

10 Billion By 2100? Our Population Futures

Part 1: Population Growth Until Now

We're going to be looking at loads of graphs and charts in this resource, so get ready.

Here's the first one: and it shows global population growth from thousands of millennia ago. As you can see, our population has been increasing at a rate never seen before. As humans developed from simple hunter-gatherers to organised society, fewer people were lost to war and, with medical advances, diseases like the black death.

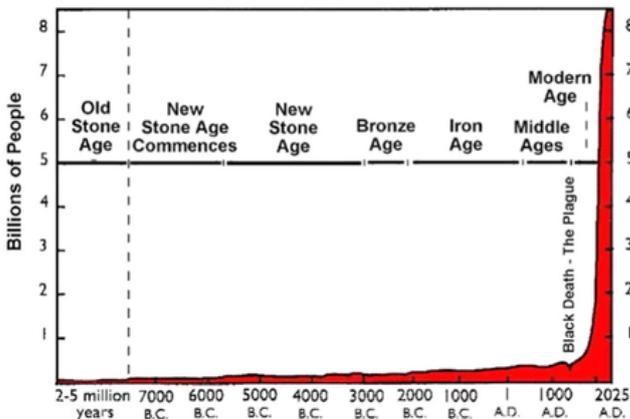


So far in this subject we've mostly been looking at regional and national trends of population change. Now it's time to broaden our scope to look at what's happening around the world.

Key prior knowledge points:

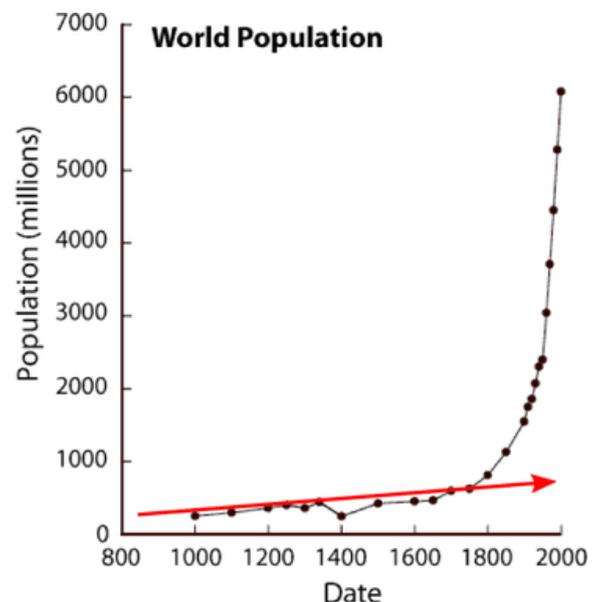
- ⇒ The global population has been growing for hundreds of years.
- ⇒ There is a disparity between nations and their population growth.
- ⇒ Lower income nations tend to have higher growth rates than developed nations.
- ⇒ Many higher-income nations now have a TFR below 2.1, meaning their populations will gradually start declining over time.
- ⇒ This is especially the case in advanced economies such as Japan and Korea, where a 'baby drought' is currently being experienced.

World Population Growth Through History



From "World Population: Toward the Next Century," copyright 1994 by the Population Reference Bureau

