A study of population is important in understanding a number of issues in human geography. So our first main issue is a study of population. The Key Issues your book mentions are:

1. Where is the world’s population distributed?
2. Where has the world’s population increased?
3. Why is population increasing at different rates in different countries?
4. Why might the world face an overpopulation problem?
Study of Population

- The study of population is critically important for three reasons:
  - The world’s population increased at a faster rate during the second half of the twentieth century than ever before in history.
  - Virtually all global population growth is concentrated in less developed countries.

- More people are alive at this time – in excess of 7 billion - than at any time in human history.
Demography

- The scientific study of population characteristics is called demography.
The issue of Overpopulation

- Overpopulation is not as much an issue of the population of the world but instead, the relationship between number of people on the earth and available resources.
- Locally, geographers find that overpopulation is currently a threat in some regions of the world but not in others. It depends on each region's balance between population and resources.
Issue 1: Distribution of World Population

The Main Points of this issue are:

- Population concentrations
  - The four largest population clusters
  - Other population clusters

- Sparsely populated regions
  - Dry lands – Cold lands
  - Wet lands – High lands

- Population density
  - Arithmetic density
  - Physiological density
  - Agricultural density
Fig. 2-1: This cartogram displays countries by the size of their population rather than their land area. *(Only countries with 50 million or more people are named.)*
## Top 10 Population Rank

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>1,355,692,576</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>1,236,344,631</td>
</tr>
<tr>
<td>3</td>
<td>United States</td>
<td>318,892,103</td>
</tr>
<tr>
<td>4</td>
<td>Indonesia</td>
<td>253,609,643</td>
</tr>
<tr>
<td>5</td>
<td>Brazil</td>
<td>202,656,788</td>
</tr>
<tr>
<td>6</td>
<td>Pakistan</td>
<td>196,174,380</td>
</tr>
<tr>
<td>7</td>
<td>Nigeria</td>
<td>177,155,754</td>
</tr>
<tr>
<td>8</td>
<td>Bangladesh</td>
<td>166,280,712</td>
</tr>
<tr>
<td>9</td>
<td>Russia</td>
<td>142,470,272</td>
</tr>
</tbody>
</table>
| 10   | Japan         | 127,103,388         | *(July 2014 est.)*
East Asia - China

- The largest cluster of inhabitants is in East Asia.
- One-fifth of the world’s people live in this region.
- Five-sixths of the people in this region live in China
East Asia – Japan & Korea

- Japan and South Korea’s population is distributed differently and is also not uniform.
- Here, more than three-fourths of the Japanese and Koreans live in urban areas.
South Asia

- The second-largest concentration of people, roughly one-fifth of the world's population, is in South Asia.
- India is the world’s second most populous country and it contains more than three-fourths of the South Asia population concentration.
Europe

- Combining the populations of Western & Eastern Europe and the European Russia forms the world’s third-largest population cluster.
- One-ninth of the world’s people live in this region.
- Three-fourths of Europe’s inhabitants live in cities.
- Interestingly, they import food and other resources.
Southeast Asia

- The world’s fourth-largest population cluster, after Europe, is in Southeast Asia, mostly on a series of islands. Indonesia, which consists of 13,677 islands, is the world’s fourth most populous country.
The United States & Canada

- The largest population concentration in the Western Hemisphere is in the northeastern United States and southeastern Canada.
- About 2 percent of the world’s people live in these areas.
- An interesting point is that less than 5% of the people in this area are farmers.
West Africa

- Another 2 percent of the world’s population is clustered in West Africa, especially along the south-facing Atlantic coast.
- Approximately half is in Nigeria, and the other half is divided among several small countries west of Nigeria.
- Most people work in agriculture.
World Population Distribution

Fig. 2-2: World population is unevenly distributed across the Earth’s surface and it can be compared to climate distribution.

Copyright © 2005 Pearson Prentice Hall, Inc.
Expansion of the Ecumene
5000 B.C. – A.D. 1900

Fig. 2-3: The Ecumene, or the portion of the Earth with permanent human settlement, has expanded to cover most of the world’s land area.
Sparsely Populated Areas

- **Dry Areas**
  - Areas too dry for farming cover approximately 20 percent of Earth’s land surface.
  - Deserts generally lack sufficient water to grow crops.

- **Wet Areas**
  - Areas that receive very high levels of precipitation.
  - These areas are located primarily near the equator.
  - The combination of rain and heat rapidly depletes nutrients from the soil, hindering agriculture.

- **Cold Areas**
  - Much of the land near the North and South poles, perpetually covered with ice (permafrost).

