Population density: How many people there are, usually expressed as people per km².

Population distribution: How a population is spread out.

Factors affecting population density include:

- the availability of water
- the availability of housing
- the availability of education
- the availability of health care

Areas (parts of continents, parts of countries or whole countries) with high population densities are usually much easier for people to live in e.g. flat lowlands or areas with a reasonable climate. They may also be areas with important resources e.g. coal, oil, metals. Or they may be in easily accessible positions e.g. near major rivers.
The main countries that are densely populated are Bangladesh, India, Sri Lanka, Japan, UK, the Netherlands, Germany, the Philippines, South Korea and Vietnam. Most of these countries have sub-tropical to temperate climates and abundant flat land.

Physical factors such as mountains, deserts or extreme climates often mean that an area is sparsely populated.

Examples of sparsely populated areas are Canada, Bolivia, Australia, Russia, Namibia, Angola, Libya, Saudi Arabia and Greenland.

Population density figures often give the average for each country, but remember there can be great variety within a country. A good example is Japan, where 75% of the land is mountainous and 77% of the population live on just 16% of the land. Other countries which appear to have low population densities have very crowded major cities e.g. the USA and Brazil.
Population pyramids

How do population structures differ?

Population structure shows the number of males and females within different age groups within a population - information shown as a graph known as population pyramid.

Population pyramids show:

- Total population divided into five-year age groups
- Percentage of people in those age groups
- The percentage of males and females in each age group
- Trends in birth rate, death rate, infant mortality and life expectancy
- The proportion of elderly and young people who are dependant upon those of working age - the economically active
- The results of people migrating in or out of a country

The characteristics of a population are defined by:
- the total population
- the population density
- the sex ratio - relative numbers of males and females
- the age structure - relative numbers of different age groups
- the age-sex structure - best shown by population pyramids

When a country has a high number of children, it is said to have a youthful population, but when a country has a high number of elderly people, it has an ageing population. Both of these situations can give rise to a number of problems.

Dependency ratio: the ratio between those of working age and those of non-working age. This is calculated as:

\[
\frac{\% \text{ pop aged } 0-14 + \% \text{ pop aged } 65+}{\% \text{ of population aged } 15-65} \times 100
\]

The ratio for an MEDC usually lies between 50 and 75. The ratio for an LEDC is typically higher. Mexico, with a youthful population structure, has a dependency ratio of 104. The higher the ratio, the greater the number of dependents that have to be provided for from the taxes on the
Youthful Population (LEDCs)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- provides a large and cheap future workforce</td>
<td>- puts strain on education and health services</td>
<td>- family planning</td>
</tr>
<tr>
<td>- provides a growing market for manufactured products</td>
<td>- puts strain on food supplies</td>
<td>- industrialisation to provide jobs in manufacturing</td>
</tr>
<tr>
<td></td>
<td>- puts strain on available accommodation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- lack of available jobs in the future</td>
<td></td>
</tr>
</tbody>
</table>

Ageing Population (MEDCs)

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A larger proportion of ageing people can add experience to the workforce</td>
<td>- cost of providing pensions, health care and sheltered housing leads to increased taxes on a proportionally small workforce</td>
<td>- abolish state pensions</td>
</tr>
<tr>
<td>- a growing 'grey' market for leisure and health products</td>
<td>- many young people are employed caring for the elderly. This harms a country's competitiveness, since they are not producing products for export.</td>
<td>- raise retirement age</td>
</tr>
<tr>
<td>- construction boom in favoured retirement locations such as the Costa del Sol (Spain).</td>
<td></td>
<td>- locate retirement 'colonies' in LEDCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- increase taxes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- sell homes of the elderly to pay for retirement care</td>
</tr>
</tbody>
</table>
Reasons for high birth and death rates in developing countries:

- work on land/farms
- Care for family when ill/old
- Lots of children die from disease
- Child go to city to earn money
- Religious beliefs against birth control
- Having a large family gives status
- Tradition of having large families
- Children are regarded as insurance

Reasons for low birth and death rates in developed countries:

- Excellent standard of living
- Don’t need lots of children to work
- Children survive so don’t have to have more
- Excellent healthcare
- Excellent family planning
- Children live free from disease
- Want to spend money on other things
- Have pensions for when get old don’t need children to look after them
➢ Want careers

Overpopulation often leads to poverty.

