HSBC Global Research

6 January 2021

Population and the pandemic

The demographic impact of COVID-19

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Economics - Global

- The pandemic looks set to accelerate falling birth numbers across the world…
- …further weakening the pace of population growth …
- … with potentially big implications for growth potential and challenges for policymakers

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Discussing demographics may seem frivolous amidst a global health emergency – but demographic trends matter for the future growth rates of the global economy. The last thing governments facing deep recessions and burdened by high debt levels want to contemplate is the possibility of their working-age populations shrinking by more than their current projections. But that is likely to happen – and COVID-19 is to blame.

The clearest impact of the pandemic on demographics is via the huge number of deaths across the world. The virus has claimed the lives of nearly two million people, many of them elderly, but with many more likely underreported or dying from other conditions as a consequence of the number of COVID-19 patients in hospitals. The official worldwide death toll currently stands at just over 1.85 million, but the true figure could be much higher.

Understandably, the impact of the pandemic on births has been much less in focus. But there are clear signs that birth numbers are falling because many people feel uncertain and face financial constraints. In 2019, it is estimated that roughly 140m babies were born across the world - even a c. 1.5% drop in that number would mean that the hit to the world's population from the drop in births would equal the number of COVID-19 deaths.

We think the impact could be much bigger than that. Evidence from previous pandemics, natural disasters and recessions suggests it is likely that the number of births in 2020 and 2021 will drop by closer to 10-15% - so nearly 10 times more of an impact on the global population than the number of deaths.

And the effects will be long-lasting. As we have argued previously, we already think the UN's estimates for global births are too high. If the hit to employment, incomes and relationships from COVID-19 means the number of global births stays lower for the next few years, there could be a mini demographic cliff. Even assuming a temporary bounce in 2021, we could easily see the world's population start to shrink by the start of 2050s, rather than the start of the 2060s, as we have been projecting before.

The implications of this are huge. For governments burdened with more debt, facing even slower potential growth further down the line would be worrying. We may have to see even more aggressive policy changes to fight the trend – most likely via higher tax rates and higher retirement ages - than any vote-seeking politician would like to see.

This is a redacted version of the report published on 06-Jan-21. Please contact your HSBC representative or email AskResearch@hsbc.com for information.

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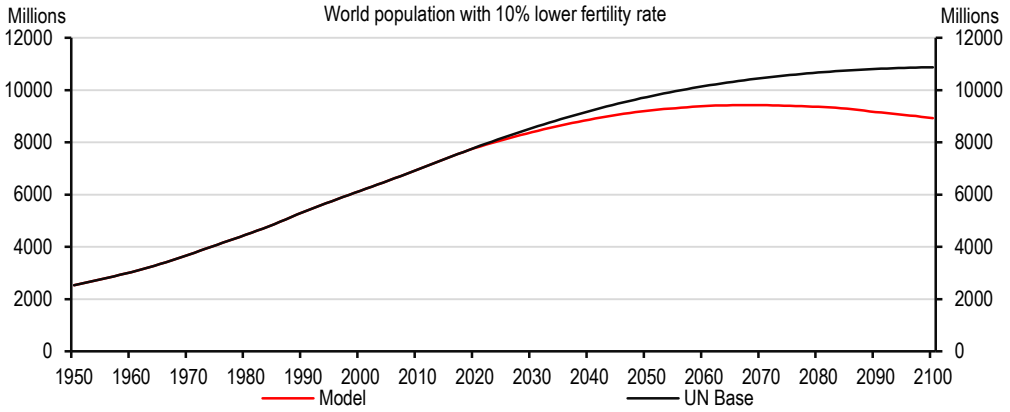
Population and the pandemic

- The pandemic looks set to accelerate falling birth numbers across the world…
- …further weakening the pace of population growth …
- … and meaning that the world's population may peak in the 2050s

COVID-19 and demographics

While discussing demographic trends may seem frivolous amidst a global health emergency that has left 1.85m dead, on official counts, and many more seriously ill – demographic trends matter for the future growth rates of the global economy. For governments loading up on debt, a population that is expected to shrink more quickly, or sooner, poses problems. We already expected the world's population to start shrinking in the early 2060s, and owing to the shifts in demographic projections brought on by the pandemic, this could happen earlier.

1. We already expected the world's population to start shrinking in the 2060s



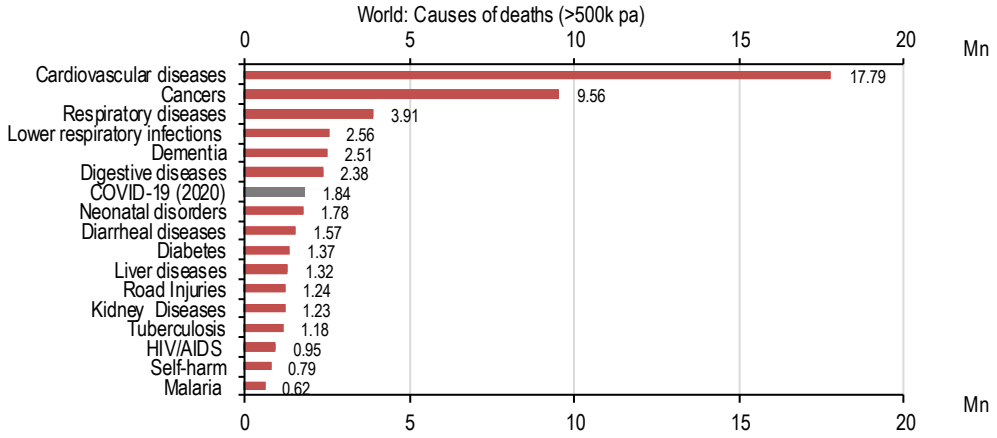
Source: HSBC estimates, UN population division. Note: Model is HSBC's modelled estimates based on fertility rates being 10% lower than the UN's base case. More information can be found within our report: *"Are demographics destiny?"*, 30 July 2018. Please contact your HSBC representative or email AskResearch@hsbc.com for information. Values from 2020 onwards are estimates.