- **High Areas**
  - Relatively few people live at high elevations with some significant exceptions in Latin America and Africa.
Fig. 2-4: Arithmetic population density is the number of people per total land area. The highest densities are found in parts of Asia and Europe.
Physiological Density

Fig. 2-5: Physiological density is the number of people per arable land area. This is a good measure of the relation between population and agricultural resources in a society.
Agricultural Density

- Two countries can have similar physiological densities, but they may produce significantly different amounts of food because of different economic conditions.
- Agricultural density is the ratio of the number of farmers to the amount of arable land.
- To understand the relationship between population and resources in a country, geographers examine its physiological and agricultural densities together.
- The Netherlands has a much higher physiological density than does India but a much lower agricultural density.
Key Issue 2: Where Has the World’s Population Increased?

- The Main Points of this issue are:
  - Distribution of World Population Growth
    - Natural Increase
    - Fertility
    - Mortality
Fig. 2-6: Total world population increased from 2.5 to 6 billion in this half century. The natural increase rate peaked in the early 1960s and has declined since, but the number of people added each year did not peak until 1990.
Geographers measure population change through three measures:

- Crude birth rate (CBR) is the total number of live births in a year for every 1,000 people.
- Crude death rate (CDR) is the total number of deaths in a year for every 1,000 people.
- Natural increase rate (NIR) is the percentage by which a population grows in a year.

The term natural means that a country’s growth rate excludes migration.

The term crude means that we are concerned with society as a whole rather than a refined look at particular individuals or groups.
The natural increase rate (NIR) is the percentage growth or decline in the population of a country per year (not including net migration). Countries in Africa and Southwest Asia have the highest current rates, while Russia and some European countries have negative rates.
Natural Increase Stats

- The natural increase rate of the planet during the decade 2000-2010 was estimated to be 1.3 percent.
- It is lower today than at its all-time peak of 2.2 percent in 1963.
- The NIR during the second half of the twentieth century was high by historical standards.
- The number of people added each year has dropped at a slower rate than the NIR, because the population base is much higher now than in the past.
- The rate of natural increase affects the doubling time, which is the number of years needed to double a population.
- When the NIR was 2.2 percent back in 1963, doubling time was 35 years.
Crude Birth Rates

Fig. 2-8: The crude birth rate (CBR) is the total number of births in a country per 1,000 population per year. The lowest rates are in Europe, and the highest rates are in Africa and several Asian countries.
Total Fertility Rates

Fig. 2-9: The Total fertility rate (TFR) is the number of children an average woman in a society will have through her childbearing years. The lowest rates are in Europe, and the highest are in Africa and parts of the Middle East.
Infant Mortality Rates

Fig. 2-10: The infant mortality rate is the number of infant deaths per 1,000 live births per year. The highest infant mortality rates are found in some of the poorest countries of Africa and Asia.
Life Expectancy at Birth

Fig. 2-11: Life expectancy at birth is the average number of years a newborn infant can expect to live. The highest life expectancies are generally in the wealthiest countries, and the lowest in the poorest countries.
Higher rates of natural increase, crude birth, total fertility, and infant mortality, and lower life expectancy are in Less Developed Countries.
Crude Death Rates

Fig. 2-12: The crude death rate (CDR) is the total number of deaths in a country per 1,000 population per year. Because wealthy countries are in a late stage of the demographic transition, they often have a higher CDR than poorer countries.
Key Issue 3: Variations in Population Growth

The Main Points of this issue are:

- The Demographic Transition
  - 1. Low growth
  - 2. High growth
  - 3. Moderate growth
  - 4. Low growth

- Population pyramids
  - Age distribution
  - Sex ratio

- Countries in different stages of demographic transition

- Demographic transition and world population growth
The Demographic Transition

Fig. 2-13: The demographic transition consists of four stages, which move from high birth and death rates, to declines first in birth rates then in death rates, and finally to a stage of low birth and death rates. Population growth is most rapid in the second stage.
US Population Growth

- The United States has moved slightly below Zero Population Growth since 2000.
- When most families lived on farms, employment and child rearing were conducted at the same place, but in urban societies most parents must leave the home to work.
Russian Population Growth

- Several Eastern European countries, most notably Russia, have negative natural increase rates, a legacy of a half century of Communist rule.
- As memories of the Communist era fade, Russians and other Eastern Europeans may display birth and death rates more comparable to those in Western Europe.
- Alternatively, demographers in the future may identify a fifth stage, characterized by higher death rates than birth rates and an irreversible population decline.
Fig. 2-14: England was one of the first countries to experience rapid population growth in the mid-eighteenth century, when it entered stage 2 of the demographic transition.
Population Pyramids

- Population in a country is influenced by the demographic transition in two principal ways: the percentage of the population in each age group, and the distribution of males and females.
- A country’s population can be displayed by age and gender groups on a bar graph called a population pyramid.
Percent of Population under 15

Fig. 2-15: About one-third of world population is under 15, but the percentage by country varies from over 40% in most of Africa and some Asian countries, to under 20% in much of Europe.
Young Pop. vs. Older Pop.

