

Dorling, D. (2021) World Population prospects at the UN: Our numbers are not our problem? Chapter 7 in C. Deeming (Ed.) The Struggle for Social Sustainability: Moral conflicts in global social policy, Bristol: Policy Press, pp.129-154. 7 (uncorrected page proofs)

World population prospects at the UN: our numbers are not our problem?

Danny Dorling

Introduction

Human population growth is slowing dramatically, and it is slowing because people are having fewer and fewer babies as compared to their parents, everywhere, without exception. More importantly, they are having fewer than we thought they would have a few years ago when the fertility rates were *already* reducing dramatically and unprecedentedly. Our species has never, ever had so few children. The reason why the total human population of the planet will keep on growing for 50 or 60 or 70 years, but almost certainly not for 80 years, is because people are living longer. It is now no longer because we are having more children.¹

'The smaller generation to come – worldwide'²

On Monday 17 June 2019 the United Nations (UN) revealed momentous news. The world did not notice, but soon it will. The headline of the UN report (prepared by the Population Division, [Box 7.1](#)) read '9.7 billion on Earth by 2050, but growth rate slowing'.³

Box 7.1: The United Nations Population Division

The Division was established in the early years of the United Nations to serve as the Secretariat of the then Population Commission, created in 1946. Over the years, it has played an active role in the intergovernmental dialogue on population and development, producing constantly updated demographic estimates and projections for all countries, including data essential for the monitoring of progress in achieving the MDGs and now the SDGs, developing and disseminating new methodologies, leading the substantive preparations for the major United Nations conferences on population and development as well

1 as the annual sessions of the Commission on Population and Development. It
2 studies population dynamics and monitors demographic trends and policies
3 worldwide. Population estimates and projections prepared by the Division for
4 all countries on fertility, mortality, international migration, urbanization and
5 population size and structure are widely used by all international bodies. The
6 2019 Revision of World Population Prospects is the twenty-sixth round of official
7 United Nations population estimates and projections that have been prepared
8 by the Population Division of the Department of Economic and Social Affairs at
9 the United Nations (UN DESA Population Division, 2019).

10
11 Source: UN Population Division, [www.un.org/en/development/desa/population/
12 about/index.asp](http://www.un.org/en/development/desa/population/about/index.asp) (Reprinted with the permission of the United Nations.)
13

14
15 A day earlier the UN projection for the year 2050 had been nearer
16 9.8 billion, and the projection for 2100 had been 11.2 billion people.
17 Something very significant had occurred.