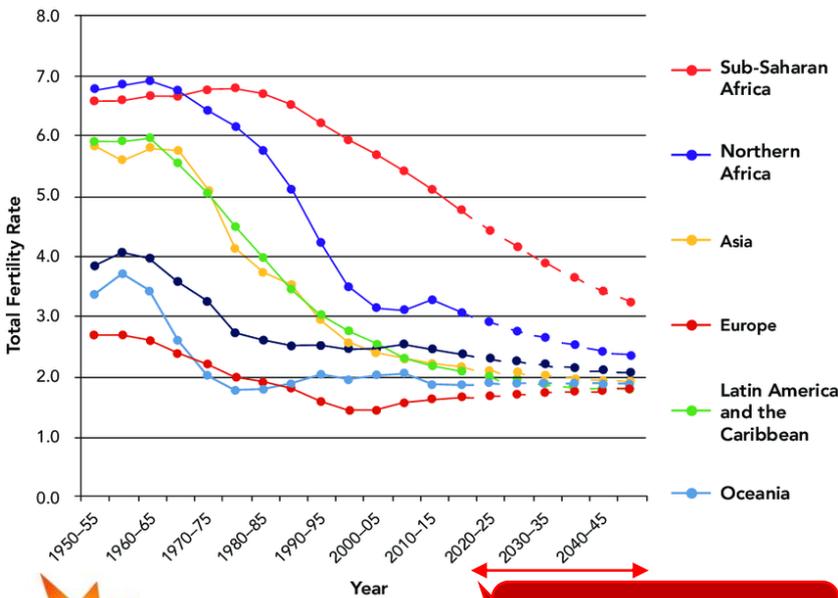
This is particularly evident when you zoom into more recent history. The graph to the right looks a bit **exponential**, *i.e.*, *the rate of growth has been increasing with the population*. In the last 200 years, our population has blown out by over 8x, from around 1 billion people in 1800 to 8.5 billion today. Industrialisation, better safety, medical technologies, improvements to reproductive health, fewer conflicts etc... have all contributed to this.



Keep going to page 2: Fertility Rates & Population Trends

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Part 2: Contemporary Fertility Rates



Regionally, there have been large recent variations in fertility. The world's population is still growing, but at a shrinking rate driven by fertility declines in all regions, but most notably Asia and Africa.

In fact, even looking back to 1950-60, there was a wide gulf between the 'West' where fertility ranged between 2-4 children per mother and the 'Third World' where it was more like 5-7 children.

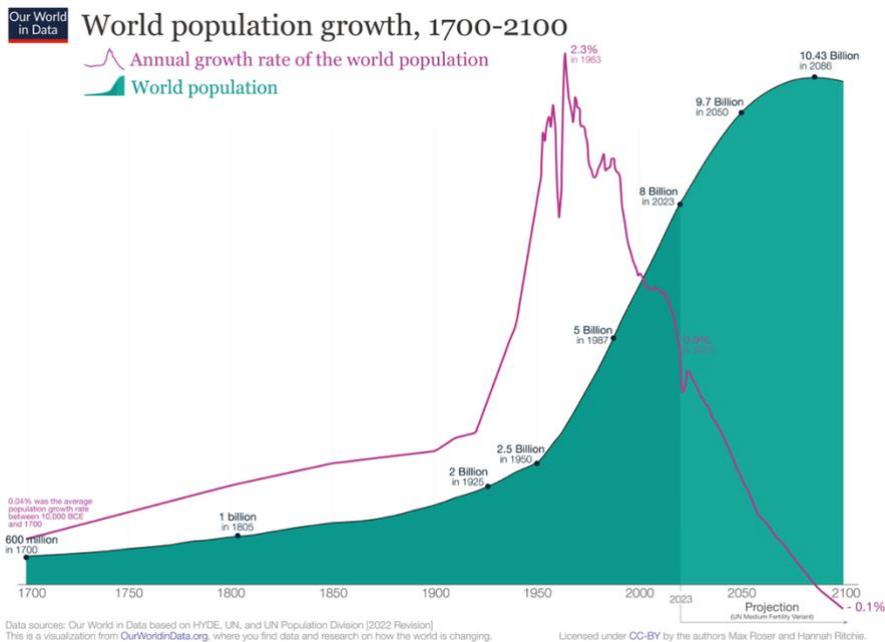
The first big recent declines, as predicted by the Demographic Transition Model, occurred in the developed world, which has been mirrored by even larger declines in South America, Asia, and Northern Africa, for instance. Now, the average fertility rate in all regions except Sub Saharan Africa is below 3.



Important: This data is only a projection

It's important to note that fertility isn't the only thing that's changed here. People are living far longer than they used to, which might actually be propping up populations more than you think. Also, countries such as China & Vietnam respectively have for at least 50 years had 1 or 2 child policies. They have recently been removed because of fears they have gone too far and caused irreversible fertility rate declines.

Part 3: Global Population Futures



In this awesome figure (right) you can see changes in annual population growth overlaid onto a recent population graph. As you can see that growth has slowed right down from 2.3% year on year to 0.9% in 2023. A good chunk of this is from Sub-Saharan Africa which is considerably behind the rest of the world, growing at an average of 2.5%. Its population is theorised to grow from 1.1 billion to 2.3-3 billion (although projections often vary with time, and data from these nations is often quite hard to come by.)

