

Unit 3: Population indicators

Population characteristics differ from one country to another. Geographers use **population indicators** to compare the characteristics of different populations. An indicator is a measurement or value that tells us what something is like.

3.1 Population indicators

The following population indicators all tell us something about a country's population:

- **Birth rate (BR):** The number of babies born per 1 000 of the population per year. In other words,
$$BR = \frac{\text{number of live births}}{\text{total population}} \times 1\,000$$
- **Death rate (DR):** The number of deaths per year per 1 000 of the population. In other words,
$$DR = \frac{\text{number of deaths}}{\text{total population}} \times 1\,000$$
- Another term for death rate is the mortality rate.
- **Life expectancy (LE):** The average number of years a person can expect to live. **Infant mortality rate (IMR):** The number of infant deaths per 1 000 live births. In other words, it is the number of babies per 1 000 born alive who then die in the first 12 months after birth.
- **Natural increase (NI):** The rate at which a country's population is growing, excluding migration into or out of the country. We calculate it by subtracting the DR from the BR. We then express the total as a percentage. For example, if BR = 24 (per 1 000) and DR = 12 (per 1 000), NI = 24 - 12 = 12 per 1 000 or 1,2%.
- **Fertility rate (FR):** The average number of children an average woman would have if she were to live to the end of her child-bearing years.
- **Literacy rate (LR):** The percentage of the total population who can read and write.
- **GDP per capita:** The gross domestic product per person. In other words, it is the income of a country divided by the population of that country.
- **Percentage of population urbanised:** The percentage of the total population living in towns and cities.
- **Doubling time:** The time in years that it would take for a country's population to double. Doubling time depends on a population's rate of growth. The table alongside shows that the greater the rate of population growth, the shorter the doubling time. Nigeria has a natural increase of 2,04%. This means that potentially, its population of 149 million could double in 35 years.

Doubling time (years)	Annual % population natural increase
140	0,5
70	1,0
35	2,0
24	3,0
17	4,0
14	5,0
7	10

Geo fact
A fertility rate of 2,1 is the replacement level for a country's population. In Niger, the fertility rate is 7,19 children per woman. This is the world's highest fertility rate.

Key word
population indicators – different measurements which give us information about a country's population characteristics

Key questions

- What factors give us information about a country's population?
- How can we compare countries' populations?

Figure 4.4 Urban places attract many people.



Activity 4: Work with population indicators

Study the table of data below. It shows population indicators for various countries. Use the table to answer the questions that follow.

Country	Total population (million)	BR per 1 000	DR per 1 000	LE (years)	NI (%)	FR	IMR per 1 000	GDP per capita (US\$)	LR (%)	Urbanised population (%)
Brazil	198,7	18,7	6,3	71,8	1,24	1,9	23,3	10 200	90,5	84,2
China	1 339	13,7	7,0	73,3	0,67	1,73	21,2	6 000	93,3	40,4
Egypt	83,1	22,1	5,1	71,9	1,7	2,89	28,4	5 400	72	42,6
Germany	82,3	8,3	10,8	79,2	-0,26	1,36	4	35 400	99	73,4
Japan	127,1	7,9	9,3	82,2	-0,14	1,27	2,8	34 000	99	66
Mozambique	21,7	38,2	20,3	41	1,79	5,11	107,8	900	44,4	34,5
South Africa	49,9	20,2	16,9	48,9	0,33	2,64	45,1	10 100	88	59,3
USA	307,2	14,2	8,3	78,2	0,59	2,05	6,3	46 900	99	80,8

1. List the countries with the highest and lowest:

- 1.1 Birth rate (BR) (1) 1.4 Natural increase (NI) (1)
 1.2 Death rate (DR) (1) 1.5 Infant mortality rate (IMR) (1)
 1.3 Life expectancy (LE) (1) 1.6 Fertility rate (FR) (1)

2. List the countries with the highest and lowest:

- 2.1 GDP per capita (1)
 2.2 Literacy rate (LR) (1)
 2.3 Percentage population urbanised (1)

3. Look for connections and relationships in your lists. Why do certain countries display the trends they do? (4)

4. Germany has a natural increase of -0,26%. List the advantages and disadvantages of a negative growth rate. (2)

5. Compare South Africa's data with the other countries. (8)

5.1 Where do we rate for birth rate, death rate, life expectancy, literacy, natural increase, infant mortality rate, GDP and percentage urbanised population? (8)

5.2 Explain possible reasons for your findings. (8)

Unit 4: Factors that influence population indicators

The population indicators for different countries display huge variations. Even within a country there will be differences. For example, in South Africa the birth and death rates are higher in rural areas than in urban areas.

