years of age. The dependency ratio can therefore be calculated using the formula:

$$\frac{\text{Number of dependent people} \times 100}{\text{Number of people of working age}}$$

In Australia, the calculation using 2008 figures would be as follows:

    Total population size = 21 300 000 people
    Percentage of people under 15 years = 19%
    Percentage of people 15 to 65 years = 68%
    Percentage of people over 65 years = 13%

Therefore the number of people of dependent ages was (19 + 13)% of 21.3 million, or 6,816,000 people (rounded off to 6.8 million).

The number of working age people was 68% of 21.3 million, or 14,484,000 people (rounded off to 14.5 million).

Therefore, Australia's dependency ratio was:

$$\frac{6.8 \times 100}{14.5}$$

or 46.9%. This means that for every 100 people of working age, there were 46.9 people dependent on them. Back in 1975, Australia's dependency ratio had been 57%, so although the proportion of elderly people has increased since 1975, it has been more than offset by a decline in the proportion of school age children.

QUESTION BLOCK 1F

1. *Use the data in the table below to calculate the dependency ratio for each country shown (except Australia which is shown in the text as an example):*

Country and its population	Size in millions 2008	% under 15	% 15 - 65	% over 65
Australia	21.3	19	68	13
China	1,324.7	19	73	8
Iran	72.2	26	69	5
Japan	127.7	13	65	22
Papua New Guinea	6.5	40	58	2
Singapore	4.8	19	72	9
Uganda	29.2	49	48	3
United Kingdom	61.3	18	66	16

2. *Select three countries with contrasting dependency ratios from the previous question, and discuss the implications of the dependency ratios on the provision of services such as schools, hospitals and transport in the countries selected.*

Population Policies

Although traditional societies often have high birth rates and high death rates characteristic of stage 1 of the demographic transition, it would be wrong to think that people in such societies have no control over their population growth. For example, the Dani people of the Baliem Valley in the Highlands of Irian Jaya, Indonesia (discussed in more detail in chapter 16) represent a society which continues to function largely according to traditional customs. Even today, some polygamy is practised, as is common in many traditional societies where warfare is common and so the ratio of women to men might be artificially high. Among the Dani people, few men have more than two wives, and only very wealthy men would have as many as three or four wives. Indeed, just over half of Dani men today have only one wife, largely because of the impact of Christian missionaries.

As the average life expectancy of Dani people is only 38 years, men usually marry at the age of 20, but girls often marry earlier, usually at around the age of 12. It has always been very uncommon for Dani women to have more than two children as the Dani have known the need to live within the resource limits of their difficult mountain environment. After a Dani woman has given birth to her second child, usually at around the age of 18 to 20, she eats the sap of a particular species of tree that induces early menopause (figure 1.22). This causes her to stop menstruating and she becomes incapable of having any more children. In this way, the Dani population has remained stable for a long period of time.

However, many people are concerned at the effects of rapid population growth in countries at stages 2 and 3 of the demographic transition. Governments often feel the need to introduce policies to control the growth of their populations. Most of these policies are **anti-natalist**, which means they discourage births and try to slow population growth. A few countries with slow rates of population increase have introduced **pro-natalist** population polices which are designed to encourage more births. There are three approaches to anti-natalist population polices. The first is the **regulatory** approach, where governments impose regulations and restrictions that control the number of births. A second approach is to offer **incentives**, such as prizes or money to families that limit the number of children they have. The third anti-natalist approach is to argue that according to the demographic transition, fertility will decline as people become more affluent. Therefore, policies are implemented to **raise people's standards of living** in the hope that this will result in reduced population growth.

In reality, governments often use a mixture of these policy types, and this can be illustrated by examining the population policies of several countries.

China's Population Policy

China has the world's largest population, and its cities are among the most densely populated places in the world, as shown in figure 1.1 at the beginning of this chapter). China's anti-natalist population control policy is perhaps the best known such policy in the world. China's policy is certainly one of the most rigid of any country, and because it insists that each family limit itself to having only one child, it is commonly known as the 'One Child Policy'.

Before 1949 when the Communist Party came to power in a revolution, China was at stage 1 of the demographic transition. Birth rates were high, with the typical number of children per family being between five and eight. However, death rates were also high and life expectancies were short – in 1930 these were 23.7 years for females and 24.6 years for males. Infant mortality rates were high (about 300 deaths per 1000 live births), and so with both death rates and birth rates being very high, population growth was slow.

By 1949, China's population had reached 538 million people. In the early years of Communist rule, China followed a pro-natalist population policy in which large families were encouraged. This reflected traditional attitudes that had existed in China for many centuries, but it was supported by the leadership of the time. The new Communist government saw a large population as making China's position in the world stronger. When Mao Zedong announced the beginning of the People's Republic in 1949, he said "The Chinese people have stood up". Mao saw a large and healthy population as being necessary for China to take its proper place in the world as a nation-state of significance.

1.23 *Information outside a birth control office in Shanghai drawing attention to China's growing population — from 540 million in 1949 to 1.008 billion in 1982 and 1.133 billion in 1990.*

In the 1950s, however, a census revealed that China had 100 million people more than previously thought. This information came to light at the same time as many people were experiencing hardship and malnutrition as a re-

sult of the Great Leap Forward, a political campaign designed to catapult China into modern industrialisation that went terribly wrong. Indeed, many people died during the Great Leap Forward when abnormal floods and droughts reduced food production. Against this background, China entered stage 2 of the demographic transition in the early 1960s as a result of improvements made to medical services.

However, with Mao's death in 1976, the Chinese government began to advocate voluntary population control to reduce the birth rate and accelerate the beginning of stage 3 of the demographic transition. The argument put to the Chinese people was based on Malthusian logic – China was modernising, but there was only a certain fixed amount of wealth to divide among the population. If people would limit their family sizes, then 'a larger slice of cake' would be available for each person. From the 1970s, birth control offices were established throughout China to give advice about limiting family sizes and to distribute information about the need to control population growth (figure 1.23).