The effects of overpopulation in developing countries are:

- Pressure on the land
- Land is over-utilised
- Housing shortages
- Lack of work
- The spreading of diseases
- Poor medical facilities
The demographic Transition Model

A - Stage 1

Both high birth rates and death rates fluctuate in the first stage of the population model giving a small population growth (shown by the small total population graph). There are many reasons for this:

- little access to birth control
- many children die in infancy (high infant mortality) so parents tend to have more children to compensate in the hopes that more will live
- children are needed to work on the land to grow food for the family
- children are regarded as a sign of virility in some cultures
- religious beliefs (e.g. Roman Catholics and Hindus) encourage large families

high death rates, especially among children because of disease, famine, poor diet, poor hygiene, little medical science.

Example: Some tribes in Amazon

B - Stage 2

Birth rates remain high, but death rates fall rapidly causing a high population growth (as shown by the total population graph). The reasons for this could be:
• improvements in medical care - hospitals, medicines, etc.
• improvements in sanitation and water supply
• quality and quantity of food produced rises
• transport and communications improve the movements of food and medical supplies
  decrease in infant mortality.

Example: Bangladesh, Nigeria

C - Stage 3

Birth rates now fall rapidly while death rates continue to fall. The total population begins to peak and
the population increase slows to a constant. The reasons for this could be:

• increased access to contraception
• lower infant mortality rate means there is less need to have a bigger family
• industrialisation and mechanisation means fewer labourers are required
• the desire for material possessions takes over the desire for large families as wealth increases

• equality for women means that they are able to follow a career path rather than feeling
  obligated to have a family.

Example: Brazil

D - Stage 4

Both birth rates and death rates remain low, fluctuating with 'baby booms' and epidemics of illnesses
and disease. This results in a steady population.

Example: UK

E? - Stage 5?

A stage 5 was not originally thought of as part of the DTM, but some MEDCs are now reaching the
stage where total population is declining where birth rates have dropped below death rates. One such
country is Germany, which has taken in foreign workers to fill jobs.
The birth rate in Thailand has fallen rapidly, partly as a result of the National Family Planning Programme, which has been run by the Ministry of Health since 1970. This has included:
- public information programmes to ensure that everyone knows about contraceptive methods
- advertising the benefits of the two-child family
- establishing health centres throughout the country to provide mainly free contraception
- training paramedics and midwives, who are mainly from the local villages and, therefore, are known and trusted. They provide healthcare for mothers and babies, so more babies are surviving
Figure 5.6 Demographic transition model in the UK, 1700-2000
Anti-natalist – encouraging people not to have children

Case study: China

In the late 1970s, the Chinese government introduced a number of measures to reduce the country’s birth rate and slow the population growth rate. The most important of the new measures was a one-child policy, which decreed that couples in China could only have one child.

- In 1950 the rate of population change in China was 1.9% each year. If this doesn’t sound high, consider that a growth rate of only 3% will cause the population of a country to double in less than 24 years!
- Previous Chinese governments had encouraged people to have a lot of children to increase the country’s workforce. But by the 1970s the government realised that current rates of population growth would soon become unsustainable.

The one-child policy

- The one-child policy, established in 1979, meant that each couple was allowed just one child.
- Benefits, including access to education, childcare and health care, were offered to families that followed this rule.
- Those who had more than one child didn’t receive these benefits and were fined.
- The one-child policy was keenly resisted in rural areas, where it was traditional to have large families. The one-child policy has been enforced strictly in urban areas, but remote rural areas have been harder to control.
- Many people claim that some women, who became pregnant after they had already had a child, were forced to have an abortion and many women were forcibly sterilised. There appears to be evidence to back up these claims.