4.1 Worlds apart

Population indicators generally vary as follows:

Population indicators of wealthy, economically developed countries and regions	Higher BR	Higher LR
	Lower BR	Lower LR
Population indicators of less wealthy, less economically developed countries and regions	Higher DR	Higher BR
	Lower DR	Lower BR
Longer LE	Higher % urban population	Higher LE
Lower IMR	Higher IMR	Shorter LE
Lower FR	Higher FR	Lower % urban population
Lower NI	Higher NI	Higher DR

4.2 Factors that affect birth and death rates

There are different factors that affect countries' birth and death rates. The factors that affect birth rates include the following:

- The status of women
- Political systems
- Literacy
- Education
- Job opportunities
- Migration
- Medical care
- The availability of contraception
- Culture and tradition
- Religion
- The age of marrying
- Polygamy
- Industrialisation
- Urbanisation

The factors that affect death rates include the following:

- Medical care
- Economic conditions
- Hygiene and sanitation
- Famine
- Diet, nutrition and malnutrition
- Disease
- War and conflict.
- Quality of life
- Natural disasters

4.3 Factors that affect fertility rate, life expectancy and natural increase

The following table explains the factors that affect fertility rate, life expectancy and natural increase:

Fertility rate (FR)	<ul style="list-style-type: none"> • FR is usually higher in countries where girls marry young and have fewer education and job opportunities. Contraception may be unavailable or, if available, is not being used. • FR is usually lower in countries where women have equal opportunities and where contraception is available and used.
Life expectancy (LE)	<ul style="list-style-type: none"> • LE is higher in countries which are economically well-developed, with good nutrition and healthcare. • LE is generally lower in countries which are less-developed, more rural, with little or no healthcare and poor nutrition.
Natural increase (NI)	<ul style="list-style-type: none"> • NI is usually lower in well-developed countries with a high GDP per capita and a good education system. • NI is usually lower in less economically developed countries with a large rural population where there are not enough schools and universities.

Key question

- Why do population indicators differ from country to country?

Activity 5: Investigate what influences population indicators

1. Look at the factors that affect birth and death rates on page 203. Explain how each factor could increase or decrease birth and death rates. (23 × 2)
2. Figures 4.5 and 4.6 show two different hospitals in different parts of the world. Use these photographs to explain how birth and death rates may differ in the two countries. (4)

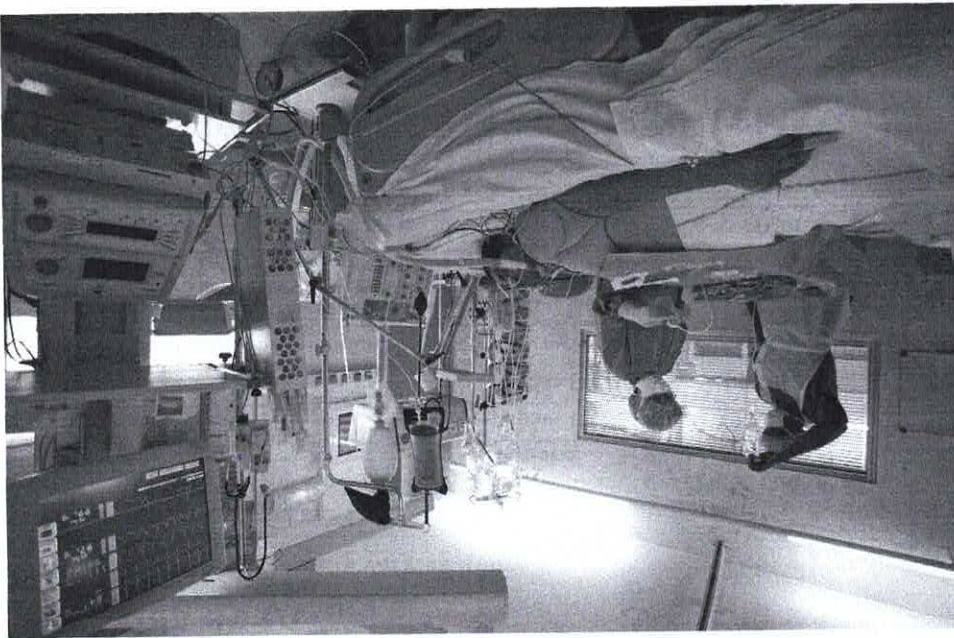


Figure 4.5 People in well-developed countries have access to good healthcare facilities.