Table 1.8
Marital Status by Age Group in China, 1982
(all figures are percentages)

Age	Unmarried	Married	Widowed	Divorced
15 - 19	97.38	2.59	0.0004	0.02
20	84.12	15.76	0.02	0.10
21	74.79	25.06	0.03	0.12
22	62.73	37.07	0.04	0.16
23	48.88	50.87	0.06	0.19
24	36.60	63.09	0.09	0.22
25	25.70	73.91	0.12	0.27
26	18.09	81.45	0.15	0.31
27	12.69	86.76	0.20	0.35
28	9.42	89.91	0.26	0.41
29	7.32	91.91	0.32	0.45
30 - 34	4.93	93.49	0.55	0.58
35 - 39	3.70	94.33	1.23	0.74
40 - 44	3.13	93.39	2.54	0.94
45 - 49	2.39	91.45	5.00	1.16
50 - 59	1.66	84.48	12.58	1.28
60 - 79	1.37	56.70	40.98	0.95
80+	1.11	17.72	80.80	0.37

Source: Li Chengrui (1992) p.173

At the same time, the minimum legal age for marriage was raised to 20 for females and 22 for males so that couples would have fewer childbearing years available to them (figure 1.24). Moreover, the Marriage Law adopted in 1980 requires that 'husband and wife are duty bound to practice family planning'. At about the time the new Marriage Law was passed, half of Chinese people were married by the age of 23 (see table 1.8). The table also shows that China has a high marriage rate, low divorce rate and that marriages in China tend to be very stable. The marriages that occurred before the legal minimum marriage age were usually in remote areas among minority ethnic groups.

1.24 *A Chinese couple in Harbin on their wedding day. It is a condition of marriage in China that couples practice family planning.*

1.25 *A special music school for single children in Tangshan, China.*

In 1980, the One Child Policy was introduced, providing rewards and benefits for couples that agreed to have only one child. Additional health care subsidies were granted to one-child families, together with priority health care, priority in housing allocation, priority in educational provision, extra land for private farming and extra food rations (figure 1.25). Furthermore, every member of a work unit that meets its standard target of 100% one-child families receives a financial bonus, and this encourages fellow-workers to put pressure on their colleagues to have only one child. If parents change their minds and have a sec-

ond child, all the privileges that have been given are taken away.

Although the one-child policy is officially policed by the promise of incentives and rewards, in reality there are also punishments for violating family planning regulations. Punishments may arise for refusal to abort unapproved pregnancies, an unapproved birth for couples under the legal marriage age, or having an approved second child too soon. Family planning staff who violate regulations by accepting bribes, making false reports, or issuing false birth certificates are also open to be punished. Penalties generally include fines, losing government benefits, demotion or dismissal from employment or from Communist Party membership.

The punishments for violating family planning policies vary for urban and rural couples. Penalties for rural couples include loss of government land grants, food, loans, and farming supplies. For example, a rural couple with an unauthorised child may be disqualified from receiving plots of land for growing grain for the next seven years or, if they have another unapproved birth, for 14 years. For workers in urban areas who violate birth control policy, fines are imposed on a percentage of their income, usually between 20% to 50% of annual salary.

There are only a few exceptions to the one-child policy. The first applies to families in some backward rural areas who may have two children because children are a vital part of the farming work force. The second exception has applied since 1995 to couples where both husband and wife are themselves single children – they may have a second child. Other exceptions include families whose first child is disabled and unable to work, pregnancies occurring after a childless couple has adopted a child, couples facing difficulties in continuing the family line, and Chinese people returning to China after living abroad. In rural areas, couples with 'real difficulties' and certain peasants may be allowed a second child; the phrase 'real difficulties' is generally understood to include situations in which a couple has a single female child. In China, it is still common to say 'a little happiness has arrived' when describing the birth of a girl, but 'a great happiness has arrived' when a boy is born.

In the early 1990s, the guidelines were tightened further. The 'Decision on Strengthening the Family Planning Programme to Strictly Control Population Growth of 1991' (known as the '1991 Decision') contains provisions suggesting the use of IUDs and sterilisation, and allowing forced pregnancy termination (abortions) in certain circumstances. However, the official policy is that coercive action should not be used as part of the country's population policies.

The one-child policy is implemented in a manner that would be described as heavy handed outside China. Women's menstrual cycles are monitored publicly by the

work unit, and compulsory pelvic examinations are performed on all those suspected of being pregnant. Insertion of IUDs in women with one child is usually mandatory, and these are checked by x-ray from time to time to ensure they have not been removed. Unauthorised pregnancies are usually terminated by abortion when detected, often regardless of stage of pregnancy.

1.26 *A typical 'One Child' propaganda poster in Beijing.*

There have been many reports of infanticide by drowning of girl babies in rural areas when couples have desperately wanted a son as their single child. According to Chinese tradition, daughters join the families of their husbands when they marry. Therefore, girls are seldom able to support or care for their parents in old age. By the 1990s, thousands of ultrasound machines were being imported to China so that couples could check the sex of their unborn baby. Domestic factories in China began manufacturing ultrasound machines at the rate of 10 000 a year. However, in 1993 authorities banned the use of ultrasound for the purpose of sex selection, but this ban cannot be enforced. Some parts of China report sex ratios at birth for of 300 males to 100 females, and reports predict that early next century China will have an excess of 70 million bachelors because of the abortion of girl babies.


1.27 *A 'One Child' painted ceramic tile street display in Guangzhou.*

This policy was supported in China's laws. Although China does not have a formal national family planning

law, the idea of family planning is firmly embedded in national and provincial laws and regulations. Article 25 of China's Constitution affirms the importance of family planning to curb population growth, calling family planning a necessary part of development. Article 49, which grants government protection to marriage and the family, confirms the 'duty' of both wife and husband to 'practice family planning'. Under a 1982 regulation, couples with two or more children may be compulsorily sterilised, although the Women's Protection Law expresses this as 'women enjoy the freedom of choosing not to bear children'.

