

Population

'There is a real danger that in the year 2000 a large part of the world's population will still be living in poverty. The world may become overpopulated and will certainly be overcrowded.'

Willy Brandt, *North-South: A Programme for Survival*, 1980

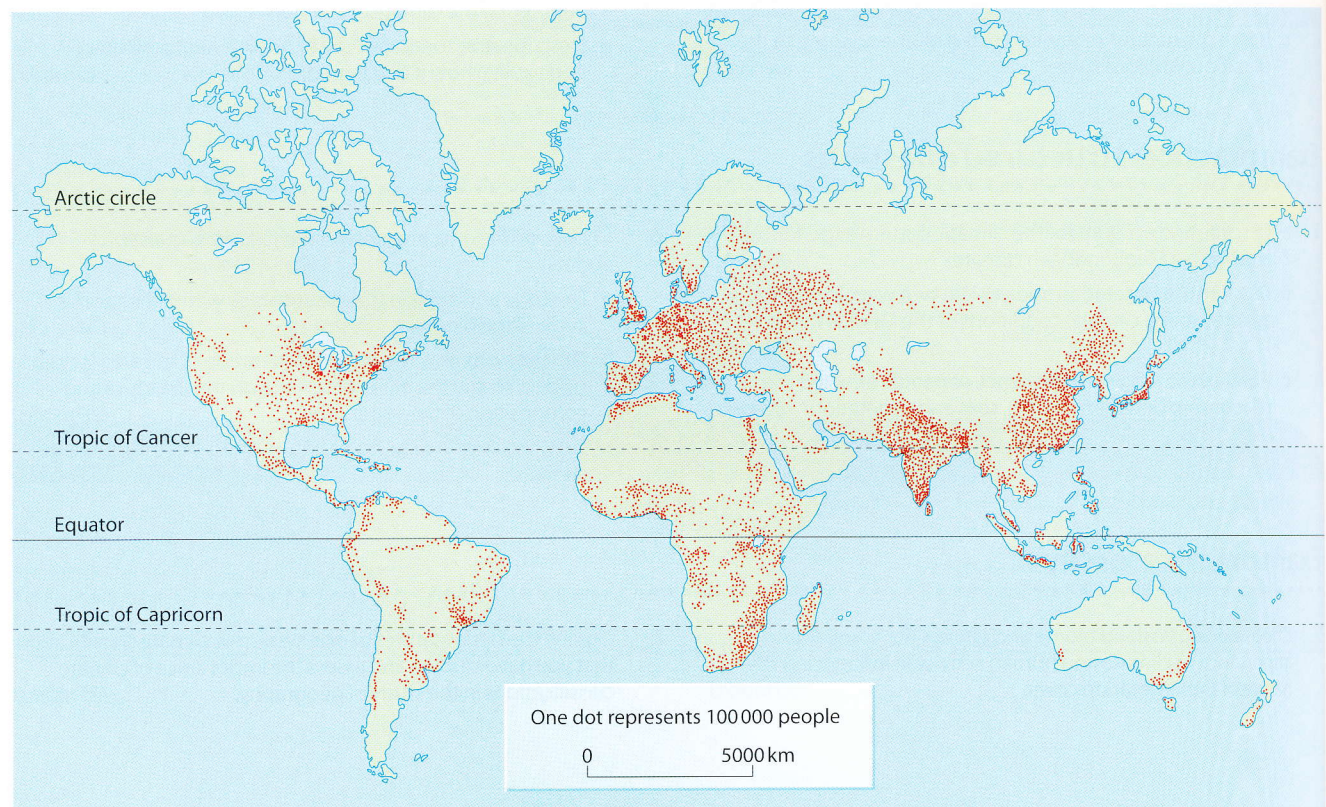
'In 1999, 600 million children in the world lived in poverty – 50 million more than in 1990.'

United Nations

In demography – the study of human population – it is important to remember that the situation is dynamic, not static. Population numbers, distributions, structures and movements constantly change in time, in space and at different levels (the micro-, meso- and macro-scales).

Figure 13.1

World distribution of population, 2008



Distribution and density

Population distribution describes the way in which people are spread out across the Earth's surface. The distribution is uneven and there are often considerable changes over periods of time.

Population distributions can be shown by means of a dot map, where each dot represents a given number of people. For example, in Figure 13.1 this method effectively shows the concentration of people in the Nile valley in Egypt, where 99 per cent of the country's population live on 4 per cent of the total land area. However, Figure 13.1 is also misleading because it suggests, incorrectly, that areas away from the Nile are totally uninhabited. In fact, parts are populated, but have insufficient numbers to warrant a symbol. When drawing a dot map, therefore, it is important to select the best possible dot value and to bear in mind its limitations.

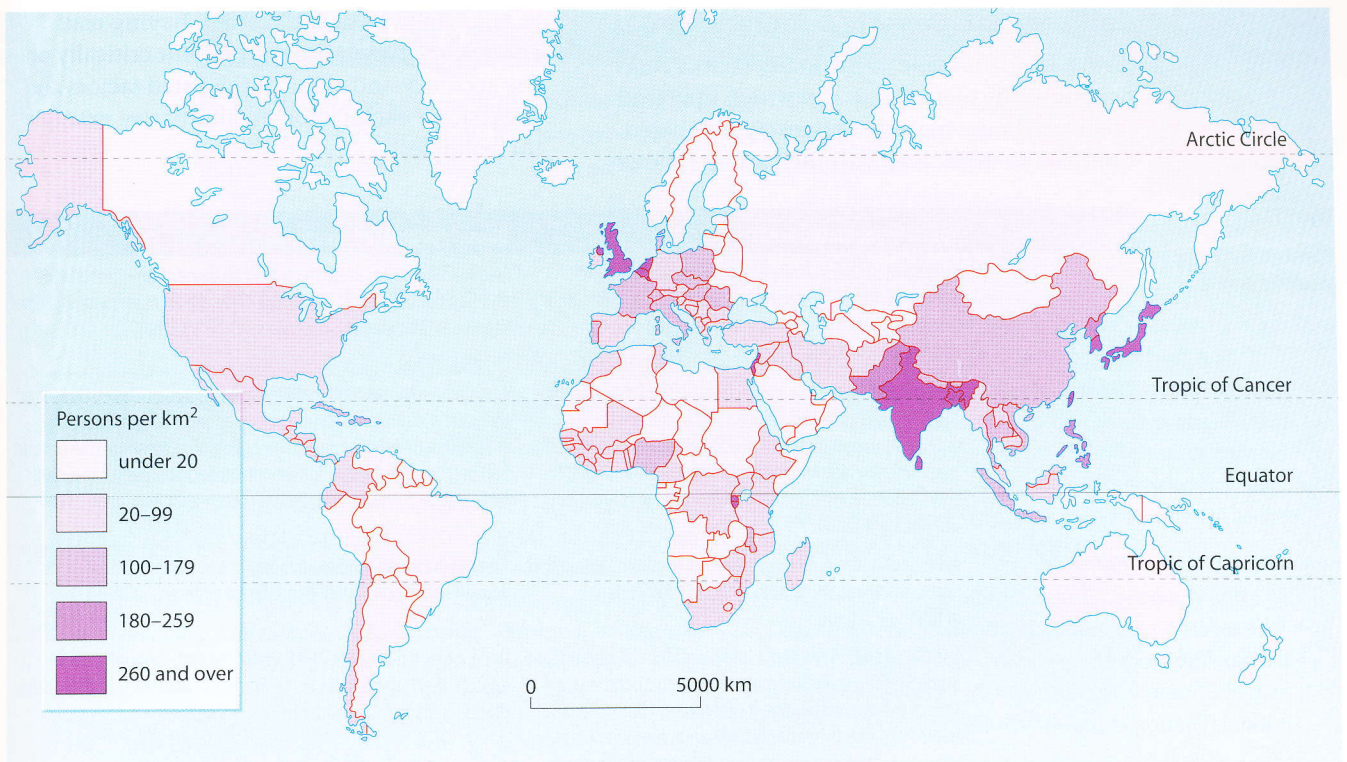


Figure 13.2
World density of population, 2008

Population density describes the number of people living in a given area, usually a square kilometre (km^2). Population densities are often shown by means of a choropleth map, of which Figures 13.2 and 13.5 are examples. Densities are obtained by dividing the total population of a country (or administrative area) by the total area of that country (or region). The densities are then grouped into classes, each of which is coloured lighter or darker to reflect lesser or greater density. Although these maps are easy to read, they hide concentrations of population within each unit area. Figure 13.2, for example, gives the impression that the population of Egypt is equally distributed across the country;

it also suggests that there is an abrupt change in population density at the national boundary. A poorly designed system of colouring or shading can make quite small spatial differences seem large – or make huge differences look smaller.

Figures 13.1 and 13.2 both show that there are parts of the world which are sparsely populated and others which are densely populated. One useful generalisation that may be made – remembering the pitfalls of generalisation (Framework 11, page 347) – is that, at the global scale, this distribution is affected mainly by physical opportunities and constraints; whereas, at regional and local scales, it is more likely to be influenced by economic, political and social factors.

Land accounts for about 30 per cent of the Earth's surface (70.9 per cent is water). Of the land area, only about 11 per cent presents no serious limitations to settlement and agriculture (Figure 13.3). Much of the remainder is desert, snow and ice, high or steep-sided mountains, and forest. Usually there are several reasons why an area is sparsely or densely populated.

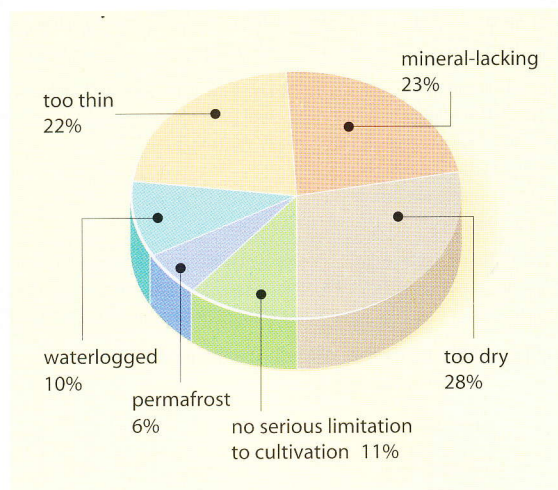


Figure 13.3
The uninhabitable Earth: how valuable are the world's soils for food production?

Sparsely and densely populated areas

Figure 13.4 lists some of the many factors that operate at the global scale and which may lead to an area being sparsely or densely populated. Compare these factors with the patterns shown

in Figures 13.1 and 13.2. Then, having read Framework 11 opposite, comment critically on the accuracy and value of the listed factors and suggest, for each factor, an alternative example (or examples).

Figure 13.4

Major factors affecting population density

Factors	Sparsely populated areas	Densely populated areas
Physical	Rugged mountains where temperature and pressure decrease with height; active volcanoes (the Andes); high plateau (Tibet) and worn-down shield lands (the Canadian Shield, Places 48, page 377).	Flat, lowland plains are attractive to settlement (the Netherlands and Bangladesh, Places 48, page 377) as are areas surrounding some volcanoes (Mt Pinatubo, Case Study 1 and Mt Etna).
Climate	Areas receiving very low annual rainfall (the Sahara Desert, page 178); areas having a long seasonal drought or unreliable, irregular rainfall (the Sahel countries, page 223); areas suffering high humidity (the Amazon Basin, page 316); very cold areas, with a short growing season (northern Canada, page 333).	Areas where the rainfall is reliable and evenly distributed throughout the year; with no temperature extremes and a lengthy growing season (north-west Europe, page 223); where sunshine (the Costa del Sol) or snow (the Alps) is sufficient to attract tourists (Chapter 20); and areas with a monsoon climate (South-east Asia, page 239).
Vegetation	Areas such as the coniferous forests of northern Eurasia and northern Canada (page 330), and the rainforests of the tropics (page 317).	Areas of grassland tend to have higher population densities than places with dense forest or desert.
Soils	The frozen soils of the Arctic (the permafrost in Siberia, Case Study 5); the thin soils of mountains (Nepal); the leached soils of the tropical rainforest (the Amazon Basin, Places 66, page 480); also, increasingly large areas are experiencing severe soil erosion resulting from deforestation and over-grazing (the Sahel, Case Study 7).	Deep, humus-filled soils (the Paris Basin) and, especially, river-deposited silt (the Ganges delta, Places 67, page 481, and Nile delta, Places 73, page 490 – both favour farming).
Water supplies	Many areas lack a permanent supply of clean fresh water: mainly due either to insufficient, irregular rainfall or to a lack of money and technology to build reservoirs and wells or lay pipelines (Malawi, Places 97, page 611). Contamination by sewage, nitrates and salt.	Population is more likely to increase in areas with a reliable water supply. This may result from either a reliable, evenly distributed rainfall (northern England) or where there is the wealth and technology to build reservoirs and to provide clean water (California). Places with heavy seasonal rainfall (the monsoon lands of South-east Asia, page 239) also support many people.
Diseases and pests	These may limit the areas in which people can live or may seriously curtail the lives of those who do populate such areas (malaria in central Africa; HIV/AIDS in southern Africa, Places 100, page 623).	Some areas were initially relatively disease- and pest-free; others had the capital and medical expertise to eradicate those which were a problem (the formerly malarial Pontine Marshes, near Rome).
Resources	Areas devoid of minerals and easily obtainable sources of energy rarely attract people or industry (Tibet).	Areas having, or formerly having, large mineral deposits and/or energy supplies (the Ruhr) often have major concentrations of population; these resources often led to the development of large-scale industry (South Wales, Places 87, page 570).
Communications	Areas where it is difficult to construct and maintain transport systems tend to be sparsely populated, e.g. mountains (Bolivia), deserts (the Sahara) and forests (the Amazon Basin and northern Canada).	Areas where it is easier to construct canals, railways, roads and airports have attracted settlements (the North European Plain), as have large natural ports which have been developed for trade (Singapore, Places 104, page 636).
Economic	Areas with less developed, subsistence economies usually need large areas of land to support relatively few people (although this is not applicable to South-east Asia). Such areas tend to fall into three belts: tundra (the Lapps), desert fringes (the Rendille, Places 65, page 479) and tropical rainforests (shifting cultivators, Places 66, page 480).	Regions with intensive farming or industry can support large numbers of people on a small area of land (as in the Netherlands, Places 71, page 487).
Political	Areas where the state fails to invest sufficient money or to encourage development – either economically or socially (in parts of the interior of Brazil, Places 38).	Decisions may affect population distribution, e.g. by creating new cities, such as Brasilia; or by opening up 'pioneer' lands for development, as in Israel (page 391).

Over 50 per cent of the world's population live in six countries: China, India, the USA, Indonesia, Brazil and Pakistan.

Framework 11 Scale and generalisation

The study of an environment, whether natural or altered by human activity, involves the study of numerous different and interacting processes. The relative importance of each process may vary according to the scale of the study, i.e. global or **macro-scale**; intermediate or **meso-scale**; and local or **micro-scale**. It may also vary according to the timescale chosen, i.e. whether processes are studied through **geological time**, **historical time**, or **recent time**.

In the study of soils (Chapters 10 and 12), it is clearly climate that tends to impose the greatest influence upon the formation and distribution of the major global (zonal) types (the podsol and chernozem). At the regional level, rock type may be the major influencing factor (Mediterranean areas with their terra rossas and rendzinas). Within a small area, such as a river valley with homogeneous climate and rock type, relief may be dominant (the catena, pages 261 and 276).

In the study of erosion, time is a major variable: a stretch of coastline may be eroded by the sea during a period of several decades or centuries; footpath erosion may occur during a single summer.

A common problem with spatial and time scales, as with models (Framework 12, page 352), is that a chosen level of detail may become inappropriate to all or part of the problem under study: it may become either too large and generalised, or too small and complex. For example, population distributions and densities may be studied at a variety of spatial and time scales. At the world scale (Figures 13.1 and 13.2), the pattern shown is so general and deterministic that it may lead the student into an over-simplified understanding of the processes that produced the apparent distribution and/or density. Such generalised patterns usually break down into something more complex when examined at a more local level or over a period of time.

Although it may often be easier to identify and account for distributions, densities, anomalies and changes at the national level, it is more difficult in the case of a country the size of Brazil (Figure 13.5) than it is for a smaller country such as Uruguay. It is often only when looking at a smaller region (Figure 13.6) or an urban area (Figure 13.7), perhaps over a relatively short time period, that the complexities of the various processes can be readily understood.

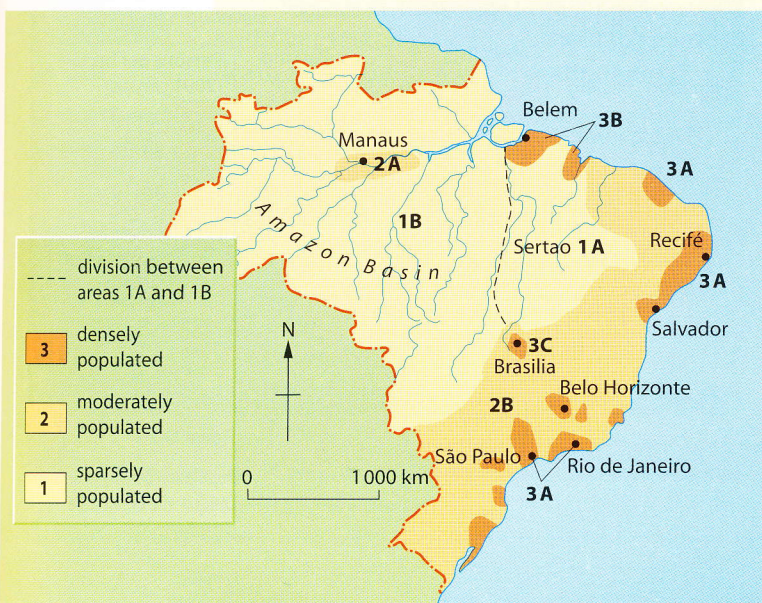
Places 38 Brazil: population densities at the national level

Even a quick look at the population density map of Brazil (Figure 13.5) shows a relatively simple, generalised pattern. Over 90 per cent of Brazilians live in a discontinuous strip about 500 km wide, adjacent to the east coast. This strip accounts for less than 25 per cent of the country's total area. The density declines very rapidly towards the north-west, where several remote areas are almost entirely lacking in permanent settlement.

The area marked **1A** on Figure 13.5 is the dry north-east (the Sertao). Here the long and frequent water balance deficit (drought), high temperatures and poor soils combine to make the area unsuitable for growing high-yield crops or rearing good-quality animals. The Sertao also lacks known mineral or energy reserves; communications are poor; and the basic services of health, education, clean water and electricity are lacking. Although birth rates are exceptionally high (many mothers have more than ten babies), there is a rapid outward migration to the urban areas (page 366), a high infant mortality rate (page 354), and a short life expectancy (page 353).

Area **1B** is the tropical rainforest, drained by the River Amazon and its tributaries. Here the climate is hot, wet and humid; rivers flood annually; and there is a high incidence of disease. In the past, the forest has proved difficult to clear, but once the protective trees have gone, soils are rapidly leached and become infertile. Land communications are difficult to build and maintain. The area has suffered, as has **1A**, from a lack of federal investment until recently when parts have been developed commercially for ranching, logging and growing soya.

Figure 13.5
Population density in
Brazil: the national scale



There are, however, two anomalies in Amazonia. The first is a zone along the River Amazon centred on Manaus (**2A** on Figure 13.5). Originally a Portuguese trading post, Manaus has had two growth periods. The first was associated with the rubber boom at the turn of the 19th/20th centuries, while the second began in the 1980s with the development of tourism and the granting of its free port status (Places 104, page 636). The second anomaly has followed the recent exploitation of several minerals (iron ore at Carajas and bauxite at Trombetas) and energy resources (hydro-electricity at Tucuri).

The more easterly parts of the Brazilian Plateau are moderately populated (area **2B**). The climate is cooler and it is considerably healthier than on the coast and in the rainforest. The soil, in parts, is a rich terra rossa (page 274) which here is a weathered volcanic soil ideal for the growing of coffee. However, rainfall is irregular with a long winter drought; communications are still limited; and federal investment has been insufficient to stimulate much population growth.

Except where the highland reaches the sea, the eastern parts of the plateau around São Paulo and Belo Horizonte and the east coast have the highest population densities (area **3A**). Although the coastal area is often hot and humid, the water supply is good. Several natural harbours proved

ideal for ports and this encouraged trade and the growth of industry. Salvador, the first capital, was the centre of the slave trade. Rio de Janeiro became the second capital, developing as an economic, cultural and administrative centre. More recently, it has received increasing numbers of tourists from overseas and migrants from the north of Brazil.

One of the world's fastest-growing cities is São Paulo. The cooler climate and terra rossa soils initially led to the growth of commercial farming based on coffee. Access to minerals such as iron ore and to energy supplies later made it a major industrial centre. The São Paulo region has had high levels of federal investment, leading to the development of a good communications network and the provision of modern services.

Area **3B** is another focus of recent growth based on the discovery and exploitation of vast deposits of iron ore and bauxite, the construction of hydro-electric power stations and the advantages of access along the coastal strip and Amazon corridor. **3C** is the new federal capital, Brasilia, built in the early 1960s to try to redress the imbalance in population density and wealth between the south-east of the country and the interior. Figures 13.6 and 13.7 show population densities at different levels of scale from that of Brazil.

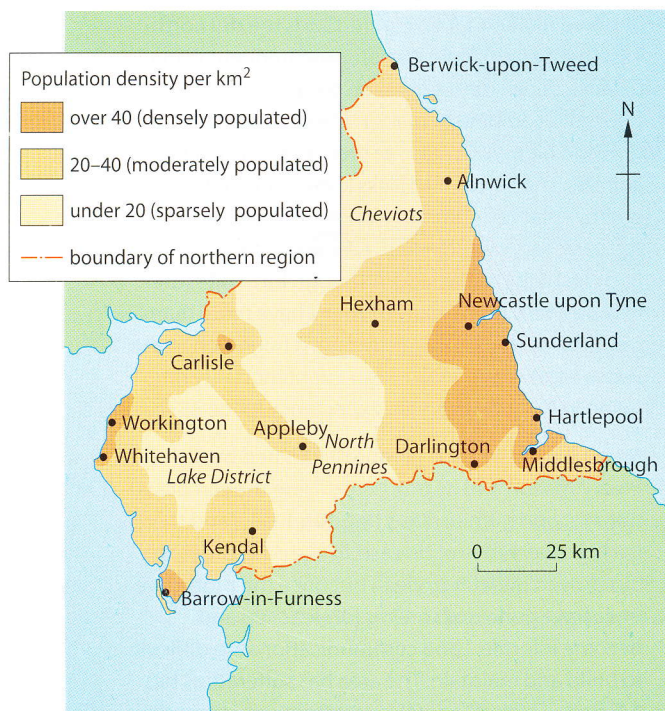


Figure 13.6
Population density in the 'North' economic planning region of England: the regional scale

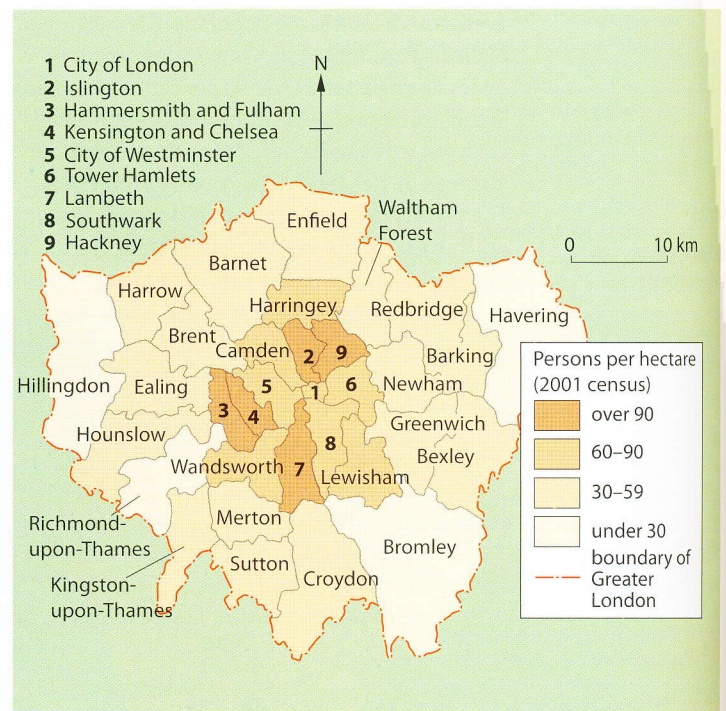


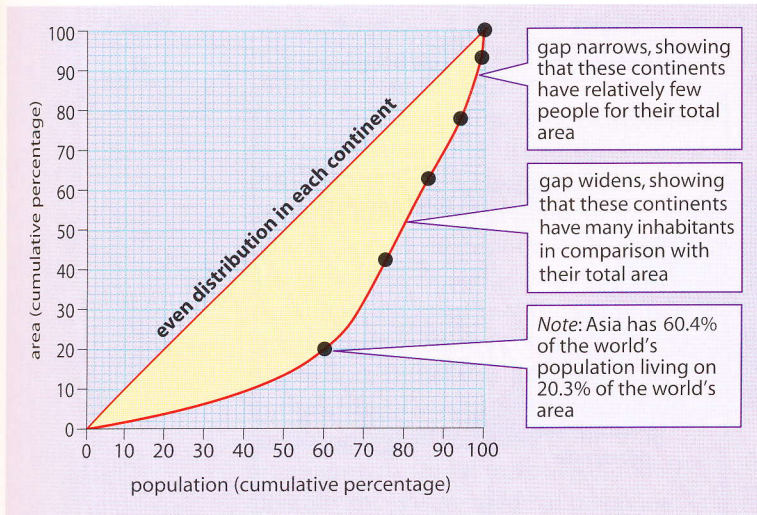
Figure 13.7
Population density in Greater London: the urban scale

Lorenz curves

Lorenz curves are used to show inequalities in distributions. Population, industry and land use are three topics of interest to the geographer which show unequal distributions over a given area. Figure 13.8 illustrates the unevenness of population distribution over the world. The

Figure 13.8

A Lorenz curve: the distribution of world population in mid-2008



diagonal line represents a perfectly even distribution, while the concave curve (it may be convex in other examples) illustrates the degree of concentration of population within the various continents. The greater the concavity of the slope, the greater the inequality of population distribution (or industry, land use, etc.).

