected.
The Dalai Lama and Tibetan government officials, after China's takeover of Tibet in 1950	The Chinese persecuted, arrested, and killed many Tibetans who opposed the takeover.	The Dalai Lama and his supporters fled Tibet to India in 1959, which allowed them to set up a government in exile.

Environmental Push and Pull Factors

People often migrate to escape harm from natural disasters, drought, and other unfavorable environmental conditions. Such migrants move to areas that are not under the same environmental stresses.

EXAMPLES OF ENVIRONMENTAL PUSH AND PULL FACTORS		
Group and Place of Origin	**Push Factors**	**Pull Factors**
Farmers from Colorado, Kansas, Oklahoma, and Texas, 1930s	A severe drought caused thousands to lose their farms.	Farmers moved to California hoping to find work.
Residents living near the Fukushima Nuclear Power Plant in Japan, 2011	An earthquake and tsunami damaged nuclear reactors, releasing radioactive materials.	Residents near the power plant resettled to cities around Japan.

Demographic Push and Pull Factors

Some countries are unbalanced demographically. For example, in the case of a gender imbalance, young adults may not find someone to marry. Or if the population is too young, the country may eventually become overpopulated.

Geographers, such as Wilbur Zelinsky, saw a connection between migration patterns and the demographic transition model. (See Topic 2.5.) Zelinsky's theory, called the **migration transition model**, argues that countries in Stages 2 and 3 of the demographic transition model experience rapid population growth and overcrowding. This overcrowding limits the economic opportunities of the people and acts as a push factor. Thus, they migrate to less-crowded Stage 4 or 5 countries, which offer greater economic opportunities with growing economies and aging populations.

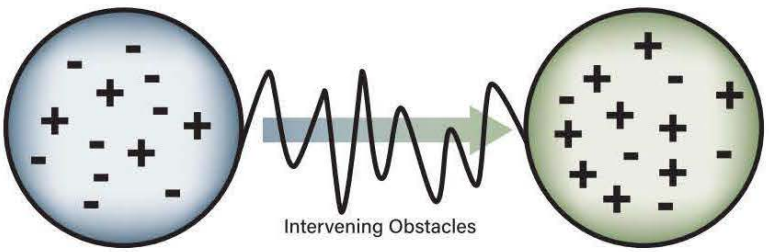
EXAMPLES OF DEMOGRAPHIC PUSH AND PULL FACTORS		
Group and Place of Origin	**Push Factors**	**Pull Factors**
Farmers in Europe, 1800s	The population of industrial countries increased, while land became scarce.	European migrants came to the United States, in part because the Homestead Act gave them plots of land.
Young educated people in less-developed countries in Latin America, North Africa, the Middle East, and Asia	Many people in less-developed countries live in areas where population is growing very quickly and unemployment and underemployment is high.	Developed countries in North America and Europe with aging populations need workers for difficult jobs, so they attract immigrants from less-developed countries.

Intervening Obstacles and Opportunities

Migration consists of more than just push and pull factors. Geographer Everett Lee introduced the idea in 1966 that migrants may encounter **intervening obstacles**, barriers that make reaching their desired destination more difficult. These obstacles might be political, such as laws restricting immigration and border patrols. They could be environmental, such as deserts or oceans for migrants to cross. Walls and fences that constructed at borders would be considered both political and environmental (physical) barriers or obstacles. Migrants can face economic obstacles in the form of costs incurred in migration.

Migrants may also encounter opportunities en route that disrupt their original migration plan. These are known as **intervening opportunities**. For example, a migrant might find a job along the way.

LEE'S MODEL OF MIGRATION



INTERVENING OBSTACLES	
Type of Obstacle	**Example**
Economic	A migrant lacks enough money to reach a destination.
Social	A migrant gets married to someone who lives along the migration route and settles in that person's community.
Political	A migrant cannot get a visa needed to pass through a country to get to his or her final destination.
Environmental	A migrant cannot cross a sea, desert, or mountain range.

Ravenstein's Laws of Migration

In the 1880s, German geographer E.G. Ravenstein observed patterns—sometimes referred to as laws—about migration tendencies and demographics. They still form the basis for migration theory today.

Short Distances Most migrants travel only a short distance. The further apart two places are, the less likely it is that people will migrate between those places. Ravenstein called this phenomenon **distance decay**. In the 1960s, geographers expanded this to time-distance decay, the idea that things near one another are more closely connected than things that are far apart.

Urban Areas Migrants traveling long distances usually settle in large urban areas. This is mainly because migrants believe that a larger city will have more opportunities than a smaller city.

In the 1970s, geographers used Ravenstein's laws to develop the **gravity model of migration**. The model assumes that the size and distance between two cities or countries will influence the amount of interactions that include migration, travel, and economic activity. The larger the population of a city or country, the more pull the location will have with migrants seeking economic opportunities. However, as the distance between two locations increases, the pull, or gravity, weakens and the person may choose a closer place to migrate.