Since 1980, large propaganda posters encouraging families to have only one child have been a prominent feature of the Chinese landscape (figures 1.26 and 1.27). These posters almost always show two modern, well-dressed, smiling parents and their single daughter. Showing a girl counters the traditional Chinese preference for boys, as it is boys who carry on the family name. The posters carry slogans such as 'One child is best for you and best for the country' and 'Limit the numbers but raise the quality'.
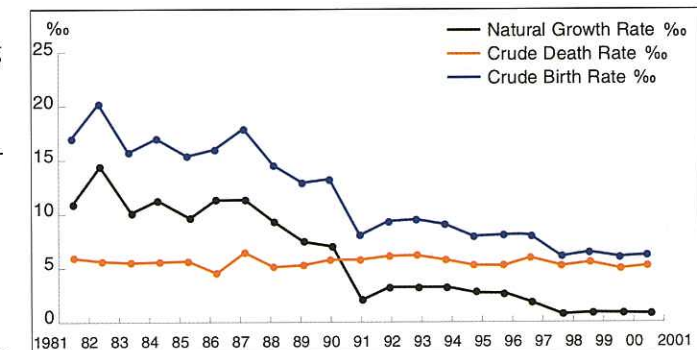

**1.28** *Changes in Beijing's population growth rates, 1981 to 2001.*

In introducing the one-child policy, the Chinese government's stated target was to limit its population to 1.3 billion people by 2000 and to lower the natural population growth rate to less than 10 per thousand (i.e. 1%) by the year 2000. The introduction of the one-child policy certainly had an immediate effect on population growth in China (figure 1.28). In 1960, China's birth rate was 37 births per 1000 people. By 1988 this had fallen to 21 per 1000, and by 1998 to 16.2 births per 1000 people. In 1960, China's population was growing at an overall rate of 2% per annum. By 1978, shortly before the One Child Policy was introduced, the rate had fallen to 1.4%. In 1980 when the new policy was introduced, the growth rate fell to 1.2%. Further drops since then have continued slowly, and in 1998, the growth rate was 1.042%, still short of the target figure of 1.00%.

By 2008, China's population (including 7.6 million in Hong Kong and Macau) was 1.332.3 billion. As a result of the One Child Policy, it is now predicted by the Chinese authorities that the country's total population will peak at 1.519 billion by 2033. The proportion of women of childbearing age decreased to 26.7% in 2000, and predicted
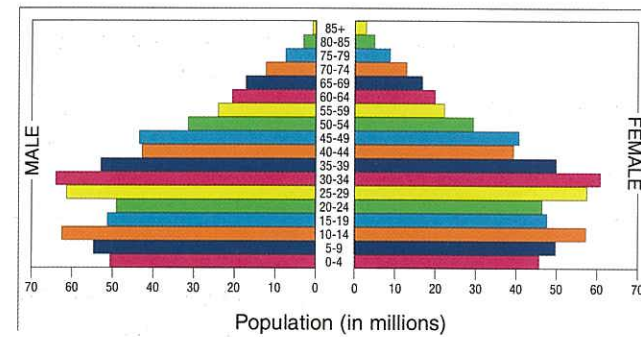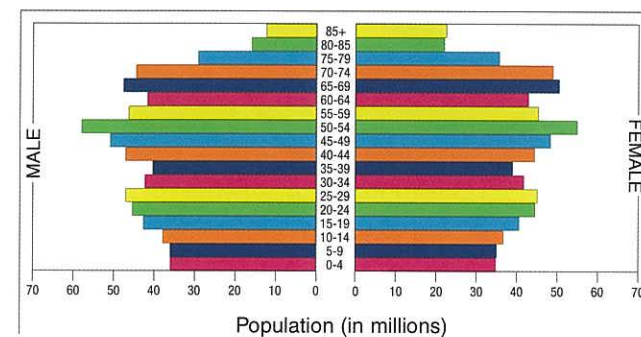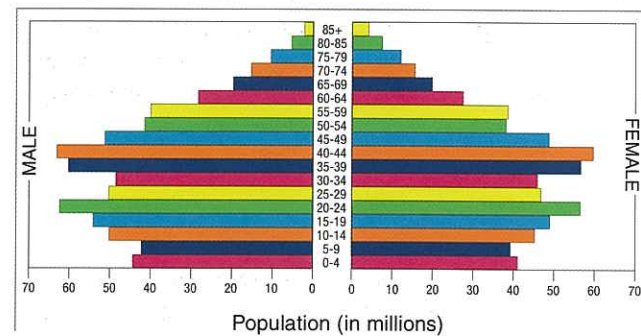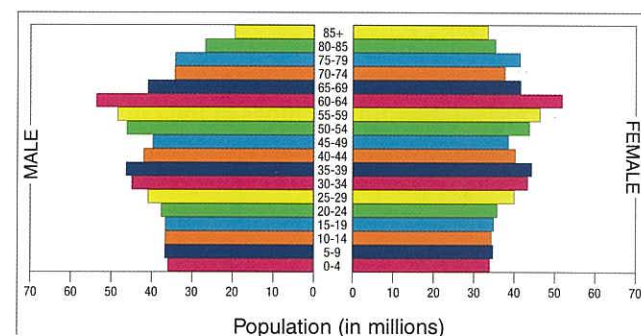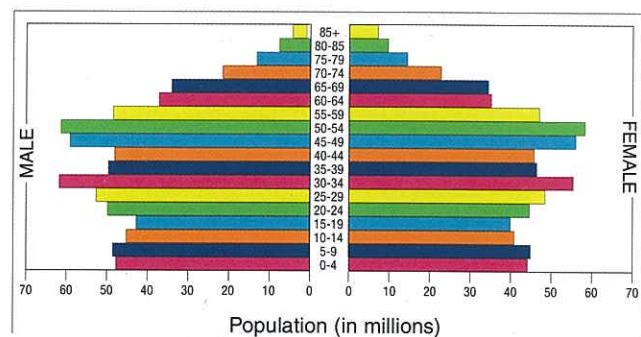
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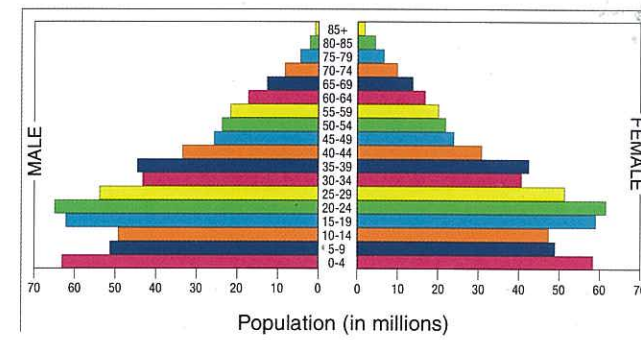
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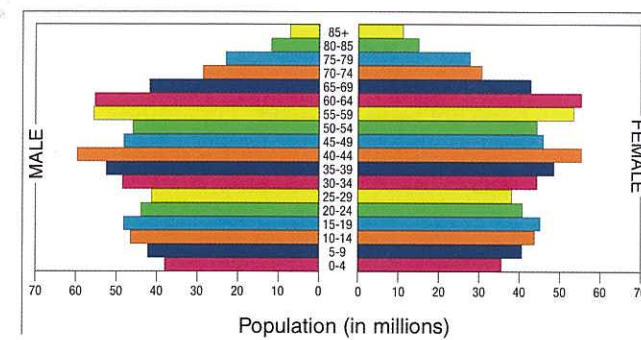
2000