Impact of the policy

- The birth rate in China has fallen since 1979, and the rate of population growth is now 0.7%. However there have been negative impacts too.
Due to a traditional preference for boys, large numbers of female babies have ended up homeless or in orphanages, and in some cases killed. In 2000, it was reported that 90% of foetuses aborted in China were female.

As a result, the gender balance of the Chinese population has become distorted. Today it is thought that men outnumber women by more than 60 million.

**Long-term implications**

China’s one-child policy has been somewhat relaxed in recent years. Couples can now apply to have a second child if their first child is a girl, or if both parents are themselves only-children.

While China’s population is now rising more slowly, it still has a very large total population (1.3 billion in 2008) and China faces new problems:

- The falling birth rate is leading to a rise in the relative number of elderly people.
- There are fewer people of working age to support the growing number of elderly dependants.

In the future China could have an ageing population

**Pro-natalist - encouraging people to have children**

**SWEDEN AND NORWAY**

Nordic governments employ a range of policies designed to help couples have more children. These governments have a long history of social policies aimed at helping people balance their work and family life. This is part of what is known as the "Nordic model".

In Sweden, each parent is entitled to 18 months leave, which is paid for by the government. Public day care is heavily subsidised and flexible work schedules are common - women with children of pre-school age are entitled to reduce their working hours. Women’s participation in the work force is high. In Norway, mothers are entitled to 12 months off work with 80% pay or 10 months with full pay. Fathers are entitled to take almost all of that leave instead of the mother. Fathers must take at least four weeks leave or else those weeks will be lost for both parents. The leave is financed through taxes, so employers don’t lose out.

Fertility rates per woman: Norway: 1.81, Sweden: 1.75

**IRELAND**

Ireland has the highest fertility rate in the EU, despite the fact that child care is seen as underdeveloped and expensive.

Mothers get 26 weeks maternity leave plus 14 weeks parental leave
Fertility rate: 1.99

**UK**

New mothers currently get six months' paid leave and the option of six months further unpaid leave. The first six weeks are at 90% of pay and the next 20 at £102.80 per week. New fathers are allowed two weeks' paid leave at a maximum £102.80 a week.

The government offers free early education places. Children from the age of four get free part-time places at nurseries - some three year olds also get places.

Parents of children under the age of six have the right to ask their employers for more flexible working hours. Although employers don’t have to agree with the request, they have to show they have considered it carefully.

Fertility rate: 1.74

**GERMANY**

Germany has long had one of the lowest birth rates in the European Union and one of the highest proportions of childless women. According to EU statistics from 2005, 30% of German women have not had children.

Demographers say Germany’s problem has probably been made worse because it has been ignored for so long.

The government offers 14 weeks maternity leave plus parental leave of up to 36 months, with the level of pay depending on a number of factors.

One of the biggest problems is a real lack of child care places. According to government figures, only one in five children under three get a place in day care. Not only do they close at lunch time, but the fees are incredibly high. Another problem for working parents is that traditionally, the school day ends at 1pm.

The government has now lifted the birth rate to the top of the political agenda. In January, it adopted a bill to give tax breaks to families. It has also floated the idea of eliminating fees for kindergarten.

Fertility rate: 1.37

**POLAND**
The Polish parliament has passed legislation to pay women for each new child they have, in an effort to boost the country's falling population.

Under the scheme every woman will receive a one-off payment of 1,000 zlotys (258 euros; £177) - for each child she has. Women from poorer families will receive double that amount.

The population has actually decreased by close to half a million in the last six years. But some women's groups say payments are a quick fix and will not address the long-term trend.

Fertility rate: 1.78

FRANCE

France has employed various policies to try to reconcile family life with women working. It has some of the most extensive state-funded child care in Europe.

Mothers can take 16 weeks paid maternity leave for the first child, rising to 26 weeks for the third child. There is also a total of 26 months parental leave.

Last year, the government pledged more money for families with three children in an effort to encourage working women to have more babies.

