

Will global population peak below 10 billion?

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A major media storm has erupted about a new scientific paper published in the Lancet claiming that global population will soon peak and decline. The prospect is met with doom and gloom, rather than jubilation. But Jane O’Sullivan finds many reasons to challenge both the claim and its assumed economic threat. By escalating unfounded fears of population decline, the researchers could undermine women’s reproductive rights and global environmental security.

Another year, another claim that human population growth is on track to peak much lower than we all thought. This week, the Lancet [published](#) a major modelling exercise by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington in Seattle. Unlike [last year’s offering](#), it was a serious scientific undertaking, and deserves close attention.

The study anticipates a peak global population of 9.7 billion in 2064, declining to 8.8 billion by 2100. If true, it would be overwhelmingly good news. But if not, it risks fostering a complacency that threatens to undermine our hopes for humanity's sustainable prosperity.

There are two components of this paper that require separate critique. The first is the projections, the second is their discussion of the socio-economic and geopolitical implications.

The projections

Much is made of the superiority of these projections over the United Nations' model, due to the use of completed fertility (the number of children a woman has by the time she reaches the age of 50) instead of total fertility rate (TFR), and by modelling key drivers of fertility decline: education, and met need for contraception (defined as "the proportion of women in a population of reproductive age whose need for contraception has been met with modern contraceptive methods"). However, the science on the extent to which these are key drivers is far from settled. IHME's assertion that "These two variables alone account for 80.5% of the variance in CCF50 over time and location" is claiming correlation as causation.

"Met need for contraception" was adopted as a Sustainable Development Goal ([SDG](#)) indicator, as the positive reflection of the "unmet need" previously used to monitor family planning access. (Unmet need had the advantage of reminding us that family planning provision has not kept pace with the growing population of women who need it – at last count, [270 million women had an unmet need](#) for contraception.) Interestingly, "unmet need" tends to increase in the early phase of the demographic transition, as women begin to recognise the desirability of limiting childbearing. The demand for contraception grows before supply systems can meet it. Hence the dynamics between met need, contraception prevalence rate and fertility can be quite complex.

The IHME study relies on education to generate the desire for smaller families. But globally, family planning promotion has had [much more impact on the rate of fertility decline](#) than [education](#). Studies in sub-Saharan Africa have drawn the same conclusion. In any place and time, more educated girls tend to have smaller families, but this could be due to a range of factors causal on both outcomes. When the change across time is measured for education and fertility, improved education level explained only around [13% of the fertility decline](#) in sub-Saharan countries from 1975 to 2005. In countries where family planning is actively promoted, uneducated women [take up contraception](#) as rapidly as those with secondary education. In contrast, in countries like Nigeria that have long had relatively high rates of girls' schooling, desired family size has barely changed. The question arises, is the IHME model extrapolating a cross-sectional correlation (i.e. between different people at one time) to model

a longitudinal effect (change in the same group of people over time)? That is a potential pitfall of their modelling.

If an effective policy choice is not modelled in projections, they can have the effect of dissipating political will for that choice. The UN's population projections induce a fatalistic attitude to population, by expressing variation probabilistically, as [chance rather than choice](#). The IHME paper emphasises that its focus on drivers of fertility decline should provide more impetus for efforts to enhance education and provision contraception, which is a good thing. But by omitting family planning promotion as a driver of fertility decline, they are directing attention to less effective levers, claiming that they are the most important, and thus undermining political will for the policies that have been most effective in the past.

So how likely are the IHME projections to come true? An initial level of scepticism must apply to projections which undercut the UN's estimates by such a large margin. Regardless of methodological arguments, the UN has not proven to be too far off the mark over recent decades. It is only since around 2000 that the UN were found to be rather over-estimating the rate of fertility decline, having not anticipated the slow-down that followed the change in family planning programs after the 1994 Cairo Conference on Population and Development. Between 2000 and 2015, the UN repeatedly [revised its projections](#) upwards, from an anticipated peak at 9 billion in mid-century to growing beyond 11 billion by 2100.

Concurrently, the Wittgenstein Centre in Austria has been producing projections which, like the IHME, emphasise the role of education in reducing future fertility, and anticipate faster fertility decline and a lower peak than the UN's. They have been even more wrong about near-term population growth than the UN (Figure 1). Why then should we expect IHME to be closer to the mark?