2040

2010

2050

2020

1.29 *China's changing population structure, 1990 to 2050.*

decreases will lower the figure to 24.5% by 2020 and 21.9% by 2040. Meanwhile the percentage of aged people increased from 7.63% in 1982 to 9.84% in 2000, and it is expected to increase to 21.9% by 2030. By 2050, the proportion of China's population that is aged will be 27.43%, and this will pose significant challenges for the provision of services for the elderly (figure 1.29).

1.30 *Many single children in China are dressed as 'little emperors' on special occasions. There is concern that China's single children are growing up to be very self-centred, an unforeseen consequence of the one-child policy.*

However, there have been consequences of this population control. In 1983 (the peak year), family planning work teams carried out 21 million sterilisations (79% on women), 18 million IUD insertions, and 14 million abortions. There is also concern that those children who are born and grow up without brothers or sisters are becoming very spoilt and selfish. Single children in China tend to have every desire fulfilled by doting parents and other adults, and they are commonly known in China as 'little emperors' (figure 1.30). In another generation, the concepts of 'aunt', 'uncle' and 'cousin' will have disappeared along with 'sister' and 'brother'.

1.31 *A family with TWO children rides on a motorbike Pingyao, China.*

In recent years, China's 'One Child' Policy has come to be treated less seriously in some parts of the country than others. In Guangdong province in China's south-east, for example, families with two children were becoming quite common by the early 2000s, and by 2010 it was almost the norm in many coastal areas and elsewhere (figure 1.31). This was because the province was quite wealthy and many people felt they could afford more than one child –

the opposite of what the Demographic Transition Model might predict! People who were self-employed felt free to have more children because, unlike government employees, they did not need official permission to have a child.

US Population Policy

In strong contrast with China, the United States does not have any formal population policy apart from its laws governing immigration. Where the US government has legislated in the area of population, it has intended to enhance individual people's right to choose their own family planning. This is the opposite of the Chinese approach, which is to make the overall goals paramount over individual people's rights.

Thus, the US government has enacted laws providing funding or refunds for family planning services. In this way, women with low-incomes have access to birth control. In most US states, a woman must have had a child or be pregnant, be single, and have an income that is less than 50% of the poverty level to be eligible for refunds for family planning.

In 1970, the US government established a national family planning programme. This programme now provides financial support to 76% of all family planning agencies in the US Each year, four million Americans use government funded family planning programmes to obtain abortions or sterilisations. As a condition of government funding, family planning agencies must provide services for adolescents including contraceptive information and devices, gynaecological examinations, pregnancy tests, and screening tests for STDs, HIV, and cancer.

Nigeria's Population Policy

Nigeria has one of the fastest growing populations in the world. In 1975, its birth rate was 46.3 per 1000 people and its death rate was 20.2 per 1000. Thus, Nigeria's annual population growth rate at that time was 2.61%, one of the highest in the world. In 2008, birth rates remained high at 43 per 1000 people, while death rates had fallen to 18 per 1000. Therefore, the population growth rate remained almost the same at 2.5%. In 1950, Nigeria's population was 32.9 million people. By 1990 this figure had climbed to 96.2 million, and by 2008 to 148.1 million. Current projections are that Nigeria will have a population of 205.4 million by 2025 and 282.2 million by 2050.

In 1981-82, Nigeria's fertility rate was 5.94 children per woman. In 1990, this had climbed to 6.01 and it is currently estimated to be 5.9. One reason for Nigeria's high level of fertility is the very low level of contraceptive use. Only about 6% of married women currently use a method of contraception. Knowledge of contraception is very low, with fewer than half of all women aged 15 to 49 knowing of any method.

At present, the average ideal family size desired by women in Nigeria is essentially the same as the total fertility rate: six children per woman. According to a government survey, half of women with five children say they want to have another child.

Another factor leading to high fertility is the early age of marriage and childbearing in Nigeria. Half of all women are married by age 17, and 50% of all women become mothers by age 20. More than a quarter of Nigerian women aged 15 to 19 are either pregnant or already have children.