What about the impact of deaths?

The clearest impact of the pandemic on demographics is via the huge number of deaths across the world. The pandemic has claimed the lives of 1.85m across the globe (based on official estimates), with many more likely underreported or dying from other conditions due to the number of COVID-19 patients in hospitals. For example, the Journal of the American Medical Association states there will be 400,000 more deaths in the US in 2020 than the recent annual

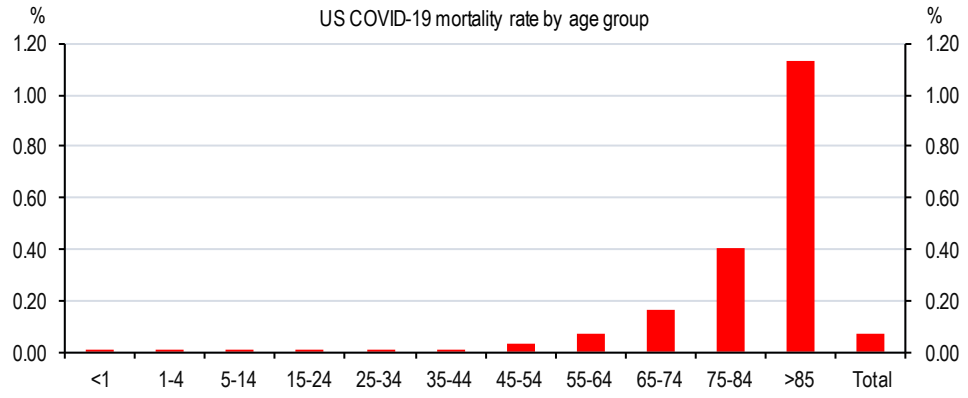
average[1]. Moreover, there are reports some countries are not counting deaths adequately[2] or possibly even covering up the true numbers.[3] As huge as those figures are (and they may have been much higher without the restrictions put in place across the world), they don't have a big impact on the world's population numbers. In a global population of roughly 7.8bn, less than 0.03% of the world's population has died as a result of COVID-19, with the pandemic accounting for just over 3% of the total number of deaths in the world in 2020. While the pandemic has had a devastating impact on many, in terms of the maths of global populations, it doesn't make an enormous difference.

2. COVID-19's impact on the number of global deaths is relatively small



Source: Our World in Data. Note: Data for 2017 for other diseases

3. …mainly because of a low mortality rate among younger age groups



Source: US Centre for Disease Control, as of 25 November 2020

Migration flows

The pandemic has meant that global migration flows have almost ground to a halt. Economies reliant on overseas labour have seen new arrivals substantially lower than in 2019. We have

[1] Excess Deaths and the Great Pandemic of 2020, Journal of the American Medical Association, 12 October 2020
[2] Extent of Covid-19 Deaths Failed to be Captured by Most Countries, The Wall Street Journal, 28 May 2020
[3] Asia's hidden deaths: coronavirus fatalities are being covered up and undercounted, The Telegraph, 22 May 2020

seen a sharp fall in visa applications in the likes of Australia and New Zealand, which may weigh on potential growth and housing demand.

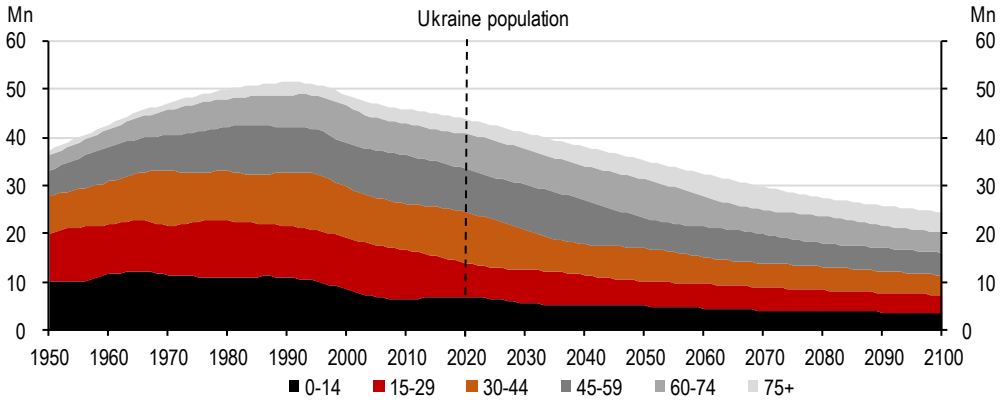
A substantial demographic impact from births

But, that's not to say there is no demographic impact – it will instead come largely through the births channel. There are a number of competing forces that will drive the outlook for birth rates as a result of the pandemic. Household behaviour has changed in many ways as a result of lockdowns, financial constraints and the massive uncertainty that 2020 created – and this is likely to mean a clear impact on the number of children being born – and when – in future.