18 The United Nations report concentrated on where there will still
19 be the most growth. To quote:
20

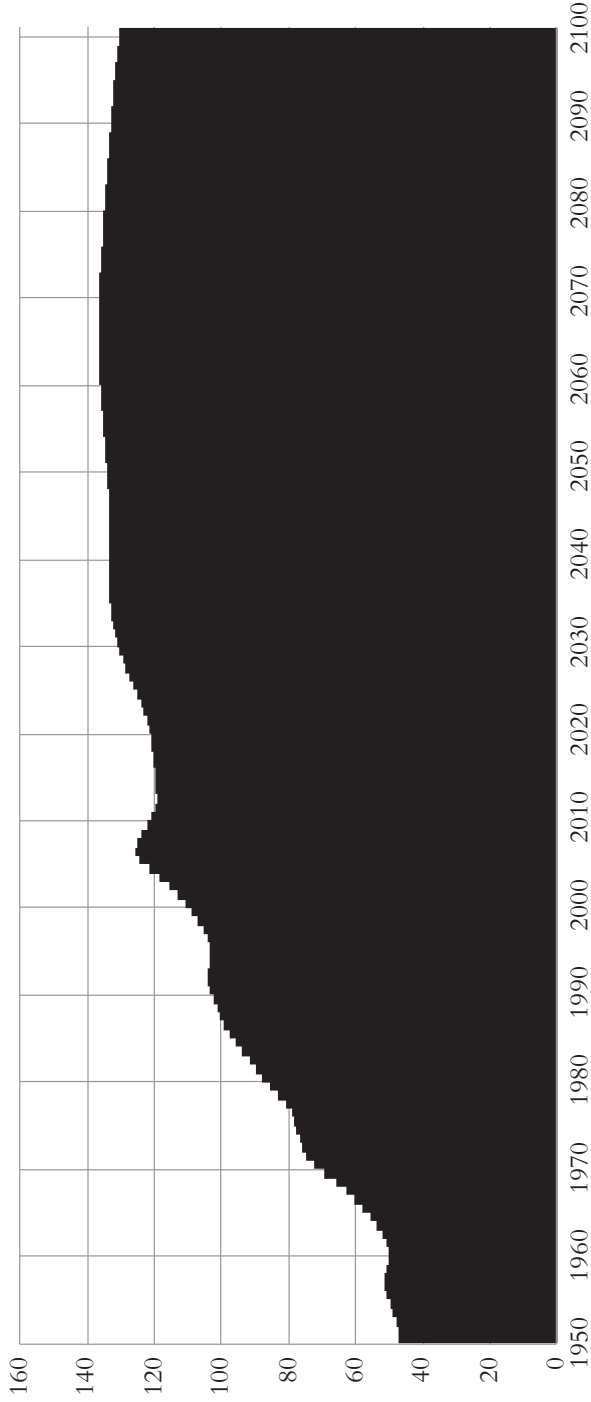
21 India is expected to show the highest population increase
22 between now and 2050, overtaking China as the world's
23 most populous country, by around 2027. India, along
24 with eight other countries, will make up over half of the
25 estimated population growth between now and 2050. The
26 nine countries expected to show the biggest increase are
27 India, Nigeria and Pakistan, followed by the Democratic
28 Republic of the Congo, Ethiopia, Tanzania, Indonesia,
29 Egypt and the United States of America.
30

31 But the report continued:
32

33 The population size of more and more countries is actually
34 falling. Since 2010, 27 countries or areas have seen a drop
35 of at least one per cent, because of persistently low fertility
36 rates. Between now and 2050, that is expected to expand
37 to 55 countries which will see a population decrease of one
38 per cent or more, and almost half of these will experience
39 a drop of at least 10 per cent.
40

41 The UN did not mention the new 2100 prediction in this particular
42 press release. [Figure 7.1](#) shows the number of people the UN estimates

Figure 7.1: Number of people aged 18 in the world, actual to 2020 and UN central predictions thereafter
The number of 18 year olds in the world-UN world population prospects estimates, 2019
(millions of people aged 18, 1950 to 2100)



1 have been, and will be, aged 18 each year from 1950 until 2100. The
2 future they predict is remarkably smooth.

3 However, some reporters noticed that something was very new: ‘The
4 world’s population is slowing down and could stop growing – or even
5 begin decreasing – by 2100’, one noticed, before adding that ‘[UN
6 population] division director John Wilmoth said this outcome “is not
7 certain and in the end the peak could come earlier or later, at a lower
8 or higher level of total population”’ (Rodriguez, 2019). However,
9 John’s central projection for the year 2100 is now 10.9 billion people,
10 300 million fewer than the UN had said it expected, the day before. It
11 is very unlikely that the future number of 18 year olds on the planet will
12 change as smoothly as suggested in [Figure 7.1](#), as it did not in the past.
13 It is likely to fall long before the 2060s date suggested by the graph.

14 Human population growth is slowing dramatically, and it is slowing
15 because people are having fewer and fewer babies as compared to
16 their parents, everywhere, without exception. More importantly,
17 they are having fewer than we thought they would have a few years
18 ago when the fertility rates were already reducing dramatically and
19 unprecedentedly. Our species has never had so few children per parent.