Continents ranked in descending order of population (1998)	Population (%)	Population (cumulative %)	Area (%)	Area (cumulative %)
Asia	60.4	60.4	20.3	20.3
Africa	14.4	74.8	22.3	42.6
Europe/Russian Federation	11.0	85.8	20.1	62.7
Latin America	8.6	94.4	15.2	77.9
North America	5.1	99.5	15.8	93.7
Oceania	0.5	100.0	6.3	100.0

Population changes in time

It has already been stated (page 344) that populations are dynamic, i.e. their numbers, distributions, structure and movement (migration) constantly change over time and space. Population change is another example of an open system (Framework 3, page 45) with inputs, processes and outputs (Figure 13.9).

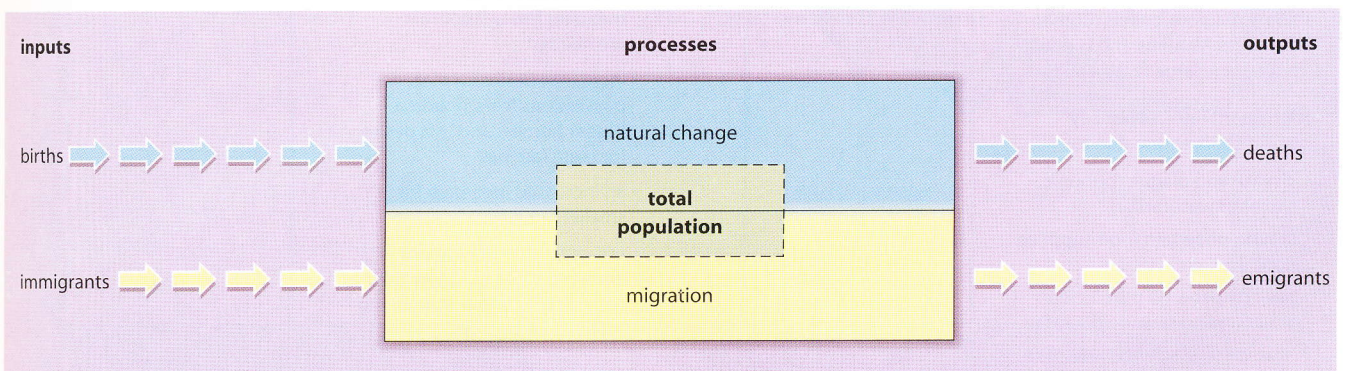
Birth rates, death rates and natural increase

The total population of an area is the balance between two forces of change: **natural increase** and **migration** (Figure 13.9). The natural increase is the difference between birth rates and death rates. The **crude birth rate** is the number of live births per 1000 people per year and the **crude death rate** is the number of deaths per 1000

people per year. Throughout history, until the last few years in a small number of the economically most developed countries, birth rates have nearly always exceeded death rates. Exceptions have followed major outbreaks of disease (the bubonic plague and AIDS, page 622) or wars (as in Rwanda). Any natural change in the population, either an increase or a decrease, is usually expressed as a percentage and referred to as the **annual growth rate**. Population change is also affected by migration. Although migration does not affect world population totals, it does affect the way people are distributed across the world. Migration leads to *either* an increase in the population – when the number of immigrants exceeds the number of emigrants (as in Spain and Congo) – *or* a decrease in population – when the number of emigrants exceeds the number of immigrants (as in Iraq and Rwanda).

Figure 13.9

Simple model showing population change as an open system



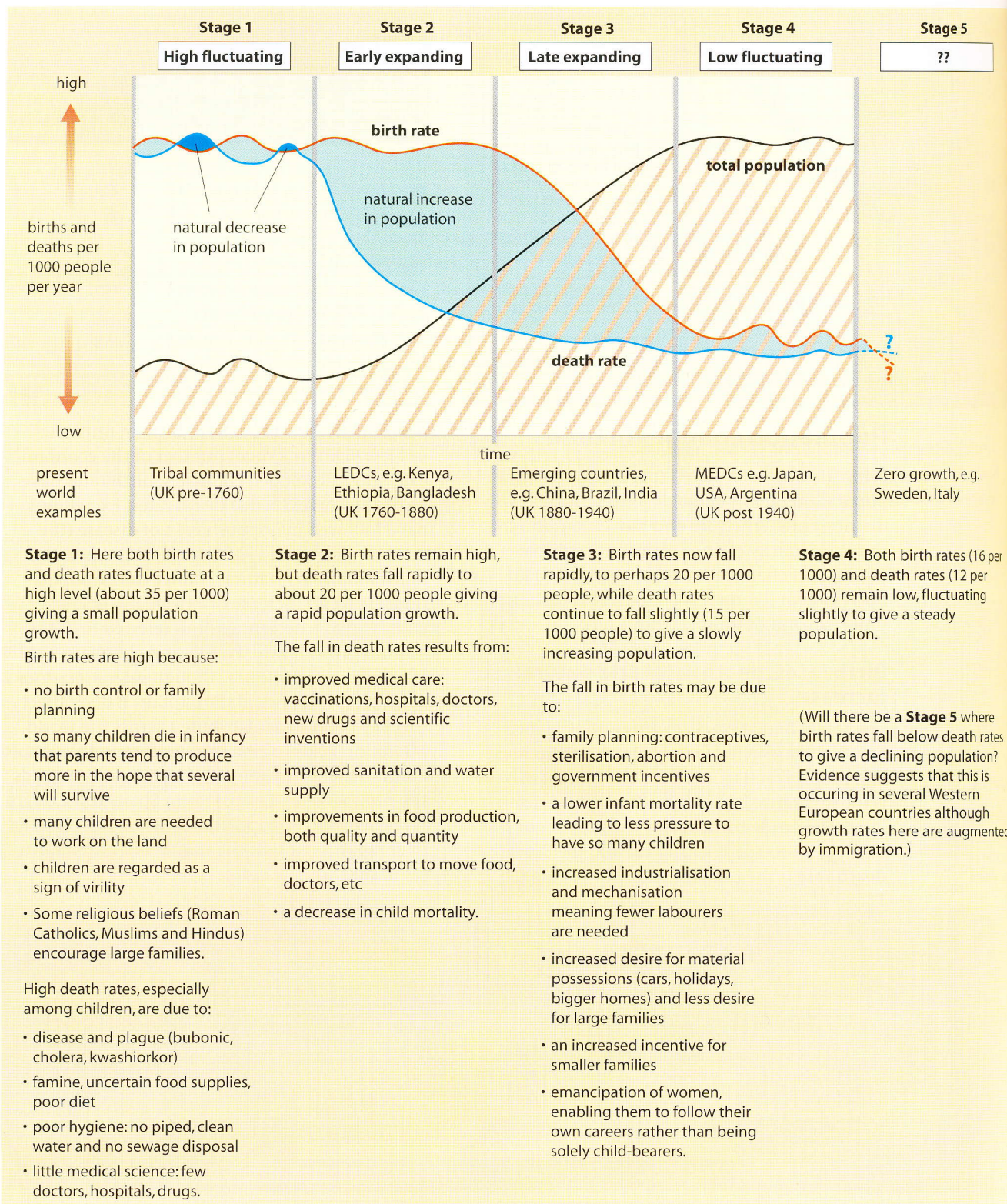
The demographic transition model

The demographic transition model describes a sequence of changes over a period of time in the relationship between birth and death rates and overall population change. The model, based on population changes in several industrialised countries in western Europe and North America,

suggests that *all* countries pass through similar demographic transition stages or **population cycles** – or will do, given time. Figure 13.10 illustrates the model and gives reasons for the changes at each transition stage. It also gives examples of countries that appear to ‘fit’ the descriptions of each stage.

Figure 13.10

The demographic transition model



Like all models, the demographic transition model has its limitations (Framework 12, page 352). It failed to consider, or to predict, several factors and events:

- 1 Birth rates in several of the most economically developed countries have, since the model was put forward, fallen below death rates (Germany, Sweden). This has caused, for the first time, a population decline which suggests that perhaps the model should have a fifth stage added to it.
- 2 The model, being more or less Eurocentric, assumed that in time all countries would pass through the same four stages. It now seems unlikely, however, that many of the economically less developed countries, especially in Africa, will ever become industrialised.
- 3 The model assumed that the fall in the death rate in Stage 2 was the consequence of industrialisation. Initially, the death rate in many British cities rose, due to the insanitary conditions which resulted from rapid urban growth, and it only began to fall after advances were made in medicine. The delayed fall in the death rate in many developing countries has been due mainly to their inability to afford medical facilities. In many countries, the fall in the birth rate in Stage 3 has been *less* rapid than the model suggests

due to religious and/or political opposition to birth control (Brazil), whereas the fall was much *more* rapid, and came earlier, in China following the government-introduced 'one-child' policy (Case Study 13).

- 4 The timescale of the model, especially in several South-east Asian countries such as Hong Kong and Malaysia, is being squashed as they develop at a much faster rate than did the early industrialised countries.

The model can be used:

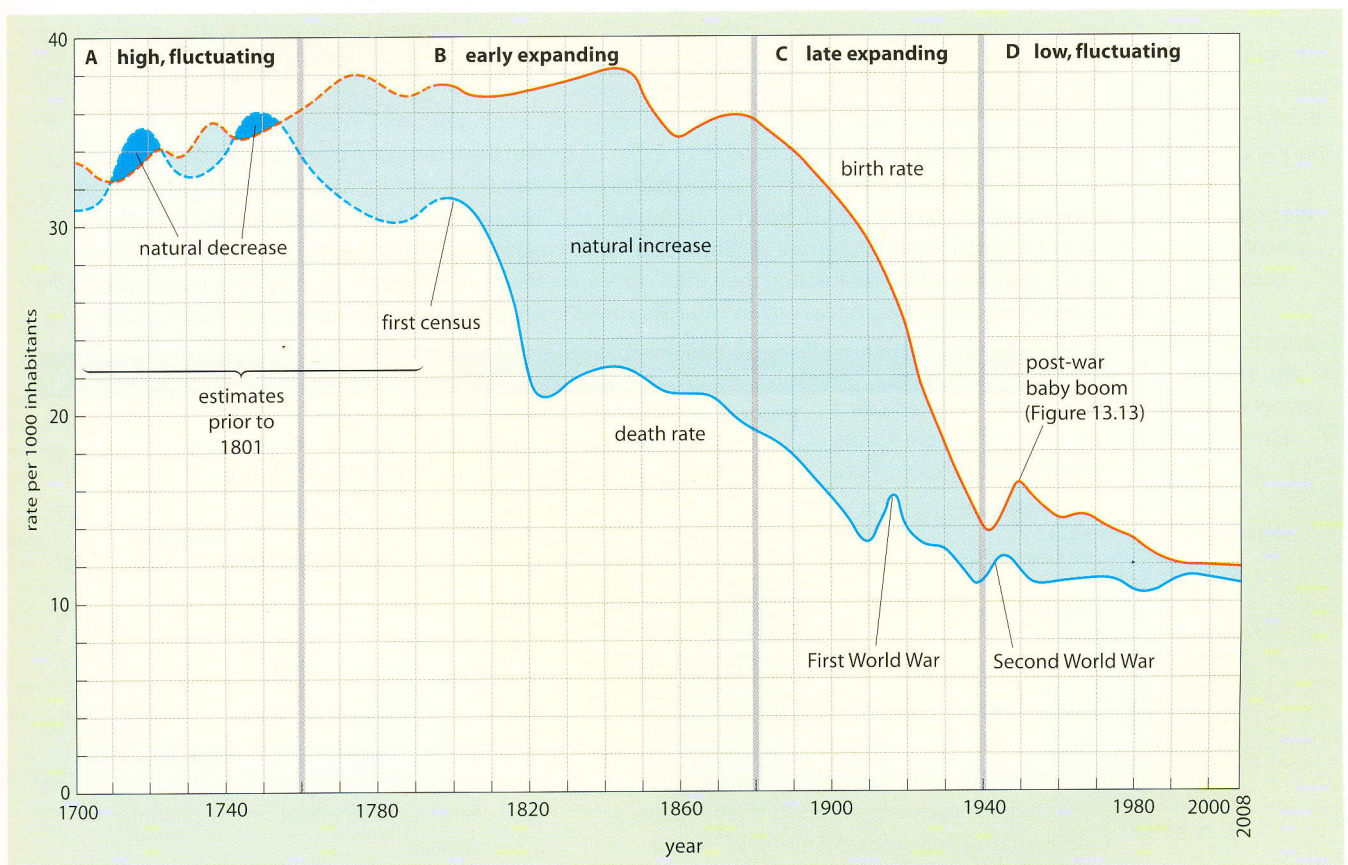
- to show how the population growth of a country changes over a period of time (the UK, in Figure 13.11)
- to compare rates of growth between different countries at a given point in time (Figure 13.12).

Figure 13.11 shows certain changes in Britain:

- 1700–1760: high birth and death rates giving a slow natural increase.
- 1760–1880: a rapidly falling death rate and a high birth rate giving a fast natural increase.
- 1880–1940: rapidly declining birth and death rates giving a slower natural increase.
- 1940–2000: low, fluctuating birth and death rates giving a small natural increase.
- Since 2000: a rising birth rate amongst new and first generation immigrants giving a faster natural increase.

Figure 13.11

The demographic transition cycle: changes in Britain's population, 1700–2008



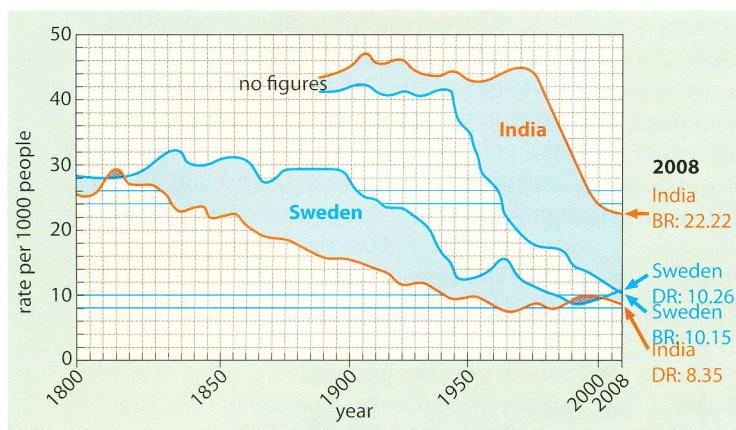


Figure 13.12

A comparison between the demographic cycles of Sweden and India, 1800–2008

Figure 13.12 shows how Sweden has long since reached Stage 4 of the demographic transition model – a characteristic of most economically more developed countries – whereas India is still at Stage 3 – a characteristic of many economically less developed countries (remember that some of the least economically developed countries are still at Stage 2).

Population structure

The rate of natural increase or decrease, resulting from the difference between the birth and death rates of a country, represents only one aspect of the

Framework 12 Models

Models form an integral and accepted part of present-day geographical thinking and teaching. Nature is highly complex and, in an attempt to understand this complexity, geographers try to develop simplified models of it.

Chorley and Haggett described a model as:

a simplified structuring of reality which presents supposedly significant features or relationships in a generalised form . . . as such they are valuable in obscuring incidental detail and in allowing fundamental aspects of reality to appear.

They stated that a model:

can be a theory or a law, an hypothesis or structured idea, a role, a relationship, or equation, a synthesis of data, a word, a graph, or some other type of hardware arranged for experimental purposes.

A good model will stand up to being tested in the real world and should fall between two extremes:

very simple and easy to work, but too generalised to be of real value

model

very difficult to use, being almost as complex as reality

To achieve this balance, several – though sometimes only one – critical criteria or variables are selected as a basis for the model. For example, J.H. von Thünen (page 471) chose distance from a market as his critical variable and then tried to show the relationship between this variable

and the intensity of land use. If necessary, other variables may be added which, as in the case of von Thünen's navigable river and a rival market, may add both greater reality and greater complexity. Models can be used in all fields of geography. Some applications are shown in the following table.

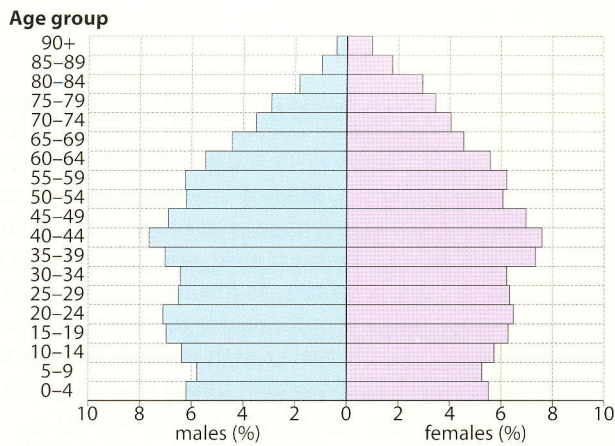
Physical (landforms)	Page	Climate, soils and vegetation	Page	Human and economic	Page
beach profile	143	atmospheric circulation	226	cities (Burgess)	420
slope development	51	heat budget	209	land use (von Thünen)	471
corrie development	110	seres	286	industrial location (Weber)	557
sand dune development	157	food chains and tropic levels	296	settlement size/distribution (Christaller)	407
glacier system	106	depressions	230	gravity models	410
drainage basins	58	soil profiles (e.g. podsols)	332	demographic transition	350
limestone scenery	198	soil catena	261	economic growth (Rostow)	615

Throughout this book, models and theories are presented; their advantages and limitations are examined; and their applications to real-world

situations are demonstrated, together with their usefulness and accuracy in explaining that situation.

Figure 13.13

Constructing the population pyramid for the UK, mid-2007



study of population structure. A second important aspect is population. This is important because the make-up of the population by its age and gender, together with its life expectancy, has implications for the future growth, economic development and social policy of a country. **Life expectancy** is the number of years that the average person born in a given area may expect to live. Differences in language, race, religion, family size, etc. can all affect a country's socio-economic welfare.

Population pyramids

The population structure of a country is best illustrated by a **population** or **age-gender pyramid**. The technique normally divides the population into 5-year age groups (e.g. 0-4, 5-9, 10-14) on the vertical scale, and into males and females on the horizontal scale (Figure 13.13). The number in each age group is given as a percentage of the total population and is shown by horizontal bars, with males located to the left and females to the right of the central axis. As well as showing past changes, the pyramid can predict both short-term and long-term future changes in population.

Whereas the demographic transition model shows only the natural increase or decrease resulting from the balance between births and deaths, the population pyramid shows the effects of migration, the age and gender of migrants (Figure 13.45) and the effects of large-scale wars and major epidemics of disease. Figure 13.13 is the population pyramid for the United Kingdom in mid-2007.

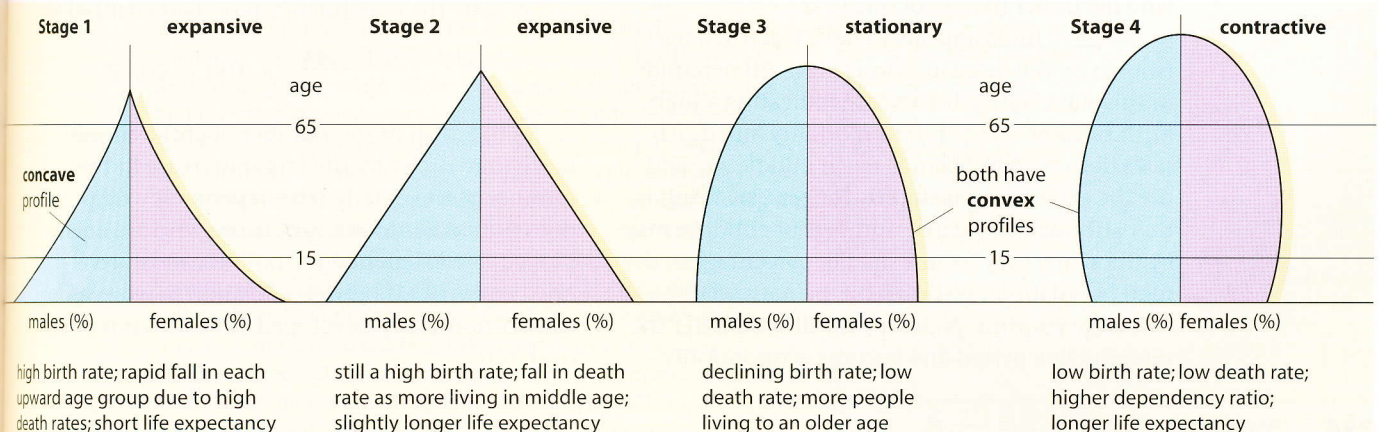
Age group	Males		Females	
	Number (000s)	Percentage	Number (000s)	Percentage
0-4	1781	6.13	1696	5.65
5-9	1691	5.80	1618	5.36
10-14	1835	6.31	1746	5.79
15-19	2003	6.78	1885	6.25
20-24	2057	7.08	1952	6.47
25-29	1934	6.55	1916	6.35
30-34	1888	6.50	1891	6.27
35-39	2183	7.51	2223	7.37
40-44	2268	7.81	2315	7.68
45-49	2040	7.02	2090	6.93
50-54	1790	6.16	1835	6.08
55-59	1798	6.19	1854	6.15
60-64	1657	5.70	1736	5.76
65-69	1263	4.35	1364	4.52
70-74	1074	3.69	1226	4.06
75-79	841	2.89	1082	3.59
80-84	557	1.91	859	2.85
85-89	286	0.98	565	1.87
90+	106	0.36	311	1.03
Total	29 054		30 162	

Notice the following:

- a narrow pyramid showing approximately equal numbers in each age group
- a low birth rate (meaning fewer school places will be needed) and a low death rate (suggesting a need for more elderly people's homes) which together indicate a steady, almost static, population growth
- the greater number of boys in the younger age groups (a higher birth rate) but more females than males in the older age groups (women having the longer life expectancy)
- a relatively large proportion of the population in the pre- and post-reproductive age groups, and a relatively small number in the 15-64 age groups which produce most of the national wealth (see dependency ratios, page 354).