Child care facilities are subsidised by the government. Younger children are entitled to full-day childcare (crèches). For children aged two to three there are pre-school programmes for which families pay on a sliding scale.

Fertility rates: 1.9 - the second highest fertility rate in Europe.

SPAIN

Currently Spain has the second-lowest rate of fertility among the original 15 EU member states. However in the early 1970s, it was among the highest.

Until recently, there had been strong public opposition to any government action aimed at increasing fertility, partly because such policies were associated with Franco's regime and partly because fertility was perceived as too high.

In 2003, the government introduced a national family policy but there is still a belief that family creation is a private matter. However, Spanish PM Jose Luis Rodriguez Zapatero has been urging companies to set up child care facilities and promoting long-term employment over short-term contracts.
Fully funded maternity leave can last for 16 weeks, and unpaid leave of three years is available, but only about one-third of Spanish mothers take up maternity benefits.

Child care services vary from region to region, with some being shorter than the working day.

Fertility rate: 1.32

ITALY

Italy has long had a problem with declining birth rates.

The problems include what is perceived to be a bias in the workplace to women who interrupt their careers to have children, the high fees charged by private nurseries and a chronic shortage of affordable housing for young people.

The Italian government offers a one-time payment of 1,000 euros (£685) to couples who have a second child.

Late last year a proposal that mooted paying women not to have abortions gained popular support in Parliament.

Fertility rate: 1.33
Migration

Migration is the movement of people. There are different types of migration. In voluntary migration, the migrant makes the decision to move rather than being forced to do so.

1. Rural to urban migration

<table>
<thead>
<tr>
<th>Push factors</th>
<th>Pull factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>Greater job opportunities</td>
</tr>
<tr>
<td>Low wages</td>
<td>Higher wages</td>
</tr>
<tr>
<td>Natural disasters</td>
<td>Better social services</td>
</tr>
<tr>
<td>Mechanisation</td>
<td>Better medical facilities</td>
</tr>
<tr>
<td></td>
<td>The &quot;bright lights&quot; theory</td>
</tr>
</tbody>
</table>

Examples: Brazil, mainly developing countries

2. Urban to rural migration

People often want to live in the countryside because there is less noise, less pollution, less traffic congestion and the surroundings are often more attractive.

Examples: South East to South West, mainly developed countries

3. International migration is a voluntary movement to a different country.

Examples: Mexico to USA, UK to Australia

What are the push and pull factors from Mexico into the USA?

Why leave Mexico?

- Low standard of living
- Lack of skilled, well-paid employment
- Few opportunities
- Lack of education
- Poor quality housing
- Poor health service
Why migrate to the USA?

- Many opportunities
- High standard of living (one of highest in the world)
- Many job opportunities (well-paid jobs)
- Education
- Excellent health care
- Search for the 'American Dream'

Some characteristics of Mexico and the USA:

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>People per doctor</td>
<td>400</td>
<td>1800</td>
</tr>
<tr>
<td>Family income</td>
<td>$24,750</td>
<td>$3,750</td>
</tr>
<tr>
<td>School attendance</td>
<td>99%</td>
<td>55%</td>
</tr>
</tbody>
</table>

4. **Immigration** is the movement into a country from another country.

5. **Emigration** is the movement from one country to another country.
   Immigration and emigration cannot happen in isolation. The country being left declines in population, while the population of the receiving country increases.

6. **Transmigration** refers movement within a country.

   **Example: Indonesia**

7. **Forced migration** is when people are forced to leave their homes (these people are often called "refugees").

   Why do they move?

- war
- politics
- religious persecution
- famine
Urbanisation – the growth in towns and cities

Urbanisation can cause problems such as transport congestion, lack of sufficient housing, over-rapid growth and environmental degradation. Many cities display particularly sharp inequalities in housing provision, health and employment.

Some people try to escape these problems by moving away from the city – a process called counter-urbanisation. Long term, however, the solution must be to make cities more sustainable.