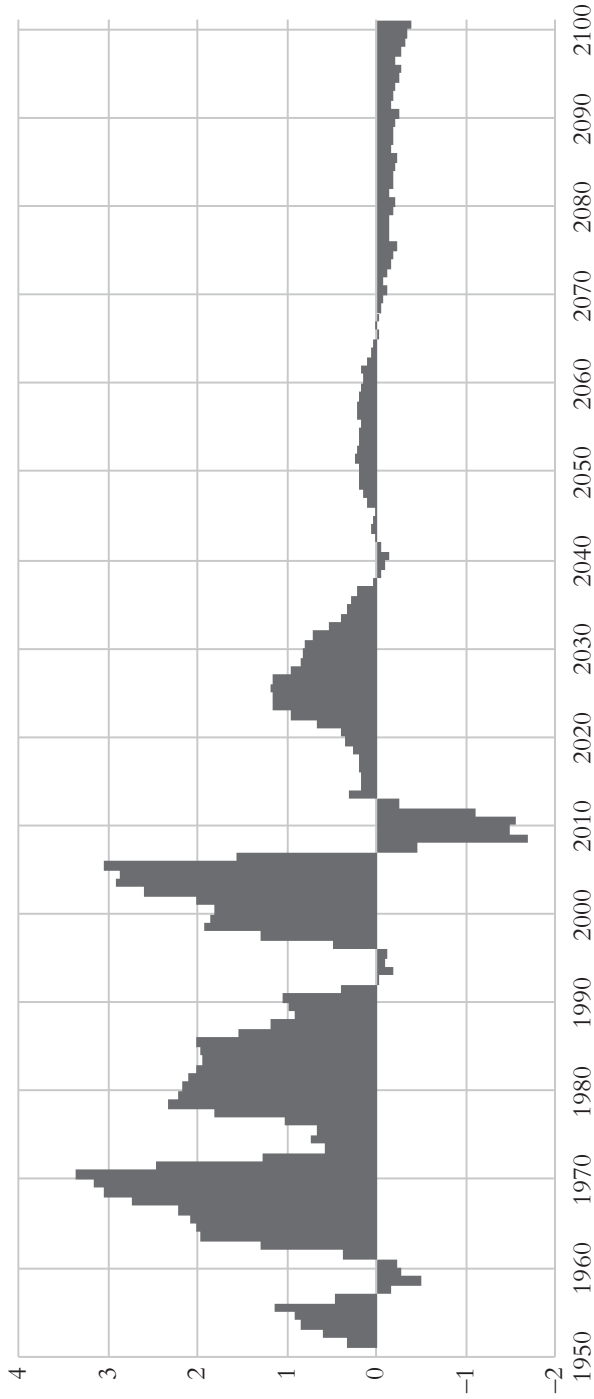
20 If people in a particular place live on average for 80 years rather
21 than 40, they double the number of people found in that place at any
22 one time without a single additional baby needing to be born. The
23 human species is ageing rapidly. More rapidly than we thought prior
24 to Monday 17 June 2019! And this is wonderful news because it is
25 caused by fewer people dying when young and healthcare for the elderly
26 improving. The next update of the United Nations projections will
27 not be published until sometime in June 2021. For now, the numbers
28 in this chapter are the best we have access to.

29 [Figure 7.2](#) shows the annual change in the number of 18 year olds
30 now predicted to occur each year and the number that did occur each
31 year in the last 68 years. The peaks in the graph occurred in 1955,
32 1970, 1985, 2005, with the next predicted to be in 2025. The length
33 of time between these peaks in years is 15, 15, 20 and 20.

34 It is the trend in the corrections to the UN revisions that matters
35 most. In their estimates published in 2011 the UN demographers
36 suggested that 10 billion was most likely by 2100. The subsequent
37 2013, 2015 and 2017 revisions updated that estimate to just over 11
38 billion. But now the 2019 revision is reducing that estimate again (UN
39 DESA Population Division, 2019).

40 Seven years ago, on 11 June 2013, a book by the present author titled
41 *Population 10 Billion* made a guess that the UN was getting it wrong
42 (Dorling, 2013). It was just a guess, but it turned out to be right. The

Figure 7.2: Annual change in the number of people aged 18 in the world, actual to 2020 then predicted
The number of 18 year olds in the world-UN world population prospects estimates, 2019
(annual change in millions of people aged 18, 1950 to 2100)



1 reason the UN was making this mistake, the book said, is that it had
2 failed to notice an echo of a baby boom. It was using current fertility
3 estimates to project forwards, unaware that fertility at the start of this
4 current century was slightly and unusually elevated, due to many
5 people turning 18 around the year 2005. This was an actual increase,
6 as shown by the peak in [Figure 7.2](#).