The Nigerian government became concerned about the consequences of such rapid increases in population, and in 1988 it adopted the National Policy on Population for Development, Unity, Progress and Self-Reliance. This policy was designed to slow the rate of population growth and improve the standards of living for the people. The policy worked on a voluntary basis, assuming that couples wish to determine the number and the spacing of their children.

The National Policy on Population identifies several objectives that include:

- promoting an awareness of population problems and the effects of rapid population growth;
- providing information on the benefits of small family size; and
- making family planning services easily accessible to all couples at an affordable cost.

The specific targets of the policy included:

- reducing the proportion of women who marry before the age of 18 by 80% by the year 2000;
- reducing the number of children a woman bears over her lifetime from the average of more than six children to an average of four;
- reducing the percentage of women having more than four children by 80% by the year 2000;
- reducing the rate of population growth from 3% per year to 2% by 2000;
- extending family planning coverage to 80% of women of child bearing age by 2000;
- reducing the infant mortality rate from the 1975 level of 111 per 1000 live births to 30 per 1000 live births by 2000; and
- providing 75% of rural communities with basic social amenities by 2000 to stimulate and sustain self-reliant development.

The main way of implementing this policy has been through an aggressive campaign, organised by the government to educate people about the importance of small family sizes, both for their own good and for the benefit of the nation. The policy has particularly tried to promote the use of family planning methods, a difficult task in a nation that is mainly Muslim. Contraception has been promoted through day care centres that have been established for employed women to leave their children while they are working. In order to encourage women to use these centres and obtain the information, legislation has been introduced to eliminate discrimination against women in education and employment and the minimum age of marriage has been increased to 18 years.


1.32 *This young Nigerian mother near the northern town of Jos has two young children and is pregnant with a third. Any anti-natalist population policy in Nigeria must change the attitudes of women such as her.*

So far, the Nigerian policy has not achieved the ambitious targets set. However, some gains have been made even though aspects of the policy violate the religious beliefs of many Nigerians. Any policy in Nigeria can only be successful if it is communicated to people in the countryside where most people live, and if it works within rather than against people's cultural sensitivities (figure 1.32). However, while most families retain a preference for having large numbers of children, the government's policy to limit population growth is unlikely to succeed.

Singapore's Population Policy

Unlike many other countries in the world, Singapore has a pro-natalist population policy. The words of a Singaporean Government publication summarise the rationale for the policy:

"People are, and always will be, our most precious resource. More than anything else, it is the effort of Singaporeans, with their drive and talent, that has made the country what it is today. Overcoming great odds as a newly-independent nation without natural resources, we have turned our city-state into a thriving and modern economy.., In the next lap, the size of our population and the quality of our people will determine how successfully we fare. (But) the population is not growing fast enough to replace itself in the long term; many Singaporeans remain unmarried; and those who do marry tend to have fewer children... Too small a population will hinder our development."
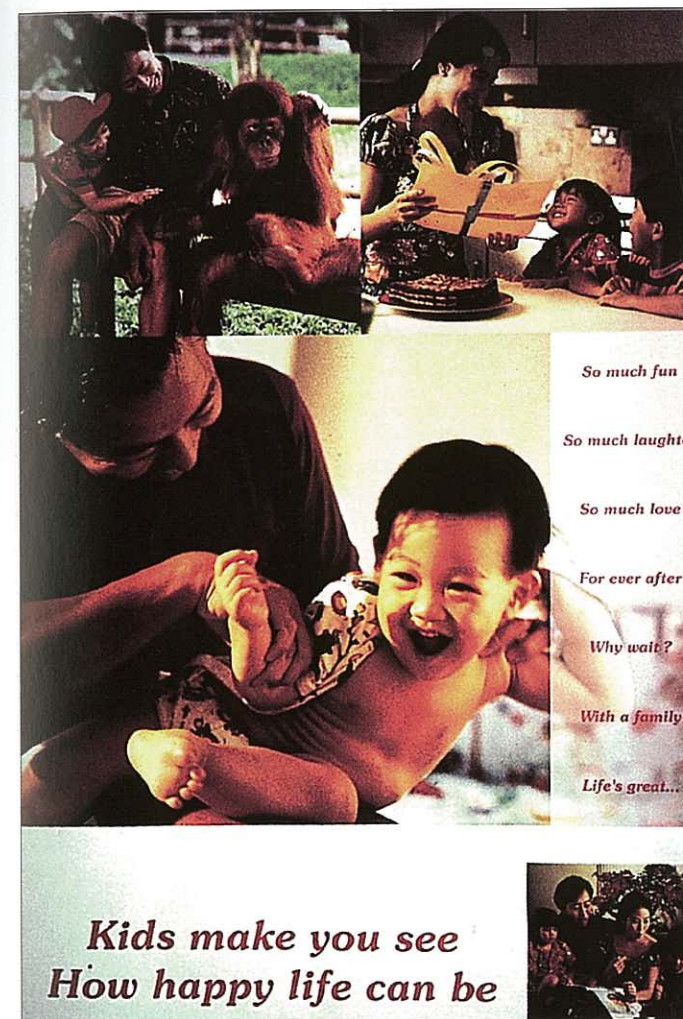
1.33 *A pro-natalist population poster in a subway in Singapore.*

At first, the claim that Singapore is underpopulated might seem surprising for a country with 4.8 million people in an area of only 685 square kilometres; its population density of 7,742 people per square kilometre is among the highest in the world. Furthermore, Singapore's birth rate of 11 births per 1000 people easily exceeds its death rate of 5 deaths per 1000 people. However, Singapore's population is ageing, and if current trends continue population numbers will peak in 2030 and then start to decline.

During the 1960s, when Singapore became an independent nation, it was rapidly rising population numbers that were causing concern. Large numbers of people had migrated to Singapore from China, Malaysia and India, and it was feared that the large numbers might cause strain in the new independent nation. At the time, an anti-natalist government policy of 'stop-at-two' was introduced. The policy was so successful that Singapore's population growth is now falling below replacement level.