Figure 13.14

Population pyramids characteristic of each stage of the demographic transition model



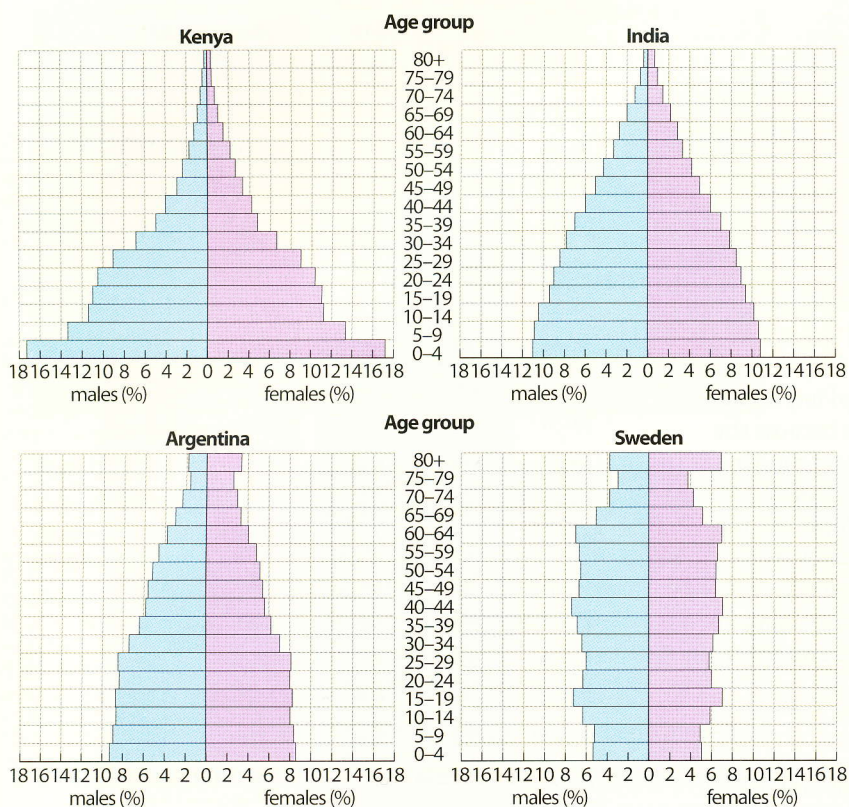


Figure 13.15
Population pyramids
for four selected
countries, mid-2007

A model has also been produced to try to show the characteristics of four basic types of pyramid (Figure 13.14). As with most models, many countries show a transitional shape which does not fit precisely into any pattern. Figure 13.15 shows the pyramids for *selected* countries – chosen because they *do* conform closely to the model! Stage 1 only occurs in isolated tribal communities.

Stage 2 Kenya's pyramid has a concave shape, showing that the birth rate is very high. Almost half the inhabitants (42 per cent) are under 15 years old (the corresponding figure for 1990 was 51 per cent); there is a rapid fall upwards in each age group showing a high death rate (including infant mortality) and a low life expectancy, with less than 3 per cent who can expect to live beyond 65. The **infant mortality rate** is the average number of children out of every 1000 born alive who die under the age of one year.

Stage 3 India appears to have reached Stage 3 (shown by the more uniform sides). All pyramids in this stage have a broad base indicating a high birth rate but, as the infant mortality and death rates decline, more people reach middle age and the life expectancy is slightly longer. The result is that although the actual numbers of children may be the same, they form a smaller percentage of the total population (as shown by the narrower base). The large youthful population will soon enter the reproductive period and become economically

active. India has 32 per cent under 15; and 5 per cent over 65 (the corresponding figures for 1990 were 39 and 3 per cent respectively).

Stage 4 Argentina has probably just reached this stage as its birth rate is declining – as shown by the almost equal numbers in the lower age groups. As the death rate is much lower, more people are able to live to a greater age, and the actual growth rate becomes stable. Argentina has 25 per cent under 15; and 11 per cent over 65 (the 1990 figures were 26 and 6).

Stage 5 Sweden has a smaller proportion of its population in the pre-reproductive age groups (16 per cent under 15) and a larger proportion in the post-reproductive groups (18 per cent over 65), indicating low birth, infant mortality and death rates and a long life expectancy (the equivalent figures for 1990 were 22 and 16). As the numbers entering the reproductive age groups decline there will be, in time, a fall in the total population.

Dependency ratios

The population of a country can be divided into two categories according to their contribution to economic productivity. Those aged 15–65 years are known as the **economically active** or **working population**; those under 15 (the youth dependency ratio) and over 65 (the old age dependency ratio) are known as the **non-economically active population**. (Perhaps in Britain the division should be made at 16, the school-leaving age; in developing countries, however, the cut-off point is much lower as many children have to earn money from a very young age.)

The dependency ratio can be expressed as:

$$\frac{\text{children (0–16) and elderly (65 and over)}}{\text{those of working age}} \times 100$$

e.g. UK 1971 (figures in millions):

$$\frac{13\,387 + 7\,307}{31\,616} \times 100 = 65.45$$

So for every 100 people of working age there were 65.45 people dependent on them.

By 2007 the dependency ratio had changed to:

$$\frac{11\,537 + 11\,344}{37\,707} \times 100 = 60.68$$

So the drop in the number of children was more than offset by the larger increase in the number of the elderly (the dependency ratio does not take into account those who are unemployed). The dependency ratio for most developed countries is between 50 and 70, whereas for less economically developed countries it is often over 100.

Trends in population growth

1 Global trends

In Mother Earth's 46 years (Places 1, page 9), it 'was only in the last hour that man began to live in settlements' and 'the human population slowly started to increase'. In the absence of any census, the population has been crudely estimated to have been about 500 million in 1650. It was only after the Industrial Revolution in Western Europe, one minute ago in the Earth's history, that numbers began to 'multiply prodigiously' in what is now the developed world while the so-called 'population explosion' only extended to developing continents after the middle of last century (Figure 13.18).

The United Nations Fund for Population Activities (UNFPA) designated October 1999 as the date when the world's population reached six billion (6,000 million). This 'celebration' – and many people would disagree with that – was fictitious as no one knew the exact figure, due to either inaccurate or non-existent census figures and the often non-recorded migration of people. Bearing in mind the approximation of population figures (Framework 15, page 448), the world clock suggests that numbers are increasing by:

	World	MEDCs	LEDCS
Year	82 million	2 million	80 million
Month	570 000	7000	563 000
Day	18 773	233	18 540
Minute	156	4	152

During 2008, the UN claimed that 139 million babies would be born and that 57 million people would die giving the natural increase of 82 million shown in the table above.

Fertility rates in many economically developing countries are slowly beginning to decline although

Figure 13.16

Global and regional trends in population growth, 2008

In global terms the major trend has been a decline in the rate of population growth from a peak of 2.1 per cent between 1965 and 1970 to approximately 1.2 per cent in 2008, although there are still 82 million more people alive at the end of each year. While the distinction between the low/no population growth of most of the 'developed' countries and the high population growth of the developing countries continues, a major feature of the last five decades has been the widening trajectories of the least developed countries. Making broad generalisations to a complex world pattern, low birth rates in Europe have led to the very real prospect of a population decrease, despite continuing net immigration. The USA and Canada are anomalies for MEDCs as they have a robust population growth, mainly due to their high immigration rates. Of the developing countries, those in Latin America and the Middle East have the lowest (though still moderately high) growth rates while the least developed countries, mostly located in sub-Saharan Africa, have by far the greatest growth. Asia has extremes from low growth rates in the newly industrialised countries (NICs, page 578) and China (one-child policy) to the continued rapid growth in parts of India

they remain considerably higher than those in developed countries (Figure 13.16). The **fertility rate** is the number of children born to women of child-bearing age. The UN claim that the annual growth rate of the world's population, which had been 2.1 per cent between 1964 and 1970, had fallen to 1.2 per cent by 2008 – a fall mainly credited to China's 'one child per family policy' (Case Study 13). The consequence of this slowing-down has led to the present revised prediction that the world's population will now only pass the 7 billion mark in 2012, rather than in that same year reaching the 7.6 billion predicted in 1992, or the 8.4 billion had the 1950–80 growth rate not declined. The UNFPA now predicts that the annual growth rate will fall to 1.0 per cent in 2020 and to 0.5 per cent in 2050. By that later date, the world's expected population is predicted to be between 7.41 billion (lowest) to 10.63 billion (highest), with a medium variant of 8.92 billion (Figure 13.17).

2 Regional trends

What these figures fail to show is the marked variations between different parts of the world, especially between the economically developed and the economically developing continents, bearing in mind that it is likely there will also be considerable variations within the continents themselves. At present, the average population growth rate for all countries referred to as developing is 1.92 per cent per year compared with only 0.52 per cent for those described as developed (Figures 13.16, 13.17 and 13.18). In 2008 (the 1998 comparable figures are shown in brackets) the population of Asia was increasing by over 48 million a year (50); Africa by 23 million (17) and Latin America by nearly 9 million (nearly 8). Africa had the highest growth rate at 2.4 per cent per year compared with Europe which actually showed a decline of 0.01 per cent.

Figure 13.17

Predictions on world population growth, after 2008

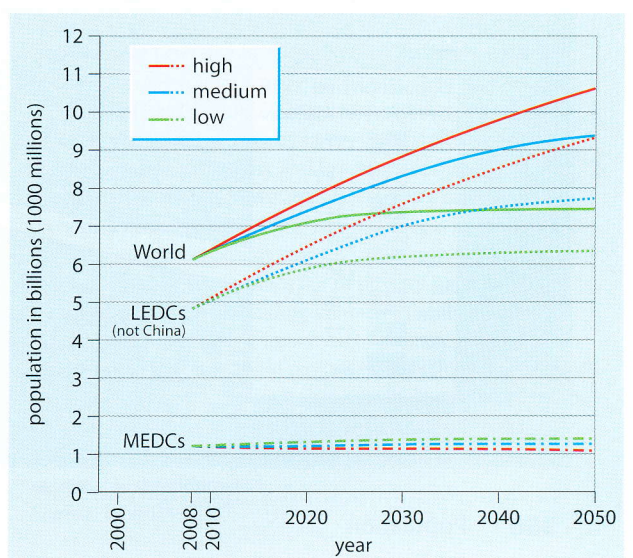
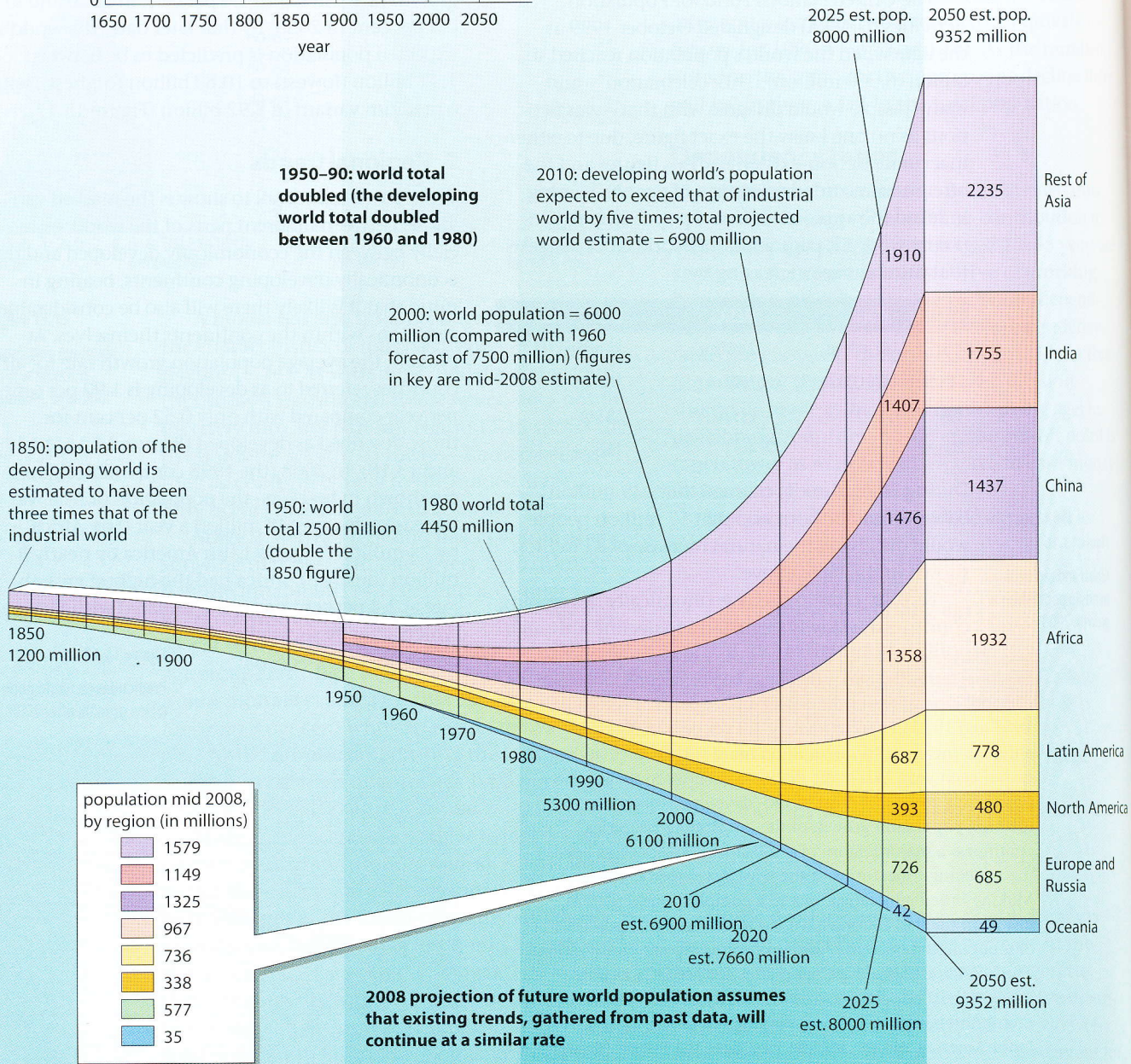
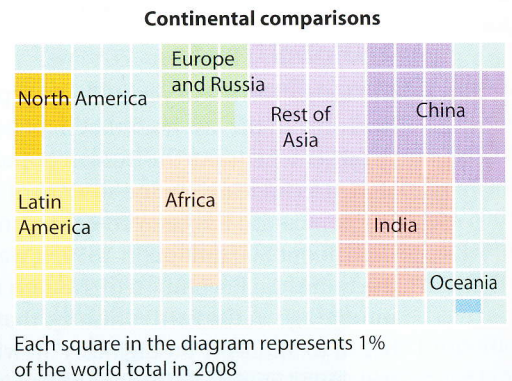
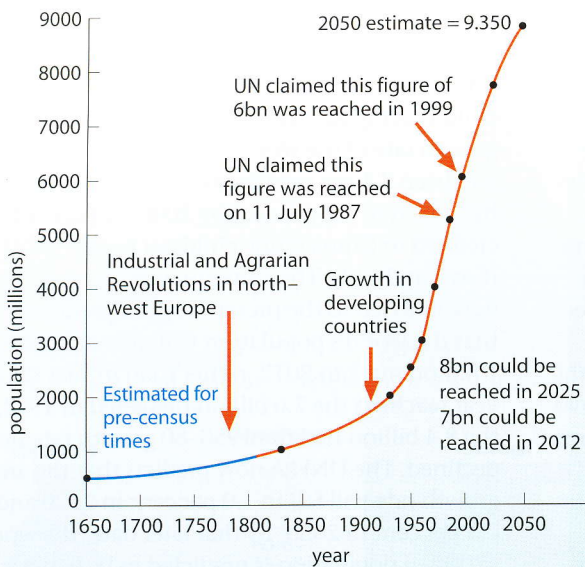


Figure 13.18
World population growth (2008 data)



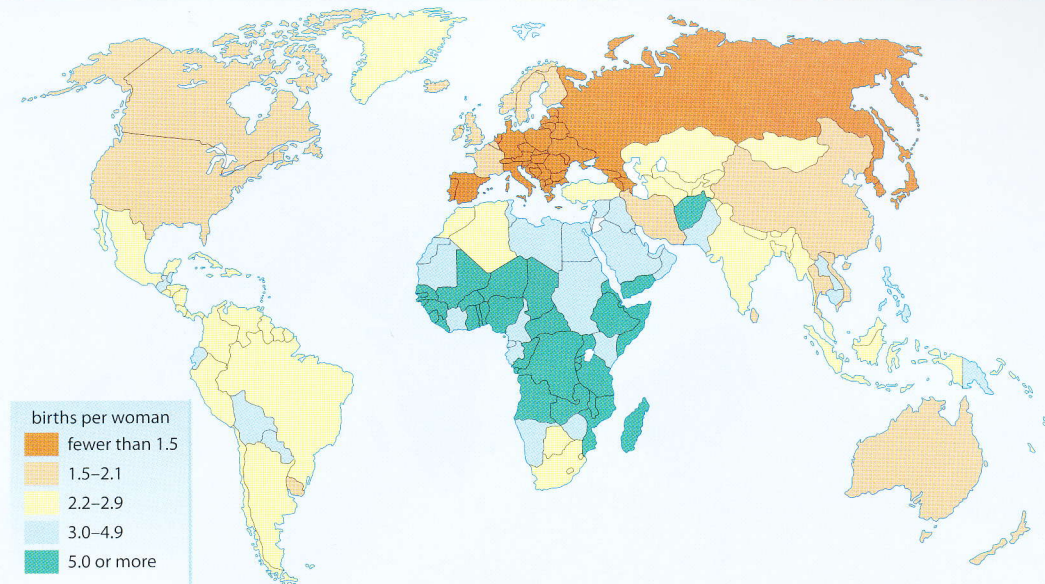


Figure 13.19

Total fertility rate, 2008

3 Birth rates, total fertility rates (TFR) and replacement rates

The world's crude birth rate in 2008 was 21 per 1000. Germany had the lowest with 8 per 1000 followed by several other Western European countries together with Taiwan and Japan, which had 9 per 1000. In contrast, of 23 countries with a birth rate exceeding 40 per 1000, 21 were located in Africa.

The **total fertility rate (TFR)** is the average number of children a woman is likely to have if she lives to the end of her child-bearing age, based on current birth rates. The present world average is 2.6, varying between 1.6 in developed countries and China to 3.2 in developing countries and 4.7 in those that are the least developed (Figure 13.19). The TFR is one of the best indicators of future population growth. In most economically developed countries the TFR is low and still declining and, while it is still much higher in economically less developed countries, it appears that changing attitudes there will eventually lead to lower TFR in the future. High birth and fertility rates have been considered characteristic of 'underdevelopment'. Indeed although there does seem to be a close correlation between a country's birth rate and its GNP (Framework 19, page 612), the UN have claimed that 'a high birth rate is a consequence, not a cause, of poverty'. Typically, the lower the use of contraceptives, the higher the TFR, and the higher the level of female education, the lower the TFR (Figure 13.20). Government policies can also have an enormous impact on the number of children women are likely to have (Places 39).

It is now recognised that the three key factors influencing fertility decline are improvements in family planning programmes, in health care, and in women's education and status (arguably in that order, although they are all interrelated). The major world movement is now towards 'children by

choice rather than chance', a goal that can only be achieved by giving women reproductive options.

The causes of this unmet need for contraception include lack of knowledge of contraception methods and/or sources of supply; limited access to and low quality of family planning services; lack of education, especially among women; cost of contraception commodities; disapproval of husbands and family members; and opposition by religious groups. Improvements in health care include safer abortions and a reduction in infant mortality – the latter meaning that fewer children need to be born as more of them survive. Improved education raises the status of women and postpones the age of marriage. Several governments, especially in South-east Asia, have attempted in recent years to encourage couples to have fewer children unless, as in the case of Singapore, prospective parents belonged to selective groups (Places 39). Other governments, notably that of China (Case Study 13), have attempted to reduce birth rates through coercion, a method that has not gained international approval.

Figure 13.20

Family planning as a human right

Reaping the rewards of family planning

The freedom to choose how many children to have, and when, is a fundamental human right. Better access to safe and affordable contraceptive methods is key to achieving the MDGs [page 609]. Family planning has proven benefits in terms of gender equality, maternal health, child survival and preventing HIV [page 622]. It can also reduce poverty and promote economic growth by improving family well-being, raising female productivity and lowering fertility. It is one of the most cost-effective investments a country can make towards a better quality of life. Limited access to contraception, in contrast, constrains women's opportunities to pull themselves and their families out of poverty [page 609]. Reproductive health, including voluntary family planning, should be at the centre of initiatives to promote the human rights of women and should replace earlier efforts that focused more on curbing rapid population growth, in some cases at the expense of women's rights. Freedom to make reproductive decisions is essential for achieving gender equality and sustainable development.

Source: UNFPA, 2007

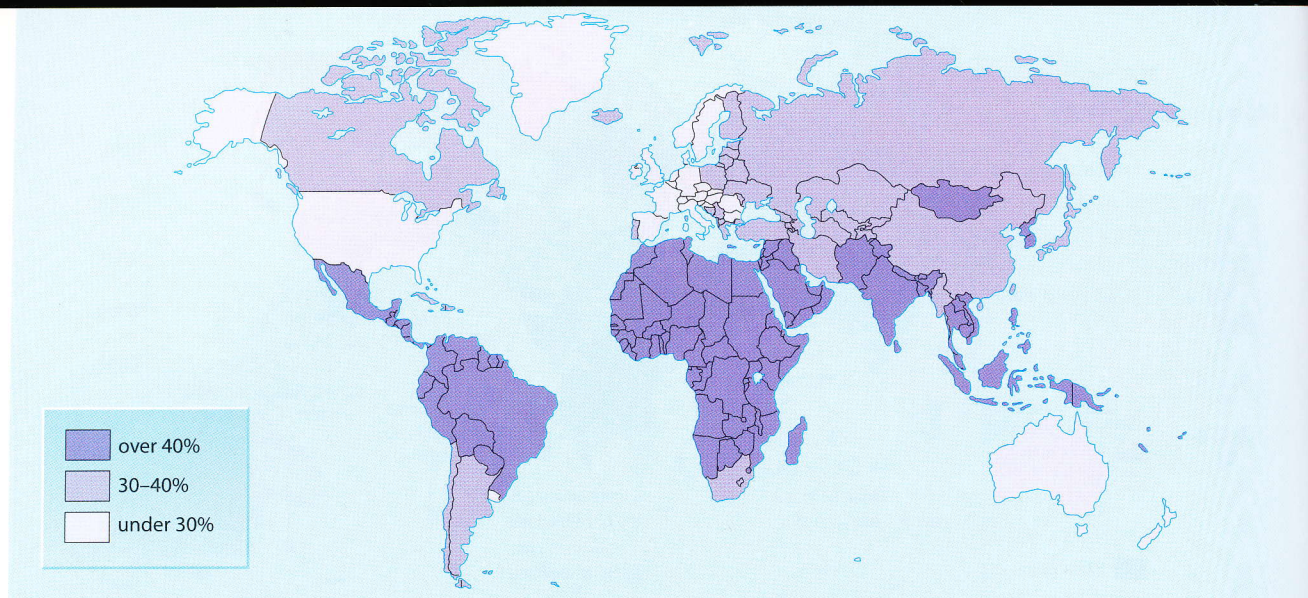


Figure 13.21
Percentage of total population under 15 years, 2008

High birth and fertility rates result in a high proportion of the total population being aged 15 or under (see Kenya's population structure in Figure 13.15). Countries where this occurs – many of them in Africa, Latin America and southern Asia (Figure 13.21) – are likely, in the future, to:

- need greater health care and education – two services many can ill afford
- have more women reaching child-bearing age.

In contrast, many of the more economically developed countries have such low birth and fertility rates that there is a growing problem of 'too few' rather than 'too many' children: is this the possible Stage 5 in the demographic transition model (Figure 13.10)?

The UN stated that, in 2008, there were 71 countries with a TFR below 2.1, the figure needed by a country to replace its population

(the **replacement rate**, said to be 2.1 children per woman, is when there are just sufficient children born to balance the number of people who die). Throughout history, except during times of plague or war, the replacement rate has always been exceeded – hence the growth in world population. At present, many African countries have a TFR of over 5.0 (in Liberia, Somalia and Uganda it is 6.8) whereas in most European and eastern Asian countries it is below 1.8 (Taiwan 1.1, Japan and Italy 1.3 and Singapore and Spain 1.4). Where the replacement rate is not being met, there are fears that, in time, there will be too few consumers and skilled workers to maintain national economies and to support an ageing population; a reduction in any competitive advantage in science and technology; and schools and colleges closed for a lack of students.