Causes of urbanisation

Urbanisation means an increase in the proportion of people living in urban areas compared to rural areas. An urban area is a built-up area such as a town or city. A rural area is an area of countryside.

As a country industrialises, the number of people living in urban areas tends to increase. The UK and many other MEDCs urbanised during the 18th and 19th centuries. People migrated from rural areas (due to the mechanisation in farming) to urban areas where there was employment in the new factories. The area of cities known as the inner city developed during this time as rows of terraced housing were built for workers.

Today the UK is a mostly urban society, with 90% of the population living in towns or cities. On a global scale, urbanisation is taking place rapidly, particularly in LEDCs. Although the UK is an urban society, more and more people are choosing to live on the edge of urban areas - with many relocating to the countryside. This is called counter-urbanisation.
**Land use in zones**

The ways that land is used are broadly the same in all towns and cities. The *land use*, for example, consists of areas for houses, businesses, leisure and transport. Areas with the same types of land use are called *zones*.

Most towns and cities grow out from their historic core. An increase in population and changing technology such as in transport and energy then changed their buildings, land use and size. Often, nearby towns and villages with their own historic core are surrounded as cities sprawl and merge to become one big city, or a *conurbation* where cities merge.

---

**The Burgess Model**

- **CBD**
- **Factories / Industry** (transitional)
- **Low Class Residential** (old inner city area)
- **Medium Class Residential** (inter-war period)
- **High Class Residential** (modern suburbs)
The Hoyt Model

- **CBD**
- **Factories / Industry (transitional)**
- **Low Class Residential** (old inner city area)
- **Medium Class Residential** (inter-war period)
- **High Class Residential** (modern suburbs)

---

**Figure 2.39 Land use change in an old part of a city.**

- **Rows of terraced houses from the 19th century are still suitable as homes, though there is not much open space for recreation and the area may need to be improved.**
- **Part of the old dockland is converted and used for leisure. The historic ship is part of a museum that attracts visitors.**
- **New homes and other buildings are being built on derelict industrial land beside the docks. Decisions have to be made about the price of the homes and who can afford to live there.**

- **A block of flats was built during the 1970s to redevelop the area, but not many people are living in them. Perhaps they should be demolished.**

- **An industrial zone that provides jobs, though heavy lorry traffic travels through the area.**

- **A football stadium that attracts crowds and traffic.**

- **Trees are conserved to help make the area more attractive.**

- **Old warehouses near the docks are used for activities such as offices, storage, health clubs and arts workshops.**

- **Old industrial buildings can look unsightly, but are kept for manufacturing, giving people jobs.**
Sustainable cities

Many people are working towards trying to make cities more sustainable. A sustainable city offers a good quality of life to current residents but doesn’t reduce the opportunities for future residents to enjoy.

Key features of a sustainable city

- Resources and services in the city are accessible to all.
- Public transport is seen as a viable alternative to cars.
- Public transport is safe and reliable.
- Walking and cycling is safe.
- Areas of open space are safe, accessible and enjoyable.
- Wherever possible, renewable resources are used instead of non-renewable resources.
- Waste is seen as a resource and is recycled wherever possible.
- New homes are energy efficient.
- There is access to affordable housing.
- Community links are strong and communities work together to deal with issues such as crime and security.
- Cultural and social amenities are accessible to all.
- Inward investment is made to the CBD.

A sustainable city will grow at a sustainable rate and use resources in a sustainable way. Think of our local area – Bristol, Bath, Chew Valley.

- Could it be more sustainable?
- Do people walk, cycle or use public transport rather than cars?
- Are there enough safe open spaces, services and cultural amenities for everyone?
- Is there enough investment in the city centre?
- Is there a strong sense of community?
- Is waste recycled?
- Is there affordable housing for everyone?
- Are homes energy-efficient?
- Do they use renewable energy?
CASE STUDY Greenwich Millennium Village - sustainable city living?

GET STARTED

Make a list of at least five things you think that people in a city can do to reduce their use of some of the Earth's resources such as oil and metals.