In response to this situation, a new pro-natalist policy known as the New Population Policy was introduced in 1987. The target of the policy was young couples who were choosing to put their careers, leisure and personal interests above marriage and parenthood. Posters were placed on buses and trains with slogans such as 'Children – Life would be empty without them' and 'Now that you've married, take the next step' (figure 1.33).

The aim of the New Population Policy was to increase Singapore's fertility rate to 2.1, which is replacement rate. In 1986, the year before the policy was introduced, fertility in Singapore fell to a record low of 1.4. In 1988, the first full year of the pro-natalist policy, fertility rose to 2.0, a significant increase but still less than replacement level. If the New Population Policy is unsuccessful and fertility remains in the 1.8 to 2.1 range, Singapore's population will peak in the year 2030 at 5.3 to 5.4 million, and then decline. Furthermore, the proportion of elderly people in the population will rise as the post-war baby boomers reach old age; in the year 2030 25% of Singapore's population will be aged 60 or older compared with 9% today. The Singapore Government believes that the country can comfortably accommodate over 5 million people with substantial gains in the quality of life.

The New Population Policy particularly targets intellectually talented people. Whereas the policy in general encourages each married couple to have two children, couples that are university graduates are encouraged to have four children. In an effort to raise the talent level of the population further, Singapore is encouraging the immigration of well-educated people from other parts of Asia and actively discouraging the emigration of university graduates.

India's Population Policy

The Indian government was one of the first in the world to introduce an anti-natalist population policy. In 1952, a well-publicised programme was launched which offered incentives such as transistor radios to men who volunteered to be sterilised by having a vasectomy. The campaign was only partly successful, largely because many men became disillusioned when they realised that sterili-

sation was permanent whereas the batteries of transistor radios are not.

The campaign to encourage male sterilisations was strengthened during the 1970s when many men were forced to be sterilised against their wishes. This lowered birth rates, but gave population policies in India a bad reputation. One of the problems faced by population workers in India is that, like China, boy babies are traditionally favoured over girls. Although there are many reasons why this is so (see extract 1.1), the pressure remains on families with many daughters to continue trying to have a son.

Today, India's population policy aims to reduce fertility rates, largely by encouraging the use of contraceptives. The current Five Year Plan for India's economy identifies controlling population growth as the sixth most important objective of national government policy. The government established the specific target of reducing the birth rate from 29.9 per 1000 in 1990 to 26 per 1000 by 1997 and achieving an average of 2.1 children per family by 2000. The policy also set targets for the numbers of users of specific types of contraception, particularly sterilisation, abortions and IUDs.

The Indian government tries to use incentives to encourage people to achieve the targets set. Among the incentives offered are new schools, provision of drinking water facilities and new road links for areas that reduce their population growth. There are also cash incentives for people willing to be sterilised or have an IUD inserted, as well as commissions for health workers who successfully motivate individuals or couples to become sterilised. In an effort to promote population control, the central government proposed an amendment to the Constitution in the mid-1990s to disqualify from election to national Parliament or state legislatures any candidate with more than two children. This bill has not yet been passed, but the proposal remains pending.

To support its population policy, the Indian government provides large-scale family planning services. The network of population control centres is placed within government hospitals, clinics, and workplace sites. All services in these centres are provided free of charge to the user. The policy also aims to increase public awareness of family planning and to train medical personnel. The government organises mass public information campaigns, primary and adult education programmes, and the training of community workers to promote family planning in rural areas. Many of the government programmes feature motivators who talk with couples and maintain a register of their reproductive activities.

Despite the great efforts put into population control in India, the successes have been modest. In 1975, India's birth rate was 38.2 per 1000 people, and by 1995 this had declined to 29.1 births per 1000, falling further to 25.2

births per 1000 by 2000 and 24 per 1000 in 2008. However, there are significant differences between different regions of India which provide some useful insights – in the state of Uttah Pradesh the birth rate is 40 per 1000, but in the southern state of Kerala the birth rate is only 18 per 1000. The reasons that Kerala has been so successful in controlling births are examined in the section that follows.

The Kerala Approach to Population Control

Kerala is a state in southern India with an area of 38,864 square kilometres and a population of 30 million people (figure 1.34). It is largely an agricultural state with coconut plantations and rice farms, and its other crops include black pepper, rubber, tapioca, oilseeds, sugar cane, tea, coffee and teak timber. The capital city is Trivandrum with a population of 600,000, although the town of Cochin is larger (with over 700,000 people) and is one of India's largest ports.

1.34 *Map of Kerala.*

Kerala has had spectacular success in lowering its birth rate without any strong regulations like China or even any financial incentives like other parts of India. Kerala is also attracting international attention for its success in controlling deaths, and especially for lowering its infant mortality rates. According to the demographic transition model, lowering birth rates occurs only when substantial economic changes such as industrialisation and urbanisation occur. However, Kerala's fall in fertility occurred at a time when Kerala had a dismal record in industrial and agricultural production and when there was high unemployment.

ToK BoX

Link to Theory of Knowledge.

In the IB Diploma Geography course, it is important to remember that Geography is just one subject within the wider context of all knowledge. The study of the 'Theory of Knowledge' is also called **epistemology**, and it is one of the most important branches of philosophy. It is the 'umbrella' that spans the entire scope of knowledge and understanding. The diagram in this ToK BoX shows one way to represent the Theory of Knowledge framework. The starting point is the centre of the circle, which is you — the knower. On the outside of the circle there are six broad areas of knowledge.

Most subjects fit into one of these six broad areas, but geography is somewhat different. Geography spans both the natural sciences (in physical geography) and the human sciences (in human geography). Indeed, one of the great distinctive features of geography is the way it links (or integrates) the physical and human facets of our world. Geography is therefore a good example of why the classification of knowledge into these six broad areas is somewhat imperfect.