Places 39 Singapore: family planning

When, in 1965, Singapore had a birth rate of 29.5 and a TFR of 4.6, the government introduced a massive family planning scheme in which the main objectives were:

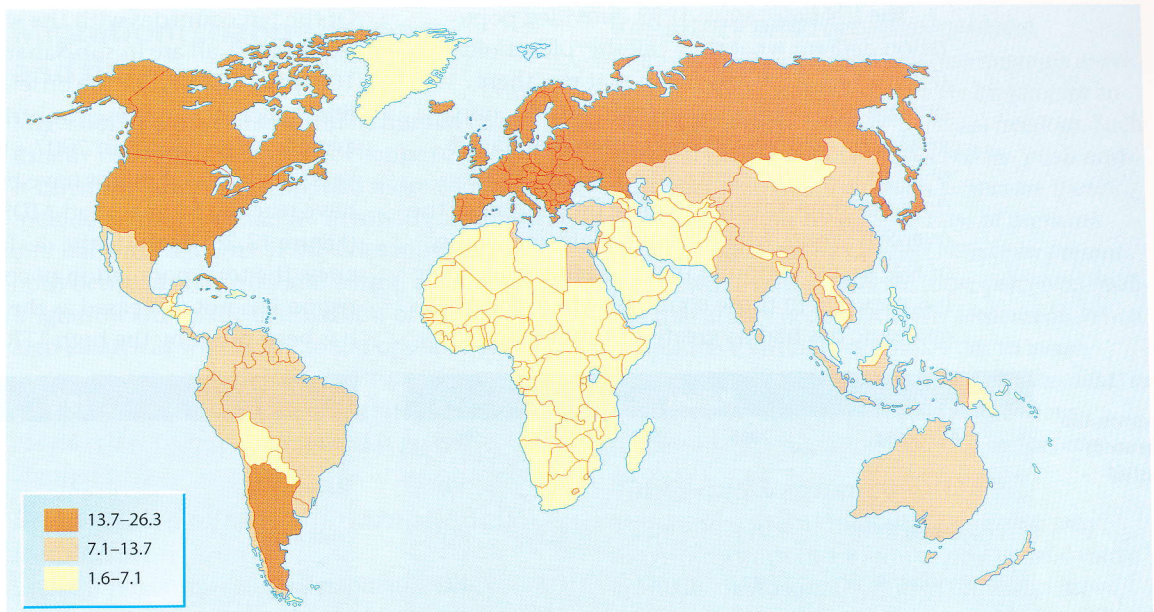
- to establish family planning clinics and to provide contraceptives at minimal charge
- to advertise through the media the need for, and the advantages of, smaller families – a voluntary 'stop at two' policy
- to legislate so that under certain circumstances both abortions and sterilisation could be allowed
- to introduce social and economic incentives such as paid maternity leave, income tax relief, housing priority, cheaper health care and free education, all of which would cease as the size of a family grew.

By 1995 the policy had been so successful that the birth rate had fallen to 15.2 and the TFR to 1.7

so that already there was an insufficient supply of labour to fill the job vacancies and fewer people to support an increasingly ageing population – hence the changed slogan of 'stop at three if you can afford three'. The government became concerned that it was the middle-class elite that was having fewest children, partly because women were pursuing their own careers and either staying single, or marrying and having children at a later age. As a result, female graduates were encouraged to have three or more children through financial benefits and larger tax exemptions, while low-income non-graduates only received housing benefits if they stopped at two children. This seems to have done little to reverse the trend as, in 2008, the birth rate had fallen to 5.8 and the TFR to 1.4, and the government sent out Valentine Day messages encouraging people to 'make love not money'.

Figure 13.23

Percentage of total population aged 60 and over in 2005



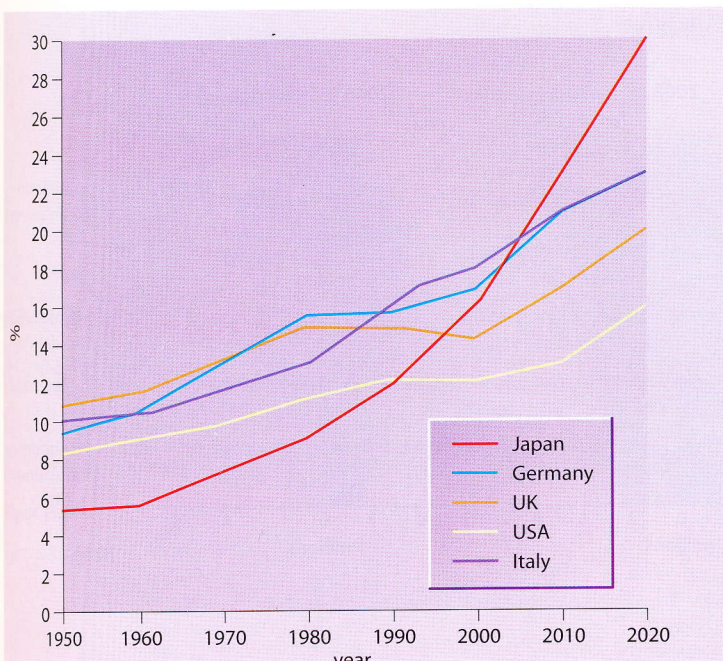
	1970		1998		2025 (estimate)	
	Male	Female	Male	Female	Male	Female
Japan (highest)	71	76	79	85	84	88
Italy	69	75	78	83	82	86
UK	69	75	76	81	78	83
USA	68	75	75	80	78	83
China	63	64	70	74	76	80
India	51	49	62	63	68	70
Bangladesh	46	44	61	62	66	68
Kenya	49	53	49	47	52	53
Zambia (lowest)	39	42	38	37	41	41

Figure 13.22

Life expectancies in selected countries

Figure 13.24

Growth in the percentage of population aged 65 and over in selected countries, 1950–2020



4 Death rates and life expectancy

Death rates, whether it be infant mortality or among children and adults, have, traditionally, declined as a country develops (i.e. Stage 2 onwards in the demographic transition model – Figure 13.10). Due to improvements in medical facilities, hygiene and the increased use of vaccines, the decline in the death rate has led to a sharp increase in life expectancy, initially in the economically more developed countries but, more recently, also in many of the economically less developed countries (Figure 13.22). Already, several of the more developed countries have over 20 per cent of their population aged over 65 (Figures 13.23 and 13.24) and several others have, for the first time in history, more people aged over 65 than they have children aged under 15 (Places 40). In Europe – the major area to be affected by ageing until overtaken recently by eastern Asia, notably Japan – the proportion of children is projected to decline from 16 per cent in 2008 to 14 per cent by 2050, while the proportion of people aged over 65 is expected to rise from 20 per cent to 35 per cent in the same period (the most rapid increases being in Spain and Italy). By 2025 the UN predict that as the number of old people in the world increases, this will mean:

- a greater demand for services (e.g. pensions, medical care and residential homes) which will have to be provided (i.e. paid for) by a smaller percentage of people of working age (i.e. in the economically active age group) in the more developed countries, and
- a rapid increase in population size with an associated strain on the often already overstretched resources of the less developed countries.

The UN have, since 1998, provided population data for what they call the 'oldest-old' (Figure 13.25), an age-group that was then divided into octogenarian (aged 80–89), nonagenarian (aged 90–99) and centenarian (aged over 100). Unlike Figure 13.13, Figure 13.25 does not show the high female proportion of the over-90s group, which has a female–male ratio of 5:1. An exception to increased life expectancy has occurred in those countries where the AIDS epidemic has had its greatest impact (page 622).

Figure 13.25
Age composition of the world's 'oldest old'

Age group	Millions		%	
	2005	2050	2005	2050
Oldest-old: 80+	79.4	379.0	100	100
Octogenarian: 80–89	71.1	314.4	88.2	83.0
Nonagenarian: 90–99	8.1	61.4	11.5	16.2
Centenarian: 100+	0.2	3.2	0.3	0.8

UN Population Division

Of the ten countries with the world's lowest life expectancy, all are in sub-Saharan Africa (Places 100, page 623). From the onset of the pandemic, life expectancy in these countries fell to an average of 42.5 years in 2007 – a decrease of 10 years – whereas it might have been expected to have reached 60 years had AIDS not occurred (Figure 13.26). Despite the decline in life expectancy, the total population of countries in the region has not decreased as the number of deaths has been offset by the high TFR.

	1970	1998	2008
Botswana	51	45	34
Malawi	41	36	45
South Africa	54	50	47
Zimbabwe	52	41	37

Figure 13.26
The effect of AIDS on life expectancy in selected countries

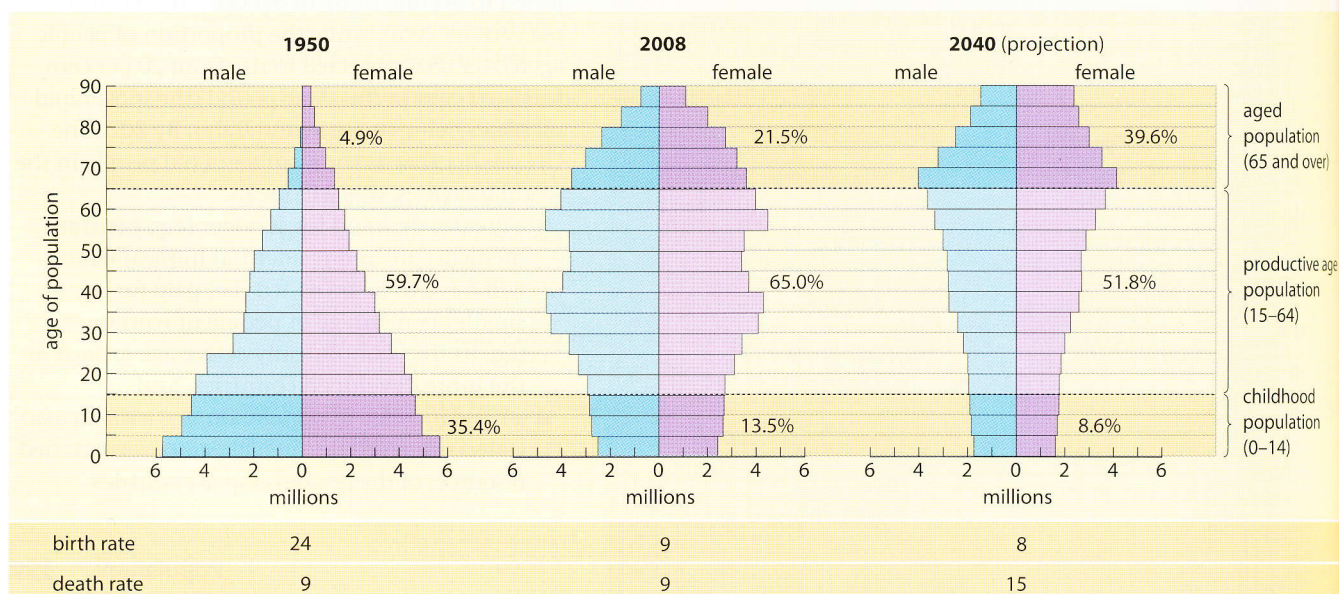
Places 40 Japan: an ageing population

Japan has developed an ominously top-heavy demographic profile (Figure 13.27) which by 2040 is predicted to be the inverse of that of a developing country at stage 2 of economic development (Figure 13.15). As Japanese women are both marrying and having children at a later age, if at all, so the country's TRF has fallen to 1.3 – one of the lowest in the world – compared with over 5 in 1928 and 1.7 in 1988. In contrast, the Japanese, who on average can expect to live to 83 years of age, have the world's greatest longevity. By 2050 Japan is projected to have the world's highest proportion of centenarians – 960 000 or 0.8 per cent of the total population. Of these, 91 per cent will be women. With a birth rate of 8.6 and a death rate of 8.8, Japan has a negative natural increase, the figure

being –0.1 in 2007. With fewer births and people living longer, this means an increasingly greater proportion of the population is aged over 65, having risen from 5 per cent in 1980 (Figure 13.27) to 21.5 per cent in 2007, and to a predicted 30 per cent by 2020 and 39.6 per cent in 2040.

The potential to the Japanese economy in terms of the demand for extra resources to look after the elderly, and the reduced revenue from taxes as the proportion of people in the working-age group decreases (Figure 13.27) has led the government to implement major reforms in its elderly care programme and to offer inducements to encourage women to have more children.

Figure 13.27
Changes in the population structure of Japan, 1950–2040



Migration: change in space and time

Migration is a movement and in human terms usually refers to a permanent change of home. It can also, however, be applied more widely to include temporary changes involving seasonal and daily movements. It includes movements both between countries and within a country. Migration affects the distribution of people over a given area as well as the total population of a region and the population structure of a country or city. The various types of migration are not easy to classify, but one method is given in Figure 13.28.

Internal and external (international) migration

Internal migration refers to population movement within a country, whereas external migration involves a movement across national boundaries and between countries. External migration, unlike internal movement, affects the total population of a country. The **migration balance** is the difference between the number of **emigrants** (people who leave the country) and **immigrants** (newcomers arriving in the country). Countries with a **net migration loss** lose more through emigration than they gain by immigration and, depending upon the balance between birth and death rates, may have a declining population. Countries with a **net migration gain** receive more by immigration than they lose through emigration and so are likely to have an overall population increase (assuming birth and death rates are evenly balanced).

Permanent	External (international):	between countries
	1 voluntary	West Indians to Britain
	2 forced (refugees)	African slaves to America, Kurds, Rwandans
	Internal:	within a country
	1 rural depopulation	most developing countries
	2 urban depopulation	British conurbations
	3 regional	from north-west to south-east of Britain
Semi-permanent	for several years	migrant workers in France and (former West) Germany
Seasonal	for several months or several weeks	Mexican harvesters in California, holidaymakers, university students
Daily	commuters	south-east England

Figure 13.28

Types of migration

Voluntary and forced migration

Voluntary migration occurs when migrants move from choice, e.g. because they are looking for an improved quality of life or personal freedom. Such movements are usually influenced by 'push and pull' factors (page 366). **Push** factors are those that cause people to leave because of pressures which make them dissatisfied with their present home, while **pull** factors are those perceived qualities that attract people to a new settlement. When people have virtually no choice but to move from an area due to natural disasters or because of economic, religious or social impositions (Figure 13.29), migration is said to be **forced**.

Times and frequency

Migration patterns include people who may move only once in a lifetime, people who move annually or seasonally, and people who move daily to work or school. Figure 13.28 shows the considerable variations in timescale over which migration processes can operate.

Distance

People may move locally within a city or a country or they may move between countries and continents: migration takes place at a range of spatial scales.

Migration laws and a migration model

In 1885, E.G. Ravenstein put forward seven 'laws of migration' based on his studies of migration within the UK. These laws stated that:

- 1 Most migrants travel short distances and their numbers decrease as distance increases (distance decay, page 410).
- 2 Migration occurs in waves and the vacuum left as one group of people moves out will later be filled by a counter-current of people moving in.
- 3 The process of dispersion (emigration) is the inverse of absorption (immigration).
- 4 Most migrations show a two-way movement as people move in and out: net migration flows are the balance between the two movements.
- 5 The longer the journey, the more likely it is that the migrant will end up in a major centre of industry or commerce.
- 6 Urban dwellers are less likely to move than their rural counterparts.
- 7 Females migrate more than males within their country of birth, but males are more likely to move further afield.

Forced migration

- Religious: Jews; Pilgrim Fathers to New England
- Wars: Muslims and Hindus in India and Pakistan; Rwanda, Chechnya
- Political persecution: Ugandan Asians, Kosovar Albanians
- Slaves or forced labour: Africans to south-east USA
- Lack of food and famine: Ethiopians into the Sudan
- Natural disasters: floods, earthquakes, volcanic eruptions (Mt Pinatubo, Case Study 1)
- Overpopulation: Chinese in South-east Asia
- Redevelopment: British inner-city slum clearance
- Resettlement: Native Americans (USA) and Amerindians (Brazil) into reservations
- Environmental: Chernobyl (Ukraine), Bhopal (India)
- Dam construction: Three Gorges (China)

Voluntary migration

- Jobs: Bantus into South Africa, Polish workers to the UK (Places 44), Mexicans into California
- Higher salaries: British doctors to the USA
- Tax avoidance: British pop/rock and film stars to the USA
- Opening up of new areas: American Prairies; Israelis into Negev Desert; Brasilia
- Territorial expansion: Roman and Ottoman Empires, Russians into Eastern Europe
- Trade and economic expansion: former British colonies
- Retirement to a warmer climate: Americans to Florida
- Social amenities and services: better schools, hospitals, entertainment

Prevention of voluntary movement

- Government restrictions: immigration quotas, Berlin Wall, work permits
- Lack of money: unable to afford transport to and housing in new areas
- Lack of skills and education
- Lack of awareness of opportunities
- Illness
- Threat of family division and heavy family responsibilities

Reasons for return

- Racial tension in new area
- Earned sufficient money to return
- To be reunited with family
- Foreign culture proved unacceptable
- Causes of initial migration removed (political or religious persecution)
- Retirement

Barriers to return

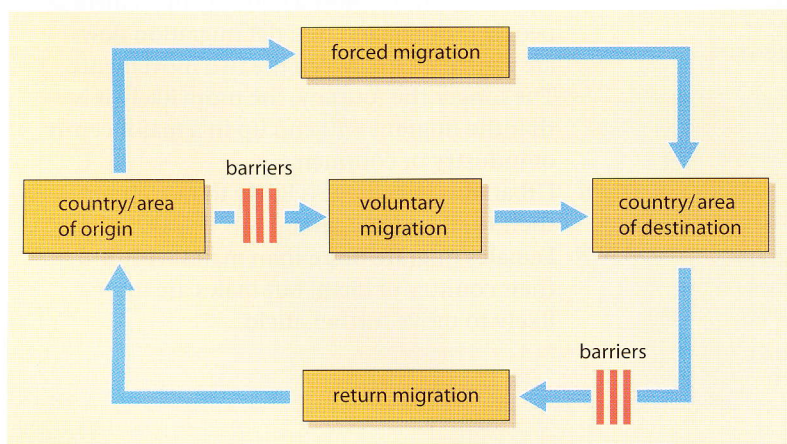
- Insufficient money to afford transport
- Standard of living lower in original area
- Racial, religious or political problems in original area
- Loss of family ties

Figure 13.29
Causes of migration, with examples

More recent global migration studies have largely accepted Ravenstein's 'laws', but have demonstrated some additional trends:

- 8 Most migrants follow a step movement which entails several small movements from the village level to a major city, rather than one traumatic jump.
- 9 People are leaving rural areas in ever-increasing numbers, especially in China.
- 10 People move mainly for economic reasons, e.g. jobs and the opportunity to earn more money. Growing numbers of short-term migrant workers send remittances home – a major factor of globalisation.
- 11 Most migrants fall into the 20–34 age range.

Figure 13.30
A migration model (after Hornby and Jones)



- 12 With the exception of short journeys in developed countries, males are the more mobile. (In many societies, females are still expected to remain at home.)
- 13 There are increasing numbers of migrants who are unable to find accommodation in the place to which they move; this forces them to live on the streets, in shanties (Places 57, page 443) and in refugee camps (page 367).
- 14 There are increasing numbers of refugees, displaced persons and economic and illegal immigrants (page 367).

The examples in Figure 13.29 help to explain the migration model shown in Figure 13.30.

Migration within developed countries

Certain patterns of internal migration are more characteristic of developed countries than economically less developed countries. Three examples have been chosen to illustrate this: rural–urban movement; regional movement; and movements within and out of large urban areas.

Rural–urban movement

Although rural depopulation is now a worldwide phenomenon, it has been taking place for much longer in the more developed, industrialised countries. Figure 13.31 and Places 41 describe and explain the changing balance between rural and urban dwellers in China since 1980.

Places 41 China: rural–urban migration

Since about 1980, rural–urban migration has become not only a major socio-economic phenomenon in China, but probably the world's greatest ever internal movement of people.

The 1940s and 1950s were a time when rural labourers were encouraged to participate in urban development. Although 40 million were recruited, only just over 10 per cent of the country's total population then lived in urban areas. Between 1958 and 1983, under the system of *hukou*, rural labourers were forbidden to leave their home villages to seek jobs or to run businesses without official permission. Rural poverty increased.

In 1984, an official document was issued which allowed rural workers to enter cities to seek work. This complete change in policy was closely related to other socio-economic and institutional changes, such as the replacement of the commune system and the creation of the Responsibility Scheme (Places 63, page 468); the reform of the system of purchase and sale of food products; the beginnings of mechanisation of agriculture; and the setting-up of 5 Special Economic Zones (SEZs) and 15 Open Cities in coastal areas (Case Study 19). Although policies at central level now encouraged a regulated movement of people to urban areas, some coastal areas and larger cities tried, at a local level, to impose restrictions limiting a totally free movement of workers. Even so, the urban population had increased to 36 per cent by 2000, and with between another 13 to 16 million workers now moving each

year to cities, to 44 per cent by 2008. To keep pace with China's industrial growth, the government now hopes that between 300 and 500 million people will leave their rural homes and settle in coastal provinces and cities by 2020, by which time the urban population could be almost 60 per cent of the total.

Seventy per cent of migrant labourers are between 16 and 35 years of age; most have received up to nine years of education and about one-third are female (Case Study 21). They contribute significantly to the development of China's industries, especially those producing cheap goods intended for global markets.

Figure 13.31

Migration within China



Regional movement in Britain

For over a century there has been a drift of people from the north and west of Britain to the south-east of England. The early 19th century was the period of the Industrial Revolution when large numbers of people moved into large urban settlements on the coalfields of northern England, central Scotland and South Wales, and to work in the textile, steel, heavy engineering and shipbuilding industries. However, since the 1920s there has been more than a steady drift of population away from the north of Britain to the south (Figures 13.32, 13.33 and 13.34). Some of the major reasons for this movement are listed here.

- A decline in the farming workforce and rural population, for reasons similar to those quoted in Places 41 on rural–urban movements.
- The exhaustion of supplies of raw materials (coal and iron ore).

- The decline of the basic heavy industries such as steel, textiles and shipbuilding. Many industrial towns had relied not only on one form of industry but, in some cases, on one individual firm. With no alternative employment, those wishing to work had to move south.
- Higher birth rates in the industrial cities meant more potential job-seekers.
- New post-war industries, which included car manufacturing, electrical engineering, food processing and, since the 1980s, micro-electronics and high-tech industries, have tended to be market-oriented. They are said to be footloose, in the sense that they have a free choice of location – unlike the older industries which had to locate near to sources of raw materials and/or energy supplies.
- The ageing population is attracted to the south coast for retirement.

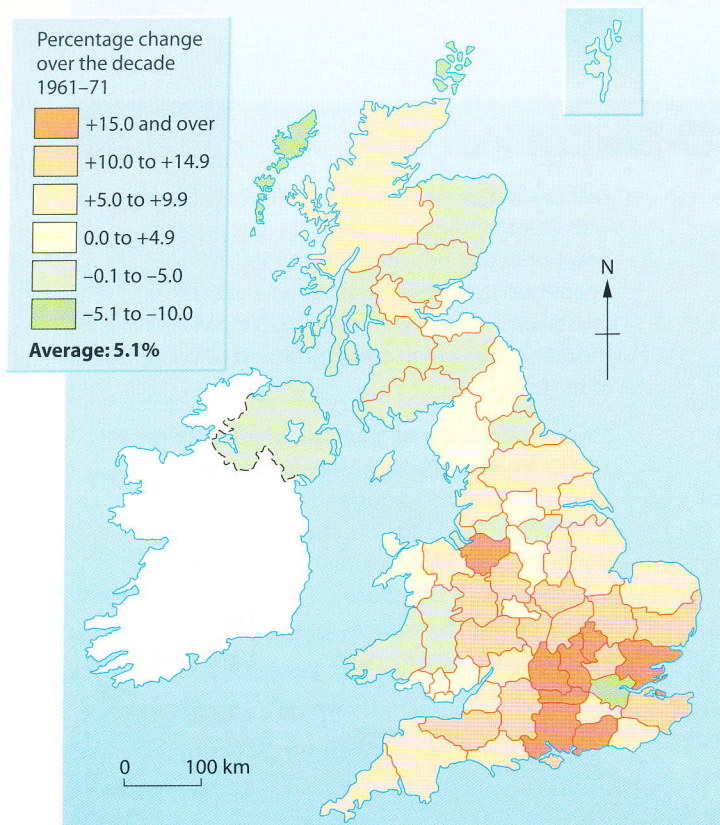


Figure 13.32
Population changes
in the UK, 1961–71
(boundaries adjusted
to the 1974 changes)

- The growth of service industries has been mainly in the south-east. This has resulted from the many office firms wanting a prestigious London address, the growth of government offices, the demand for hospitals, schools and shops in a region where one in five British people live, and tourism taking advantage of Britain's warmer south coast.
- Joining the EU meant increased job opportunities in the south and east, while traditional industrial areas and ports such as Glasgow, Liverpool and Bristol, which had links with the Americas, have declined.
- Salaries were higher in the south.
- With so much older housing, derelict land and waste tips, the quality of life is often perceived as being lower in the north, despite the beauty of its natural scenery and slower pace of life.
- There are more social, sporting and cultural amenities in the south.
- Communications were easier to construct in the flatter south. Motorways, railways, international airports, cross-Channel ports and the Channel Tunnel were built and/or improved as this region had the greatest wealth and population size.

