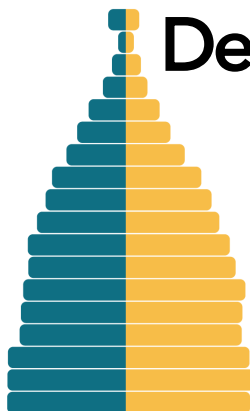# Population Pyramids & The Demographic Transition
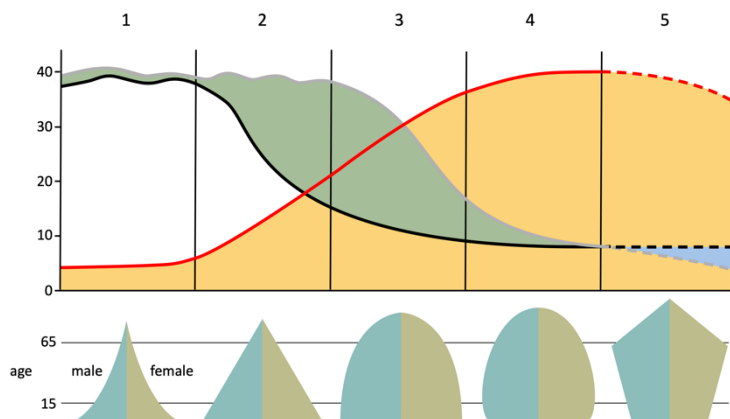
Why is this important?
Demography, or the study of populations, likes to focus on large scale trends visible across multiple countries or societies from which trends can be observed and conclusions made as to why / what may happen in the future.

Our world is changing rapidly right in front of our eyes. Developed society is becoming older and fewer children being born, with immigration plugging much of the demographic deficit. Developing countries have a youthful population in search of work and opportunities only possible in our interconnected, globalised world.

Part 1: Natural Population

This metric relates to the growth (typically) of a population without it being corrected for immigration (or emigration) of an area. This is comprised of raw data from vital rates:
Birth Rates, Death (Mortality) Rate, Infant Mortality Rate (IMR), Fertility Rate and Life Expectancy. It gives us a population growth rate (%) which determines how quickly a population is increasing (or decreasing!)

When you plot two crude variables for a society (one of birth rate and one death/mortality rate.) you get the graph to the left. Geographers like to break it down into 5 Stages:

Stage 1 – Initially Developing

Here, a society has a **very high birth rate** as birth control is non-existent, and also **very high death rate** (both at a young age and a low life expectancy) owing to disease/famine etc… Therefore, the age-based demographic is one which is **youthful** but **barely growing**. There are very few nontribal societies in this region.

Look at the data!
Which of the lines do you think represents birth rate, death rate and population in the graph above? The answer is at the bottom of the page!

Stage 2 – Early Expanding

A **steep fall in death rates**, whilst **birth rates remain consistently high**. This is often societal improvements to healthcare, hygiene and living standards. Having more children is seen as **economically advantageous**. Many countries in sub-Saharan Africa probably still occupy this zone.

Stage 3 – Late Expanding

In stage 3, countries experience **falling birth rates**. Societal developments including the **emancipation of women, contraception developments and education** (see underline page 3) reduce the need for large families and offer the tools to facilitate this. **Death rates are falling, too**, but the general population is **still growing**.

What about?... A Stage 5

This isn't officially in the model, but I reckon there's a good case for it. Many countries, take Japan and Korea as an example, have experienced long-term birth rates below **natural replacement level*** meaning theirs is in 'terminal' decline. *What comes next?*

Stage 4 – Early Expanding

Most contemporary higher income nations fit within this bracket. We're talking the UK, Australia, USA etc…. **both birth and death rates become low** (especially death rates) which leads to a **reducing rate of natural increase** all the way to zero.
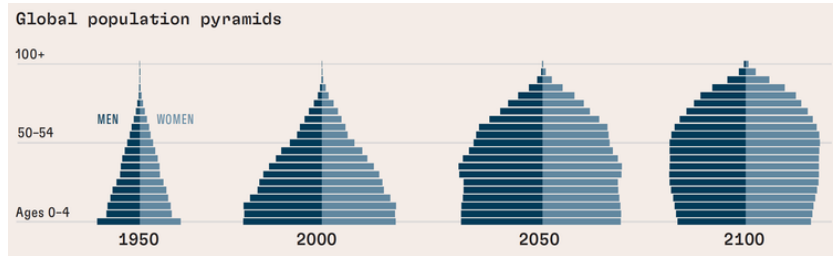
Red line = total population, grey line = birth rate, black line = death rate
*****Natural Replacement Level (2.1 Births per woman) is the statistical rate to replace her and her partner. Below this, in basic demography, a population will stop growing.**

Part 2: Population Pyramids

Geographers love to graphically represent stuff. Whether it's on maps or in datasets, we believe what we can see far easier than what we hear. Behold! The Population Pyramid. This cool little chart is essentially a horizontally stacked bar histogram (don't worry you don't need to know all that for an exam or whatnot.)

It shows the age-sex composition of a population/country/society at a specified time period. The bigger the bars, the 'more' people there are in that group. These are usually in five-year breaks.