Do lockdowns mean more babies?

During the first half of 2020, when COVID-19 first struck, having a child was not top of most people's minds. That is, unless you were Volodymyr Zelensky, Ukraine's president, who called on his compatriots to take advantage of the enforced lockdowns to boost the country's shrinking population[4]. The UN estimates that Ukraine's population will almost halve between now and 2100 (chart 4).

4. Ukraine's population is expected to halve between 2000 and 2080



Source: United Nations

So, what if Mr Zelensky gets his wish? And people across the world, with little to do outside their homes, opted to have more babies?

The idea that we could see a baby boom nine months following a major disaster is not unprecedented. Extreme weather events have been known to lead to an increased birth rate in the following nine months: for instance, hurricanes Sandy, Harvey, Irma, and Maria. There is also some evidence to suggest that after the Cuban Missile Crisis, the Oklahoma City Bombing, and 9/11 birth rates rose due to the fear and distress caused by losing family and friends[5]. Nevertheless, these events were all very sudden, high impact events which affected specific regions of the world. COVID-19 is a longer-term, global, and equally high impact event. Therefore, it is difficult to compare this pandemic with the events mentioned above.

[4] Will the coronavirus lockdown lead to a baby boom?, The Economist, 3 April 2020
[5] Will the Coronavirus Spike Births? Institute for Family Studies, 11 March 2020

73,600

Weddings postponed in the UK between 23 March and 3 July 2020

There were theories at the beginning of the pandemic about couples in close proximity for a long time leading to a rise in pregnancies. However, it is possible that any such effect (if true) would be negated by an increase in divorces, strains on relationships, and fewer new couples forming over the period. In the UK, the Office for National Statistics estimates 73,600 weddings between 23 March and 3 July 2020 were postponed[6]. Many of these will now take place in 2021 or later when tight restrictions on numbers and locations may eventually be lifted. YouGov surveys show that 45% of British people dating before lockdown completely stopped dating during the period. Moreover, 38% of 18-34-year-olds reported being less, or a lot less, sexually active. The figure extends to 23% for 25-34 year olds and 25% for 35-44 year olds.[7]

Meanwhile dating apps are seeing a boom in usage. Before the pandemic, dating app download numbers were shrinking but, because of lockdowns, people have been forced to seek relationships online. During the first stage of lockdowns, Bumble saw a 26% increase in the number of messages being sent and Tinder saw a 10-30% increase in the length of conversations[8]. Despite the surge in online dating this clearly does not translate into births and, with the impact of the recession hitting young people hardest, we could see people cut spending on relationship-seeking more widely, such as via fewer dates. This could lead to a more sustained decrease in couple formation and marriages in the medium term, and birth rates too.

Varying impacts across the world

Across the world, the impact of lockdowns on birth rates could vary wildly, as there are large disparities in: access to contraception, readily available quality healthcare, and social security payments. For instance, the IZA Institute of Labour Economics predicts US birth rates will drop 15% between November 2020-February 2021, over 50% more severe than the impact from the great recession[9]. There is also some evidence to suggest that during the most restrictive period of lockdown the number of aborted pregnancies increased. According to UK government figures, in April 2020 there was a c.28% increase from the 2019 figures. Overall in 2020 there was an estimated 4.1% increase in the number of abortions compared to 2019[10].

This is a stark comparison to much of the world, where reproductive health services have been reduced significantly. The UN Population Fund estimates[11] there could be up to 7 million unintended pregnancies in 2020 as a result. The key question is what proportion of these children are being 'brought forward' i.e. a woman who would have had 2 children is having one sooner than expected, and what proportion will have this child in addition to their pre-existing plans. There are c. 140m children born each year worldwide, therefore 7m would be a significant increase.

[6] Coronavirus round up, ONS, 3 July 2020
[7] Sex and dating under COVID-19, YouGov, 12 June 2020
[8] Why the coronavirus might change dating forever, CNBC, 25 May 2020
[9] The pandemic may be leading to fewer babies in rich countries, The Economist, 28 October 2020
[10] Abortion statistics for England and Wales During the COVID-10 pandemic, Department for Health and Social Care, 31 October 2020
[11] COVID-19 could lead to millions of unintended pregnancies, new UN – backed data reveals, UN News, 28 April 2020