- Young dependents outnumber elderly ones by 10:1 in stage 2 countries, but the numbers of young and elderly dependants are roughly equal in stage 4 countries.

- The large percentage of children in Sub-Saharan Africa and other stage 2 countries strains the ability of poorer countries to provide needed services.
Changes in the Pyramid

- As countries pass through the stages of the demographic transition, the percentage of elderly people increases.
- More than one-fourth of all government expenditures in the United States, Canada, Japan, and many European countries go to Social Security, health care, and other programs for the older population.

**Figure 2.3**

Changes in the Population Pyramid

Source: Statistics Bureau, MPHPT; Ministry of Health, Labour and Welfare.
Population Disparities

- The number of males per hundred females in the population is the sex ratio.
- In Europe and North America the ratio of men to women is about 95:100.
- In the rest of the world the ratio is 102:100.
- In poorer countries the high mortality rate during child birth partly explains the lower percentage of women.
- The difference also relates to the age structure.
- Societies with a high rate of immigration typically have more males than females.
Fig. 2-16: Population pyramids can vary greatly, with different fertility rates (Laredo vs. Honolulu), or among military bases (Unalaska), college towns (Lawrence), and retirement communities (Naples).
Countries in Different Stages of Demographic Transition

- No country today remains in stage 1 of the demographic transition, but it is interesting to compare countries in each of the other three stages.
Rapid Growth in Cape Verde

Fig. 2-17: Cape Verde, which entered stage 2 of the demographic transition in about 1950, is experiencing rapid population growth. Its population history reflects the impacts of famines and out-migration.
Fig. 2-18: Chile entered stage 2 of the demographic transition in the 1930s, and it entered stage 3 in the 1960s.
Low Growth in Denmark

Fig. 2-19: Denmark has been in stage 4 of the demographic transition since the 1970s, with little population growth since then. Its population pyramid shows increasing numbers of elderly and few children.
Demographic Transition and World Population Growth

- The Worldwide population increased rapidly during the second half of the twentieth century.
- The four-stage demographic transition is characterized by two big breaks with the past.
  - The first break—the sudden drop in the death rate—has been accomplished everywhere.
  - The second break—the sudden drop in the birth rate—has yet to be achieved in many countries.
- The nineteenth-century decline in the CDR in Europe and North America took place in conjunction with the Industrial Revolution.
- In contrast, the sudden drop in the CDR in Africa, Asia, and Latin America in the twentieth century was accomplished by different means and with less internal effort by local citizens.
- Medical technology was injected from Europe and North America instead of arising within the country as part of an economic revolution.
- In the past, stage 2 lasted for approximately 100 years in Europe and North America, but today’s stage 2 countries are being asked to move through to stage 3 in much less time in order to curtail population growth.
Key Issue 4: Will the World Face an Overpopulation Problem?

The Main Points of this issue are:

- Malthus on overpopulation
  - Population growth and food supply
  - Malthus’ critics
- Declining birth rates
  - Malthus theory and reality
  - Reasons for declining birth rates
- World health threats
  - Epidemiological transitions
Fig. 2-20: Malthus predicted population would grow faster than food production, but food production actually expanded faster than population in the second half of the twentieth century.
Neo-Malthusians

- Contemporary geographers and other analysts are taking another look at Malthus’s theory, because of the unprecedented rate of natural increase in LDCs.
- Neo-Malthusians paint a frightening picture of a world in which billions of people are engaged in a desperate search for food and fuel.
- Many LDCs have expanded their food production significantly in recent years, but they have more poor people than ever before.
Malthus’s Critics

- Criticism has been leveled at both the population growth and resource depletion sides of Malthus’s equation.
- Contemporary analysts such as Esther Boserup and Julian Simon (argue that) a larger population could stimulate economic growth and therefore the production of more food.
- The Marxist theorist Friedrich Engels dismissed Malthus’s arithmetic as an artifact of capitalism. Engels argued that the world possessed sufficient resources to eliminate global hunger and poverty, if only these resources were shared equally.
Malthus Theory and Reality

- Vaclav Smil has shown that Malthus was fairly close to the mark on food production but much too pessimistic on population growth.
- Many people in the world cannot afford to buy food or do not have access to sources of food, but these are problems of distribution of wealth rather than insufficient global production of food, as Malthus theorized.
Crude Birth Rate Decline, 1981–2001

Fig. 2-21: Crude birth rates declined in most countries between 1981 and 2001 (though the absolute number of births per year increased from 123 to 133 million).
Reducing Birth Rates

- Two strategies have been successful in reducing birth rates.
  - One alternative emphasizes reliance on economic development.
  - The other on distribution of contraceptives.
One approach emphasizes improving local economic conditions.