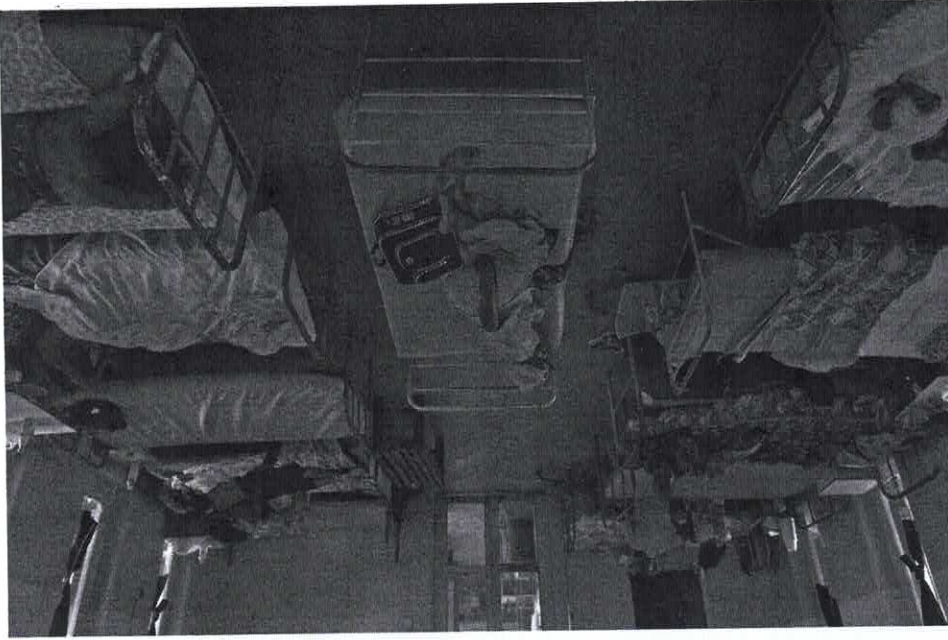


Figure 4.6 Medical facilities in less developed countries are usually underfunded, understaffed and poorly equipped.

3. Suggest reasons for the following:

- 3.1 Birth rates are lower in highly-developed countries. (1)
- 3.2 Death rates are higher in less-developed countries. (1)

Unit 5: Population structure

A country's population consists of people of different genders and ages.

5.1 Population structure

When studying a country's population, it is useful to know about the population structure. The **population structure** tells us how many people there are in a certain age group and what gender they are. For example, it tells us how many people there are who are younger than 5 years and how many of these people are male or female.

5.2 Population pyramids

Figure 4.7 shows the structure of a population pyramid. A **population pyramid** is a special kind of bar graph which shows the age and gender structure of a country's population. One side of the pyramid shows the ages of the male population and the other side shows the ages of the female population. The vertical axis shows age, usually in groups of 5 or 10 years. The horizontal axis indicates the number or percentage of people in that age group.

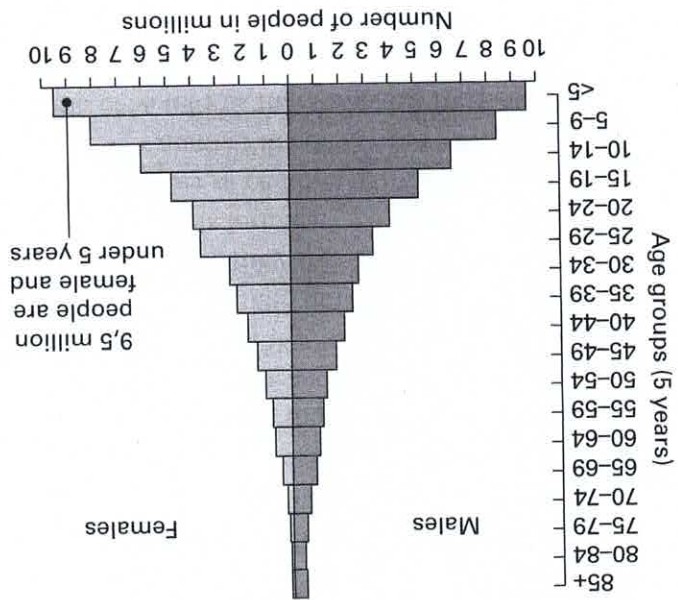


Figure 4.7 The structure of a population pyramid

What do population pyramids show us?