Movements within urban areas

Since the 1930s there has been, in Britain, a movement away from the inner cities to the suburbs – a movement accelerated first by improved public transport provision and then by the increase in private car ownership. The former

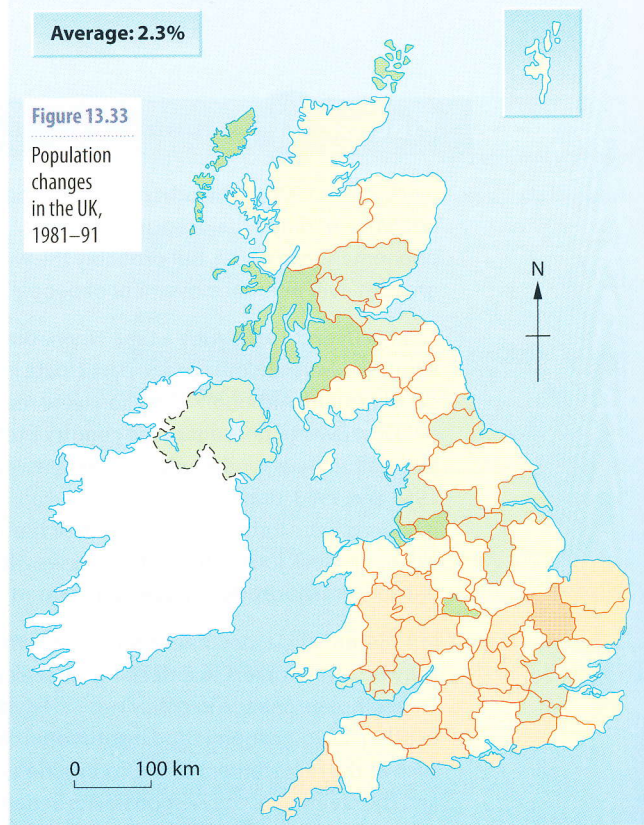
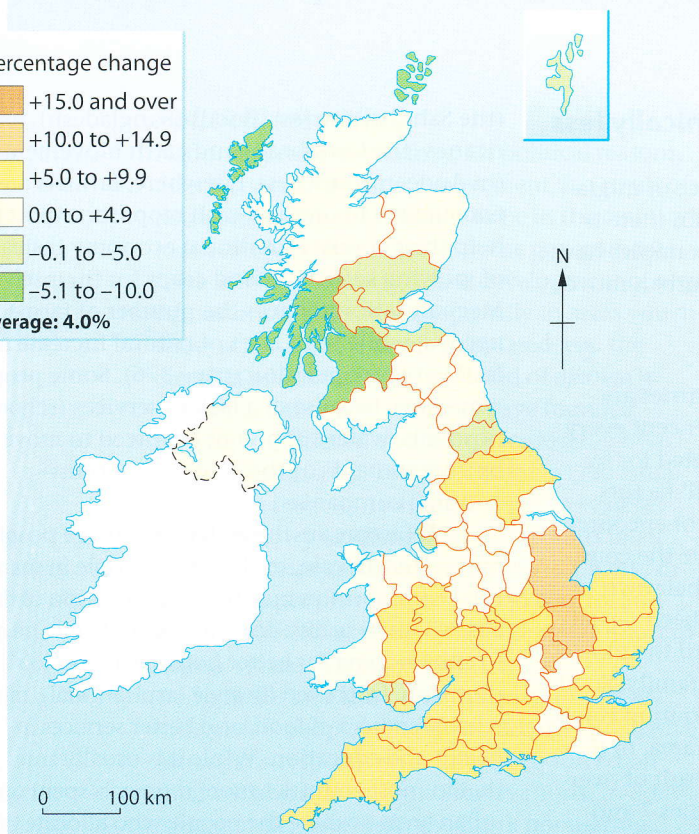
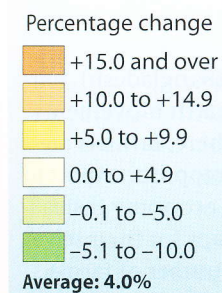


Figure 13.33
Population changes
in the UK,
1981–91

included more bus services, the extension of the London Underground and the construction of the Tyne and Wear Metro. Some of the many stereotyped reasons for this outward movement are summarised in Figure 13.35. The result, in human terms, has been a polarisation of groups of people within society and the accentuation of inequalities (wealth and skills) between them. (Beware, however, of the dangers of stereotyping when discussing these inequalities; Framework 14, page 437.)

- The inner cities tended to be left with a higher proportion of low-income families, handicapped people, the elderly, single-parent families, people with few skills and limited qualifications, first-time home-buyers, the unemployed, recent immigrants and ethnic minorities.
- The suburbs tended to attract people moving towards middle age, married with a growing family, possessing higher skills and qualifications, earning higher salaries, in secure jobs and capable of buying their own homes and car. Recently there has been, in part at least, a reversal of this movement and parts of some inner cities have become regenerated and 'fashionable'. This re-urbanisation is partly due to energy conservation, partly to changes in housing markets, partly to planning initiatives such as refurbished waterfronts (London, Places 56, page 440; Baltimore) and partly to new employment growth (leisure, financial services).



Movements away from conurbations

After the mid-1950s, large numbers of people moved out of London altogether (Figure 13.36). Initially these were people who were virtually forced to move as large areas of 19th-century inner-city housing were demolished. Many of these people were rehoused in one of the several planned new towns that were created around London. More recently, even the outer suburbs have lost population (Figure 13.35) as people moved, often voluntarily, to smaller towns, or into commuter and suburbanised villages, with a more rural environment. This process of counter-urbanisation became characteristic of all Britain's conurbations (Figure 13.37) until a reverse movement began, initially in the 1990s mainly due to the regeneration of inner-city areas (especially those with a quayside location) and in the 2000s as an increasing number of migrants moved in.

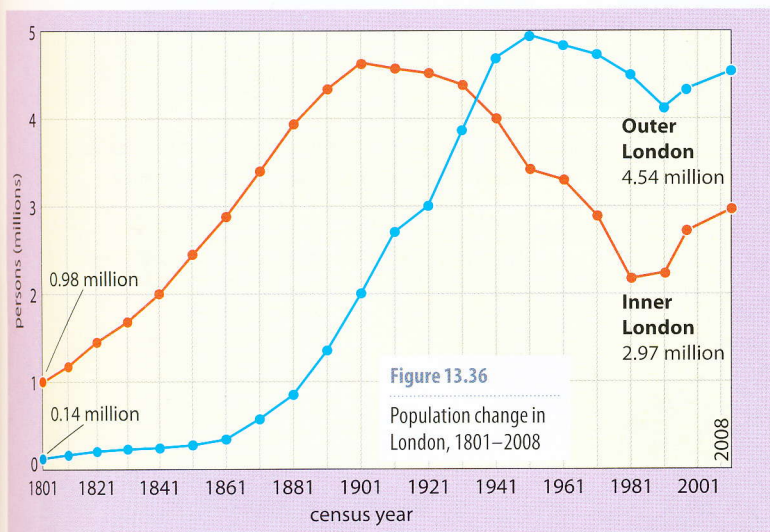
Figure 13.34

Population changes in the UK, 2001–2006

Figure 13.35

Some causes of migration from the inner cities to the suburbs

	Inner city	Suburbs
Housing	Poor quality; lacking basic amenities; high density; overcrowding	Modern; high quality; with amenities; low density
Traffic	Congestion; noise and air pollution; narrow, unplanned streets; parking problems	Less congestion and pollution; wider, well-planned road system; close to motorways and ring roads
Industry	Decline in older secondary industries; cramped sites with poor access on expensive land	Growth of modern industrial estates; footloose and service industries; hypermarkets and regional shopping centres; new office blocks and hotels on spacious sites
Jobs	High unemployment; lesser-skilled jobs in traditional industries	Lower unemployment; cleaner environment; often more skilled jobs in newer high-tech industries
Open space	Limited parks and gardens	Individual gardens; more, larger parks; nearer countryside
Environment	Noise and air pollution from traffic and industry; derelict land and buildings; higher crime rate; vandalism	Cleaner; less noise and air pollution; lower crime rate; less vandalism
Social factors	Fewer, older services, e.g. schools and hospitals; ethnic and racial problems	Newer and more services; fewer ethnic and racial problems
Planning and investment	Often wholesale redevelopment/clearance; limited planning and investment	Planned, controlled development; public and private investment
Family status/wealth	Low incomes; often elderly and young; large family or none	Improved wealth and family/professional status



Conurbation	1961–71	1971–81	1981–91	1991–96	2001–06
Greater London	-6.8	-11.3	-4.9	+5.9	+2.6
Inner London	-13.2	-20.0	-6.6	+8.1	+4.0
Outer London	-1.8	-5.0	-4.1	+7.7	+1.7
Greater Manchester	+0.3	-5.6	-5.5	+3.0	+0.1
Merseyside	-3.6	-9.3	-9.1	+1.2	-3.0
South Yorkshire	+1.5	-2.3	-4.1	+3.3	+0.1
Tyne and Wear	-2.6	-6.3	-5.4	+2.9	-2.6
West Midlands	+17.8	-5.9	-5.5	+3.6	+2.2
West Yorkshire	+3.1	-2.2	-2.7	+4.8	+2.2
Glasgow City	-13.8	-23.1	-15.5	+2.6	-5.5

Figure 13.37

Population change in UK conurbations (percentage change per decade)

Internal migration in economically less developed countries

There is usually a much greater degree of migration within developing countries than there is in more developed countries. Two examples have been chosen to illustrate this: rural–urban movement and political resettling.

Rural–urban movement

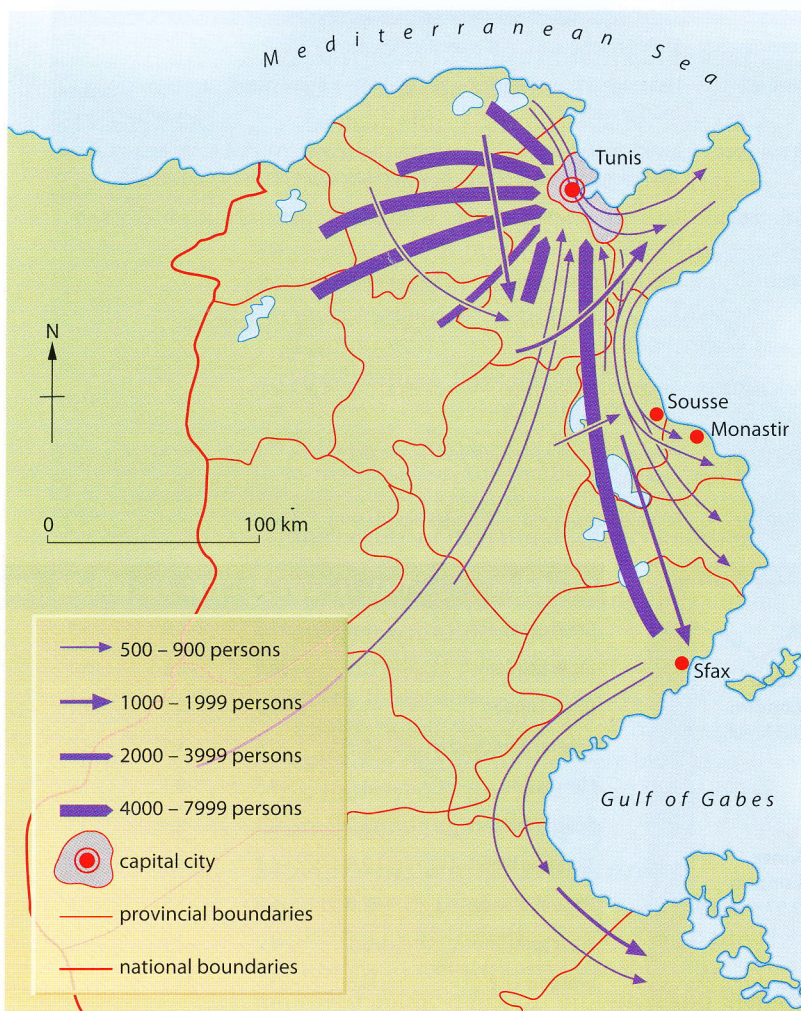
Many large cities in developing countries are growing at a rate of more than 20 per cent every decade. This growth is partly accounted for by rural ‘push’ and partly by urban ‘pull’ factors.

Push factors are those that force or encourage people to move – in this case, to leave the countryside. Many families do not own their own land or, where they do, it may have been repeatedly divided by inheritance laws until the plots have become too small to support a family. Food shortages develop if the agricultural output is too low to support the population of an area, or if crops fail. Crop failure may be the result of overcropping and overgrazing (Case Studies 7 and 10), or natural disasters such as drought

(the Sahel countries), floods (Bangladesh), hurricanes (the Caribbean) and earth movements (in Andean countries). Elsewhere, farmers are encouraged to produce cash crops for export to help their country’s national economy instead of growing sufficient food crops for themselves. Mechanisation reduces the number of farmers needed, while high rates of natural increase may lead to overpopulation (page 376). Some people may move because of a lack of services (schools, hospitals, water supply) or be forced to move by governments or the activities of transnational companies.

Pull factors are those that encourage people to move – in this case, to the cities. People in many rural communities may have a perception of the city which in reality does not exist. People migrate to cities hoping for better housing, better job prospects, improved lifestyle (aspirational), more reliable sources of food, and better services in health and education. While it is usually true that in most countries more money is spent on the urban areas – where the people who allocate the money themselves live – the present rate of urban growth far exceeds the amount of money available to provide accommodation for all the new arrivals. Recent studies seem to confirm that many migrants make a stepped movement from their rural village first to small towns, then to larger cities and finally to a major city.

Figure 13.38
Migration patterns



Places 42 Tunisia: migration patterns

Figure 13.38 shows migration patterns in Tunisia. There are several points to notice:

- There is a greater movement of rural than of urban dwellers.
- Most migrants move to Tunis, the capital city.
- Most migrants tend to travel short distances: relatively few make long journeys (distance decay factor, page 410).
- Most move from rural, inland, desert areas to urban, coastal areas.
- A few move from Tunis to coastal towns, such as the holiday resorts of Sousse and Monastir.
- Very few migrants return to rural districts.
- There is evidence of a twofold movement into and out of Tunis and Sfax.

Political resettling

National governments may, for political reasons, direct, control or enforce movement as a result of decisions which they believe to be in the country's (or their own) best interests. Some governments have actively encouraged the development of new community settlements, especially in areas which were, at the time, sparsely populated, e.g. the creation of *kibbutzim* in Israel and of *ujamaa* in Tanzania. Other governments have founded new capital cities in an attempt to develop new growth regions, e.g. Brasilia, Dodoma (Tanzania) and Abuja (Nigeria); while others have built settlements to try to strengthen their claims to an area (e.g. Israeli settlements in the West Bank) or to rehouse people moved for flood control and the production of energy (Three Gorges Project in China – Places 82, page 544).

In Brazil and the USA, minority groups of indigenous people – the Amerindians and Native Americans respectively – have been forced off their tribal lands and onto reservations. In South Africa, under *apartheid*, the black population was forced to live either in shanty settlements in urban townships or on homelands in rural areas, which lacked resources (Places 45, page 372). In the last few years, an increasing number of people have been forced to move due to so-called 'ethnic cleansing' policies enforced by several governments, as in the former Yugoslavia.

External migration

- **Refugees** The United Nations High Commission for Refugees (UNHCR) defines a refugee as 'a person who cannot return to

his or her own country because of a well-founded fear of persecution for reasons of race, religion, nationality, political association or political opinion'. The term is often expanded to include people forced to leave their home country due to internal strife (civil wars) or environmental disasters (e.g. earthquakes, famine) in order to seek security or help.

- **Asylum seekers** are people who have left their country of origin, have applied for recognition as a refugee, and are awaiting a decision on their application. International law recognises the right of individuals to seek asylum but does not force states to provide it.
- **Economic migrants** make a conscious choice to leave their country of origin knowing that they will be able to return to it without any problems at a future date. This group includes **migrant workers** (page 369).
- **Illegal immigrants** enter a country without meeting the legal requirements for entry or residence. They often arrive with only the barest necessities and without personal documents or passports. Many become part of the 'hidden economy', having to rely on people for shelter and work which leaves them vulnerable to exploitation.
- **Internally Displaced Persons (IDPs)** are included here for although they have not left their country of origin, they may have been forced to flee their home for similar reasons to those of refugees. Many IDPs exist in the same conditions and face the same problems as do refugees. Globally, IDPs outnumber refugees.

Before the Second World War, the majority of refugees tended to become assimilated in their new host country but since then, and beginning with the setting-up of Palestinian Arab camps following the creation of the state of Israel in 1948, the number of permanent refugees has risen rapidly. According to UNHCR, the number of global refugees reached a peak of 17.6 million in 1992 before falling to a trough of 13.2 million in 1999 before rising once again. The UNHCR claim that as most refugees are illegal immigrants, accurate figures are impossible to give but they believed that in 2008 there were 16 million refugees and 51 million IDPs, of whom 26 million were conflict-generated IDPs and 25 million were natural disaster IDPs (Figure 13.40). The refugee and IDP problem has intensified due to conflicts in countries such as Iraq and Afghanistan, and food shortages and political unrest in much of sub-Saharan Africa including Darfur, Somalia and Zimbabwe (Figure 13.39).

Figure 13.39

Part of a displacement camp at Nyaconga, Rwanda



Places 43 The world: refugees

The UNHCR have, in previous years, pointed out that half of the world's refugees are children of school age; most adult refugees are female; and four-fifths of the total are in developing countries which have the fewest resources to deal with the problem. Refugees usually live in extreme poverty and lack food, shelter,

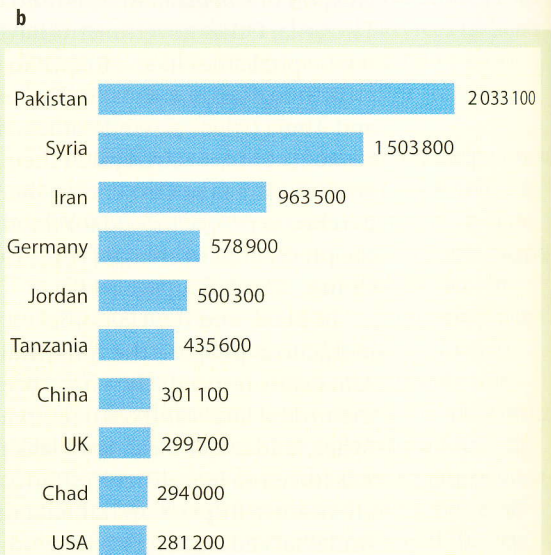
clothing, education and medical care – the basic Millennium Development Goals (page 609). They rarely have citizenship and few (if any) civil, legal or human rights. There is little prospect of their returning home and the long periods spent in camps means that they often lose their sense of identity and purpose.

Figure 13.40

World refugees at the end of 2007

a World total
b Major refugee hosting countries

Region	Total refugees at end 2007
UNHCR regions	
Central Africa and Great Lakes	1 100 100
East and Horn of Africa	815 200
Southern Africa	181 200
West Africa	174 700
Total Africa (excluding North Africa)	2 271 200
Americas	987 500
Asia and Pacific	3 825 000
Europe	1 585 300
Middle East and North Africa	2 721 600
Total UNHCR regions	11 390 600
UNRWA regions (Palestinians)	4 622 000
Total all refugees	16 012 600



A 2008 analysis of refugee data by UNHCR revealed two major patterns:

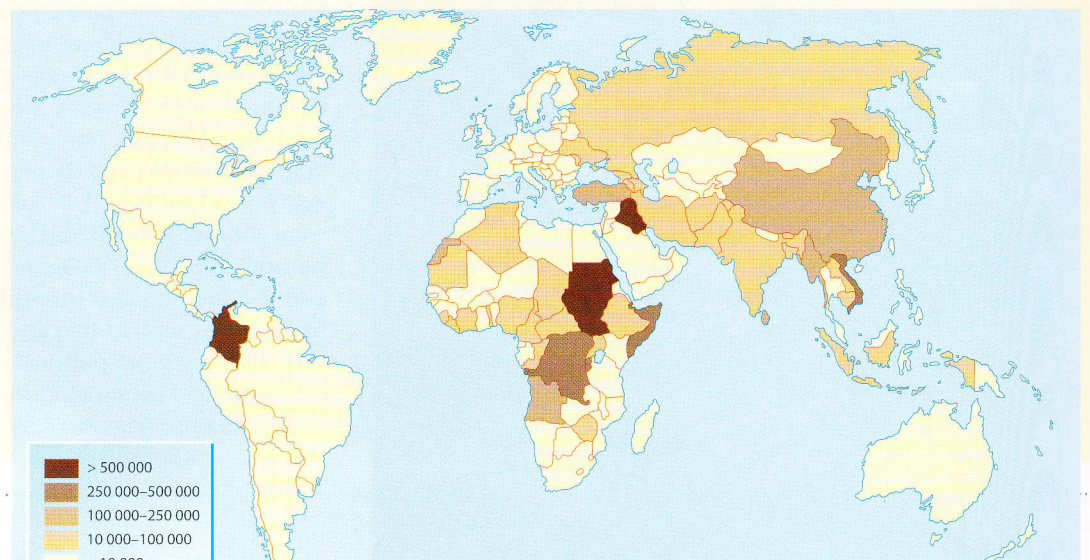
- 1 The vast majority of refugees are hosted by neighbouring countries, with over 80 per cent remaining in their region of origin i.e. within Africa or the Middle East. This conflicts with the perception that many seek protection in North America or Western Europe.
- 2 The number of refugees living in urban areas continues to grow and now exceeds 50 per cent of the total.

Apart from 4.6 million Palestinian refugees who come under UNRWA which is a different UN department from UNHCR, Afghanistan continues to be the leading

country of origin. At the end of 2007 (Figure 13.41), there were almost 3.1 million Afghan refugees, of whom 96 per cent were to be found in neighbouring Pakistan and Iran, and 2.3 million Iraqis, most of whom have sought refuge in Syria or Jordan. Afghans and Iraqis together account for almost half of the world's total refugees under UNHCR responsibility, followed by half a million Colombians. Other main source countries were the Sudan, Somalia, Burundi and the Democratic Republic of the Congo. At that same time, about 60 per cent of all refugees were residing in Asia, particularly Pakistan, Syria and Iran (Figure 13.40b). Of the remainder, Africa, Europe and North America respectively hosted 20, 14 and 9 per cent.

Figure 13.41

Major source countries of refugees, 2007



Migrant workers

As economic development has taken place at different rates in different countries, supplies of and demand for labour are uneven, and due to improvements in transport there has been an increase in the number of people who move from one country to another in search of work. Such cross-border movements in search of work can operate at different timescales. For example:

- **Permanent** For a century and a half, the UK has received Irish workers and, since the 1950s, West Indians and citizens from the Indian subcontinent. Most of these migrants have made Britain their permanent home.
- **Semi-permanent** After the Second World War, several European countries experienced a severe labour shortage. In order to help rebuild their economies, countries such as

France accepted cheap semi-skilled labour mainly from North Africa while the then West Germany did the same for workers from Turkey, Yugoslavia and the Middle East. Recently, similar types of workers from Eastern Europe, particularly Poland, have been attracted to the UK (Places 44).

- **Short-term and seasonal** The South African economy depends largely on migrant black labour from adjacent nation states. In North America, large numbers of Mexicans find seasonal employment picking fruit and vegetables in California (Case Study 15A).
- **Daily** With the introduction of free movement for EU nationals within the EU, an increasing number of workers commute daily into adjacent countries.

Places 44 UK: Polish migrant workers

In 2004, Poland and seven other former Eastern European countries gained entry into the EU. Of the existing members, only the UK and the Republic of Ireland allowed unlimited immigration from the new members. This led, in the UK, to the largest influx for centuries with, by early 2008, the arrival of over 800 000 migrant workers – an average in excess of 200 000 a year. Of these an estimated 500 000 had come from Poland (Figure 13.42).

Migrants from Poland were largely welcomed as they came with a wide range of skills, many of which were currently lacking in the British workforce. At one end were people who gained senior jobs in administration, business and management such as computing, IT support, teaching and the National Health Service. At the other were those prepared to work for long hours either as health care workers, as shop assistants, or as manual labour in either factories or on farms. Somewhere in the middle were people such as plumbers, electricians, bricklayers and decorators – four other professions in which Britain had a severe skills shortage.

Whereas earlier migrants into Britain tended to concentrate in certain urban areas, and then within specific districts in those areas, it was claimed that by May 2008 Polish workers were living in every local authority area of Britain. As a group, they set up their own radio stations, printed their own newspapers, celebrated church Mass in their own language, produced Polish bread and processed other food products which they then sold in their own shops (Figure 13.43).

Why did they come to the UK?

Most came to find better-paid jobs as, when they arrived, the average wage in the UK was several times higher than that in Poland. To some the idea was to work hard, earn as much money as they could and then return home, hopefully with the finance needed to set up their own business. To others it was a case of earning sufficient money to live on themselves and to send the remainder back to Poland to help their families there improve their standard of living. The majority of immigrants were men, of whom over 80 per cent were aged between 18 and 34 years.