7 The slowdown in the growth of this single year age group, and then
8 the fall to come in young adults worldwide, raises all kinds of issues.
9 In general, smaller generations have been more powerful generations
10 in the past. Their bargaining position is better. Each child becomes
11 more precious. But in strange times (like those we currently live in)
12 people begin to try to imagine all kinds of new scenarios. However,
13 'artificial intelligent' robots are not going to replace the young. The
14 reason why is simple. We are animals, evolved to be acutely aware of
15 just how much attention we are or are not getting from others of our
16 species. That is how we have survived for millennia.

17 Rutger Bregman's (2020) new book *Humankind* explains it most
18 simply. We were cared for by the old and cared for our young. Most of
19 us are acutely aware of even the smallest slight we receive, the mildest
20 of ignoring. Most of us warm with happiness when we are praised by
21 those we love. Emulating humans to fool other humans with machines
22 is a fool's game because it is to compete with what drove our evolution.
23 Instead, robots are best used to undertake repetitive tasks that our
24 inquisitive natures hate.

25 What is likely to happen next? Look again at [Figure 7.2](#) showing
26 the future change in the number of 18-year-olds that has now been
27 predicted to carry through to the year 2100. Note how the UN
28 prophesies a rapid move towards stability. To achieve that, every 18 year
29 old has to have slightly more than two children each (because a few
30 babies will still die even in the most utopian of futures). But then look
31 at what has happened most recently. Look at the falls between 2007
32 and 2013 in the graph and note how that plummeting below the line
33 almost exactly fits the gap that can be seen in the time series between
34 1991 and 1996, around 17 years earlier.

35 Young adults in the future are unlikely to conform to what the UN
36 demographers currently predict. If we manage to avoid world war,
37 famine, a very deadly pandemic and severe prolonged global economic
38 crisis, then young people will continue to have fewer and fewer children
39 each, for some time to come. What is more, they will almost certainly
40 have even fewer than the UN experts currently predict. And this has
41 been what a majority of women wanted in the past: fewer children
42 than their (almost always) male partner wanted. And more and more

1 women now get what they want (Dorling and Gietel-Basten, 2017).
 2 The views of women on the ideal family size, or whether to have
 3 children at all, are far more important than men's views.

4 If you find it hard to believe that the finest demographic minds the
 5 world can muster might still be making a mistake, even though they
 6 are at least now finally moving their predictions down towards what
 7 reality is telling them, look at [Figure 7.3](#). This graph shows the 'change
 8 in change' each year in 18 year olds. This is simply one annual change
 9 figure subtracted from the next. To give an example: in 2006, 2007 and
 10 2008 the number of 18 year olds thought to be alive worldwide on 1
 11 July each year was 125.850, 125.386 and 123.692 million, respectively.
 12 The change between those three numbers was -0.46 and -1.69 million;
 13 the population was falling, and the change in change between those two
 14 numbers, the rate of deceleration or acceleration, was -1.23 million,
 15 a rapid deceleration (or acceleration in the rate of fall, if you want to
 16 see it that way).

17 [Figure 7.3](#) shows all of those 'change in change' figures derived from
 18 the very latest UN population estimates for the world. Each great
 19 deceleration, the troughs in 1955, 1972 and 2007, has been greater
 20 in magnitude than the last. Now look at what the UN thinks will
 21 happen in future, and then start planning for even fewer 18 year olds
 22 than that, because ~~ignoring~~ this clear downwards trend is still being
 23 ignored. The period after 2020 will be a continuation of the trends
 24 seen before 2020 in [Figure 7.3](#), not what is revealed here.