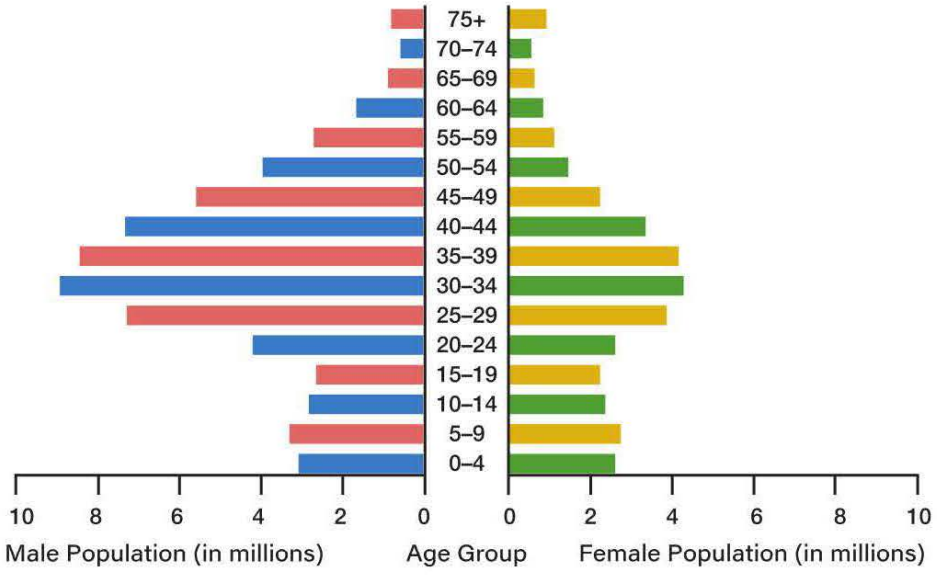
One demonstration of the model is the Cuban migration to the United States following Fidel Castro's successful overthrow of the government in 1959. Most people settled in Florida, the state closest to Cuba. And most settled in large cities, such as Miami. Today, more than two-thirds of Cuban Americans in the United States live in Florida. More than half of all Cuban Americans live in Miami.

Multiple Steps Most migration occurs through **step migration**, a process in which migrants reach their eventual destination through a series of smaller moves. For example, in a common pattern in rural-to-urban migration, a migrant from a small town is most likely to move first to a larger town, later to a small city, and finally to a large city.

Rural to Urban Most migration in history has been from rural agricultural areas to urban city areas. Because of the Industrial Revolution, rural areas needed fewer laborers on farms, and cities needed more people to work, first in factories and then in offices. This **rural-to-urban migration** remains common today. It includes migrations both within countries—rural residents of India moving to Indian cities such as Mumbai, for example—and between countries—rural residents of Syria moving to cities in Germany.

Counter Migration Each migration flow produces a movement in the opposite direction, called **counter migration**. For example, in the 1990s and early 2000s, as many Mexican migrants were moving to the United States, a counter migration of people moved from the United States to Mexico. Some were part of a **return migration**, immigrants moving back to their former home. Others were retirees from the United States who had never lived in Mexico but were attracted by its warm weather and lower cost of living. One result of counter migration is that neighborhoods of former U.S. residents are found scattered throughout Mexico. Today, about 1 million retired U.S. citizens live in Mexico.

AGE-SEX PYRAMID OF INTERNATIONAL MIGRANTS, 2019
NORTHERN AFRICA AND WESTERN ASIA



Using the graph, identify one pattern of migration related to age and one pattern related to gender. Explain reasons why the patterns occurs.

Youth Most migrants are younger adults, between ages 20 and 45. People in that age group are usually not as established with jobs, homes, and families as older groups, so they are more likely to move to improve their fortunes.

Gender Patterns Most international migrants are young males, while more internal migrants are female. Men are more likely to move outside of the country looking for work. For example, several countries in the Middle East have guest-worker programs where young men are recruited from South and Southeast Asia to work in the oil and construction industries.

Women are more likely to move within a country. One reason is that many women living in traditional societies move in with their husbands and husbands' families. However, today women comprise nearly half of the international migrants. The female migration pattern is changing for a variety of reasons:

- An increasing demand in destination countries and markets for jobs typically done by women, including employment in medical care, home and domestic work, and labor-intensive factories.
- Increasing female education is opening up employment opportunities.
- More women are becoming the primary income earner in their family.
- Although this trend is slowing, family reunification with husbands and children still occurs.
- An emerging trend is women migrating from countries with gender inequality to more gender-equal countries. However, this trend is being slowed by laws in sending countries that block women from migrating out of the country.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How have different causal factors encouraged migration?*

Push and Pull Factors	Explanation of Push and Pull Factors as Cultural, Demographic, Economic, Environmental, or Political

KEY TERMS

migration
voluntary migration
push factor
pull factor
immigrant
emigrant
emigrate
migration transition model
intervening obstacles
intervening opportunity
distance decay
gravity model of migration
step migration
rural-to-urban migration
counter migration
return migration

2.11

Forced and Voluntary Migration

Essential Question: What are the types of forced and voluntary migration?