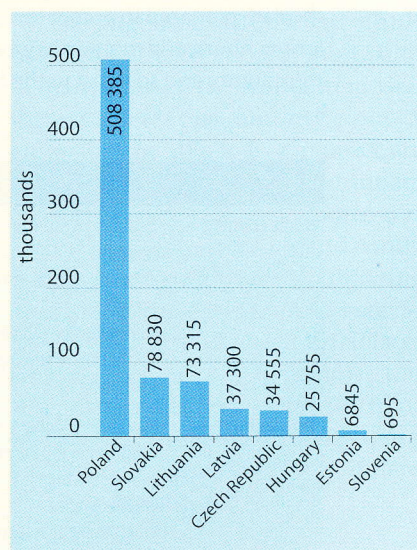


Figure 13.42
Nationality of foreign workers, May 2004 – February 2008



Figure 13.43

One of the many Polish shops to be found in the UK

Peterborough is one of several British towns where Poles now comprise over 10 per cent of the total population. Many have concentrated in the Lincoln Road area where houses were less expensive. Whereas in 2004 the local primary school had had to make provision for children of Pakistani origin, now it has to provide for Polish speakers who, in the four years after 2004, grew from 0 per cent of the school population to over 30 per cent. Although many migrant workers in Peterborough find jobs on building sites or in factories and superstores, the majority seek work on farms in the nearby Fens picking and packing fruit and vegetables (Figure 13.44). Farm labourers are likely to work from 7 am to 5 pm, six days a week. Even with overtime they may only earn between £300 and £500 a week.

The Poles are generally well accepted by local communities in Britain. Perhaps this is because they are European, or is an acknowledgement of just how hard they work and how valuable they are at filling vacancies in the British skills market. However, that is not to say that their presence does not create problems. In large numbers they can 'swamp' schools, hospitals and other services; by buying property at the lower price range they compete with local first-time buyers; those with fewer skills compete with local job-seekers, because they are prepared to accept lower wages and longer hours; and money they earn is sent out of the country and so is lost to the British economy.



Figure 13.44

Polish workers picking vegetables from the fields of East Anglia

In contrast, while families in Poland benefit from remittances sent back to them, the country as a whole may lose its most skilled and educated workers; has to train women to fill job vacancies; and sees families divided with so many males working abroad.

Why are they returning home?

By 2008, the migration pattern began to alter. Since the first arrivals in 2004, prices in the UK have increased far more than they have in Poland. Also, as the pound has become weaker in comparison with the Polish zloty, the UK is less attractive as a place to live and work. Meanwhile the Eastern European economy has grown and both investment and wages within Poland have increased. The result is that many Poles are now beginning to return home to build their own houses, set up their own businesses and to start families. They are also needed to provide facilities, including stadiums for the 2012 UEFA football tournament which is to be held in Poland. Some predictions suggest that half the Polish workers will have returned home by 2010 leaving Britain, once again, with a shortage of skills.

Figure 13.45 lists some of the advantages and disadvantages to both the home and the host country with respect to migrant workers. The same can be applied to migrant workers from North Africa into France, Turkey into Germany, and Mexico into California, as from Poland into the UK.

Figure 13.45

Advantages and disadvantages of migrant workers

	Advantages	Disadvantages
Home country	<ul style="list-style-type: none"> • Reduces pressure on jobs and local resources • Birth rate may be lowered as people of child-bearing age leave • Money may be received as remittances from abroad • Migrants may develop new skills which they can bring back home 	<ul style="list-style-type: none"> • People of working age migrate • Those with skills and education are most likely to leave • It is mainly males who migrate and this divides families • An elderly population is left with fewer people to look after them • Can create a dependency on money being sent back as remittances
Host country	<ul style="list-style-type: none"> • May receive highly skilled migrants to fill specialised vacancies in the job market • Labour shortage overcome, especially in dirty, poorly paid, unskilled jobs • Provides cheaper labour who work for longer hours • Cultural advantages of discovering new foods, music, pastimes, etc. 	<ul style="list-style-type: none"> • Migrants can put a strain on local services and resources • Resentment towards migrants if they take the best jobs • Some migrant groups do not mix and try to retain their own culture • Mainly young males which can create social problems • Migrants may feel discriminated against which can cause racial tension



Multicultural societies

This is often a sensitive and emotive issue. Attempts here to explain terms are not intended to cause insult or resentment.

The latest scientific research suggests that humans evolved in central Africa about 200 000 years ago and began, 100 000 years later, to migrate to other parts of the world. This common origin, identified by the study of genes, shows that humans are genetically homogeneous to a degree unparalleled in the animal kingdom.

Previous scientific opinion suggested that the many peoples of the modern world had descended from three main races. These were the Negroid, Mongoloid and Caucasoid. The dictionary definition of *race* is 'a group of people having their own inherited characteristics distinguishing them from people of other races', e.g. colour of skin and physical features. In reality, often because of intermarriage, the distinction between races is now so blurred that the word 'race' has little significant scientific value. Today, while colour still remains the most obvious visible characteristic, groups of people differ from one another in religion, language, nationality and culture. These differences have led to the identification of many ethnic groups.

What criteria do members of various ethnic groups prefer to use when identifying themselves?

- **Colour of skin** Whereas people of 'European' stock have long accepted being called 'white', it is only in more recent years that, in Britain, people from Africa and the Caribbean have

preferred to be known collectively as 'black'. The 1971 UK census divided immigrants born in Commonwealth countries into the Old (white) and New (black) Commonwealth. (It made no allowance for children born in the UK of New Commonwealth parentage.)

- **Place of birth (nationality)** *The Annual Abstract of Statistics* for the UK lists immigrants under the heading 'country of last residence' – thus avoiding a reference to colour. Most groups of people, in the USA for example, have been identified by their place of birth, or that of their ancestors, and are known as Chinese, Puerto Rican, etc. There is currently a major movement in the USA (and to a lesser extent in the UK) by blacks, also wishing to be identified by place of origin, to be referred to as African-Americans. Will black people in the UK eventually prefer to be known as African-Caribbean, African-British, or another term not yet invented?

- **Language** At present, the largest group of migrants moving into the USA is the Hispanics, i.e. Spanish speakers. These migrants, mainly from Mexico, Central America and the West Indies, have been identified and grouped together by their common language and higher fertility.

- **Religion** Other ethnic groups prefer to be linked with, and are easily recognised by, their religion, e.g. Jews, Sikhs, Hindus and Muslims. The 1991 UK census asked respondents, for the first time, to identify themselves by ethnic group. Figure 13.46 lists these groups, and gives the results of this question, which was repeated in the 2001 census. The increase in Asian or Asian British was due to their high birth rates, not to new immigrants.

The migrations of different ethnic groups have led to the creation of multicultural societies in many parts of the world. In most countries there is at least one minority group. While such a group may be able to live in peace and harmony with the majority group, unfortunately it is more likely that there will be prejudice and discrimination leading to tensions and conflict. Four multicultural countries with differing levels of integration and ethnic tension are: South Africa (Places 45), the USA and Brazil (Places 46), and Singapore (Places 47). Remember, though, that when we look at these countries from a distance we can rarely appreciate the feelings generated by, or the successes/failures of, different state or government policies.

Figure 13.46

Ethnic groups in Britain at the 1991 and 2001 censuses

Ethnic groups	Percentage in each group	
	1991	2001
White	94.5	92.1
Mixed*	–	1.1
Asian or Asian British		
Indian	1.5	1.8
Pakistani	0.9	1.3
Bangladeshi	0.3	0.5
Other Asian	0.4	0.4
Black or black British		
Black-Caribbean	0.9	1.0
Black-African	0.4	0.8
Black Other	0.3	0.2
Chinese	0.3	0.4
Other	0.5	0.4
Total non-white	5.5	7.9

* New category for 2001 census for people considering themselves to belong to more than one group

Places 45 South Africa: a multicultural society

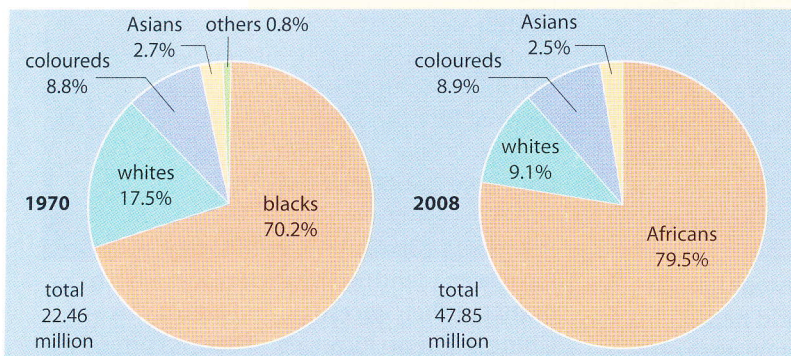


Figure 13.47

Ethnic groups in South Africa, 1970 and 2008

As shown in Figure 13.47, the population of South Africa doubled between 1970 and 2008 and the proportion of Africans (referred to as blacks in 1970) had increased considerably.

The first inhabitants in this region were the San (Bushmen) and Khoi-Khoi. Today's African majority originated as Bantu speakers who migrated into the area many centuries ago, while the white population is descended from Dutch, German, French and British immigrants who arrived after the 1650s. Asians, mainly from India, Malaysia and Indonesia, began arriving after 1860. The coloured ethnic group result from mixed relations between European settlers, Asian migrants and indigenous peoples.

A policy of segregation between black and white originated in the first Dutch settlement, the Cape, in 1652. This practice became customary, and was established legally as apartheid by the first National Party government in 1948 when some members of the Party united to protect their language, culture and heritage from a perceived threat by the black majority and to assert their economic and political independence from British colonial domination.

Statutory apartheid regulated the lives of all groups, but particularly of blacks, coloureds and Indians. The Population Registration Act categorised the nation into White, Black, Indian, Malay and Coloured citizens. Further Acts made mixed marriages illegal, and prescribed segregation in restaurants, transport, schools, places of entertainment and political parties. The Group Areas Act stipulated where and with whom people could live; and the Black Authorities Act established black homelands.

The outcome of all this legislation was the unequal division of rights and resources. This included the disproportionate division of land; the unequal distribution of funding for education; and the general denial of constitutional rights for the majority of South Africans.

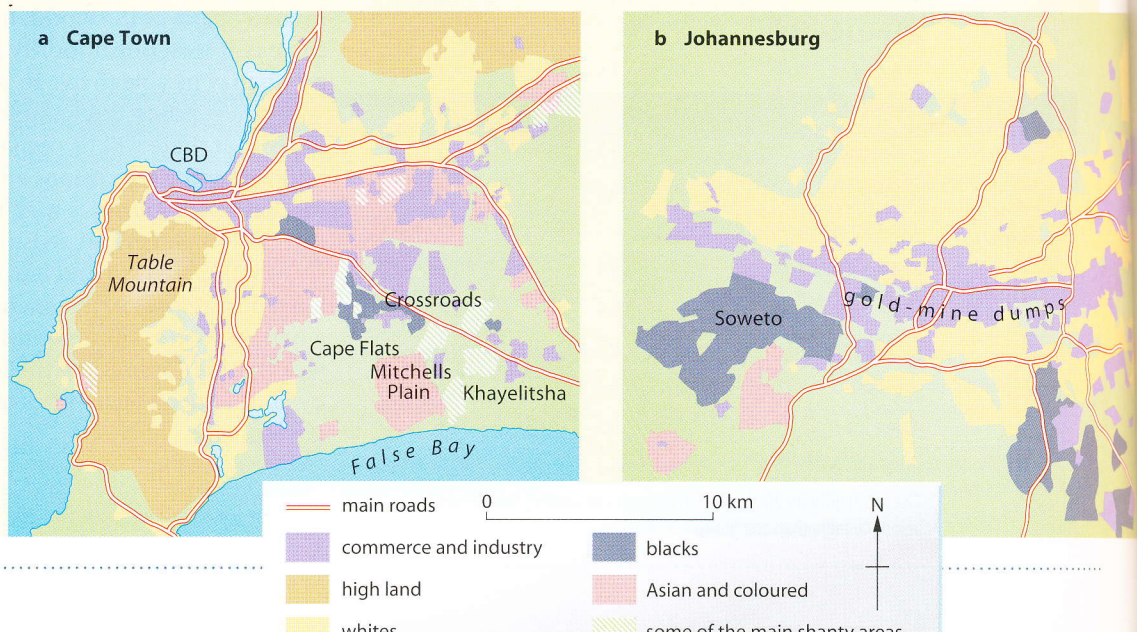
Legalised racial discrimination was abolished in the early 1990s and the first free all-party elections, held in 1994, established a multi-party Government of National Unity. This ended the existence of the homelands and set out to improve standards and to reduce inequality in human rights, housing, health care, education and land ownership. It was expected that the legacy of apartheid, some aspects of which are described below, would take many years to eradicate.

Housing

The Group Areas Act (1950) ensured that white, coloured and Asian communities lived in different parts of the city (Figure 13.48) with the whites having the best residential areas (Figure 13.49). Buffer zones at least 100 m wide, often along main roads or railway lines, were created to try to prevent contact between the three groups. Blacks were

Figure 13.48

Segregated residential areas in two South African cities



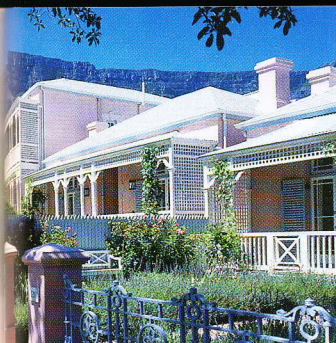


Figure 13.49

A white residential area in Cape Town



Figure 13.50 (centre)

Housing in the Soweto township, Johannesburg



Figure 13.51

Shanty settlement, Khayelitsha, Cape Town

treated differently. Those who had lived in the city since birth, or had worked for the same employer for 10 years, were moved to newly created townships on the urban fringes. The remainder were forced away from the cities to live on one of ten designated reserves or homelands, where the environmental advantages were minimal (drought, poor soils and a lack of raw materials). The homelands took up 13 per cent of South Africa's land; held 72 per cent of its total population; and produced 3 per cent of the country's wealth. Most blacks living in the homelands were employed on one-year contracts, to prevent them gaining urban residential rights.

Life in the townships was no less difficult. These were built far away from white residential areas, which meant that those blacks who found jobs in the cities had long and expensive journeys to work. Many of the original shanty towns have been bulldozed and replaced by rows of identical, single-storey houses (Figure 13.50). These have four rooms and a backyard toilet, but only 20 per cent have electricity. Corrugated-iron roofs make the buildings hot in summer and cold in winter. The settlements lack infrastructure and services and, due to rapid population growth (high birth rates and in-migration), are surrounded by vast shanty settlements (Figure 13.51). Two of the better-known townships are Soweto in Johannesburg (an estimated 4 million inhabitants) and Cape Flats in Cape Town.

Although the African National Congress (ANC) had managed to build 700 000 new houses by 2000, thousands of Africans were still living either in the squalid poverty-stricken squatter camps which had developed during the apartheid era, or in new, but mainly one-roomed, low-cost housing which, their owners claimed, were often poorly constructed and too small for their large families.

Guguletu is part of Cape Flats (Figure 13.48). In the late 1990s, a typical shack was small, 3 m square, and built from discarded wood and corrugated iron (compare Figure 13.51). Doors and windows were held together by nails or string while bricks and rope held down the flat roof. Up to six people might live in a shack which may have contained, as furniture, only a bed, some seating and a table. Although electricity was often available, most shacks lacked running water and sewerage and up to six families were obliged to share

an outdoor toilet and had to queue each morning for their daily water supply. Roads were rarely maintained. However, since then several self-help schemes, most run by women, have developed skills, created jobs and improved the quality of some of the housing.

In 2004 people in Soweto celebrated the centenary of the township. They were also celebrating its transformation from a hopeless ghetto to both a tourist attraction and a desirable suburb. Most of the residents lived in new homes, although they were still small. The relatively few remaining old shacks housed the newest arrivals who tended to be migrants who had fled the poverty of rural South Africa. Local people have, in the last decade or so, developed a sense of optimism for the future despite the fact that unemployment in Soweto is about 40 per cent and violent crime and AIDS are still major problems.

Employment

Under apartheid, blacks were severely restricted in mobility and type of job. Male workers had to return to their homeland in order to apply for a job. If successful, they were given contracts to work in 'white' South Africa for 11 months, after which they had to return to their homeland – a policy that prevented migrant workers becoming permanent city residents. Throughout the 1990s unemployment remained the core cause of poverty and social division. In 2007, unemployment was still high although since 1998 it had fallen for Africans from 38 to 27 per cent and for Asians from 11 to 9 per cent (it had remained the same for coloureds and whites at 11 per cent and 4 per cent respectively). It was much higher for women than it was for men.

Education

Under apartheid, schooling was free and compulsory for whites and Asians, but not for coloureds or blacks – the 1996 census showed over one-quarter of black children did not receive any formal education. Despite attempts by the ANC to improve school buildings and to encourage school attendance, in 2007 most whites attended private schools, coloured children went to schools in the suburbs and Africans to those in the townships. White schools still have a better teacher : pupil ratio and a higher proportion of qualified teachers.

The USA

According to the US Census Bureau, the proportion of 'racial and ethnic minority groups' increased from 24 per cent in 1996 to 33 per cent in 2006 (Figure 13.52). Since 45 per cent of under-5-year-olds in the USA belong to this group, as these children reach child-bearing age, together with the half to one million immigrants per year from Mexico, it is predicted that by 2050 over half of the country's population will be from racial and ethnic groups. Already in more than 10 per cent of America's 3140 counties this sector of the population exceeds 50 per cent of the population, especially with blacks in the south-eastern states and Hispanics in the south-west.

Although Americans have long prided themselves that their country is a 'melting pot' in which people of all ethnic groups can be assimilated into one nation, problems have, and do, exist. The indigenous Native American population has been granted reservations where they can maintain their culture, but as these are usually in areas lacking resources, many have drifted to urban areas. Likewise many black African-Americans, released from slavery after the Civil War, could not find jobs on the land and so moved to large urban areas where they congregated in inner-city 'ghettos' (Chicago Places 52, page 421; and Los Angeles Case Study 15B). Hispanics are the largest growing group, most arriving from Mexico and other Spanish-speaking countries in Latin America.

Despite the US claim that it has an 'open-door' policy, strong restrictive laws have frequently been imposed as a barrier to immigration (Figure 13.30), e.g. against Chinese in the 1920s, the Japanese

during the Second World War, Mexicans since the 1980s and, currently, illegal immigrants. Meanwhile many immigrant groups still identify themselves with their 'home country' and its culture, living and marrying within their own ethnic or national group (Puerto Ricans in New York) or congregating to form ethnic areas (Chinatown, Japantown, Koreatown and Filipinotown in Los Angeles).

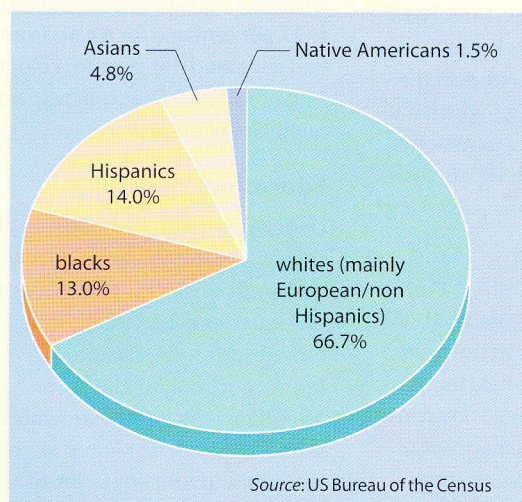
Brazil

Most of the inhabitants of Brazil, having almost every colour of skin conceivable, regard themselves as Brazilians, and the country rightly claims that it has little racial discrimination or prejudice. The Census Department does, however, recognise the following divisions based on colour:

- 1 Whites (*Branco*): anyone with a lighter-coloured skin. This group includes many of the European migrants who came from Portugal (the original colonists), Italy, Germany and Spain.
- 2 Mulatto (*Pardo*): darker skins but with a discernible trace of European ancestry. They are the result of mixed marriages or 'liaisons' between the early Portuguese male settlers and either female Indians or African slaves. There is pride rather than prejudice in coming from two racial backgrounds.
- 3 Blacks (*Preto*): those of pure African descent.
- 4 Orientals (*Amarelo*): recent emigrants from south and east Asia.
- 5 Amerindians: a continually declining, yet still distinctive, indigenous group.

All these groups mix freely, especially at football matches, in carnivals and on the beach. Yet despite the lack of racial tension there tends to be a correlation between colour and social status and employment. Walking into a hotel on arrival in Rio, it is apparent that the baggage-carriers are black, hotel porters a slightly lighter colour and the receptionists and cashiers white. In the army, officers are usually white and the ranks black or mulatto. Similarly, the lighter the colour of skin, the more likely it is that a person will become a doctor, bank manager, solicitor or airline pilot.

Figure 13.52
Ethnic groups in the USA, 2006



Places 47 Singapore: racial and religious harmony

The three main races of Singapore have separate religions, yet each is completely tolerant of the others, with most people even celebrating all three 'New Years' (Figure 13.53). Although by 1994 there was still a Chinatown (restricted to ten streets – Figure 15.48), Arab Street (four streets) and Little India (six streets), the government had pulled down most of the old houses in those areas. Ethnic

concentrations had been broken up and now almost 90 per cent of Singaporeans live in modern high-rise flats either within the city itself or in surrounding new towns (Places 60, page 450). Posters promote racial harmony (Figure 13.54) and all races, religions and income groups live together in what appears to be a most successful attempt to create a national unity – a unity best seen on National Day.

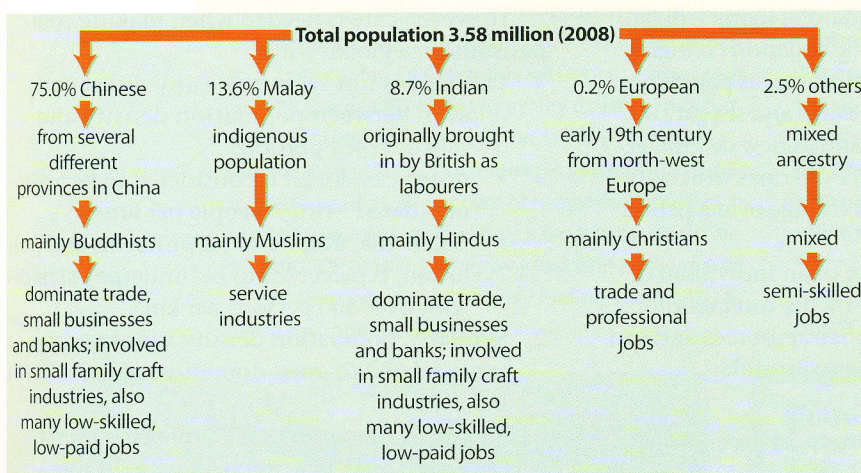


Figure 13.53

Ethnic and religious groups in Singapore

Daily migration: commuting

A commuter is a person who lives in one community and works in another. There are two types of commuting:

- Rural–urban**, where the commuter lives in a small town or village and travels to work in a larger town or city. There is rarely much movement in the reverse direction. The **commuter village** is sometimes also referred to as a **dormitory village** or a **suburbanised village** (page 398).
- Intra-urban**, where people who live in the suburbs travel into the city centre for work. This category now includes inhabitants of inner-city areas who have to make the reverse journey to edge-of-city industrial estates and regional shopping centres.

A **commuter hinterland**, or **urban field**, is the area surrounding a large town or city where the work-force lives. Patterns of commuting are likely to develop where:

- hinterlands are large, communications are fast and reliable (the London Underground), public transport is highly developed and private car ownership is high (south-east England)
- modern housing is a long way from either the older inner-city industrial areas or from

Figure 13.54

Racial harmony poster, Singapore



the CBD (as in the New Towns in central Scotland)

- there is a nearby city or conurbation with plenty of jobs, especially in service industries (London)
- there is no rival urban centre within easy reach (Plymouth)
- salaries are high so that commuters can afford travelling costs
- people feel that their need to live in a cleaner environment outweighs the disadvantages of time and cost of travel to work (people living in the Peak District and working in Sheffield or Manchester)
- housing costs are high so that younger people are forced to look for cheaper housing further away from their work (as in south-east England)
- flexible working hours allow people to travel during non-rush-hour times
- the more elderly members of the workforce buy homes in the country or near to the coast and commute until they retire (the Sussex coast)
- there have been severe job losses which force people to look for work in other areas/towns (some of the inhabitants of Cleveland work in south-east England).