25 But let us take the projections the UN made in 2019 at face value;
 26 even if they are not an overestimate they still reveal a dramatic slowdown
 27 to come, as [Figure 7.4](#) makes clear. In this ~~year~~ the vertical axis shows
 28 the number of people estimated to have been, or predicted in future
 29 to be, living in the world at each date. The horizontal axis shows the
 30 annual absolute rate of population change at that time. Acceleration
 31 slowed after the 1960s and stopped around 1990. For 2010 onwards
 32 we have an obvious slowdown in population growth.

34 **The stabilizing global population to come, worldwide**

36 For children and young adults, everyone aged under 21, [Figure 7.5](#)
 37 shows that the deceleration began earlier and the peak is expected to
 38 be reached around 2060. Please think what this means. In less than
 39 40 years from now the number of children alive in the world is set
 40 to fall. And then the fall accelerates. Note how the line is sloping
 41 downwards after 2090. This, as has been repeatedly pointed out here,
 42 is a conservative estimate.

Figure 7.3: Annual change-in-change in the number of people aged 18 in the world
The number of 18 year olds in the world-UN world population prospects estimates, 2019
(annual change in change,,millions of people aged 18, 1950 to 2100)

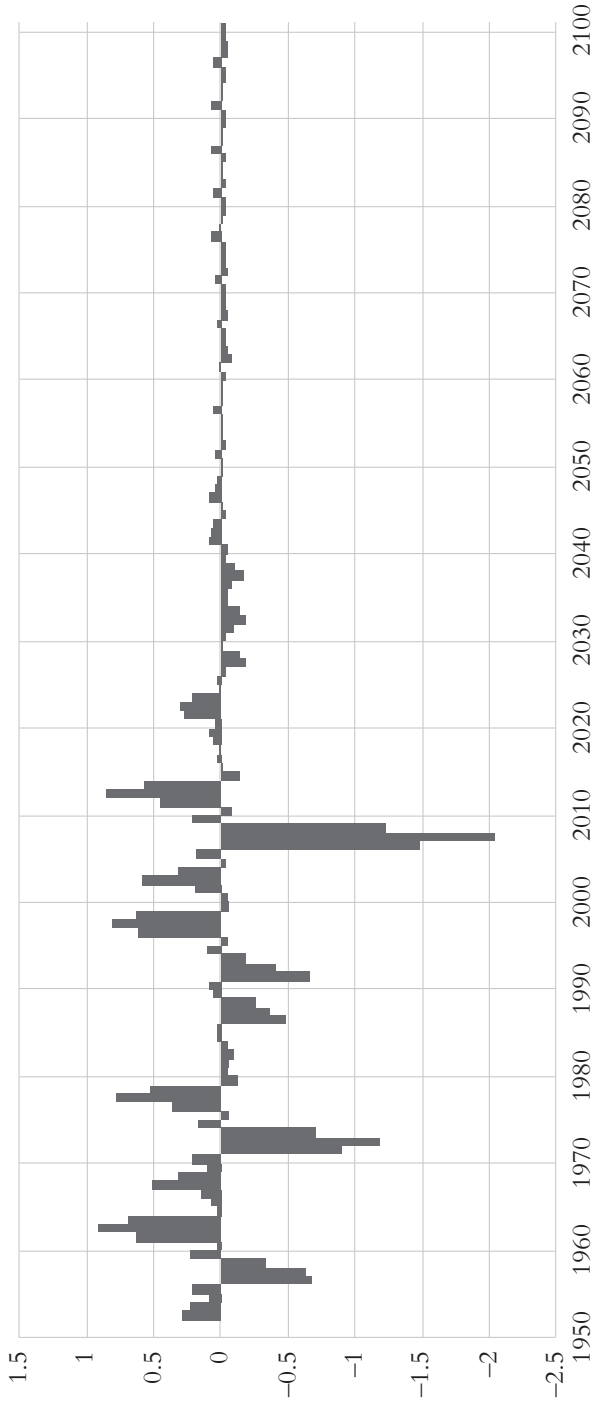
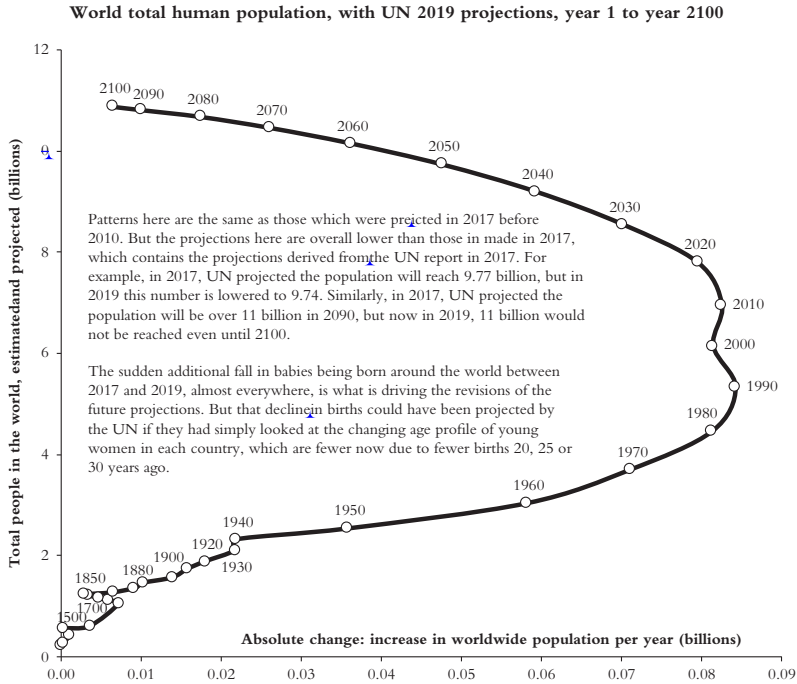