Geographers classify migration and migrants as either forced or voluntary depending on the reason for which people move. Ideally, people would only move because they wanted to. That is often the case. However, throughout history and continuing into the present, millions of migrants have moved unwillingly. There are economic, cultural, political, and environmental push and pull factors behind both the voluntary and involuntary migration patterns.

Forced Migration

Migration that is involuntary, meaning migrants have no choice but to move, is **forced migration**. Today, the largest number of forced migrants are fleeing natural disasters, war, political persecution, or ethnic and cultural problems in their homelands.

Slave Trade

Throughout history, millions of people have migrated unwillingly. The largest forced migration in history is that of the African slave trade. From the 15th through the 19th centuries, about 12.5 million Africans were captured, enslaved, and forcibly moved from their homes in Africa to North America, the Caribbean, South America, and the Middle East.

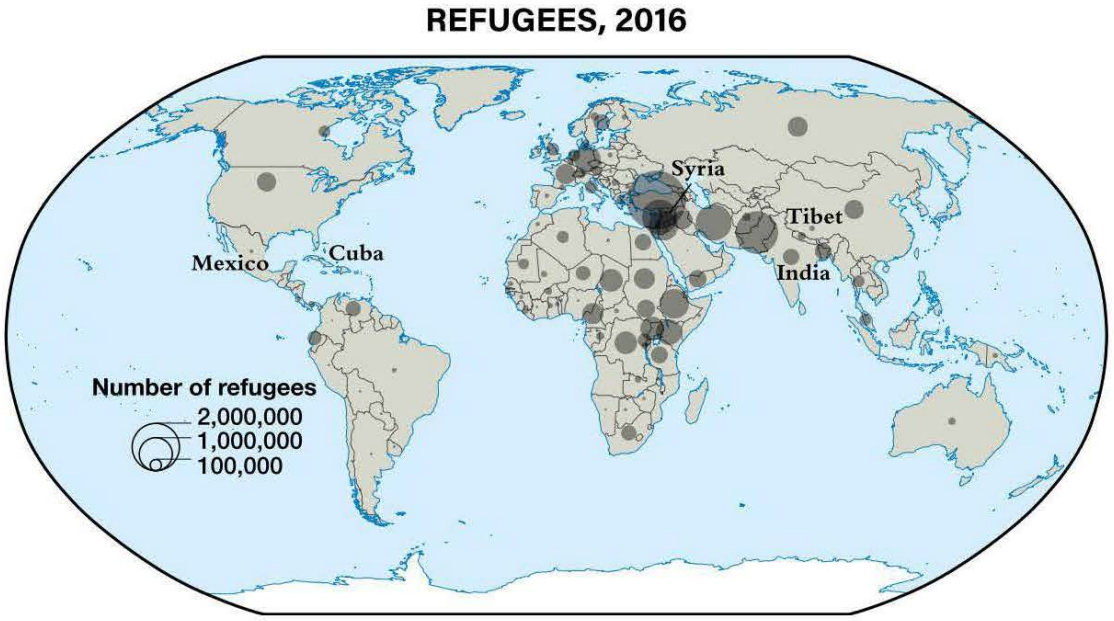
Internally Displaced Persons and Refugees

Forced migration can result from political events and policies or environmental crises such as floods, earthquakes, or famines that threaten peoples' lives. Such migrants must usually flee quickly in order to stay alive and cannot bring many items with them. Most intend to return to their homes once the danger has passed. If these migrants move to another part of the same country, they are classified as **internally displaced persons (IDPs)**. If they cross international borders, they are **refugees**.

An example of forced migration is the Syrian Civil War, which began in 2011 and forced about half the population to flee their towns and villages. The result was the creation of more than 6 million internally displaced persons and more than 4 million refugees. Most of these refugees fled to neighboring or nearby countries such as Turkey and Greece. It is typical for refugees to be relocated to neighboring countries, which has resulted in a clustering of refugees.

Source: Wikimedia Commons

Refugees of the 2011 Syrian Civil War fled to neighboring countries. In the image, Syrian refugees jump from a boat off the coast of Greece to reach safety. Why would refugees risk their lives to take such a dangerous journey?



Source: unhcr.org

What are several geographic distribution patterns of refugees in 2016?

Some political refugees apply for **asylum** when they arrive in their country of destination. Asylum is protection granted by one country to an immigrant from another country who has a legitimate fear of harm or death if he or she returns. If granted, asylum-seekers receive protection and special status from the government of the receiving country.

EXAMPLES OF DISPLACED PERSONS AND REFUGEES		
Category	**Internally Displaced Persons**	**Refugees**
Political	Many Afghan people moved to safer areas during the war between the United States and the Taliban in the early 2000s.	Jews fled Nazi Germany in the 1930s and 1940s, hoping to find safety in other countries.
Environmental	Thousands of Louisianans fled to neighboring states after Hurricane Katrina in 2005.	Thousands of Haitians relocated to neighboring countries after earthquakes in 2010.