140m

Children born each year across the world

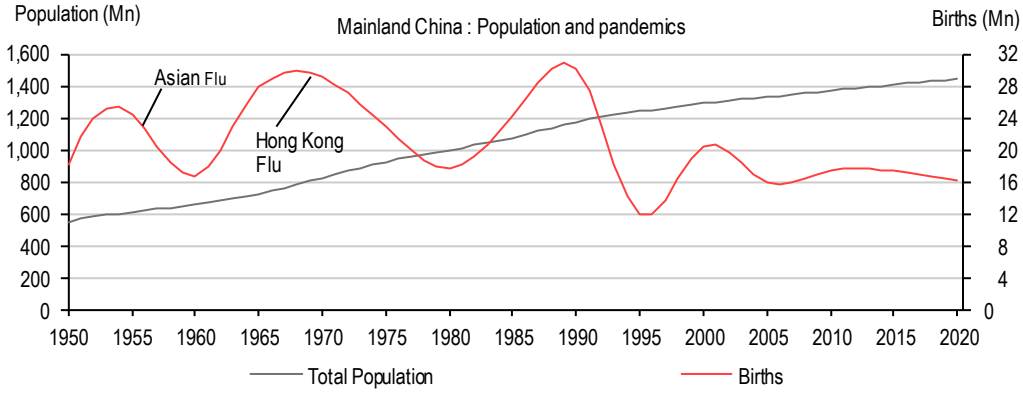
We have seen in many African nations that the number of children a woman is likely to have has fallen over the past few decades. For instance, in 1990 across Africa there were 37.3 births per thousand people. In 2020 this fell to 30.7. We can see that African nations are reducing their birth rates at a quicker pace than the UN had initially predicted, which is why the UN cut its population forecast for 2100 by 309m in 2019. Only two years ago the UN predicted Kenya would reach a median fertility rate of 2.1 in 2070. This year it has been brought forward by a decade[12]. Therefore, it is likely that any increase in the number of children born this year due to a lack of access to contraception or sexual health clinics will be offset in years to come as societal and economic conditions continue to change.

Pandemics mean fewer babies

Based on historical analysis of past epidemics, such as Ebola, Zika, SARS as well as high mortality events such as Hurricane Katrina, a predominant trend emerges. Nine months following the outbreak of disease or natural disaster striking, birth rates drop by more than 10% on average and in Brazil 10 months after the Zika outbreak began birth rates dropped by more than 20% compared to prior seasonal averages[13]. This effect in shown in chart 5. Mainland China saw substantial decreases in birth rates in the years following the Asian Flu and Hong Kong Flu pandemics.

However, there is evidence to suggest that after a high mortality/epidemic event there is a subsequent compensatory rise in birth rates. This 'bounce-back effect' typically peaks 19-20 months after the outbreak and on average exceeds 120% relative to the seasonal norms. Twenty months following the SARS outbreak in Hong Kong birth rates exceeded 130% of the norm.

5. We saw a drop in births in mainland China after previous pandemics



Source: United Nations

Upon initial inspection, this bounce-back effect could repeat itself. Most developed countries have implemented substantial furlough schemes and increased social security benefits to compensate for the loss of work and economic hardship caused by the pandemic. This could

[12] The UN revises down its population forecasts, The Economist, 22 June 2019
[13] Will the Coronavirus Spike Births? Institute for Family Studies, 11 March 2020

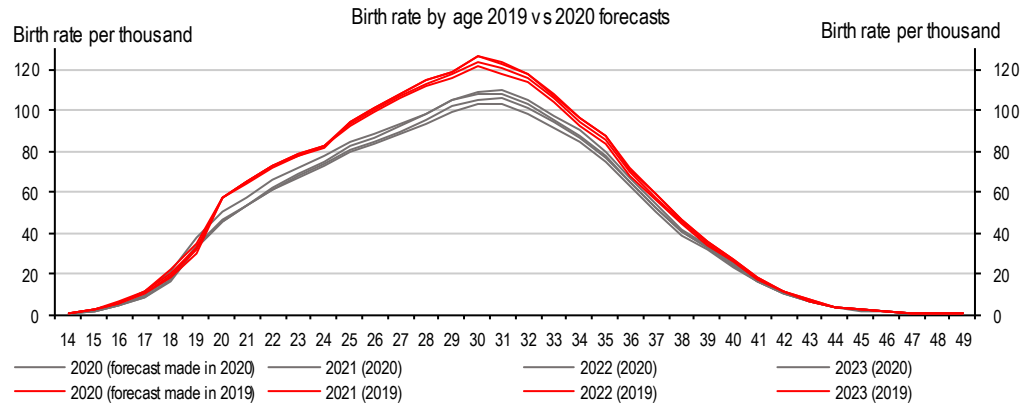
help to mitigate the negative effects on birth rates from a loss of income or job and help to boost the bounce-back effect.

There are two main drivers of the bounce-back effect: 1.) having children delayed during the epidemic, and 2.) "mortality replacement". COVID-19 has a much lower mortality rate compared to other pandemics with regards to children and young people, so the effect on birth rates of parents having more children as a result of a deceased child is mitigated in this instance.

According to the Guttmacher Institute, 34% of woman interviewed in the US said they have delayed childbearing or have changed the number of children they plan on having because of the pandemic. The institute conducted a similar survey in 2009 during the Great Financial Crisis and the results are strikingly similar. In fact, the COVID-19 survey showed women are now more careful about using contraceptives and more want to delay having children than in 2009[14].

The US Congressional Budget Office appears to take the view that the overall impact of the pandemic will be to depress birth rates in the coming years, with an updated population forecast, released in September, showing a projection for the US population to reach 374m in 2046,10m less than the forecast it made in 2018.[15] This was largely down to the high unemployment rate and economic anxiety having a high correlation with birth rates. In the US the birth rate per thousand women is highest for 29.5 year olds. In order to arrive at the 10m downward revision the CBO has assumed a reduction in the birth rate for women in their 30s in 2020 of 11.5%, in 2021 17.2%, 2022 16.4%, and 2023 14.2%, with the reduction eventually levelling out in 2029 at which point from 2029-2093 the CBO assumes long run birth rates are reduced by 1.7%. relative to the 2019 forecasts[16].