Optimum, over- and under-population

Optimum population

The **optimum population** of an area is a theoretical state in which the number of people, when working with all the available resources, will produce the highest per capita economic return, i.e. the highest standard of living and quality of life. If the size of the population increases or decreases from the optimum, the output per capita and standard of living will fall. This concept is of a dynamic situation changing with time as technology improves, as population totals and structure change (age and sex ratios), trade opportunities alter, and as new raw materials are discovered to replace old ones which are exhausted or whose values change over a period of time.

The **standard of living** of an individual or population is determined by the interaction between physical and human resources and can be expressed in the following formula:

$$\text{Standard of living} = \frac{\text{Natural resources} \left\{ \begin{array}{l} \text{minerals,} \\ \text{energy,} \\ \text{soils, etc.} \end{array} \right\} \times \text{Technology}}{\text{Population}}$$

Overpopulation

Overpopulation occurs when there are too many people relative to the resources and technology locally available to maintain an 'adequate' standard of living. Bangladesh, Ethiopia and parts of China, Brazil and India are often said to be overpopulated as they have insufficient food, minerals and energy resources to sustain their populations. They suffer from localised natural disasters such as drought and famine; and are characterised by low incomes, poverty, poor living conditions and often a high level of emigration. In the case of Bangladesh (Places 48), where the population density increased from 282 people per km² in 1950, to 704 in 1985, and to 1062 in 2008, it is easier to appreciate the problem of 'too many people' than in the case of the north-east of Brazil where the density is less than 2 persons per km² (Places 38, page 347).

Underpopulation

Underpopulation occurs when there are far more resources in an area, e.g. of food, energy and minerals, than can be used by the number of

people living there. Canada, with a total population of 33 million in 2008, could theoretically double its population and still maintain its standard of living (Places 48). Countries like Canada and Australia can export their surplus food, energy and mineral resources, have high incomes, good living conditions, and high levels of technology and immigration. It is probable that standards of living would rise, through increased production and exploitation of resources, if population were to increase.

However, care is needed when making comparisons on a global scale.

- 1 There does not seem to be any direct correlation between population density and over-/underpopulation:
 - north-east Brazil is considered to be 'overpopulated' with 2 people per km²
 - California, despite water problems and pollution, is perceived to be 'underpopulated' with over 600 persons per km².
- 2 Similarly, population density is not necessarily related to gross domestic product (GDP) per capita:
 - the Netherlands and Germany both have a high GDP per capita and a high population density
 - Canada and Australia have a high GDP per capita and a low population density
 - Bangladesh and Puerto Rico have a low GDP per capita and a high population density
 - Sudan and Bolivia have a low GDP per capita and low population density.

The balance of population and resources within a country may also be uneven. For example:

- a country may have a population that is too great for one resource such as energy, yet too small to use fully a second, such as food supply, e.g. Saudi Arabia
- some parts of a country may be well off, e.g. south-east Brazil, while others may be relatively poor, e.g. north-east Brazil.

The relationships between population and resources are highly complex and the terms 'overpopulation' and 'underpopulation' must therefore be used with extreme care.

The latest term to be introduced to try to illustrate the relationship between the increase in the world's population and its effect on the Earth's resources is the **ecological footprint**. This is explained on page 379.

Places 48 Bangladesh and Canada: overpopulation and underpopulation

Is Bangladesh overpopulated?

Bangladesh, with 153.5 million inhabitants (2008), has one of the world's highest population densities with 1062 person per km² (Figure 13.55). It has a high, but falling, birth rate (49 per 1000 in 1970, 29 per 1000 in 2008) and fertility rate (7 per woman in 1970, 3 in 2008) together with a falling death rate (28 per 1000 in 1970, 8 per 1000 in 2008). This led to a high and accelerating natural increase from 1.6 per cent in 1950 to 2.7 per cent in 1990 but this fell back to 2.0 per cent in 2008 (page 349). Infant mortality is also falling, but is still very high (140 per 1000 in 1970, 57 in 2008), and life expectancy is increasing (45 years in 1970, 63 in 2008). In 2008, 37 per cent of the population was under 15 years of age but only 3.5 per cent were over 65. The GDP of US\$ 1300 is very low, and an estimated 45 per cent are living in poverty (defined by the UN as living on under US\$1 a day).

Figure 13.55

High population density in Bangladesh



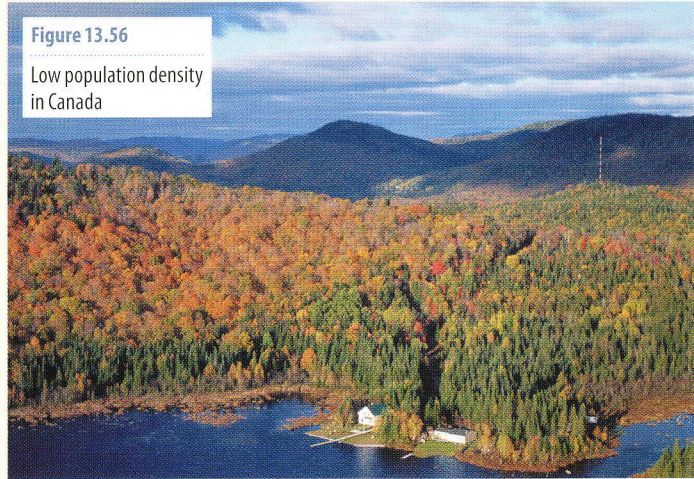
Is Canada underpopulated?

Canada, with 33.2 million inhabitants (2008), has one of the world's lowest population densities with just over 3 persons per km² (Figure 13.56). It has a low birth rate (16 per 1000 in 1970, 10 in 2008), a low fertility rate (2.2 per woman in 1970, 1.6 in 2008), a low death rate (7 per 1000 in both 1970 and 2008) and a low infant mortality rate (16 per 1000 in 1970, 5 in 2008) although life expectancy continues to increase (74 years in 1970, 81 years in 2008). Together, these give an extremely low natural increase (1.0 per cent in 1970, 0.8 per cent in 2008). In 2008, only 18 per cent of the population was under 15 years of age but 15 per cent were over 65. The GDP of US\$ 38 400 is very high, and less than

As most of the country is a flat delta, it is prone to frequent and severe flooding. This results from either flooding by the Ganges and Brahmaputra rivers, mainly due to the monsoon rains and to deforestation in the Himalayas, or from tropical cyclones moving up the Bay of Bengal (Places 19, page 148; Places 31, page 238). Most Bangladeshis are farmers (63 per cent) who live in rural communities (76 per cent urban dwellers). There is a shortage of industry, services and raw materials (it has no energy or mineral resources of note) and the transport network is limited. The low level of literacy (54 per cent male, 32 per cent female) has restricted internal innovation and a lack of capital has meant that the country can ill afford to buy overseas technical skills (its trade is valued at US\$ 177 per person per year). In 2007 Bangladesh received US\$ 9.31 per person in international aid.

Figure 13.56

Low population density in Canada



10 per cent are said to be living in poverty (that is by Canada's standard, not that of the UN which would be negligible).

Natural disasters, apart from those associated with extreme cold, are rare. Relatively few Canadians are farmers (2 per cent – Places 70, page 486) or live in rural areas: 80 per cent are urban dwellers. Canada has developed industries, services and an efficient transport network, and has utilised its vast energy supplies and mineral resources. The high level of literacy (99 per cent) and national wealth have enabled the country to develop its own technology and to import modern innovations (its trade is valued at US\$ 24 954 per person per year). In 2007 Canada gave US\$ 93 per person in international aid.

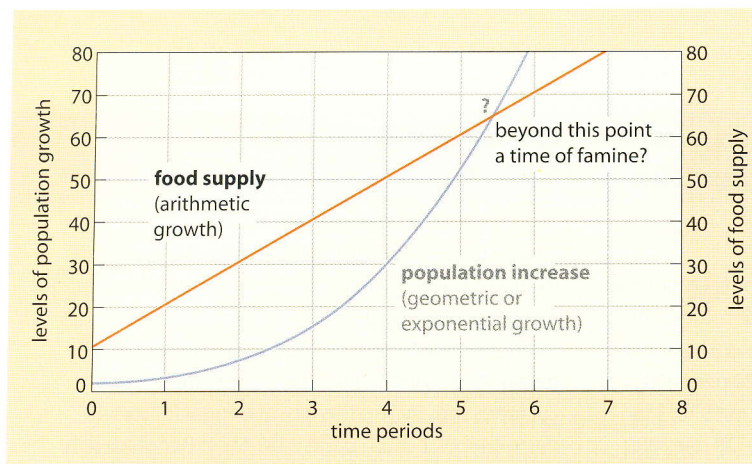


Figure 13.57
Relationships between population growth and food supply (after Malthus)

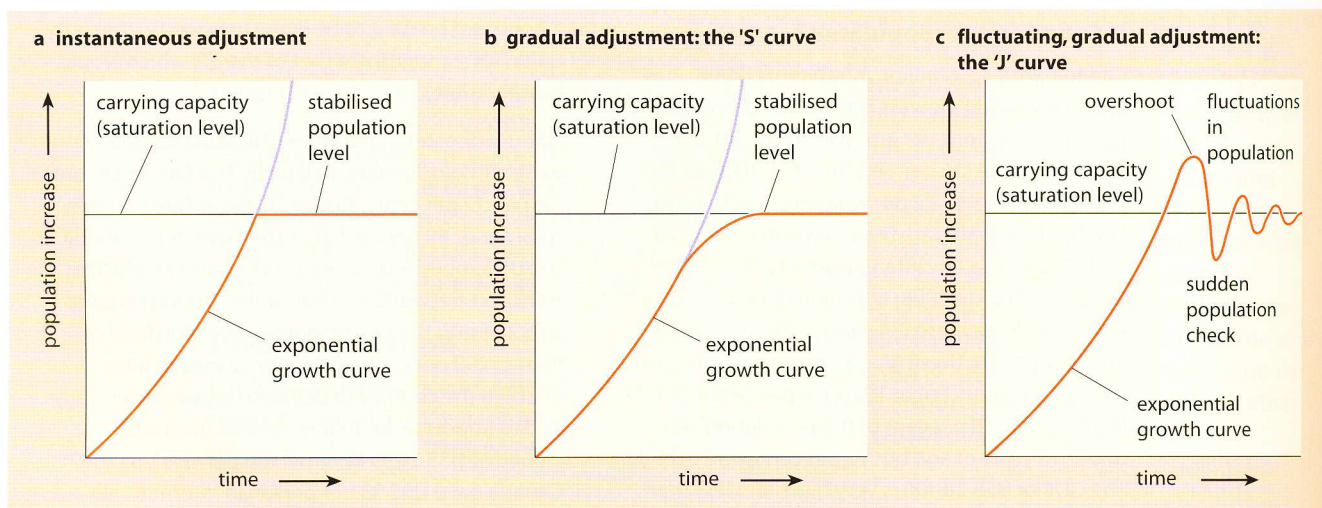
Theories relating to world population and food supply

Malthus

Thomas Malthus was a British demographer who believed that there was a finite optimum population size in relation to food supply and that an increase in population beyond that point would lead to a decline in living standards and to 'war, famine and disease'. He published his views in 1798 and although, fortunately, many of his pessimistic predictions have not come to pass, they form an interesting theory and provide a possible warning for the future. Indeed, his doomsday theory was resurrected in 2007, but due to rising global food prices rather than to food shortages. His theory was based on two principles.

- 1 Human population, if unchecked, grows at a **geometric or exponential rate**, i.e. $1 \rightarrow 2 \rightarrow 4 \rightarrow 8 \rightarrow 16 \rightarrow 32$, etc.
- 2 Food supply, at best, only increases at an **arithmetic rate**, i.e. $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$, etc. Malthus considered that this must be so because yields from a given field could not go on increasing for ever, and the amount of land available is finite.

Figure 13.58
Three models illustrating the relationships between an exponentially growing population and an environment with a limited carrying capacity



The rate of increase may be unchanged until the ceiling is reached, at which point the increase drops to zero. This highly unlikely situation is unsupported by evidence from either human or animal populations.

More realistically, the population increase begins to taper off as the carrying capacity is approached, and then to level off when the ceiling is reached. It is claimed that populations which are large in size, have long lives and low fertility rates, conform to this 'S' curve pattern.

Here the rapid rise in population overshoots the carrying capacity, resulting in a sudden check – e.g. famine and reduced birth rates. After an initial dramatic fall, the population recovers and fluctuates, then settles down at the carrying capacity. This 'J' curve is more applicable to populations that are small in number, and have short lives and high fertility levels.

Malthus demonstrated that any rise in population, however small, would mean that eventually population would exceed increases in food supply. This is shown in Figure 13.57, where the exponential curve intersects the arithmetic curve. Malthus therefore suggested that after five years, the ratio of population to food supply would increase to 16:5, and after six years to 32:6. He suggested that once a ceiling had been reached, further growth in population would be curbed by negative (preventive) or by positive checks.

Preventive (or negative) checks were methods of limiting population growth and included abstinence from, or a postponement of, marriage which would lower the fertility rate. Malthus noted a correlation between wheat prices and marriage rates (remember that this was the late 18th century): as food became more expensive, fewer people got married.

Positive checks were ways in which the population would be reduced in size by such events as a famine, disease, war and natural disasters, all of which would increase the mortality rate and reduce life expectancy.

The carrying capacity of the environment

The concept of a population ceiling, first suggested by Malthus, is of a saturation level where the population equals the carrying capacity of the local environment. The **carrying capacity** is the largest population of humans/animals/plants that a particular area/environment/ecosystem can carry or support.

Three models portray what might happen as a population, growing exponentially, approaches the carrying capacity of the land (Figure 13.58).

Links between population growth, use of resources and economic development

An international team, known collectively as the **Club of Rome**, predicted in 1972, through the use of computers, that if the then rapid trend in population growth and resource utilisation continued, then a sudden decline in economic growth would occur in the next century. Their suggested plans for global equilibrium, few of which have been implemented, included:

- the stabilisation of population growth and the use of resources
- an emphasis on food production and conservation.

At the World Population Conference in Mexico City in 1984, the emphasis was put on taking positive steps to reduce population growth, largely through family planning programmes. The general consensus view articulated the need for population strategies in integration with other development strategies. By 2005, international organisations were suggesting that high population growth rates were a symptom of poverty, not the cause of it. They claimed that all the spending on birth control measures and family planning programmes were having little effect in places where poverty remained the key influence on people's everyday lives.

Ecological footprint

The ecological footprint is a resource management tool that aims to measure the impact of people's lifestyles upon planet Earth. It calculates how much productive land and sea a human population needs to generate the resources it consumes in order to provide all the food, energy, water and raw materials required in

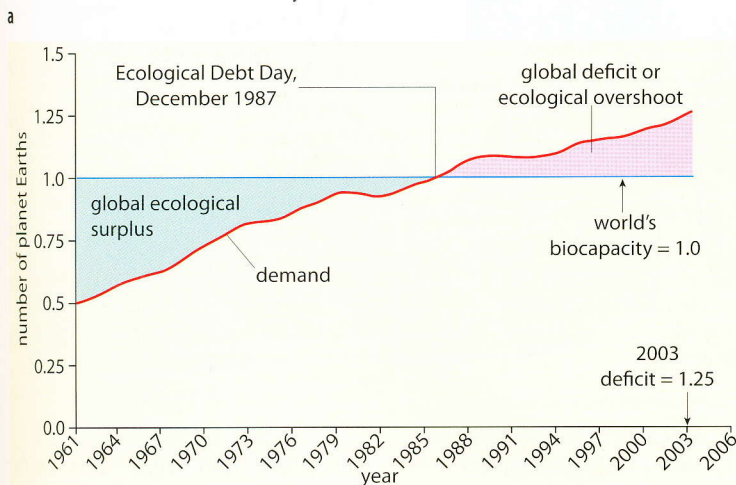
people's everyday lives. It also calculates how long it takes to absorb and render harmless the waste that humanity creates or for the ecological balance to renew itself.

Figure 13.59a shows how the ratio between the world's demand and the world's biocapacity has changed over time. Expressed in terms of 'number of planet Earths', the biocapacity is always 1 (the horizontal line). The graph shows that whereas in net terms humanity only used about half the planet's biocapacity in 1961, by 2003 this had increased to 1.25 times. The present global ecological deficit of 0.25 represents the world's **ecological overshoot**. This means that as humanity's ecological footprint is 25 per cent more than the planet can regenerate, it now takes one year and three months for the Earth to replace what people use and the waste they create in a single year. By measuring the ecological footprint of a population (a person, a city, a country, and even all humanity) we can assess our overshoot and should, therefore, be able to manage the Earth's ecological resources more carefully.

While the term 'ecological footprint' is now being more widely used and understood, methods of measuring it still vary, although some calculation standards are now emerging. Figure 13.59b lists the countries with the greatest global ecological surplus and the greatest ecological deficit. In 2003, the most recent year for data to be available, the total biocapacity for the world was 2.26 global ha/person. This figure was reached by adding together the global ha/person for each of the following footprints: cropland 0.49, grazing land 0.15, forest 0.23, fishing grounds 0.15, carbon 1.07 (page 638), nuclear 0.09 and built-up land 0.08.

Figure 13.59

The world's ecological footprint
 a Human demand and the Earth's biocapacity
 b Countries with the greatest global ecological deficit and surplus



b

Global ecological footprint			
	Surplus		Deficit
1 Gabon	17.8	UAE	-11.0
2 Bolivia	13.7	Kuwait	-7.0
3 New Zealand	9.0	USA	-4.8
4 Mongolia	8.7	Belgium	-4.4
5 Brazil	7.8	Israel	-4.2
6 Congo	7.2	UK	-4.0
7 Canada	6.9	Saudi Arabia	-3.7
8 Australia	5.9	Japan	-3.6
Other selected countries: Germany -2.4, China -0.9, India -0.4, Kenya and Bangladesh -0.2, Ghana +0.3, Malaysia +1.5, Korea, Sweden and Spain each +3.5			

13 Case Study

Population in China

China had, in mid-2008, an estimated population of 1.33 billion, which was 20 per cent of the world's total. As in other countries, this population was far from evenly distributed (Figure 13.1), with 95 per cent living on only

40 per cent of the total land area (Figure 13.60). A population density map (Figure 13.61) shows that the highest densities are either in coastal provinces or in the middle and lower Yangtze Basin and the lowest in

the mountains and deserts of the north and west. Despite China's large population, the country does not have a particularly high density – only 138 per km² (half that of the UK's 273 per km²).

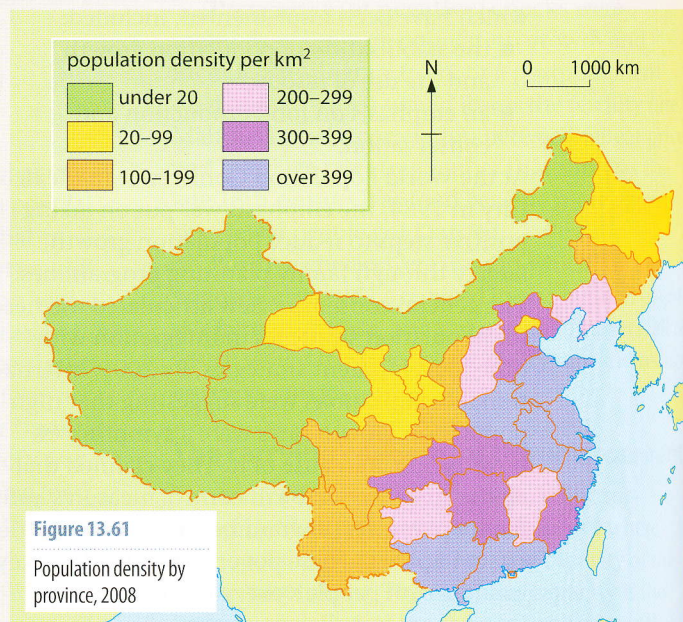
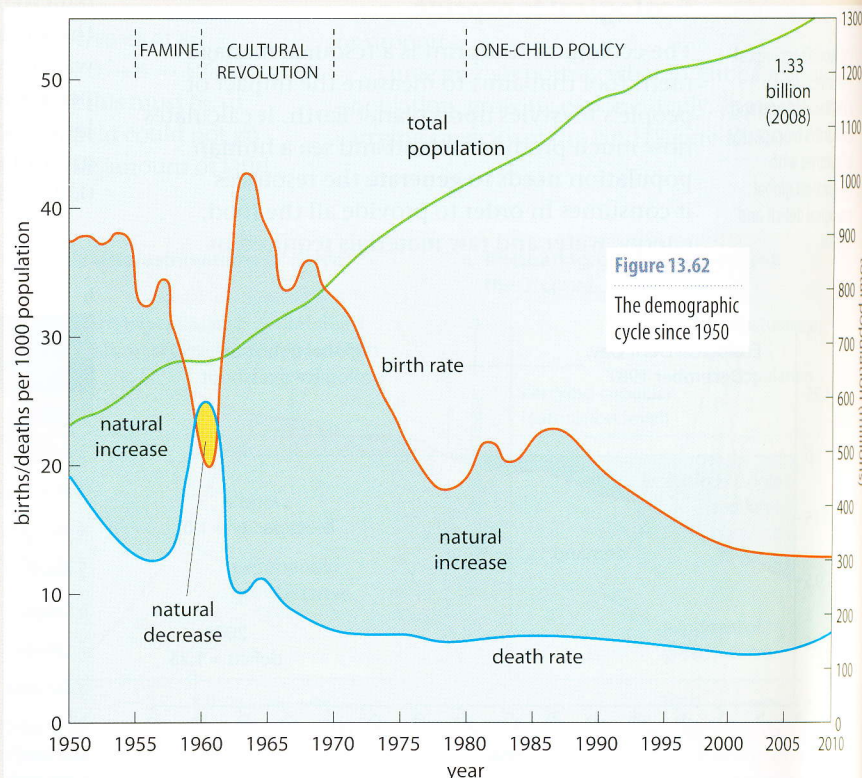


Figure 13.62 shows the demographic cycle for China since the formation of the People's Republic in 1950; and Figure 13.63 China's age structure based on estimates for mid-2007.

The high birth rate of the 1950s was a response to the state philosophy that 'a large population gives a strong nation', and people were encouraged to have as many children as possible. At the same time, death rates were falling, mainly due to improved food supplies and medical care.

The period between 1959 and 1961 coincided with the 'Great Leap Forward'. It was a time when industrial production had to be increased at all costs, and little attention was paid to farming (Places 63, page 468). The result was a catastrophic famine in which an estimated 20 million people died; infant mortality rates rose and birth rates fell.

During the 1960s, attempts to control population growth were thwarted by the Cultural Revolution. Every three years, China's population increased by 55 million – equal to the UK's total population at that time.



State family planning programmes were introduced in the 1970s and by 1975 the average family size had fallen to three children. The state, considering this to be still too high, began an advertising campaign for *wan-xi-shao* – ‘later, longer, fewer’ (later marriages, longer gaps and fewer children). Concern grew with the realisation that with millions of couples about to enter the child-bearing age group, the country’s population could double within 50 years. A Chinese demographer, on little supportive evidence, calculated that China’s optimum population was 700 million (at that time it was already almost 1000 million) and recommended that the state aimed to reduce its population to that figure by 2080. To achieve this, the TFR (page 357) would have to be reduced to a maximum of 1.5.

In 1979 the state decided to ‘play safe’ and introduced a rigorous carrot-and-stick ‘one-child policy’ (i.e. to achieve a TFR of 1.0). The ‘carrot’ for having only one child included free education, priority housing and family benefits, while the ‘stick’ imposed after the birth of a second child included the loss of these benefits, heavy fines and even forced abortions and threats of sterilisation. The marriageable age was raised and couples had to apply for permission to marry and, later, to have a child. The state did, however, begin to give education on family planning and in a relatively short time over 80 per cent of married women had access to contraception – no mean achievement in view of China’s then lack of economic development, its huge size and its mainly rural population. Even so, reports coming out of the country did refer to female infanticide.