Voluntary Migration

Unlike forced migration, **voluntary migration** occurs when people choose to relocate. The term **internal migration** is used to describe movement that occurs within a country. One of the most important phenomena reshaping our world today is rural-to-urban migration. (See Topic 2.10.) Millions of people who leave villages and small towns every year for opportunities in cities and more densely settled areas. In less-developed countries, such as Kenya and India, migration is the most important factor driving urban growth.

Often internal migration, including rural-to-urban, operates in the process of step migration (see Topic 2.10), where people make a series of intermediate moves. Many people move to more urbanized areas gradually, step-by-step, toward their final destination. Internal migration does not have to be exclusively voluntary. Internally displaced persons are also an example of internal migrants. The country of Ethiopia is divided into ten regions. Civil strife in several of these regions has forced local populations to seek better circumstances in neighboring regions without leaving the country. These migrants are examples of both IDPs and internal migration.

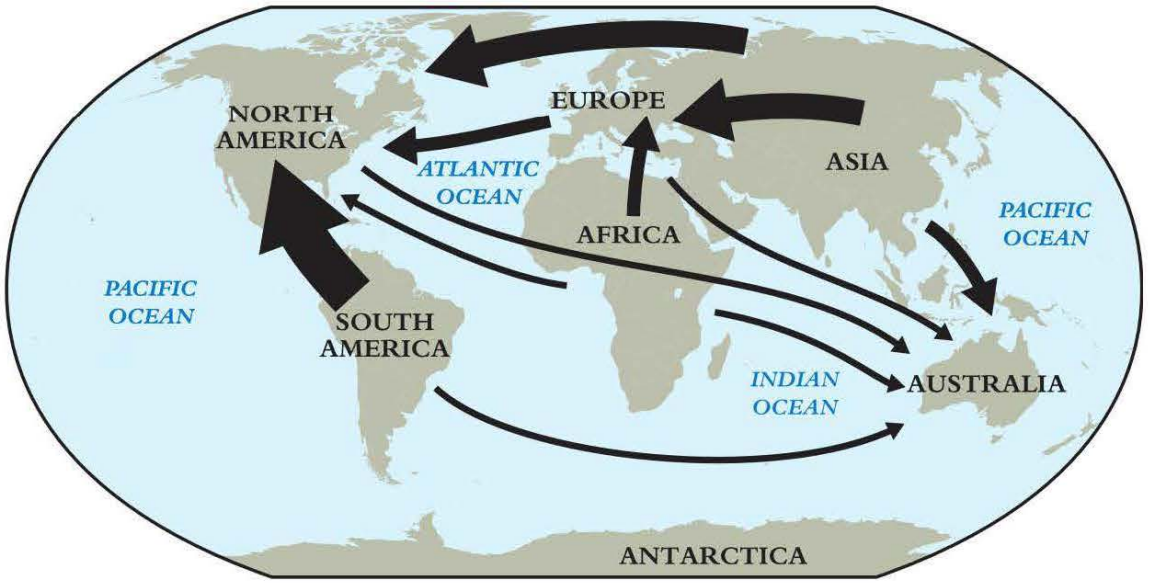
Transnational migration is when people move from one country to another, or internationally rather than internally. For example, a person migrates from Mexico to the United States. When people migrate to and settle in a new country, they often decide to locate in a city or community where others from their home country, family members, friends, or those from thier culture group have previously settled. This process of **chain migration** explains many patterns of migration and helps migrants transition into the receiving country.

Guest workers are also transnational migrants who relocate to a new country to provide labor that isn't available locally. Most are unskilled jobs such as agricultural work or manual labor. Countries in the Persian Gulf are notable for having large percentages of the total populations made up of foreign migrants. In Bahrain, Kuwait, Qatar, and the United Arab Emirates, migrants constitute more than half the population. Most of these migrants work in some part of the petroleum industry. Many also work in the service industry to support tourism, which has boomed in the region.

Most migratory workers do not intend to make a permanent move. Often, they intend to return home or are given permission to stay for only a finite period of time. However, guest workers frequently decide to stay in the host country permanently, and thus become migrants.

The process of herders moving with their animals to different pastures during different seasons is **transhumance**. In mountainous regions, herders move their animals to higher areas in the summer and lower elevations during the winter. This ancient practice still takes place in Italy, Greece, and Turkey, where it is an example of internal migration. In parts of the Sahara in North Africa, herders move their animals across international boundaries as seasons change to find food for their animals.

PATTERNS OF HUMAN MIGRATION



Which region is the source of most international migrants? Which regions are most common destinations for immigrants? What push and pull factors are driving this global pattern of movement?

Migration Trends

Since the mid-20th century, international migration flows have changed. Europe, once a region people were leaving, has become a destination for migrants from around the world. Many come from former European colonies in the Middle East, South Asia, and Africa. The immigrants are usually seeking jobs, unifying with family or escaping war and conflict. This pattern has continued into the 21st century.