The population pyramid of a country gives us an idea of the composition and structure of that country's population. The different horizontal layers of the pyramid indicate how many young, middle-aged and older people there are in that country. We can use a population pyramid to answer questions such as:

- Are there many young people?
- Are there few old people?
- Are there more older women than older men?
- Is the population expanding or shrinking?
- Has there been mass immigration or emigration?
- Are there many male or female migrant workers in certain age groups?
- How did a war or natural disaster affect the population?

Key questions

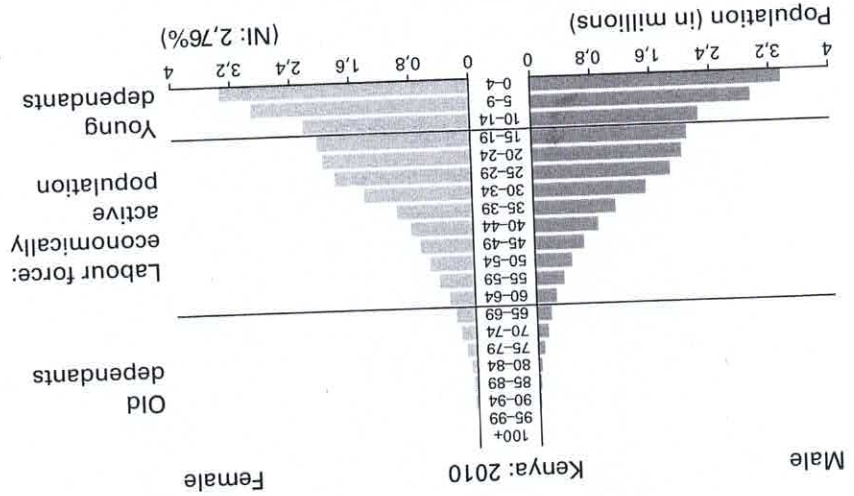
- What are population pyramids and what do they show us?
- Why do different countries have different population pyramids?

Key words

population structure – how a country's population is made up

population pyramid – a type of graph showing a country's population according to age groups and gender

Figure 4.8 Population pyramid for Kenya - 2010.



Rapid growth, expanding population:

Figure 4.8 shows the population pyramid for a population with rapid growth and an expanding population, such as Kenya. The data for the male and female population is usually similar, so that the pyramid has a symmetrical or triangular shape. This population also has a high BR and high DR, many young people, a high IMR, a low LE, few older people and a high NI.

Figures 4.8 to 4.11 show some of the most common population pyramids.

- A dependency ratio of 56 tells us that for every 100 people working, there are 56 people dependent on them.

$$\text{Dependency ratio} = \frac{\text{number of children 0 to 14} + \text{adults 65+}}{\text{number of adults aged 15 to 64}} \times 100$$

dependency ratio, we use this formula:

The shape of a country's population pyramid changes with time. The shape of a population pyramid indicates the structure of the workforce. The age groups 15-64 are usually an economically active population. People under 15 and over 64 years usually do not work and are dependent on the economically active population for survival. The **dependency ratio** is a demographic indicator which shows the number of children aged 14 and under and people aged 65 and older in a population as a ratio of the number of active adults, who are people aged 15 to 64. The dependency ratio indicates how many people in a country need to be supported because they are not economically active. To calculate the dependency ratio, we use this formula:

Key word

dependency ratio - a population indicator which shows how many people in a country need to be supported because they are not economically active

What does the shape of population pyramids indicate?