Regeneration in Greenwich

The Greenwich Millennium Village (GMV) is one of several developments in the UK where homes are being built in ways that try to let people live more sustainably. It is being built on land that was part of London's old Docklands on the south bank of the Thames. The O2 Dome is nearby. It is an example of an urban regeneration scheme. When the scheme is finished in 2010, at least 1400 new homes will have been built on the 20-hectare site. There will also be new shops, services and other facilities.

The claims to sustain

One reason the Greenwich Millennium Village claims to be sustainable is because it is set for homes to use 10 per cent less energy and 10 per cent less water. This is being done by generating some power locally and combining this with a heating system called a combined heat and power system (CHP).

The buildings use materials that the builders say are sustainable, such as cedar wood from sustainable forests. In some buildings, aluminium is used because it lasts and can eventually be recycled. They are designed to take advantage of sunlight and to be protected from cold east winds. The site itself is on old housing and industrial land that has been cleared of pollution.

Fact file

Redevelopment of the Greenwich Peninsula (76 hectares), including the GMV on its eastern side

- 20 hectares is for parkland and other open spaces, with two ecology parks.
- 10,000 new homes in neighbourhood districts.
- 24,000 new jobs.
- 150 new shops and restaurants.
- New community and leisure facilities, including the O2, factory.
- Access to the Jubilee underground line and bus routes.
- Pedestrian and cycle routes.
- An integrated primary school and health centre.
- 2.2 km of river walkways.

Mixing the land use

Another way to help people live sustainably is to help them to reduce their use of all forms of energy. One way to do this is to make it easy to get to places such as shops, so energy is not used in travel. This is done by having mixed land use, for example, a primary school, community centre, shops and some bus routes. A Sainsbury's 'eco-store' in the GMV that uses 20 per cent less energy than other supermarkets has been built.

There is also an eco-park with a lake and strips of open space that connect different parts of the development. There is a new underground station nearby so people can get to other parts of London on public transport. There are cycleways and bus routes so people do not have to use cars.

The real test

The Greenwich Millennium Village is only one example of how ideas are changing about building not only individual houses, but also larger areas. It is likely that some mistakes will be made and not all claims will match the reality. Some people, for example, say that not even the Greenwich Millennium Village is really sustainable. People still buy goods that use finite resources that are often made elsewhere. They still use energy from fossil fuels and may still have to travel out of the area to get to work. But anything that can be done to reduce CO2 emissions and to help people think and act more sustainably has to be worth trying.

ACTIVITIES

1. Study the photos of the Greenwich Millennium Village. What are your first impressions of the area as a place in which to live?

2. Draw up a table to show how the GMV meets all the elements of sustainability.

3. Do you think that the people who live in this area of London will feel they are part of a community? Explain your answer.

4. Study Figure 2.5. What do you think about how land has been used in the GMV and how this will encourage people to live sustainably?

5. What does it mean for something to be eco-friendly in a city, such as a house, shop, transport or a park?

6. Read the viewpoints about the GMV plan. What are the regrettable points and do you think that anything could be done to overcome them?

7. What questions would you ask people who live in the area to find out if they are happy living there and the reasons for their replies?

RESEARCH LINK

Is the GMV considered to be a success? Why by?

The plan claims that more than 70 per cent of energy use in the GMV will be renewable.

Figure 2.4

Land use layout of the GMV. (Source: Greenwich Millennium Village.)
Shopping

Case study - Bristol

---

**KEY TERMS**

- **Catchment area** – the area from which people come to a shop or a shopping centre.
- **Consumer goods** – things that people buy.
- **Convenience goods** – goods that people buy frequently for everyday needs such as groceries.

---

**Farmer's market** – a place where farmers sell produce direct to customers, usually from stalls on one day a week.

**Hierarchy** – an arrangement in order with one at the top and an increasing number at lower levels.

**Shopping mall** – an undercover area with a variety of shops.

---

Go over the Powerpoint slides on how shopping has changed over time.