The knower (you!) accesses the six broad areas of knowledge through four 'Ways of Knowing' — reasoning, the emotions, sense-perception and language.

In each chapter of this book, there will be a "ToK BoX" which is designed to help you place the understandings you acquire in Geography within the wider context of the areas of knowledge and the ways of knowing.

The next ToK BoX is on page 61.
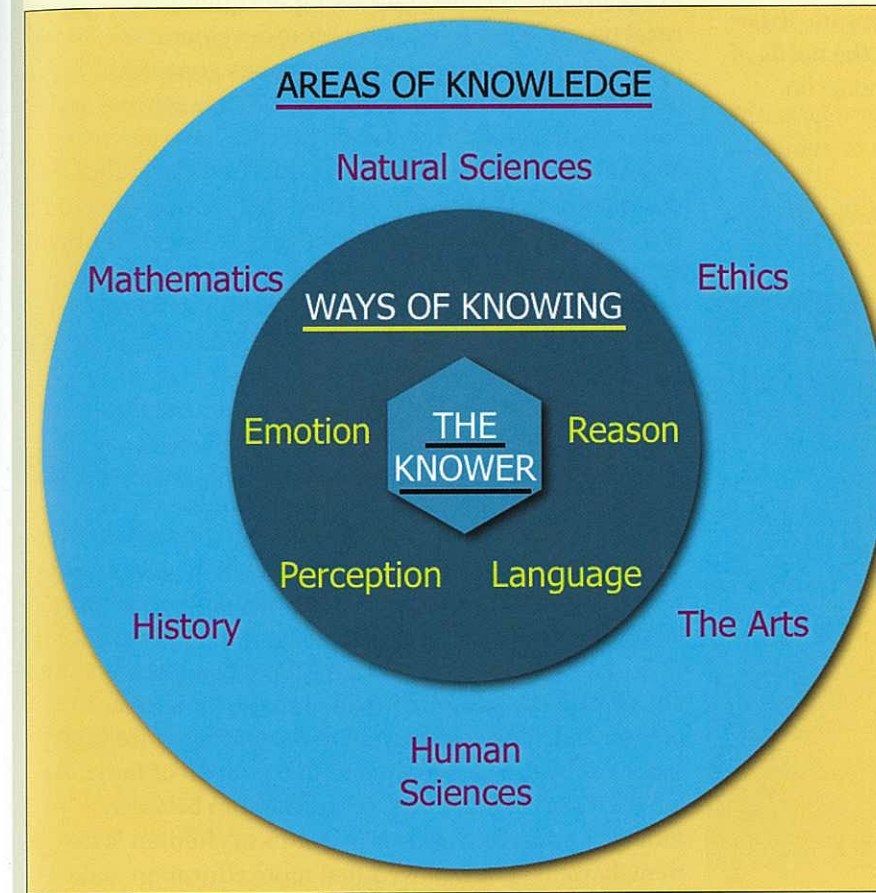
Kerala has always been one of the most densely populated parts of India. As long ago as 1901, Kerala's population density was double that of India as a whole. In the most recent census (1981), Kerala's population density of 654 people per square kilometre was three times India's national average. Kerala is also unusual in that unlike the rest of India (and most of the world), Kerala gives birth to more girls than boys, and the female to male ratio has been increasing over the years. In 1901, Kerala had 99.6 males for every 100 females; this figure fell to 98.9 in 1921, 97.3 in 1951 and 96.7 in 1981.

Traditionally, Kerala has had the highest fertility rates and one of the lowest death rates in India. Therefore, its population growth rate was among the fastest in India. In the mid-1960s, Kerala's birth rate was about 42 per 1000 people, but with the impact of the Indian government's population policies this fell to 35 per 1000 in 1970. By 1980, the birth rate had fallen to 30 per 1000 and by 1990 to 20 per 1000. The decline has continued since then, reaching 17 per 1000 in 1993 and 15 per 1000 in 1997. With a fertility rate of 1.7, Kerala's population growth has slowed to less than replacement level, a remarkable decline in fertility in the space of just over 30 years.

In the period 1991 to 1996, the average number of births in Kerala was 466 000 per year, but by 2021 to 2026, this figure will fall to 205 000. Today, many schools are already empty and industries catering to children's needs are likely to have a bleak future. On the other hand, the proportion of aged people in Kerala will grow in the years ahead. The proportion of people in Kerala aged 60 and over in 1961 was 5.8%. By 1981, this figure had risen to 7.5% and it is expected to rise further to 10.2% in 2001 and 18.4% in 2026.

The decline in birth rates has been matched by large falls in the death rates also. Although Kerala has traditionally lower death rates than the rest of India, it reached 13 per 1000 people in 1993 and has stayed at that level since that time. Between 1991 and 2031, the number of elderly people in Kerala will increase by 289% – from 2.6 million to about 9.6 million. In 1991, there were only 16 elderly people for every 100 people in the working ages of 20-59 years; by 2031 this figure will have risen to 60.

It is important to understand that even within Kerala, there are substantial differences in mortality rates depending on educational level, religion and occupation of the

people concerned. This can be seen with reference to infant mortality rates, as shown in table 1.9.

Such major changes in birth rates and death rates in a relatively short period of time have significant implications. In the past, many resources have had to be allocated to the needs of children, such as in education, children's health, clothing and toys. In the future, these resources will need to be diverted to care of the needs of the elderly – housing, food, medical care, and so on.