Population pyramids have different shapes, depending on the country's population structure. For example:

- The shape of a population pyramid indicates the level of economic development of a country. A developing country's population pyramid usually has a classic triangular or pyramid shape (see Figure 4.8). A developed country's population pyramid usually has a narrow, oblong shape (as in Figure 4.9).
- A population with a broad base illustrates a country with a youthful population and a high birth rate (as in Figure 4.8).
- A population pyramid with a narrow base and a bulge in the middle illustrates a country with good birth control, fewer younger people and more older people (as in Figure 4.10).
- The shape of a country's population pyramid changes with time.

This information is very useful for government planners and business people. For example, they can use the information to make decisions such as:

- Do they need to build more schools?
- Will they need more care facilities for old people?
- Is the market for goods expanding or shrinking?
- Should they encourage people to have more children or not?

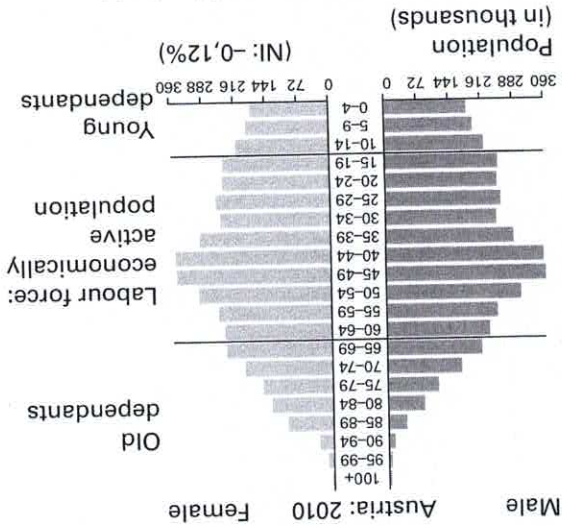


Figure 4.11 Population pyramid for Austria.

Zero population growth (ZPG) occurs in a population when births + immigration = deaths + emigration. This means the population remains stable – it neither expands nor shrinks. In certain countries, such as Germany and Japan, there is in fact population decline because of a negative natural increase. This means the population is 'shrinking' over time.

There are more middle-aged and older people than young people. LE is longer, especially for the female population. The population 'shrinks' over time and there is a negative NI. Both BR and DR are low and DR can exceed BR. The population pyramid can also be asymmetrical. The population pyramid, such as Austria, declining, diminishing population, shows a population pyramid for a country with a

• **Declining, diminishing population:** Figure 4.11

NI is 0% or close to 0%.

a longer LE, the female population lives longer than the male population and the almost equal, there are almost constant numbers of people up to age group 60, pyramid can also be bell-shaped. The BR and DR are both declining and are with a stable and static population, such as the population of Poland. The

• **Stable, static population:** Figure 4.10 shows a population pyramid for a country generally living longer than the male population, and a low NI.

than the DR, more middle-aged people, longer LE with the female population population also shows a decrease in BR and DR, a BR which is slightly greater population, such as the USA. The pyramid can also be bell-shaped. The

• **Slow growth, gradually expanding population:** Figure 4.9 shows the population pyramid for a population which shows a slow growth and a gradually expanding

Figure 4.9 Population pyramid for the USA – 2010.

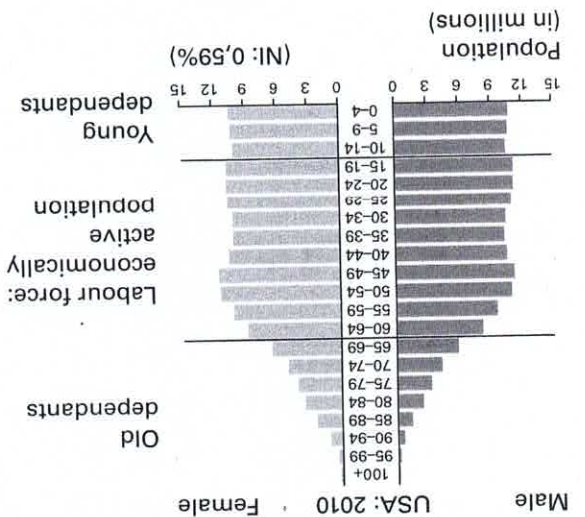
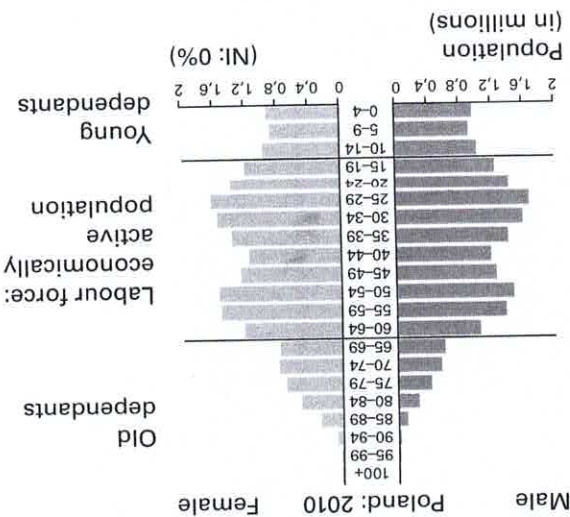