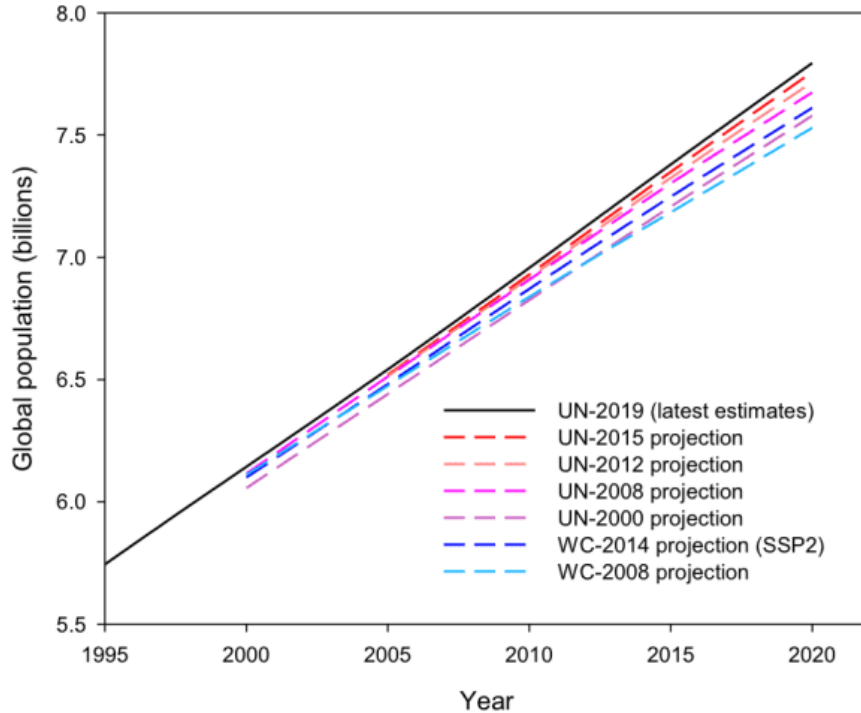


Figure 1: Past projections by the United Nations and Wittgenstein Centre have underestimated, rather than overestimated, global population growth.

It is noteworthy that the IHME model uses education attainment at age 25 as a predictor of completed fertility at age 50. This means that only the historical relationships with education up to 1992 (25 years before their base year of 2017) can have been included in the calibration of their model. They therefore were not informed by the large increases in girls' education that were achieved under the Millennium Development Goals (2000-2015), which coincided with [slow-downs](#) or [stalls in fertility decline](#) in many countries (although the lag effect on completed fertility is yet to play out). The fact that the 2017 fertility rates that IHME list for many high fertility countries are lower than those listed by the UN or Population Reference Bureau (PRB) might suggest that their model is already over-estimating the extent to which recent increases in education have reduced fertility (Figure 2). Such a head-start in establishing accelerated fertility decline, if untrue, would make their projected population totals much lower than are likely to occur.