COUNTRIES WITH THE HIGHEST NET EMIGRATION AND NET IMMIGRATION, 2010–2020			
Net Emigrants (in thousands)		**Net Immigrants** (in thousands)	
Syria	-752	United States	974
India	-501	Germany	466
Bangladesh	-415	Turkey	318
Venezuala	-329	Russia	271
China	-225	United Kingdom	260
Pakistan	-225	Canada	245
Nepal	-183	Saudi Arabia	240
Myanmar	-134	Italy	238
Zimbabwe	-121	Australia	178
Philippines	-117	South Africa	165

The United States has experienced several trends in immigration and forced migration from other countries. Between 1500 and 1700, European countries raced to colonize North America. By 1700, North America had been claimed primarily by England, France, and Spain. However, major sources of migrants (both voluntary and forced) entering the United States have shifted over time:

- 1600s to 1808: northern and western European colonizers and enslaved Africans
- 1808 to 1890: northern and western Europe immigrants
- 1890 to 1914: southern and eastern Europe immigrants
- 1945 to the present: Latin America and Asia immigrants

Since 1950, the United States and Canada together have received the highest number of immigrants, but recently countries in the Middle East and Europe have increased rates. Government policies have influenced migration trends and will be discussed in Topic 2.12.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the types of forced and voluntary migration?*

Examples of Forced Migrations	Examples of Voluntary Migrations

KEY TERMS

forced migration
internally displaced persons (IDPs)
refugee
asylum
voluntary migration
internal migration
transnational migration
chain migration
guest workers
transhumance

2.12

Effects of Migration

Essential Question: What are historical and contemporary geographic effects of migration?

The number and characteristics of migrants can have profound political, economic, and cultural effects on both the places they leave and the places they move to. Movements of people, though, are often controversial, particularly when people are moving from one country to another.

Migration Policies and Their Consequences

While countries have encouraged immigrants, others have restricted them, Political policies attempt to regulate migration both internal and international.

Policies Encouraging Immigration

Before the 1880s, the U.S. government placed few restrictions on immigration. The ratio of farmland to the number of people to work it was high, so immigrants were often welcomed. In addition, most Americans recalled their own immigrant heritage with pride.

Homestead Act One policy that attracted immigrants was the Homestead Act (1862), a program in which the U.S. government gave land to settlers willing to stay and farm it for five years. Most of the people who benefited from this program were White settlers, who eventually became the property owners. In recent years, the U.S. government offered visas to well-educated people with hopes they would remain in the country.

Current Immigration Policies Today, many governments regulate the flow of workers into their country. For example, the Persian Gulf countries of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates formed an organization called the Gulf Cooperation Council, and through it they set **guest-worker policies.** These regulate the number of workers who can temporarily enter each country to work in specific industries for a defined amount of time. Once the work visa has expired, workers are expected to either renew or return to their sending country. Some guest workers are highly skilled engineers, programmers, or teachers. Others find employment as domestic and home care workers and manual laborers in agriculture or manufacturing.

Most countries have **family reunification** policies that allow migrants to sponsor family members who migrate to the country. Other policies allow refugees to migrate quickly in emergencies and allow foreign college students an easy pathway to becoming permanent residents after they graduate.

Policies Discouraging Immigration

Countries may also pass laws to restrict immigration. They can make entering the country difficult by establishing educational standards for immigrants or by restricting the type of work immigrants can do. Countries can also simply set a quota to limit the number of people allowed to enter the country legally.

Some restrictions reflect **xenophobia**, a strong dislike of people of another culture. Other restrictions reflect economic concern that immigrants will take away jobs from citizens. For example, in the United States, xenophobia and economic fears combined to prompt Congress to pass the Chinese Exclusion Act that banned immigration from China between 1882 and 1943.

Countries sometimes restrict immigration primarily in an attempt to preserve their own cultural homogeneity, or cultural sameness. For example, the people of Japan form one of the most ethnically similar countries in the world. Japan maintains this homogeneity by strictly limiting immigration.

Economic and Cultural Effects of Migration

There are several effects, both positive and negative, that migration has on the countries of origin as well as on the destination countries. Effects include ones that are demographic, economic, cultural, and political.

Effects on Countries of Origin

One benefit on the countries of origin is relief from overcrowding. According to Zelinsky's migration transition model, when countries are heavily populated, opportunities are scarce. Migrants who leave reduce the competition for jobs and resources. The demographic transition model helps explain this effect. People from countries in Stage 2 and 3 seeking jobs, where population growth is high, will migrate to countries in Stage 4 or 5, where jobs are available.

Benefits of Migration Since immigrants generally move from poorer regions to wealthier ones, they often can afford to make **remittances**—money sent to their family and friends in the country they left. Remittances help the individuals receiving them, and account for nearly 40 percent of the income of some small countries, such as the Central Asian countries of Tajikistan and Kyrgyzstan.

Costs of Migration Migration can also have negative effects on the places people are leaving. When working-age people leave an area, it is left with a population skewed toward the elderly and children, creating a dependency ratio problem. This occurred during China's rural-to-urban migration, which was the largest internal migration in history. Additionally, when a family member leaves, a disruption can be caused in traditional roles and social structures of the family.