Check out our resource on the Sahel – a region of Sub-Saharan Africa where fertility rates are at their highest globally! only on the Geography Portal



Portal case study fact file > pop. and env

Population Growth & Aridification in the Sahel

By Luke Pearson, Geography Portal

Topic: 3.2.4.7 Case study of a country/region in population change to illustrate causes, problems, patterns, and implications of this.

Sahel region, Africa

This is the Sahel, it's a northern region of Sub-Saharan Africa, stretching 8,000 km. It's a 'rain shadow' region, meaning it's very dry and hot.

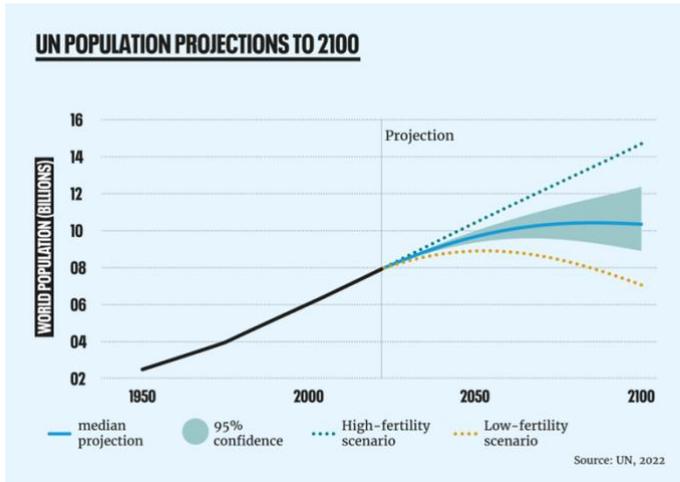
In an exam, you may be asked to compare the area of the Sahel with other areas. For this, check out our resource on the Sahel region. It will be a good idea to know the following:

- Where is the Sahel?
- What are the main causes of population change in the Sahel?
- What are the main problems in the Sahel?
- What are the implications of population change in the Sahel?
- How does climate change affect the Sahel?

It is estimated that the world's population will, by 2100, reach around 10 billion. Much of this growth will be in the youngest populations, with 47% under the age of 25. This fact file will look down some of the issues that are likely to be happening, what the issues are and how they are related to geopolitical issues, climate change and the environment.

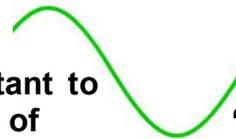
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The most important part of our graph, however, is what's happening into the future. From 2025 to 2065ish, we are still going to see some growth, but when looking at the big picture, global population should be peaking at between 9.5-10.3 Billion before beginning a shallow decline to 2100. The low and high fertility scenarios are realistically near impossible, and all studies point to a trend within our 95% confidence interval. This doesn't mean all countries will be shrinking however!

What happens after 2100 is more of a mystery. Population modelling is often fraught with irregularities and regularly updated, and as we mentioned before, many countries contributing to this growth do not accurately report census data. Some people have theorised it will gradually decline further, whilst others think it will take a **sinusoidal motion**, i.e.



It is important to note that earlier projections of 'unlimited' population growth simply won't happen. Demographers in the old days loved to cast doom and gloom scenarios whereby too many people were born leading to a collapse of food production and civilisation's demise. This is highly unlikely except in the most unstable nations (although that is where most of the growth is.) More interesting is the impact on the economy of countries like China and India, who are currently on the rise globally. Both will soon stop growing (if they haven't already).

Part 4: What May This Look Like?

This is the challenging bit.

We can kind of predict what is going to happen by looking at countries where this decline is already happening. Japan has an aging population and declining workforce, which means it needs to invest highly in automated industries and robotics to maintain any economic growth it can find. The high dependence on older people may put global pension and healthcare systems into strife, although on the flip side, a general decline in population would put less pressure on agriculture, housing and, of course, the environment. (Although the last one might be countered by more and more wealthier people consuming more products.)

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.

A-Level Exam Question & Answer Bank



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