6. The US CBO has slashed its birth rate assumptions for the next few years



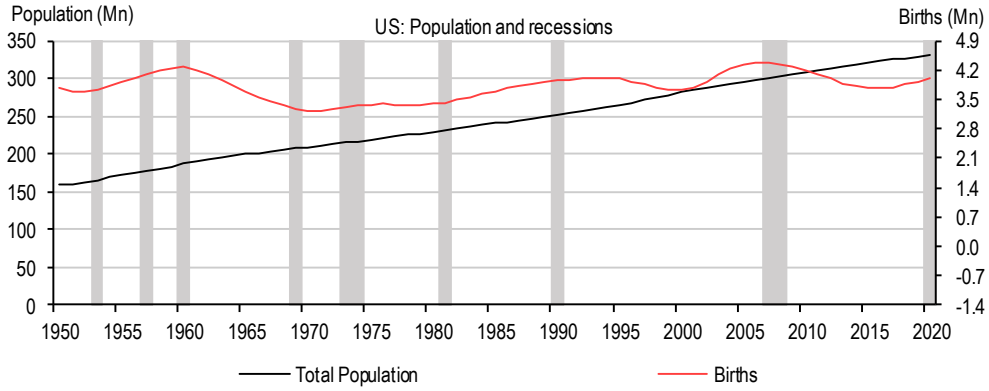
Source: US Congressional Budget Office

Recessions mean fewer babies

There is significant evidence that birth rates closely track economic conditions. For instance, for every one percentage point increase in unemployment in the US (2003-2018) the birth rate fell by 1.4%. Analysing the effect of the Great Recession, we see in 2007 that US birth rates were 69.1 births per 1000 women aged 15-44, and by 2012 this had dropped to just 63. A 9% decrease amounting to c. 400k fewer births.[17]

[14] Early Impacts of the COVID-19 Pandemic, Guttmacher Institute, June 2020
[15] Demographics and Debt Hang Over Long-Term U.S. Growth, The Wall Street Journal, 30 September 2020
[16] The 2019 Long-Term Budget Outlook, Congressional Budget Office, 25 June 2019
[17] Half a million fewer children? The coming COVID baby bust, Brookings Institution, 16 June 2020

7. Economic downturns typically deter people from having children

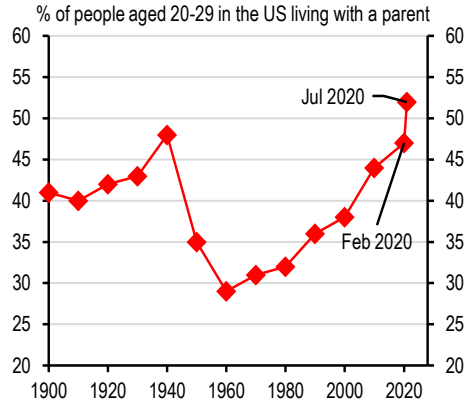


Note: shading indicates recession

Source: United Nations

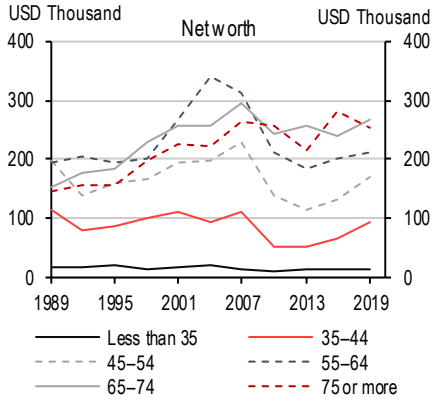
It is clear that in developed countries such as the US the longer and more severe the recession, the steeper the fall in birth rates, and the more likely it is that a fall in birth rates becomes a permanent change in family planning. An important consideration to make is that this generation of child-bearing age women and men have now been through two of the largest recessions in the last century.

8. More young people are living at home in the US…



Source: PEW Research Centre

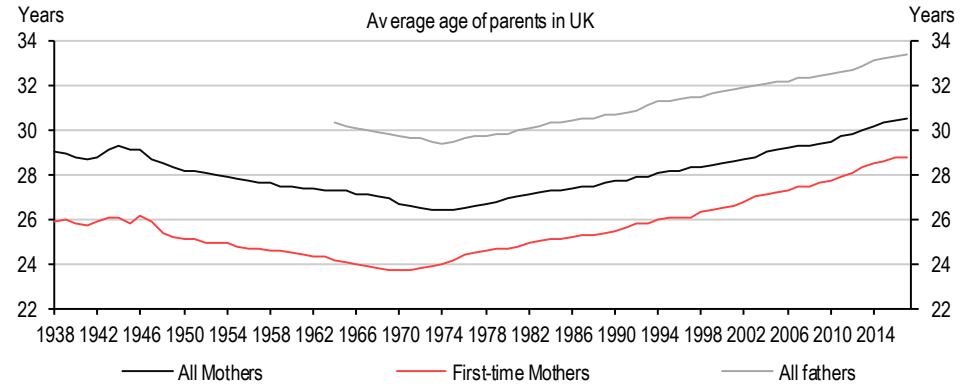
9. …and the value of their financial assets is lower than in the past



Source: Federal Reserve, Survey of Consumer Finances

More young people are living at home again and have not accumulated assets, such as property or financial savings. Therefore, it seems likely that the COVID-19 recession further contributes to an already increasing trend of this generation having fewer children.