When migration out of a country is made up of many highly skilled people, it is called a **brain drain**. Today, students from around the world enter the United States or Great Britain to study medicine, engineering, or other fields and often decide to stay, rather than return to the land of their birth. This creates a brain drain on their countries of origin. A recent United Nations

report found that about 11 percent of Africans with graduate or professional degrees were living in the United States, Europe, or other developed countries.

Effects on Receiving Countries

Countries receiving immigrants usually benefit greatly. Immigrants make important cultural contributions to their new countries, including new foods, new words and languages, diverse forms of entertainment, and a variety of religious traditions. **Ethnic enclaves**, or neighborhoods filled primarily with people of the same ethnic group, such as "Little Italy" or "Chinatown," add to the cultural richness of the countries in which they develop.

In addition, because most immigrants want to better their economic situations, they are highly motivated to get an education, work hard, and succeed. Many start businesses. Immigrants often start small, labor-intensive businesses such as restaurants, nail salons, and other service-oriented enterprises, but not all of these businesses stay small. Nearly 200 of the 500 largest businesses in the world were started by immigrants or their children.

Conflicts sometimes arise between immigrants and native-born citizens in receiving countries. The two groups might clash over religious beliefs, cultural practices, or access to jobs. Countries sometimes pass laws, and businesses follow practices that discriminate against immigrants.

Signs expressing prejudice against the Irish appeared in the United States in the early 1900s.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are historical and contemporary geographic effects of migration?*

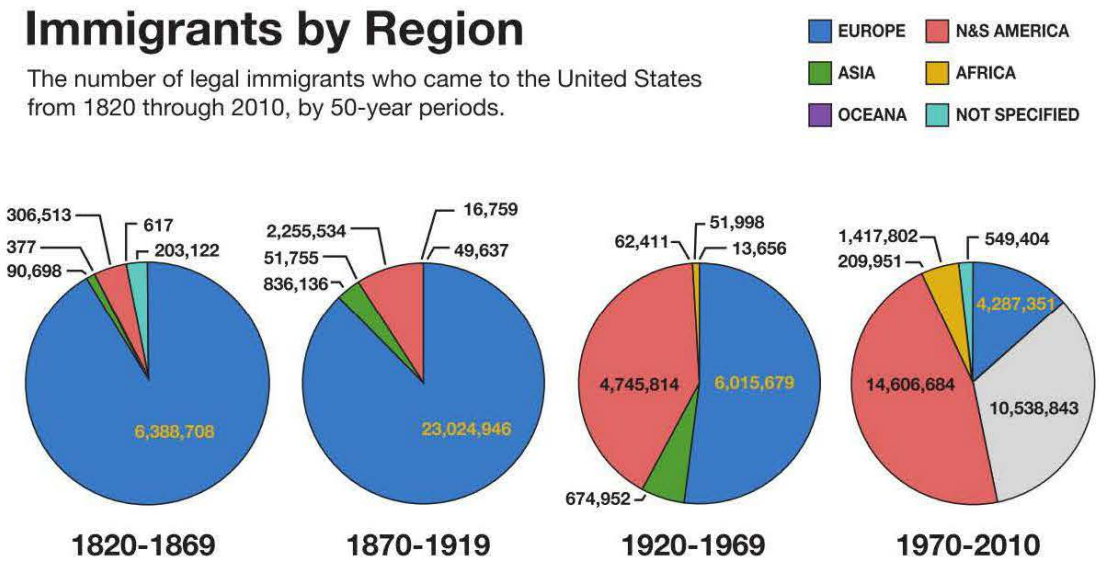
Policies Influencing Migration	Effects of Migration

KEY TERMS

guest-worker policies
family reunification
xenophobia
remittances
brain drain
ethnic enclaves

A Nation of Immigrants

The United States has experienced trends in immigration during different periods of the country's history. Prior to 1820, most people entering the United States came from Europe and Africa. However, there has been a shift in places of origin of migrants to the United States in the last two centuries



Source: U.S. Dept. of Homeland Security

Migration Within the United States

Significant events in U.S. history caused people to move within the country. This was evident during and after both world wars.

The Great Migration from the South

Starting with the entry of the United States into World War I in 1917, millions of Americans migrated from the South to cities in the rest of the country. This movement is known as the Great Migration. The major pull factor was employment since factory jobs were plentiful in cities. With reduced immigration from Europe because of World War I, opportunities for laborers increased. In addition to the pull of jobs, African Americans left the south in large numbers to escape severe racial discrimination, violence, and poverty. The migration continued throughout the 20th century in response to the rapid industrialization in the North and on the Pacific coast.

The Migration to the South

A second large migration still shaping the modern United States is from the Northeast and Midwest to the South and Southwest. After World War II, government policies—the construction of a fast-moving national highway system and tax subsidies for buying new homes—made moving anywhere easier. But the development of air conditioning made life in hot climates

more pleasant, and the expansion of defense industry jobs in the South and Southwest pulled many people to the band of states from southern California to Florida. These migrants felt pushed out of the North and Northwest by harsh winters and the decline in job opportunities because of factory automation. In addition, stable benefits for retirees and lower costs of living in the Sun Belt encouraged migration causing retirement communities to flourish. Between 1950 and 2020, Arizona's population grew from 750,000 to over 7,000,000.