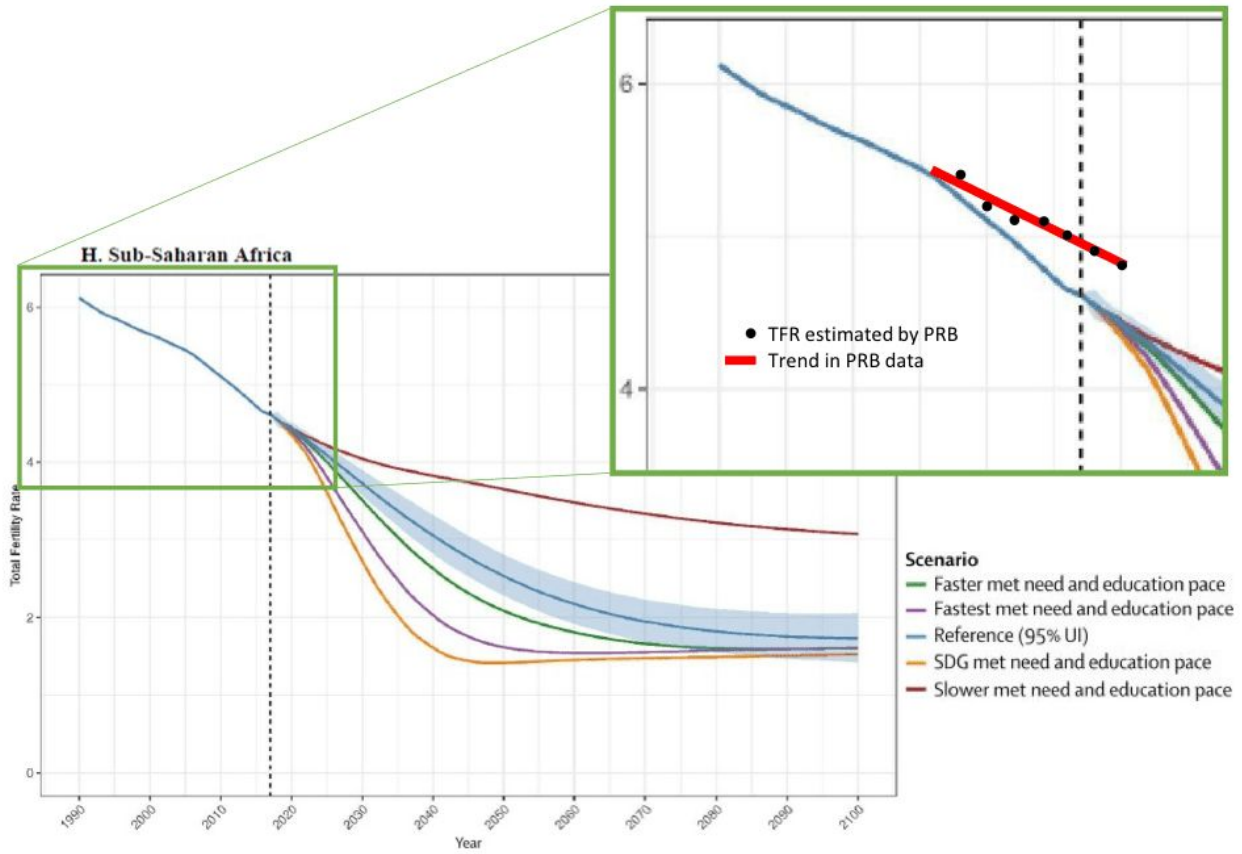


Figure 2: The IHME's projected fertility rates in sub-Saharan Africa begin with an accelerated decline from 2006, which other agencies have not observed. The expanded section of the figure shows fertility estimates from Population Reference Bureau's [World Population Datasheets](#) from 2008 to 2020, joined with a red trend line.

Another major cause of difference between the IHME projections and those of the UN or even the Wittgenstein Centre is their assumption that fertility will settle at very low levels, below 1.5 children per woman in most countries. This is a highly speculative assumption, since the countries that have reached such low levels have particular disincentives to childbearing that might not apply elsewhere, and might not persist as population pressure eases. Before their rapid fertility decline, these countries tended to have reached levels of crowding that constrain both housing and employment prospects, and they tend to still have misogynistic cultures in which women find it difficult to combine careers with raising children. These countries also saw fertility fall during a period of rising secularism, in contrast to the persistent or rising religiosity in many of today's high-fertility countries. As strongly religious people tend to have [higher fertility](#), their proportion of populations is [projected to rise](#), providing further resistance to fertility decline.

If we are able to achieve such low levels of fertility in most countries, I suspect that they would only be sustained through deliberate promotion of low fertility, embracing the benefits of population decline for the environment, and for human security and wellbeing. Can the slogan [“One planet, one child”](#) gain global following? We can only hope. Yet the IHME paper undermines this outcome, by arguing strongly for policies to maintain population growth through pro-natalism and “liberal” immigration as “the optimal strategy for economic growth, fiscal stability, and geopolitical security”.

Interpretation

Which brings us to the paper’s pre-occupation with the anticipated, but entirely unsubstantiated, hazards of declining and aging populations. The lengthy discussion of “profound economic, social, and geopolitical impacts” due to a shrinking “working-age” population (defined by IHME as people aged 20-64) far outweighs the passing reference to population decline’s “positive implications for the environment, climate change, and food production.”

And yet there is no evidence at all that a declining “working-age” proportion will limit economic activity. In the [real world](#), aging countries have simply had higher workforce participation, not lower employment. The IHME study uses “GDP per working-age adult” to project economic growth, which assumes workforce participation won’t increase as the proportion of adults aged less than 65 declines and the labour market tightens. But it already has been increasing. This biases their projections to disadvantage countries that permit or encourage population decline.

By associating more working-age people with more economic growth, they are extrapolating an association that existed in the first half of the demographic transition, when working-age proportion increased concurrent with declining population growth rate, to the other end of the transition, in which working-age proportion is declining concurrent with declining population growth rate. But [what if it is the declining population growth](#) that generates economic stimulus, not the age structure? If so, they would be getting this relationship plain wrong.

There is good reason to believe that it is indeed high population growth rate, rather than a surfeit of “dependents”, which most impedes enrichment in high-fertility countries. The sheer [cost of producing enough extra infrastructure](#), housing, schools, health services and everything else to support each year’s additional people, prevents countries getting ahead. On top of that, agricultural productivity growth falls behind population growth, exacerbating rural poverty, landlessness and unemployment. It was more likely the improvement in capital assets per person, rather than the availability of workers, which increased workforce participation and

productivity in emerging economies as their birth rates fell. Neither rich nor poor countries show signs of a worker shortage.