Figure 7.4: Total world population and annual change in world population, year 1 to 2100

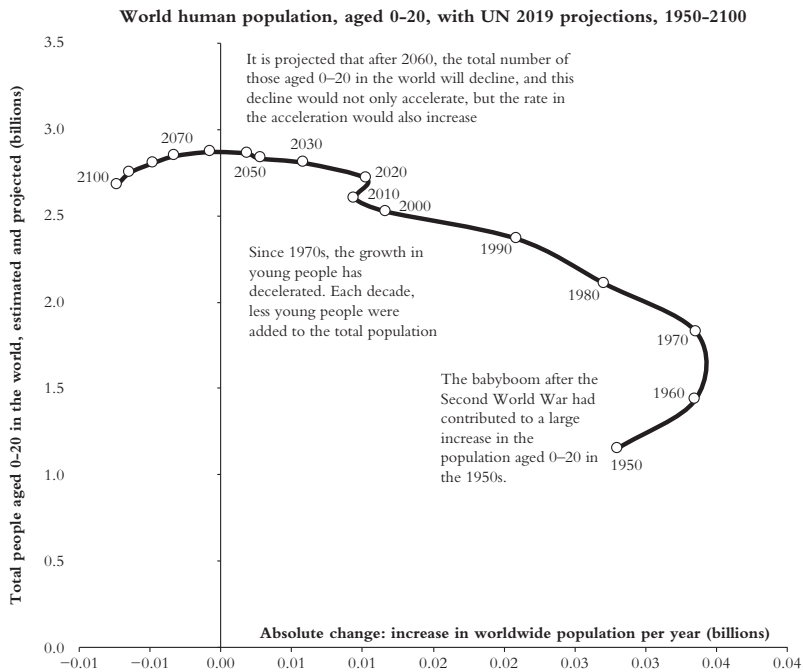


For those aged 21 to 40, Figure 7.6 shows that the deceleration began abruptly in 1980, as they were being born in fewer numbers in the early 1960s, and the peak is expected to be reached around 2080. You might argue that even if such a scenario begins to come true, the rich world will continue to impoverish the poorer countries of the world and the current trends cannot continue. You might suggest that there will be absolute immiseration as the billionaires continue to increase their wealth. But how will the billionaires continue to grow their wealth in a world in which the markets they target are no longer growing, in which there are fewer and fewer young people for them to exploit?

