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In July 2020, Peter Hartcher, The Sydney Morning Herald's Political and International Editor, wrote an article analysing the disparity in the population projections made by the world's three leading sources of demographic data. In this article, we take a closer look at these population projections and the assumptions that underpin them.

In 2011, the world's population reached 7 billion. Today it stands at an estimated 7.8 billion. That's quite a fast rate of growth! But what of the future? While we often rely on the UN's Population Division as the principal source of global demographic data, it's important to remember that it's not the only authoritative source such data. The other globally recognised population forecasting institutions are Austria's Wittgenstein Centre for Demography and Global Human Capital and the University of Washington's Institute for Health Metrics and Evaluation.

All three institutions reject the notion that the world's population will just continue to grow indefinitely, and they all project a peak later this century and then a steady decline this is where the agreement ends. Estimates of when the peak will be achieved and projections about the rate of decline vary considerably.

## The UN's projections

The UN states that the world's population will continue to grow, albeit at a slower pace than at any time since 1950, from an estimated 7.7 billion people in 2019 to around 8.5 billion in 2030, 9.7 billion in 2050, and 10.9 billion in 2100. This is the UN's 'medium-variant' projection which assumes a decline of fertility for countries where large families are still the norm, a slight increase of fertility in countries where women have fewer than two live births on average over their lifetime, and continued reductions in mortality.

Much of the projected increase will be driven by current age structures and would occur even if fertility rates

were to fall to around two births per woman in those countries still experiencing high fertility rates. This is because of the large population of children and young people who will reach reproductive age over the next few decades and begin to have children of their own.

Continued rapid population growth presents challenges for sustainable development. The 47 least developed countries are among the world's fastest-growing – many are projected to double in population between 2019 and 2050 – putting pressure on already strained resources. Angola, Benin, and Niger are, for example, expected to see their population increase by 150 per cent or more in the period 2020–2050.

At the other end of the population growth continuum are those countries projected to experience declining populations. The UN concludes that 91 countries and territories have total fertility rates below the replacement level (2.1). These include Brazil, China and the USA. Thirty-eight countries and territories are projected to have a smaller population in 2050 than in 2020.

Despite such projections, the UN concedes that there is inherent uncertainty in population projections. At the global level that uncertainty depends on the range of plausible future trends in fertility, mortality and international migration, which have been assessed for each country or area using demographic and statistical methods. Given these parameters, the UN claims, with 95 per cent certainty that the earth's population will reach between 9.4 and 12.7 billion in 2100.

**Figure 1: UN World population, actual and projected 2020–2100**

Region	2020	2050	2100
World	7.79 billion	9.74 billion	10.88 billion
Asia	4.63 billion	5.29 billion	4.72 billion
Africa	1.34 billion	2.49 billion	4.28 billion
Europe	748 million	711 million	630 million
Latin America & Caribbean	651 million	762 million	680 million
North America	369 million	425 million	491 million
Oceania	43 million	57 million	75 million

*Austria's Wittgenstein Centre for Demography and Global Human Capital projections*

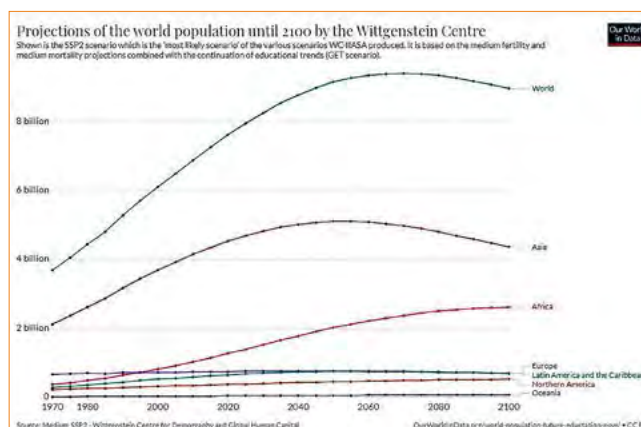
The second of the three institutions, Austria's Wittgenstein Centre for Demography and Global Human Capital, rejects the UN's claim that the world's population will exceed 10 billion in 2100. Wittgenstein's demographers estimate that the population will peak at 9.4 billion around 2070 and then begin to decline. By the end of the century, there will be fewer than 9 billion people on Earth, 1.9 billion fewer than the UN estimates. The Wittgenstein 'most likely scenario' estimates are based on medium fertility and medium mortality projections combined with a continuation of educational trends.