If more women are able to attend school, they learn employment skills, gain more economic control of their lives, and make more informed reproductive choices.

With the survival of more infants assured, women would be more likely to choose contraceptives to limit the number of children.
Distribution of Contraceptives

- In less developed countries, demand for contraceptive devices is greater than the available supply.
Use of Family Planning

Fig. 2-22: Both the extent of family planning use and the methods used vary widely by country and culture.
World Health Threats

- Lower crude birth rates have been responsible for declining natural increase rates in most countries.
- However, in some countries of sub-Saharan Africa lower natural increase rates have also resulted from higher crude death rates, especially through the diffusion of AIDS.
- Medical researchers have identified an epidemiologic transition that focuses on distinctive causes of death in each stage of the demographic transition.
Epidemiologic Transition Stages 1 and 2

- Stage 1 of the epidemiologic transition, as originally formulated by epidemiologist Abdel Omran in 1971, has been called the stage of pestilence and famine.
  - Infectious and parasitic diseases were principal causes of human deaths.

- Stage 2 of the epidemiologic transition has been called the stage of receding pandemics. A pandemic is a disease that occurs over a wide geographic area and affects a very high proportion of the population.
The Black Plague

- The Black Plague, or bubonic plague, originated in present-day Kyrgyzstan and was brought from there by a Tatar army when it attacked an Italian trading post on the Black Sea.
- About 25 million Europeans died between 1347 and 1350, at least one-half of the continent’s population.
- Five other epidemics in the late fourteenth century added to the toll in Europe.
- In China, 13 million died from the plague in 1380.
Cholera in London, 1854

Fig. 2-23: By mapping the distribution of cholera cases and water pumps in Soho, London, Dr. John Snow identified the source of the waterborne epidemic.
Stage 3 of the epidemiologic transition, the stage of degenerative and human-created diseases, is characterized by a decrease in deaths from infectious diseases and an increase in chronic disorders associated with aging.

- The two especially important chronic disorders in stage 3 are cardiovascular diseases, such as heart attacks, and various forms of cancer.

Omran’s epidemiologic transition was extended by S. Jay Olshansky and Brian Ault to stage 4, the stage of delayed degenerative diseases.

- The major degenerative causes of death—cardiovascular diseases and cancers—linger, but the life expectancy of older people is extended through medical advances.
Some medical analysts argue that the world is moving into stage 5 of the epidemiologic transition, the stage of reemergence of infectious and parasitic diseases.

Infectious diseases thought to have been eradicated or controlled have returned, and new ones have emerged.
Reasons for Stage 5

Three reasons help to explain the possible emergence of a stage 5 of the epidemiologic transition.

- One is evolution:
  - Infectious disease microbes have continuously evolved and changed in response to environmental pressures by developing resistance to drugs.
  - Malaria was nearly eradicated in the mid-twentieth century by spraying DDT in areas infested with the mosquito that carried the parasite.
  - The disease returned after 1963, however, and now causes more than 2 million deaths worldwide.
  - The reason was the evolution of DDT-resistant mosquitoes.

- A second reason for continued epidemics is poverty.
- The third factor in the reemergence of epidemics is improved travel.
  - As they travel, people carry diseases with them and are exposed to the diseases of others.
Fig. 2-24: The tuberculosis death rate is a good indicator of a country’s ability to invest in health care. TB is still one of the world’s largest infectious-disease killers.
SARS Infections in China, 2003

Fig. 2-25: China had 85 percent of the world's SARS cases in 2003. Within China, the infection was highly clustered in Guangdong Province, Hong Kong, and Beijing.
Bio-Terrorism

- Some fear that terrorists may also be responsible for spreading infectious diseases.
- After September 11, U.S. government officials urged health care and other emergency response workers to be immunized against smallpox, because terrorists were thought to have access to samples of the disease that remained for medical research.
HIV/AIDS Prevalence Rates, 2002

Fig. 2-26: The highest HIV infection rates are in sub-Saharan Africa. India and China have large numbers of cases, but lower infection rates at present.
AIDS in Africa

- Crude death rates in many sub-Saharan Africa countries rose sharply during the 1990s as a result of AIDS, from the mid-teens to the low twenties.

- The populations of Botswana and South Africa are forecast to decline between now and 2050 as a result of AIDS.