Figure 4.10 Population pyramid for Poland – 2010.



Key word

zero population growth – when a population remains stable (births + immigration = deaths + emigration)

Activity 6: Read a population pyramid

Study Figure 4.12, which is a population pyramid for South Africa in 2010. Then answer the questions that follow.

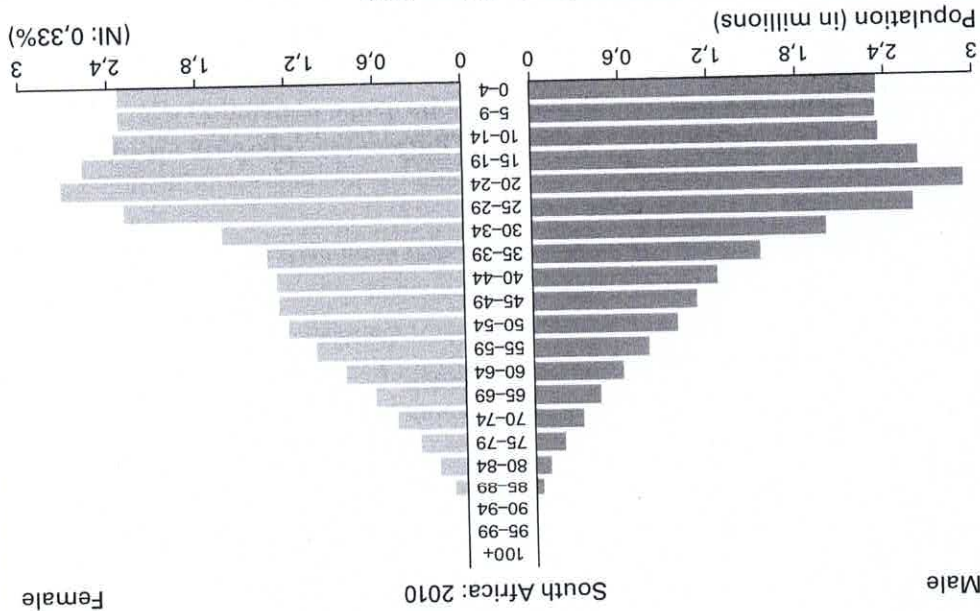


Figure 4.12 Population pyramid for South Africa - 2010.

1. Use the population pyramid to determine the following:

- 1.1 How many males are aged 15-19? (1)
- 1.2 How many females are aged 15-19? (1)
- 1.3 Which age group makes up the largest portion of the total population? (1)
- 1.4 How many people in total are aged 65 and over? (1)
- 1.5 How many people in total are under 15 years old? (1)

- 2. Classify the shape of the pyramid. Use Figures 4.8 to 4.12 to help you. (1)
- 3. What does this pyramid tell you about South Africa's BR, DR and LE? (3)
- 4. List two economic and social advantages and two economic and social disadvantages you think this pyramid shape has for South Africa. (4)
- 5. Describe and explain any gender differences the population pyramid shows. (2)

6. The table below compares some population statistics for Zimbabwe and Sweden:

Country	Zimbabwe (2010)	Sweden (2010)
Number of people under 15	5 million	1,43 million
Number of people over 65	0,45 million	1,7 million
Total population	11,6 million	9,1 million

- 6.1 Use the information in the table to calculate the dependency ratios for Zimbabwe and Sweden. (4)
- 6.2 Explain what your answers in Question 6.1 mean. (2)
- 6.3 Suggest reasons for any differences between the dependency ratios of Zimbabwe and Sweden. (2)