The trend by region provides several interesting insights. According to the Wittgenstein Centre, Asia's population is projected to peak around 2050 at 5.11 billion before declining to 4.36 by the end of the century. Europe's population will peak in 2060 at 702.24 million before declining to 630 million in 2100. Africa, North America and Oceania are the only regions where the population is projected to keep growing, with Africa reaching 2.62 billion by the end of the century (up from 1.27 billion

in 2020); North America experiencing an increase from 371.37 million to 520.48 million in 2100; and Oceania projected to experience an increase from 41.9 million to 65.93 million. See figures 2 and 3.

**Figure 2: Projections of the world population until 2100**

*The Wittgenstein Centre's projections of the world population until 2100, by region.*



Source: <https://ourworldindata.org/grapher/projections-of-the-world-population-until-2100-by-the-wittgenstein-centre>

**Figure 3: World population, actual and projected 2020–2100**

*The Wittgenstein Centre's world population projections, actual and projected 2020–2100*

Region	2020	2050	2100
World	7.61 billion	9.14 billion	8.95 billion
Asia	4.53 billion	5.11 billion	4.36 billion
Africa	1.27 billion	2.02 billion	2.62 billion
Europe	748.06 million	754.42 million	702.24 million
Latin America & Caribbean	650.96 million	757.88 million	683.88 million
North America	371.37 million	447.32 million	520.48 million
Oceania	41.90 million	56.92 million	65.93 million

Source: Wittgenstein Centre for Demography and Global Human Capital

## University of Washington, Institute for Health Metrics and Evaluation

The third organisation providing world population projections is the University of Washington's Institute for Health Metrics and Evaluation. The Seattle-based institute predicts that human numbers will peak around 2064 at around 9.73 billion and fall to 8.79 billion by the end of the century.

The Institute's population projections for the five largest countries in 2100 are India (1.09 billion), Nigeria (791 million), China (732 million), the USA (336 million) and Pakistan (248 million).

The Institute also draws attention to the shifting age structure in many parts of the world, with a projected 2.37 billion (27%) of individuals older than 65 years and just 1.70 billion (19.34 %) of the population younger than 20 years. The current population mix is 9.1 per cent over the age of 65 years and 21 per cent younger than 20 years of age.

By 2050, the Institute estimates that 183 countries were forecasted to have a fertility rate lower than replacement by 2100. Of these, 23 countries, including Japan, Thailand, Italy and Spain, are forecasted to have population declines greater than 50 per cent.

Japan's population is expected to contract from 126 million in 2020 to 53 million. In Europe, Italy, Spain and Portugal are also expected to lose half their populations. In Asia, the populations of Thailand and South Korea is also projected to decline by a half. China's population will peak at about 1.6 billion before declining to 732 million.

Dramatic declines in working age-populations are predicted in countries such as India and China. This, in turn, will hamper their economic growth and lead to shifts in global powers. China's population was forecasted to decline by 48 per cent and while China's economy is forecast to be the world's largest economy by 2035, the USA is projected to once again claim the title of the largest economy by 2098.

The institute also projects that if the world meets the UN's Sustainable Development Goal targets for education and contraception, the global population will have declined to 6.29 billion by 2100.

## Population boom or bust?

In his article Peter Hartcher cites the work of Canadians Darrell Bricker and John Ibbitson. In their book, *Empty Planet: The Shock of Global Population Decline*, Bricker and Ibbitson argue that the earth does not face the problem of a 'population bomb' but rather a 'population bust' – 'a relentless, generation-after-generation culling of the human herd unlike anything that has ever happened before'.

While it's difficult to predict what fertility rates will be in 40-50 years there is now a growing consensus (as noted above) that the world's population will peak sometime in the second half of this century and then start declining. The main driver of this decline is likely to be a fall in fertility rates. In 1950 the average woman had 4.7 children in the course of her life. Today, the global average is, according to the UN's 2020 World Population Data Sheet, about 2.3. Improvements in access to modern contraception and the education of girls and women are the principal drivers of this decline.

The fertility rate required to keep the population constant (referred to as the 'replacement rate') is about 2.1 children. The University of Washington's, Institute for Health Metrics and Evaluation estimates that the global average will fall below 1.7 by 2100. In other words, the fertility rate will have fallen below the rate required to sustain the world's population. Anything below 2.1 children per women results in decline in human numbers.

Such declines will help mitigate some of the challenges facing humanity including climate change, environmental degradation and food supply. There are, however, several negative consequences for labour forces, economic growth and social support systems.

**From the Editor: A related media report posted in the Guardian in November 2020**

**Japan to help cover IVF costs in attempt to avert demographic crisis –**

<https://www.theguardian.com/world/2020/nov/06/japan-to-help-cover-ivf-costs-in-attempt-to-avert-demographic-crisis?fbclid=IwAR25ADzt3i5FJKNUpxfcMn8T4IQjonooMkMD2tF0O81bK9FtBHgalRjxqQ0>