10. People have been having children later in life for the past thirty years



Source: Office for National Statistics

While a rebound in economic activity may have the same impact on birth rates, a lot of economic damage has been done which could impact birth rates in the longer term. The Brookings Institution estimates that in the US, the number of births in 2021 could be as many as 300-500k lower than expected[18]. Taking the midpoint of this estimate, this would equate to more than a 10% fall in the birth rate.

The recession could suppress the phenomenon of a post pandemic boost to birth rates because of the economic damage. 2008's recession saw a 9% fall in births over the next four years, and the 1918 Spanish Flu resulted in a 12.5% decline. It is possible that COVID-19 will result in even bigger declines in births than the 1918 pandemic, largely because of the more damaging economic effects. Improvements in family planning mean that choosing to have fewer children is easier than it was a hundred years ago. Of course, some households haven't been as affected financially, and may choose to have children sooner, but they too may be delayed from 'missing out' on travel and social activities in recent months.

Of course, the depth of economic pain varies by country. European economies with second lockdowns could see more economic scarring than the likes of the US or those economies which seem to have contained the virus more quickly – such as mainland China.

In developing countries economic hardship has traditionally often had the opposite effect, with birth rates often rising in response. This has typically occurred in rural areas where the benefits of unpaid child labour increase in times of hardship and children provide security to parents in old age. However, in the developing world there is a structural trend towards a larger share of the population living in urban areas. Urban areas are more exposed to economic downturns, have easier access to contraception, and more family planning options. Therefore, any bounce-back we have seen from past epidemics and recessions in birth rates could be dampened because of this urbanisation trend.

Societal change

According to a YouGov survey[19] 25% of bosses say they were previously sceptical of working effectively from home and have been converted, while 49% were already convinced. In addition to this, 39% of workers say they want to work from home at least some of the time and 18% all of the time after the pandemic is over. It certainly seems inevitable that more people will be spending at least part of their time working from home and being in the office fewer days per week than before COVID-19.

[18] Half a million fewer children? The coming COVID baby bust, Brookings Institution, 16 June 2020
[19] A quarter of bosses become 'work from home' converts, YouGov, 03 September 2020

31%

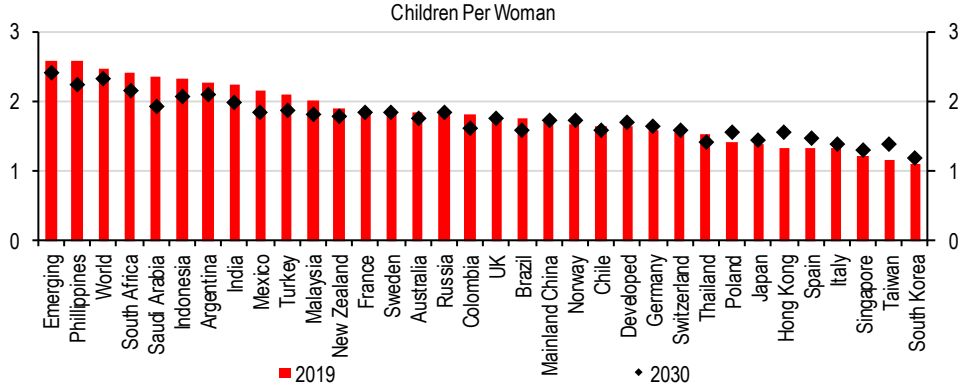
Of millennials are not interested in having children

It is not entirely clear what effect this could have on birth rates. It is possible that the increased flexibility will encourage more child caring responsibility for men and allow women to more easily re-enter the workforce more quickly or part-time following maternity leave. This could allow couples to have more time and money to have more children should they wish. However, it does not seem time and career are the only factors influencing millennials and Generation Z to have fewer children. There has been a steady decline in the number of 23-38 year olds who live with a family of their own, from 85% of members of the Silent Generation in 1968 to just 55% of millennials[20]. According to one survey, 31% of millennials are not interested in having children at all, 38% think it is too expensive to raise children, and 13% are concerned with the climate change implications of a large population.[21]

Putting it all together

Putting all of these factors together, it seems sensible to think that the depth of the recession will be a big driver in terms of long-term fertility rates. This is a generation, particularly in the developed world, which has been having fewer children already, and is facing the brunt of the economic damage from the pandemic, weakening the financial ability to have children in future.

11. Fertility rates vary across the world



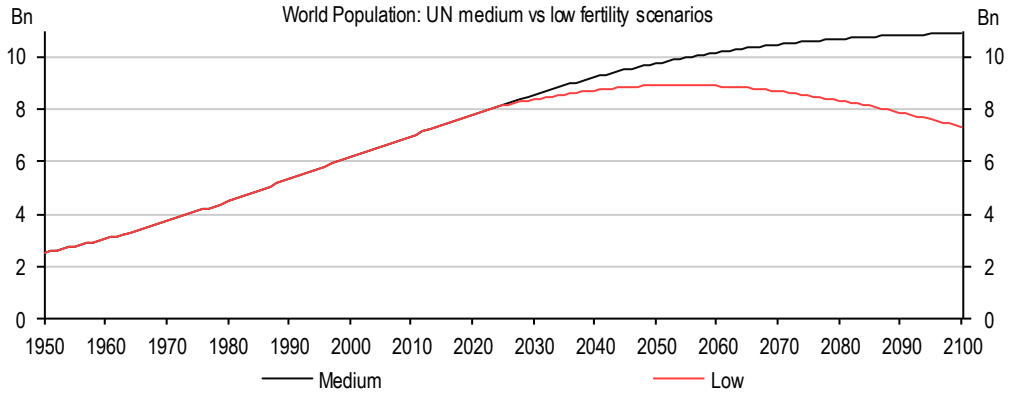
Source: United Nations. Note: Emerging and Developed aggregates include economies not on the chart – so the EM number is skewed by high fertility rates in parts of Africa.