Yet, on the basis of this unfounded assumption, the IHME paper presents a decidedly negative prognosis for population decline, despite the indisputable benefits for the environment on which we all depend.

Thankfully, they do argue strongly against coercive measures to boost fertility, such as limiting access to contraception and abortion. But their strident warnings about the economic hazards of declining working-age populations are exactly the sort of provocation that has induced countries like [Iran](#) and [Tanzania](#) to withdraw family planning access.

The wrap

In the end, projections must be taken with a large pinch of salt. Particular care is needed to distinguish assumptions built into the model from genuine findings emerging from it. A case in point is the assertion that “Our findings suggest that continued trends in female educational attainment and access to contraception will hasten declines in fertility and slow population growth.” This is assumption, not finding. The strength of these as drivers of fertility decline is disputed in recent literature.

An important emergent finding is the wide divergence between the reference scenario and the “slower met need and education pace” scenario. Just a modest pull-back in the pace of fertility decline would mean that high-fertility countries increase their share of the global population so fast that global fertility goes up (Figure 3A), and we sail past 13 billion with no peak in sight (Figure 3B).

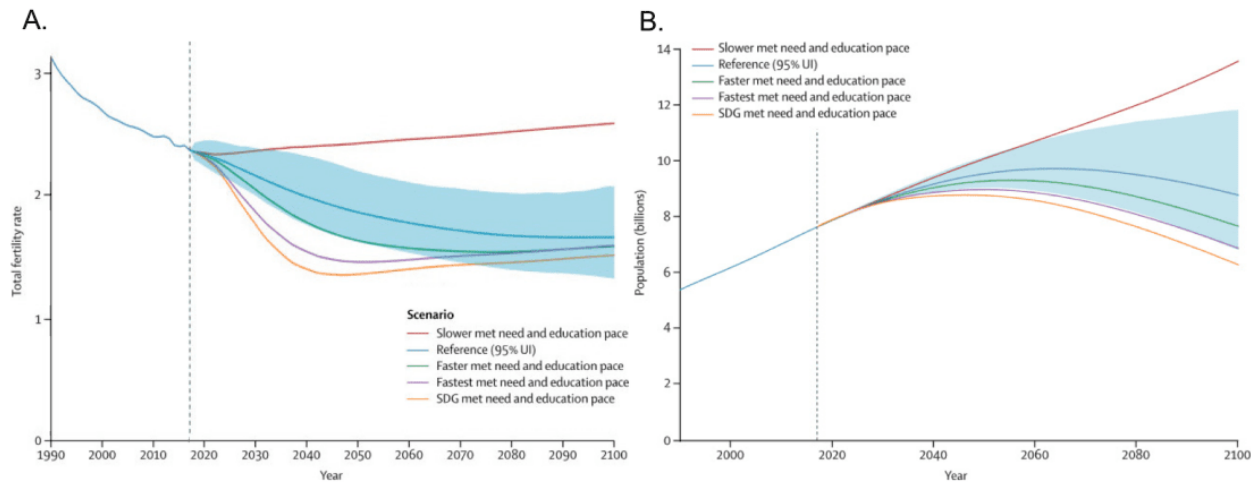


Figure 3: Projections of global Total Fertility Rate (A), and population (B), from Figures 3 and 5 respectively, in the IHME paper, showing the disastrous trajectory of the “slower met need and education pace” scenario.

It is a sad reflection of our society’s economy-centred thinking that this risk, with its attendant existential threats of catastrophic climate change, famines and mass movements of desperate people, rates lower than the imagined hazard of having a slightly lower supply of able-bodied workers, even while jobs are being automated out of existence. Whatever happened to the Precautionary Principle?

I conclude that the IHME reference scenario is not the probable, business-as-usual outcome they claim it to be. For it to come true would take concerted efforts to change cultural norms around family size and to boost family planning programs in high-fertility countries, and for low-fertility countries to embrace their mature, declining populations instead of trying to boost growth. But these are exactly the actions that the paper discourages. With the media eager to present declining populations as disaster, and boosting growth as the solution, this paper could do serious harm to the advancement of women’s reproductive rights, and with it everyone’s prospects for environmental security. Because they chose to focus on unfounded negatives of “[an inverted age structure](#)” instead of the vast and certain [benefits of population decline](#), sadly, the IHME projection is likely to be a self-defeating prophesy.

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