Global population pyramids

Take a glance at these population pyramids. They crudely show the **world's population** from 1950 to (projected) 2100. What observations can you make? Not only is the overall world population massively increasing, but so is its distribution across ages. Stage 2 countries probably have pyramids looking like '1950' whilst stage 4 countries are closer to 2050. 2100 is what a rapidly aging demographic would look like, with births below the natural replacement rate.

A* Study Time

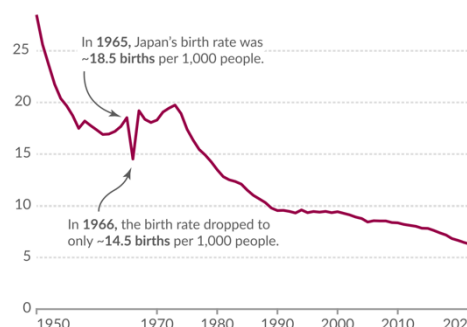### *What happens when we don't have enough kids?*

This isn't officially in the model, but I reckon there's a good case for it. Many countries, take Japan and Korea as an example, have experienced long-term birth rates below **natural replacement level** meaning theirs is in 'terminal' decline. *What comes next?*

Watch this really cool documentary by CAN, Singapore's Public Broadcast Service about the challenges facing contemporary Japanese society through a demographer's lens.
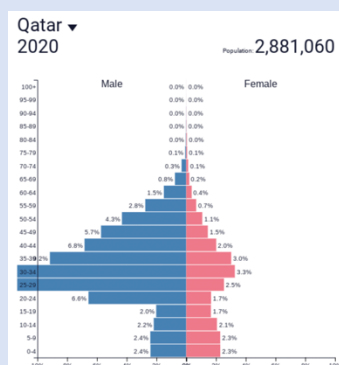
So what does it tell us?

Remember the demographic transition model from Page 1? Broadly, a country will follow the trends shown in this model which will in turn impact its population pyramid. As births start to slow and catch up with the low death rate, the pyramid will have a narrower base and begin to look more rectangular in shape. This relationship will continue until births decrease enough for the pyramid to begin going inverse (top heavy.) Countries which are experiencing a baby drain such as Japan fit into this category.

Japan's birth rate dropped sharply in 1966, influenced by cultural beliefs

Annual number of live births in Japan per 1,000 people.

In **1965**, Japan's birth rate was ~**18.5 births** per 1,000 people.

In **1966**, the birth rate dropped to only ~**14.5 births** per 1,000 people.

Extra bit: some really cool population pyramids!

Not all pyramids were built equally, some are just plain sick. Get a load of these:
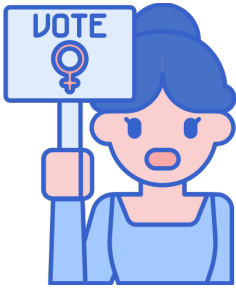

Qatar 2020 — Population: 2,881,060

Qatar has probably the most mental pyramid, probably due to the huge levels of young migrant labour (mostly from South Asia) which is the bulk of their workforce.

The Soviet Union obviously no longer exists but had a 1 of 1 pyramid due to the impact of successive wars, famines, and pogroms on its own populace. This is shown in the imbalance and skewiff'ness of it.
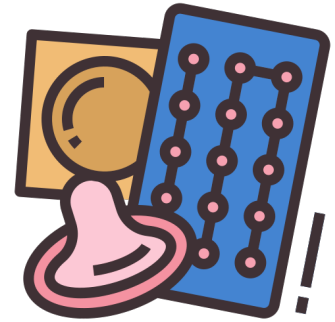

Soviet Union – 1989

Part 3: Factors Behind Reducing Fertility Rates:

The Emancipation of Women is the "process, strategy and myriad efforts by which women have been striving to liberate themselves from the authority and control of men and traditional power structures" - *European Institute of Gender Equality.* As women around the world have received more agency over decisions previously made for them, they are able to consider reproductive matters, which includes how large their family should be, when to have kids etc…

Improvements To Artificial Contraception Methods have taken place over the last hundred years, including ease of access measures, which has led to a marked reduction in unplanned pregnancies and subsequent births. This, in addition to wider pro-choice Abortion legalisation movements across the world have led to increasing choice in terms of childbearing.

Education and Cultural Expectations in terms of family planning, the denormalization of heterosexual nuclear families etc… have changed fairly dramatically in recent history. In many societies, the notion of living to procreate and 'continue your bloodline' is fading away and increasing numbers of young people are having fewer children. Formally considered a boost to parents' finances, increasing retirement age and the dramatic cost increases in raising a child has also deterred many from having children.

Keen to learn more?
Here are a few handpicked resources to keep you interested:

China's Baby Bust – can it be reversed?
By Time Magazine Online (2023)

Nigeria's Population Boom – Curse or Blessing?
By DW The 77 Percent (2019)

What if I want to practice an actual exam question?

We have you covered! The Geography Portal contains a huge bank of questions tailored to the AQA A-Level specification. Some come from past papers, some from teachers and examiners, all of them have detailed mark schemes which you can read through to figure out how well you did, where you could've added details or for your teacher to grade it.

Access A-Level Exam Questions & Mark Schemes Here!