Currently the UN suggests that fertility rates across the world will fall from 2.5 on average per woman in 2019 to 2.3 in 2030. Developed markets may see children per woman increase slightly to 1.69 from 1.64, while emerging markets will see a reduction from 2.6 to 2.4. India, Indonesia, Mexico, Saudi Arabia, and Philippines are all expected to see the number of children born per woman fall by 0.25 or greater, due to higher income levels and better quality healthcare. The UN's estimates suggest that Hong Kong, Spain, and Taiwan will see increases in the number of births per woman by 0.15 or more by 2030.

[20] As Millennials Near 40, They're Approaching Family Life Differently Than Previous Generations, Pew Research Centre, 27 May 2020
[21] Millennials Were Already Putting Off Having Children. Then the Pandemic Hit, Morning Consult, 28 September 2020

And there are clear risks to these numbers, most notably to the downside. There are ample reasons to suggest that fertility rates will be lower in the coming years than the UN's base case suggests. Even if we take the low fertility forecast and the median fertility forecasts that the UN provides, the difference that opens up in the world's estimated population is stark, and it could be as wide as 3bn by 2100.

12. Changes in fertility rate assumptions can dramatically change the demographic outlook



Source: United Nations. Note: Low fertility scenario projects total fertility to remain 0.5 births below medium scenario

Modelling the outcomes

To assess what the COVID-19 impact on birth rates could mean for the world's population, we've come up with some scenarios for the future of births across the world.

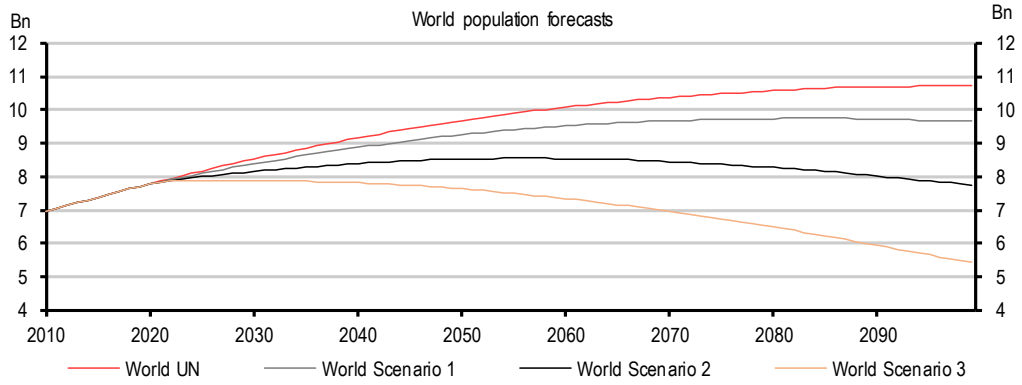
In each scenario we have assumed that birth rates in 2020 fell by 15%. We arrive at this figure by looking at past pandemics' impact on birth rates, which typically exceeds 10%[22], and given the impact and global scale of COVID-19 we believe it will exceed the average. While this will vary across the world, a global average of 15% seems reasonable.

We have also assumed that in 2021 the birth rate recovers towards the UN forecasts. Typically, the 'bounce-back effect' in birth rates exceeds 120%. However, given the depth of the recession we believe this will negate the bounce-back significantly. Some families who have delayed having children in 2020 will choose to have them in 2021, likely to be those hit least hard by the recession, but we may also see those hit harder choosing to delay children further into the future.

Finally, we have three models for birth rates going into the future: 50%, 75%, and 90% of the UN model, respectively. Given that the current generation of child-bearers were already choosing to have fewer children, it is likely we will see this effect catalysed because of the impact of a severe global recession as well as the rapidity of societal change. This generation has now been through the two most damaging recessions in peacetime. This will further widen generational inequality and enhance the perception and reality that having children is simply too expensive for many in a generation which is struggling to move out of the parental home.

[22] Will the Coronavirus Spike Births? Institute for Family Studies, 11 March 2020

13. Lowering the expected birth rate has a dramatic impact on the global population



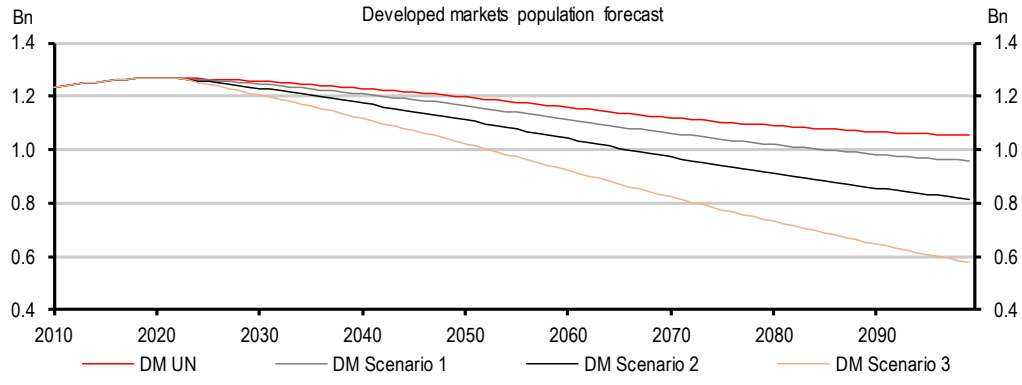
Source: United Nations, HSBC[23]. Note: In scenario 2, the line flatlines in the early 2050s and starts declining very slowly.