1. Which period had the largest number of total immigrants to the United States?
2. From which world region were the largest number of immigrants in each period?
3. What effect have crises, such as world wars, had on migration within the United States?
4. How have each of the following types of pull factors—economic, environmental, and cultural—affected internal migration in the United States?

THINK AS A GEOGRAPHER: *INFLUENCES ON MIGRATION*

Geographers study the push and pull factors that influence migration. Use the information in the chart to help answer the questions.

INFLUENCES ON MEXICAN MIGRATION TO THE UNITED STATES

Year or Period	Event or Trend
1970 to 2010	The TFR for women in Mexico falls from 7 to 2.
1979 to 1982	Worldwide oil demand creates a boom in Mexico.
1982	An economic crisis hits Mexico.
2000	The election of a new leader in Mexico creates hope.
2000 to 2010	The United States increases the number of agricultural work visas from 29,000 to 52,000.
2006 to 2020	A new president begins a powerful new resistance against drug lords and gangs in Mexico that results in violence, death, and widespread fear.
2016 to 2020	The United States increased deportation of undocumented workers and reduced the number of work visas for legal immigrants.

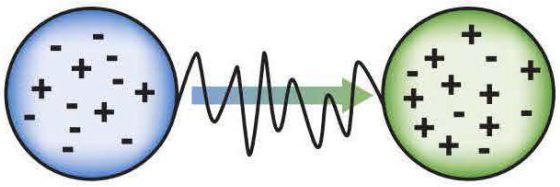
1. Identify one statement from the chart that was a push factor for Mexicans to migrate. Identify one that reduced the push.
2. Identify and explain how one statement from above acted as a pull factor for Mexican immigrants to the United States.
3. Choose one of the statements above and explain how it reflects the global influence on Mexico.

CHAPTER 5 REVIEW:
Migration

Topics 2.10–2.12

MULTIPLE-CHOICE QUESTIONS

Question 1 refers to the diagram below.



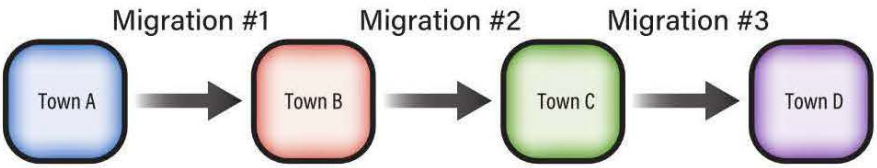
1. Which best summarizes the migration process represented by the diagram?
   (A) With European colonization and migration, positive aspects of European culture spread across the globe in spite of obstacles.
   (B) In the process known as step migration, migrants move from rural to urban areas through a series of smaller moves, or steps.
   (C) Each migration produces a counter migration of people returning to their country of origin.
   (D) The gravity model predicts that most migrants will move to the closest metropolitan area in search of economic opportunities.
   (E) Migrants leave their homelands because of push factors and move to places with pull factors, but they often face barriers.

2. Which statement best summarizes Zelinsky's model of migration in relation to the demographic transition model (DTM)?
   (A) High unemployment in countries in Stages 4 and 5 pushes migrants to Stage 2 and 3 countries in search of economic opportunity.
   (B) Overcrowding in countries in Stages 2 and 3 pushes migrants to Stage 4 and 5 countries in search of economic opportunity.
   (C) Overcrowding in countries in Stages 4 and 5 pushes migrants to Stage 2 and 3 countries in search of economic opportunity.
   (D) A gender imbalance in countries in Stages 4 and 5 pushes migrants to Stage 2 and 3 countries to find mates and start families.
   (E) Overcrowding in countries in Stages 4 and 5 pushes migrants to Stage 2 countries in a counter migration as large as the original migration.

3. According to the gravity model of migration, in which state and city of the United States would Mexican migrants be most likely to live?
   (A) Florida and Philadelphia
   (B) Texas and Los Angeles
   (C) North Carolina and Chicago
   (D) Georgia and Memphis
   (E) Alabama and Washington, DC

4. The most common impact of emigration on the country of origin is
   (A) an increase in unemployment rates
   (B) a decline in the crowded conditions of urban areas
   (C) a loss of farmers resulting in smaller food supply
   (D) a loss of working age population to another country
   (E) an increase in the number of abandoned and homeless children

Question 5 refers to the diagram below.