The apparently rigid state controlled one-child policy, which has proved successful if the sole aim was to limit population growth, did, however, have many exceptions and loopholes. During 1999, the present author was told, during a month in China researching for the previous edition of this book, that the ‘one-child policy was very complicated’ and a more recent joint Chinese–American report has claimed that only about 63 per cent of the total population were ever subject to its regulations. The complications, exceptions and loopholes resulted from particular circumstances:

- The Han, who form the ethnic majority (92 per cent of the total population) and were the more likely to live in

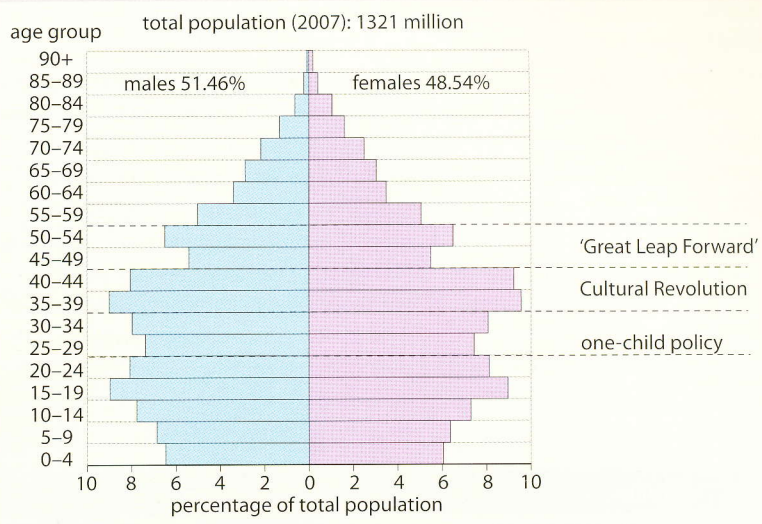


Figure 13.63 Age structure of Chinese population, mid-2007

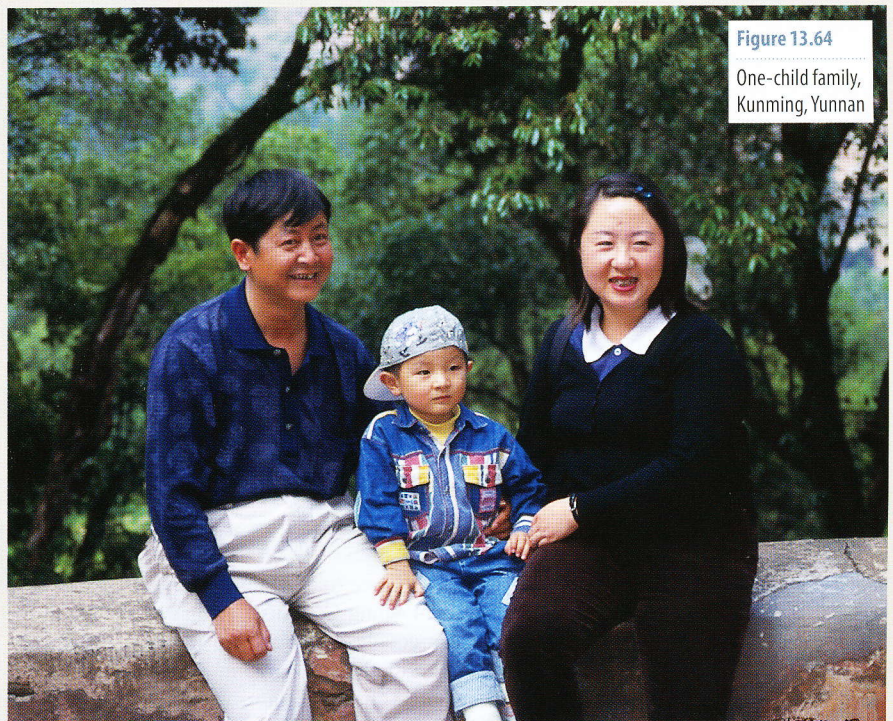


Figure 13.64 One-child family, Kunming, Yunnan

the expanding urban areas, were the most severely restricted to one child (Figure 13.64) unless their firstborn was mentally or physically handicapped, or died when young.

- Minority groups, of whom there are 56 recognised ‘minority nationalities’ and whose combined population is now 104 million or 8 per cent of China’s total, live mainly in the outlying provinces. They were allowed two children (Figure 13.66) or, if they lived in very remote areas where officials were few in number, possibly up to four children.

- Those Han who lived, often in large numbers, in rural areas where boys were allegedly needed to help work on the farm (the author saw as many girls working in the fields as he did boys) were allowed a second child if the firstborn was a girl (if the second was also a girl, then that was that!).
- The Han who lived in rural areas and who had a second child were often allowed to keep it on payment of a fine. The scale of these fines varied between provinces and often depended on the degree of honesty of local officials.

13 Case Study Population in China

- People working for state firms could be made redundant on the birth of a second child, unlike those who were employed by transnational (overseas) corporations.
- In the event of twins, the state paid the extra costs.

Over a period of time:

- as more married couples received a better education, fewer began to apply even for a single child
- when the first children of one-child families reached marriageable age (women in 2000, men in 2002) then if

two 'only' children married they were allowed two children.

In the author's experience, most people, especially those living in urban areas, seem to have accepted the necessity of the policy. Those in their early twenties, who were the first generation to be 'only' children, admitted that while they would have liked to have had a brother or sister, they acknowledged that the policy had helped their family and the local community raise their standard of living. Figure 13.65 gives some of the pros and cons of the one-child policy viewed from a 2008 perspective.

Benefits	Problems
<ul style="list-style-type: none"> • The birth rate fell from 44 per 1000 in 1950 to 14 in 2008, and the TFR from 6 to 1.5 in the same period (Figure 13.68). • In the first 20 years, only 70 million children, instead of 300 million, were born. • It was claimed in 2008 that China's population was 400 million less than it would have been without the policy (the present population of North America is only 338 million). • There is far less pressure on land, water, energy and other resources. • There has been a greater increase in people's standard of living and, according to the UN, an estimated 120 million people have been lifted out of absolute poverty. 	<ul style="list-style-type: none"> • The birth rate is now lower than the replacement rate (page 358). • There is a rapidly ageing population with an increasing number of over 60s (page 383) who are dependent on fewer people in the working/productive age group (page 354). • China's rapid industrialisation is threatened by a shortage of workers for its factories. • There is a gender imbalance (page 383) due to, in the early days of the policy, female infanticide; abortion of female foetuses is now illegal. In 2005 the male to female ratio was 118 : 100. • There is international criticism on grounds of human rights.

Figure 13.65

Consequences by 2008 of the one-child policy

China sticking with 'one-child' policy

Although China's 'one-child' policy and family planning policies have softened over the years, the Minister for the National Population and Family Planning Commission announced that the country's 'one-child-per-couple policy' would not change for at least another decade until the present surge in birth rate subsides. This refuted speculation that officials were contemplating adjustments to compensate for mounting uneven demographic distributions in age and gender. The Minister said that 200 million people would still be entering child-bearing age in the next ten years and that prematurely abandoning the one-child policy could add unwanted volatility to birth rates. With such a large population base [Figure 13.63], this could lead to serious problems and extra pressure on social and economic development.

Figure 13.67

Adapted from *China Daily*, March 2008

As shown in Figure 13.65, China is faced with an imbalance of people in the working age and ageing groups, as well as between the two genders. In the last few years, some provincial authorities, notably Beijing where the replacement rate is not being met, have:

- abolished quotas for child births and replaced them with voluntary family

planning programmes that allow a wide choice of contraception types

- relaxed penalties on those having larger families
- allowed more exceptions to the one-child rule, e.g. to Sichuan families who lost their children in the earthquake (Places 2, page 11).



Figure 13.66
Two-boy family,
Lijiang, Yunnan

Even so, the state announced in 2008 that the one-child policy would be likely to remain in place for at least another decade (Figure 13.67).

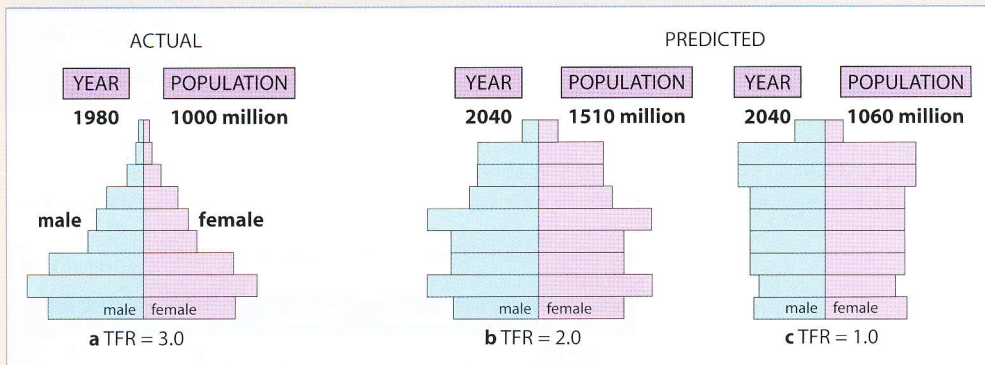
Whereas China's major demographic concern in the 1970s and 1980s was population growth, by the beginning of the 21st century it had become that of an ageing population (Figure 13.69) resulting from an increase in life expectancy. Figure 13.70 shows that a person born in 2008 can expect to live 33 years longer than one born in 1950 (men 71.4 years, women 75.2 years). While the problem of ageing is increasingly affecting many developed countries, it is more acute in China than elsewhere. This is partly due to the distortions created by the baby boom encouraged under Chairman Mao in the 1950s and 1960s (notice the 35–54 age groups in China's age structure in Figure 13.63) and partly to the recent improvements in health care. Predictions for the proportion of those aged over 60 are:

1990	4 per cent (of total population)
2008	11 per cent (total of 143 million)
2020	16 per cent
2050	30 per cent (about 430 million).

This means that the ratio of workers to elderly dependants will fall considerably from 10:1 in 2008 to 3:1 by 2030 (Figure 13.68). Also, in time, more single children will have to support up to two parents and four grandparents – the so-called 4-2-1 pattern. This pattern is more common in rural areas, where grandparents still tend to live, as they always have done, with the family – a situation that is less common in large urban areas.

Figure 13.68

Predicted population growth based on different total fertility rates



Population in China

Case Study 13



Figure 13.70

Increase in life expectancy, 1950–2008

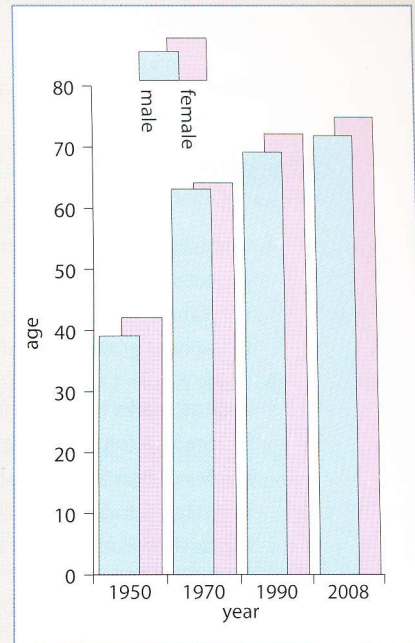


Figure 13.69

Ageing Naxi women, Lijiang, Yunnan

The World Bank claims that China will have an old-age burden of a high-income country such as Japan with only the financial resources of a middle-income economy to shoulder it.

These changes will, according to the *China Business Handbook* (2008), 'have a massive impact on Chinese society and will require urgent reform of the provision of pensions, healthcare and benefits. At

present, there is no pension scheme at all for the majority of the population, especially in rural areas, although several pilot schemes have been introduced into cities across the country'. As those same words were expressed in the 1999 edition, it would appear that little progress has been made.

The imbalance between gender, resulting from the traditional preference for boys, is

another concern. A recent survey suggests that there are up to 118 newborn Chinese boys to every 100 girls. Statistics, which probably underestimate the ratio, suggest that 99 cities across China have a ratio even in excess of 125:100. These ratios compare with a world average of 105 male births to every 100 female births and a UN recommended ratio of 107:100.

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www.census.gov/ipc/www/

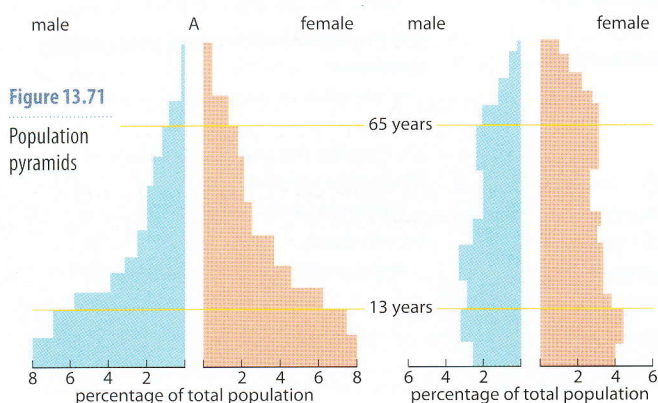
World Bank:

www.worldbank.org/data&Statistics

Questions & Activities

Activities

- 1 a What do the following terms mean:
- total fertility rate (2 marks)
 - natural increase of population (2 marks)
 - annual growth rate of population? (2 marks)
- b Study Figure 13.11 on page 351. What statistical change marks the move from:
- Stage A (high, fluctuating) to Stage B (early expanding)
 - Stage B to Stage C (late expanding)
 - Stage C to Stage D (low, fluctuating)? (3 marks)
- c Explain how social and/or economic changes could have brought about each of the moves described in **b**. (10 marks)
- d Suggest how the total population of the UK might change over the next 50 years.
Give reasons for your suggestions. (6 marks)
- 2 Study the two population pyramids in Figure 13.71.
- a i What do you understand by the term 'dependency ratio'? (2 marks)
- Suggest, with reasons, what stage of the demographic transition is represented by each of the pyramids. (4 marks)
- b Choose **one** country that has a population structure similar to the one shown in pyramid A.
- Suggest two problems that are likely to arise in that country as a consequence of the large proportion of the population in the 0–15 age group. (4 marks)
 - How is the country attempting to manage these problems? (7 marks)
- c Choose **one** country that has a population structure similar to that shown in pyramid B.
Describe two problems that might arise in future as a consequence of the ageing population structure, and suggest how these problems might be managed. (8 marks)
- 3 Study the two tables of data in Figure 13.72.
- a i Describe how the education of women has affected fertility rates in Morocco. (3 marks)
- Suggest reasons for the changes you have described. (4 marks)



a Average number of children per Moroccan women according to age and educational level, 1994 **Figure 13.72**

Age group	No education	Primary	Secondary	Higher
20–24	1.6	1.1	0.7	0.5
25–29	2.7	1.7	1.3	0.9
30–34	3.9	2.6	1.9	1.3
35–39	5.1	3.4	2.4	2.2
40–44	6.1	4.2	3.2	2.7
45–49	6.7	4.9	3.4	2.5

b Fertility indices (average number of children born to each woman) of Maghreb women in country of origin and country of residence*

Year	Algerian women in		Moroccan women in		Tunisian women in	
	Algeria	France	Morocco	France	Tunisia	France
1977	7.47	4.73	5.93	5.75	5.84	5.05
1981	6.39	4.35	5.92	5.84	5.19	–
1985	6.24	4.24	–	4.47	4.53	4.67
1987	5.29	3.95	4.46	4.09	4.10	4.49
1989	4.72	3.66	3.95	3.71	3.40	4.30
1991	–	3.35	–	3.25	3.34	3.88
1992	–	3.27	3.28	2.99	3.36	3.56

* 'The Maghreb' is the western part of North Africa. It was colonised by France, gaining independence in the 1950s and 1960s. These countries still have close ties with France, and there has been much migration from Maghreb to France.

- b i Describe the changes to the fertility indices of women from the Maghreb who have migrated to France. (3 marks)
- Suggest reasons for these changes. (4 marks)
 - Suggest how the emigration from the Maghreb may have affected the fertility rate of women who have remained in those countries. (5 marks)
- c What lessons can be learned from these figures by development workers in countries suffering from pressure caused by rapidly increasing population? (6 marks)
- 4 a What do you understand by:
- birth rate (1 mark)
 - life expectancy (1 mark)
 - overpopulation? (2 marks)
- b Figure 13.73 illustrates Malthus's view of the relationship between population and food supply in a typical country or region.
- Describe what the diagram shows. (2 marks)
 - Explain what Malthus thought would be the consequences of the changes shown in the model. (2 marks)

Growth of population	1	2	4	8	16	etc.
Growth of food supply	1	2	3	4	5	etc.
Time periods	→	→	→	→	→	→

Figure 13.73

Malthus's view of population and food supply

- iii Suggest why Malthus's predictions did not come true in England following publication of his ideas in the early 18th century. (4 marks)
- iv Describe the views of Boserup on the balance between population and resources, and explain how these are different from the views of Malthus. (5 marks)

- c Choose **one** country that has attempted to manage its population by introducing laws that it hopes will affect birth rate.
 - i Explain how the population policy was intended to operate.
 - ii Discuss the consequences of the policy, mentioning both its successes and its failures. (8 marks)

Exam practice: basic structured questions

- 5 a Study the map of Brazil's population distribution (Figure 13.5 on page 347).
 - i Describe the distribution of areas of dense population. (2 marks)
 - ii The area marked 1B is the tropical rainforest. Suggest why this area, or any other area of tropical rainforest that you have studied, has a very sparse population. (6 marks)
- b Study the map of population density in London (Figure 13.7 on page 348).
 - i Describe the distribution of population shown on this map, and explain why this pattern has developed. (7 marks)
 - ii During the 20th century there was a large movement of people out from central London into the suburbs and beyond. Explain why people wished to move, and how changing technology allowed them to make the move. (10 marks)
- 6 The period following the Second World War saw some of the biggest international migrations that the world has ever known.
 - a Name one major international migration that took place during this period. Refer to the source and the destination of the migrants. (1 mark)
 - b Explain the causes of the migration. Refer to pushes from the source and pulls to the destination. (6 marks)
 - c Discuss the consequences of the migration for:
 - i the source country
 - ii the host country
 - iii the migrants themselves. (12 marks)
 - d Suggest why large international migrations have been so common in the period since the Second World War. (6 marks)

Exam practice: structured questions

- 7 Study Figure 13.73 above.
 - a Outline the theory developed by Malthus to explain the relationship between population increase and the increase in food supply. (5 marks)
 - b Malthus wrote in the early 18th century. He predicted that population growth could soon cause widespread famine and other disasters in England. His predictions have not come true. Explain why. (10 marks)
 - c In recent years views described as neo-Malthusian have become common. Explain why these ideas have developed. Contrast the neo-Malthusian view with the more optimistic view of population growth developed by Boserup. (10 marks)
- 8 a Study Figure 13.22 on page 359.
 - i Describe the range of life expectancy figures shown by this table and comment on the changes shown over time. (6 marks)
 - ii Choose **one** country in the table with an increasing life expectancy and account for the changes that have been observed and that are predicted. (7 marks)
- b Name a country that you have studied, where life expectancy has fallen in the last 10–20 years. Explain the causes and the consequences of this fall. (12 marks)
- 9 a At what stage of the demographic transition model is population growth most rapid? Give the reasons for this rapid growth. (5 marks)
- b Many demographers say that the key to reducing the birth rate in less economically developed countries lies in changing the educational and economic status of women. Discuss this view, with reference to one or more countries that you have studied. (10 marks)
- c Name **one** country that has adopted policies designed to deal with a rapidly growing population. Describe the policies and evaluate their success. (10 marks)
- 10 Study the two population pyramids in Figure 13.71 on page 384.
 - a i Compare and contrast the shapes of the two pyramids. (3 marks)
 - ii Account for the differences between the two pyramids. (4 marks)
 - iii Suggest what population problems are likely to be met in these two countries during the next 20 years or so. (8 marks)
 - b i Name a country that has adopted policies to help it to manage its total population and its rate of population change.
 - ii Describe its population policies and assess how successful these policies have been. (10 marks)

- 11 a i Name a country where immigration has led to the development of a 'multicultural society'. Name the main cultural groups that make up that country's population. (2 marks)
- ii Explain the causes of the immigration into the country. (5 marks)
- iii Outline the pattern of distribution of **one** group or people who recently migrated into the country. (5 marks)
- b Discuss some of the geographical issues caused by the development of a multicultural society in the country named in a i. (13 marks)

Exam practice: essays

- 12 Many countries in Africa, Asia and Latin America have experienced very rapid population growth since 1950, but now rates of population growth are slowing down in many of these countries. Discuss the factors affecting the rate of population change in a range of countries in Africa, Asia and Latin America. (25 marks)
- 13 The term 'ecological footprint' is in wide use as a way of assessing the sustainability of the lifestyle of a person, a family, a region or a country. Explain the meaning of the term, and evaluate the usefulness of the concept of the ecological footprint. (25 marks)

Issues Analysis

Population policies – the pros and cons of trying to limit population growth

Across the world and over time countries have adopted a wide range of differing policies to limit their population growth. The characteristics of such policies vary according to the urgency of the situation, the politics of the country and the approach taken. Policies can be compulsory – they tell people what they can and cannot do and use 'sticks' (penalties) to enforce this. Equally, they can lead by example, encouraging people towards certain behaviour with 'carrots' (rewards).

China

With over 1.3 billion people (2005) – one-fifth of global population – China will soon overtake the UK as the world's fourth richest nation. In the early 21st century its economy has grown three times faster than that of the USA (before the 'credit crunch' of 2008, which affects both nations). China has used vast quantities of global raw materials to fuel this unprecedented economic growth and is likely to continue to do so.

People are China's asset and its problem. Without them its labour-intensive industrial growth would not have taken off. Most industry is labour intensive and labour is cheap. However, the government of the 1970s realised that continued rapid growth would create a demographic and economic crisis.

Massive famine was forecast by the end of the 20th century if population growth was not stemmed. This was the reason for the unprecedented 'one-child' policy. Few other countries could have, or ever will have, such a radical policy. Communist governments, such as China's, have great control over people. Democracies vote for their governments, so people have a say in what they do.

Interpretation of the Chinese 'one-child' policy

Read about China's 'one-child' policy above and on pages 381–383 in this chapter.

- 1 a Write down your initial reactions to, and opinions of, this population policy.
- b List the ways in which this policy has been a success.
- c What problems have arisen from the policy, in your opinion?
- d Discuss your ideas with others in your class. Revise any aspects of your answers to (b) and (c), based on these discussions.
- 2 a Summarise the possible future directions of the 'one-child' policy.

- b Which future direction do you consider to be the most practical for China as a country, and why?
- c Which future direction do you consider to be the best for individual Chinese people, and why?

India

'Each year India adds more people to the world's population than any other country.'

Geofile 521, April 2006, by Tim Bayliss and Lawrence Collins, Nelson Thomas

By 2025 India's population (1.1 billion in 2006) will probably overtake that of China. To a limited extent, India has followed similar policies to China to curb its rapid growth, but more free will and persuasion have been employed. Total fertility rate (TFR) has decreased to 3.5 per woman from over 5.0 in the 1970s, suggesting success, but changes are far from even across this large nation. India's growth represents a very different set of challenges from those before the Chinese government.

India's first national family programme began as early as 1952. It has not always been popular; Prime Minister Indira Gandhi's method of encouraging young men to be

sterilised in return for something as small as a radio became part of a huge backlash, contributing to the fall of her government. India has great cultural, religious, socio-economic and geographical variations. It might be a case of one policy does not fit all.

Interpretation of India's policies

3 Figure 13.74a shows varying birth rates across India in 2007, while Figure 13.74b shows adult literacy data by region.

- a Describe the patterns shown in the two maps.
- b Is there any correlation between the data in the two maps?
- c Based on the data provided in Figure 13.74a only, summarise the ways Kerala stands out from other regions of India.

- 4 a Research different aspects of India's population control policy. The websites suggested (right) will give you a start.
- b How does Kerala's population policy differ from those followed elsewhere in the country?

Decision-making exercise

5 The population policies of China and India, in particular of Kerala state (Figure 13.75), show very different approaches to the need to limit rapid

Kerala state in south-west India has one of the lowest birth rates in the country at less than 1 per cent per annum. Women have higher status here than in much of the rest of the country and are encouraged to work outside the home. Education is valued by government and families are encouraged to see that fewer children and better education lead to greater life chances and a better standard of living. The state policy aims to encourage:

- later marriage
- wider spacing of births
- contraception use by married women – the majority do so
- sterilisation once the desired family size is reached
- value placed on education, which can be achieved better in a smaller family.

Spacing of births has not been successful. Parents have tended to have their desired number of children close together and then opted for sterilisation to prevent further births. Abortion is sometimes used, but this is often to achieve the desired gender balance in the family. Between 40 and 75 per cent of abortions are thought to be for this reason. While less than ideal, this does show that people are trying to produce smaller families.

Some 91 per cent of adults are literate – much higher than the national 65 per cent average. This shows that education initiatives are working and perhaps also influences people's reproductive behaviour.

Figure 13.75
Population policy in the state of Kerala

population growth. Discuss the differing approaches, considering the ways in which people are forced/encouraged to limit family size.

6 Put yourselves in the place of the government of a relatively poor African country with rapid population growth. Assume that this country is a democracy. Devise a population policy suitable for the needs of the country which will not damage its slowly growing economy, yet will also not be too unpopular with the electorate. Consider the best ways to convince your people (who are also your

electorate) that this national policy will benefit them as individuals and the country as a whole.

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