Table 1.9
Infant and Child Mortality rates in Rural Areas of India and Kerala

Mother's Characteristic	Infant Mortality Rate		Under 5 Mortality Rate	
	Kerala	India	Kerala	India
Educational level				
Illiterate	55	145	100	176
Below Primary	44	101		
Primary			67	123
Middle			46	88
Matriculation	29	71	33	66
Graduate			25	46
Religion / Caste				
Hindu	45	138	74	168
Muslim	43	126	82	148
Christian	27		56	108
Lower caste	85	152	113	203
Tribal		120	157	193
Occupation				
Main Worker	74	142	96	177
- Cultivator			89	164
- Farm Labourer			111	190
- Non-manual			41	111
- Manual			103	171
Marginal Worker			87	188
Non Worker	34	134	64	154
All Women	42	136	72	164

Source: Zachariah & Rajan (1992) p.44

Why have such significant demographic changes occurred in Kerala? At first the changes seem puzzling, especially as Kerala lags behind the rest of India according to most economic measures. Kerala's elected state government has had long periods of Communist control. The Communists have believed that as most of Kerala's people live in the rural areas, then improving the quality of life of rural people is the key to economic development. Therefore, most government expenditure has gone into education and health care in rural areas – village schools and rural health clinics. The Kerala officials have not spent any more money on health and education than other Indian states, but they have ensured that money is spent on low cost rural facilities where the people live rather than on large prestigious projects in the cities. In 1988, there were 259 hospital beds per 100 000 people in Kerala compared with an average of only 77 for India as a whole. Of these beds, 56% were in rural areas, whereas for India in general, only 18% of hospital beds are in rural areas. In Kerala, 47% of villages have a health clinic within two kilometres, but for India in general the figure is only 12%.

Particular attention was placed on raising female literacy. Traditionally in India, girls were often denied an education, but in Kerala girls were treated equally with boys. At the last census for which data has been released (1981), 71% of all women in Kerala aged 15 and above were literate, compared with 26% for all of India. In Kerala, 13% of women had been educated to the end of senior high school or beyond, compared with 6% for all of India. As table 1.9 showed, the inverse relationship between a mother's education and early deaths of children is extremely clear. It is believed that more education makes mothers less fatalistic about illness, bolder to question their mother-in-law's authority, more demanding of better health care and better food for their children, and raises incomes and therefore standards of living.

With the exception of the rise in female literacy, there has been no substantial change in Kerala's economy that might have accelerated the demographic transition in the way that seems to have happened. However, there has been a fundamental shift in the attitudes of people of Kerala to want fewer children but to give each child a better quality of life. The decline in Kerala's fertility is a good example of diffusion. i.e. that an idea begins at one point and spreads from there. The evidence that the fertility decline is an example of diffusion is as follows:

- The increase in the minimum age for females to marry was not an important factor in Kerala's fertility decline; it accounted for only 15% of the decline between 1961 and 1981.

- Fertility declined at the same time as knowledge about contraception was becoming more widespread.

- The decline in fertility happened very quickly; over a period of 30 years fertility went from a typical developing country situation to below replacement level.

- The decline in fertility and the rise in female literacy seem very closely linked.

- Fertility declined more among non-Muslims than Muslims, suggesting that contraception is more likely to be adopted where it does not violate religious and social norms.

Does Kerala's experience have applicability to other areas of India and the world? For Kerala, the key to lowering fertility seems to have been raising the level of female literacy. Kerala has been successful in raising female literacy for three reasons. First, mass education has been a central policy of governments in Kerala for many decades. Second, Kerala has a high proportion of Christians in the population, and this group is more open to the education of females than most other religious groups in Kerala. Finally, the high population density in Kerala increases people's accessibility to schools, raising the participation rate in education. The rest of India lags some 40 years behind Kerala in the level of female literacy, and it is even possible that the rest of India will never bridge this gap because of the traditional barriers to educating females among many groups in India.

QUESTION BLOCK 1G

1. *Explain how a traditional, isolated society might limit their population growth.*

2. *Draw a diagram to show a classification of the different types of population policies which are possible. Under each type of policy, list an example of a country which implements this type of policy.*

3. *Why did China have a pro-natalist population policy in the 1950s?*

4. *In what way does raising the minimum age for marriage control population growth?*

5. *Show the information in table 1.8 on a line graph. Draw the horizontal axis to show 'age' and the vertical axis to show 'percentage of population'. Remember to make the intervals on the horizontal axis proportionally spaced to reflect the gap in ages accurately.*

6. *What are the main findings you can draw from the information in table 1.8?*

7. *Outline the aims of China's 'One Child' Policy, and describe the ways in which the policy is implemented.*

8. *What exceptions are made under the 'One Child' Policy?*

9. *How successful has the 'One Child' Policy been in China?*

10. *What problems have been encountered with the 'One Child' Policy?*

11. *Contrast the aims of the U.S. and the Chinese population policies.*

12. *Comment on the rate of population increase in Nigeria. Use figures to quantify your answer.*

13. *Why is the rate of population growth in Nigeria increasing?*

14. *How successful is Nigeria's population policy? Give reasons why this is so.*

15. *In what way is the aim of Singapore's population policy different to population policies in China and Nigeria?*

16. *In what way has the aim of Singapore's population policy changed over the past decades?*

17. *Why is Singapore's population policy particularly targeting university graduates?*

18. *How successful has Singapore's population policy been?*

19. *What are the aims of India's population policy?*

20. *How does the Indian Government encourage people to conform to its population policy?*

21. *How successful has India's population policy been?*

22. *Describe the location of the Indian state of Kerala.*

23. *Write about half a page to describe the demographic change which has occurred in Kerala.*

24. *With reference to table 1.9, describe the relationship between infants' and children's mortality rates and the educational level of women.*

25. *What will be the impact of Kerala's demographic changes in the years ahead?*

26. *List and then briefly describe the factors that have caused Kerala's large demographic changes.*

27. *What is meant by the claim that 'the fertility decline (in Kerala) is an example of diffusion'?*

28. *To what extent could Kerala's approach in controlling population growth be applied to other parts of the world such as China and Nigeria?*

Movement responses – migration

Migration

It was stated earlier in this chapter that total population is a function of natural increase plus net migration. **Migration** is the movement of people. It can be permanent or temporary, and if temporary it can be long-term (more than a year) or short-term. If a migrant returns home periodically, as is common with seasonal farm workers or