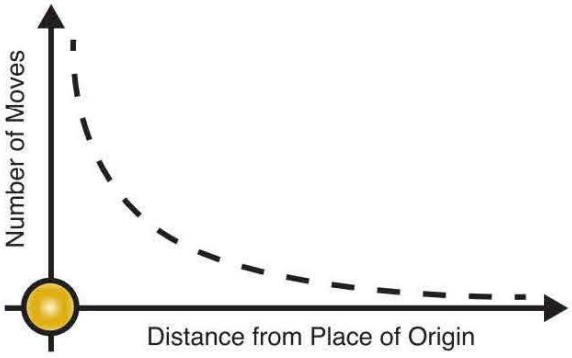
5. A person living in Town A moves three times, as shown in the diagram, and settles in Town D. This is an example of
   (A) chain migration
   (B) step migration
   (C) distance decay
   (D) intervening obstacle
   (E) intervening opportunity

6. Which best illustrates counter migration?
   (A) Chinese farmers migrating from a village to a small city and then to Beijing
   (B) Ethiopians migrating to Turkey and then to Germany
   (C) Italians migrating to France at the same time some French are migrating to Italy
   (D) Nigerians migrating to Ghana and then migrating back to Nigeria
   (E) Enslaved Africans being taken by force to Brazil and then voluntarily migrating to Argentina

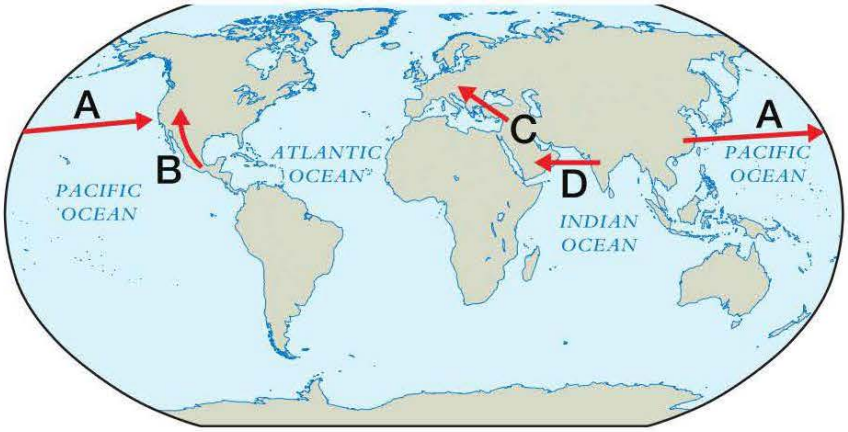
7. Which pair of phrases best describes asylum-seekers?
   (A) Voluntary migration, internal migrants
   (B) Voluntary migration, transnational migrants
   (C) Forced migration, transnational migrants
   (D) Forced migration, internal migrants
   (E) Forced migration, rural-to-urban migrants

FREE-RESPONSE QUESTION

1. Use the distance decay model of migration and the map of global migration flows to answer the questions below.



LARGE-SCALE MIGRATIONS



   (A) Define the concept of distance decay shown in the graph.
   (B) Using both visuals, explain how a specific migration trend from the map illustrates the concept of distance decay.
   (C) Explain the difference between push and pull factors.
   (D) Using the map, identify ONE economic pull factor.
   (E) Using the map, identify ONE political push factor.
   (F) Describe ONE positive result for countries receiving migrants.
   (G) Describe ONE positive result for countries sending migrants.

UNIT 2 REVIEW:
Connecting Course Skills and Content

APPLYING GEOGRAPHIC SKILLS

Applying geographic skills is critical for success on the AP® Exam. For each skill listed, write a one-paragraph response that illustrates your understanding of that course skill. Support your response with specific examples and evidence. Refer to the Unit 1 introduction (pages 3–7) for tips on how to apply geographic skills.

1B Explain the importance of either the demographic transition model or Malthusian theory as it relates to explaining population growth or decline.

2B Explain how the spatial interaction measured by migration is likely impacted if a less-developed region or country is experiencing rapid population growth while a neighboring highly developed economic region is experiencing an aging and zero population growth demographic scenario.

3F Use the map in Topic 2.4 that shows and life expectancy for countries of the world. Explain possible limitations of the data shown on the map.

4D Using the three visual images from Changing the Perception of Girls in Chapter 4 (page 102) compare patterns of similarities in the images and describe the similar conclusion that the images' creators likely want the viewers to understand.

5D Explain the degree to which Malthusian theory effectively explains population growth and decline across different geographic scales.

WRITE AS A GEOGRAPHER: *PLAN THE ANSWER*

Before writing an answer to a free-response question, plan what claims you want to make and can support. Think about what you want to say, the order you want to say it in, and how your points fit together. Students often begin to plan by making notes about what they know: concepts, facts, and examples. And if the question includes an exhibit, they add information from the map, diagram, chart, or other type of source.

Next, students plan how to transform this list of content into a coherent answer. A good answer is a narrative—not simply a list of points. It states a clear response to the question rather than simply stating information that might be related to the question.

The response does not need to begin with an introductory paragraph, and answers are not graded on grammar or style. And no extra points are given for extraneous information. One challenge many students face is to keep their answer focused. They tend to wander off, inserting interesting facts they know that are not relevant to the question.

For each part of the following question, plan a possible answer. Describe the information you would use and how you would organize it.

1. People migrate as a result of push and pull factors, and their movement affects both the places they leave and the places they arrive.
   - (A) Describe TWO pull factors that might cause someone to migrate to the United States.
   - (B) Describe TWO push factors that might cause someone to migrate away from the United States.
   - (C) Give a detailed account of THREE consequences of migration to or from the United States.