We believe it is most likely that we end up around scenario 2, with birth rates in the long run being about 75% of the UN forecasts. Some of this 25% reduction is made up of the factors discussed in previous publications[24], such as the chance that medical advances and structural changes in household formation means that developed market fertility rates don't rise as much as the UN's estimates suggest (or even at all) and emerging market ones fall more quickly.

The pandemic has catalysed many of these factors and is likely to crystallise others. We are likely to see long-term trends of millennials and Gen Z having fewer children amplify significantly in the short term, and possibly have a knock-on effect into the medium term – due to the effects of the pandemic directly and perhaps more so because of the severe recession it has caused globally.

In the developed world under each scenario we see the population fall below one billion people by 2100. However, this assumes zero migration, and if we were to overlay this impact (although in the UN's data the impact is very small beyond 2025), it is likely the population will increase above one billion as countries in developed countries may be more open to migrant flows to fund ageing populations.

14. Developed market populations look set to shrink, the only question is how quickly?



Source: United Nations, HSBC

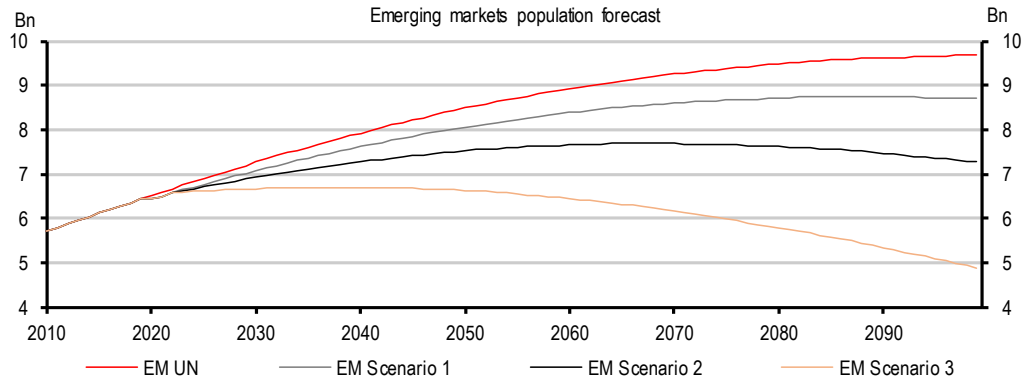
In emerging markets, in scenario two we estimate that the population could remain below 8bn, and even in the more conservative scenario (scenario one) we could see an emerging market

[23] Each scenario sees a 15% fall in birth rates in 2020 and a recovery to UN estimates in 2021. In scenario 1,2, and 3 we model ongoing reductions of 90%, 75%, and 50% of UN estimates.
[24] Such as: Are demographics destiny?, 30 July 2018

population that is almost one billion lower than the UN's estimate by 2100, all because of lower fertility rates.

COVID-19 has led to many structural changes, such as encouraging an already booming digital economy, which could particularly help developing nations in the long term. As services such as education and healthcare become more digital, it could help to lift emerging market growth potential. For instance, in mainland China in early 2020, 730k (81% of K-12 students) attended classes online using the Tencent K-12 Online School in Wuhan.[25] This transition will take time: 95% of students in Switzerland and Norway have a computer for schoolwork compared to 34% in Indonesia[26], but significant technological strides in the coming years will help to lift incomes in the emerging world and improve healthcare quality. However, this is likely to mean lower birth rates.

15. If birth rates fall quickly, we could start to see EM populations shrink by 2070



Source: United Nations, HSBC

What does this mean for policymakers?

Having seen public finances stretched substantially by the pandemic, as well as the need for further expenditure in the coming years, the last thing that governments across the world will want to have to account for is the chances of their populations (and in particular working-age populations) shrinking earlier than their models currently envisage.

As we've outlined in the past, the toolkit to tackle demographic challenges isn't one that is full of enticing options. Governments would ideally like to see fertility rates rise – but as we've discussed this is now even more unlikely than it was pre-pandemic. Policies such as improving state education, access to childcare and even grants for having children have been tried all over the world, but only a handful of countries have seen their fertility rates rise in recent decades.

And even if they were able to overcome these headwinds, the impact on demographic trends may not be seen for many years to come. A quicker alternative would be to attract more workers from overseas, but both as a result of closed borders thanks to the pandemic and a lack of political appetite for such policies, such an option may not be openly pursued.

And so, governments will have to face the tougher decisions: raising taxes (or cutting spending, or both) – which may prove difficult against a backdrop of ageing populations meaning that expenditure on healthcare and pensions must rise – or raising the retirement age, substantially. The latter is the bluntest solution to the problem – but it's one that even more governments will likely have to consider going forwards, even if it remains politically unpopular.

[25] The COVID-19 pandemic has changed education forever. This is how, World Economic Forum, 29 April 2020

Disclosure appendix

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