The falling population of Europe

For those aged 81 and over deceleration comes much later; but there are only so many graphs one chapter can include! So consider instead Figure 7.7, which compares Germany, France, Italy and Spain. By 2100 Germany has fallen below 75 million people, France to just 65 million, Italy has now dropped below 40 million and Spain to just 33 million. None of these falls need happen. Each of these countries

Figure 7.5: Total world population aged under 21 and annual change in that population, year 1 to 2100

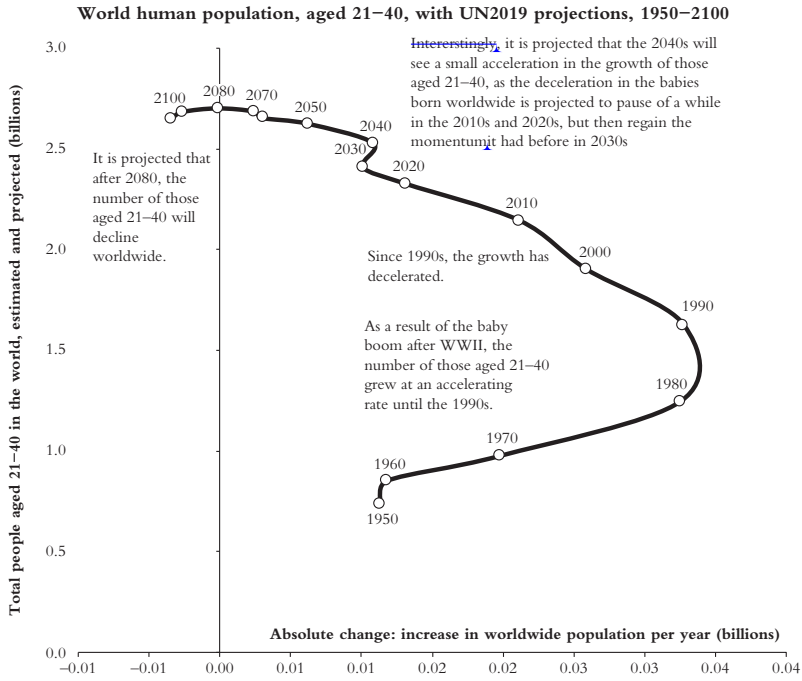


and the European Union that they lie in could open up its borders a little more obviously than each already does, and each need not suffer such falls. However, were they to do so then the populations of the countries that people migrate from will fall even faster than they are already predicted to fall in future, or would rise by less than they are predicted to rise.

The slowing of the rise in the population of Africa

In the 2019 UN report, the population in Egypt in 2050 is projected to be 160 million. It was previously projected to increase to 153 million in the 2017 UN report. The population growth rate accelerated fastest in the 1950s but is now expected to continue to rise until the 2040s. The 2019 UN population report revised the total population in Egypt in 2100 upward from its 2017 projection of 199 million to 225 million, 26 million more. Again this illustrates that the projections are highly variable. There is no great certainty for any particular country, but an overall sense should now be realized that the projections tend to be revised downwards more than they are revised upwards. If more

Figure 7.6 Total world population aged 21–40 and annual change in that population, year 1 to 2100



people move from Egypt to Europe then the population of Egypt will not grow as quickly as projected by the UN and the population of the entire world will also grow more slowly as those who move will have fewer children than if they did not move.

Figure 7.8 shows the project trend for Egypt and three other countries in Africa. In 2019, the UN revised its 2017 projections for the population in Nigeria downward. It is now projected that the acceleration between 2020 and 2050 in Nigeria’s population will be less rapid. Hence, its population will reach 401 million in 2050, instead of the 411 million which was projected before (in 2017). Comparing the projections made in 2019 with those made in 2017 also reveals a much quicker slowdown in population growth now projected after 2050. The quicker slowdown now makes the projection of the population that will be reached in 2100 fall to 733 million, which is much smaller than the previous projection of 794 million, made just two years earlier: a drop of 61 million.

The most pronounced downward revision the UN made in its 2019 report is in the projections it now presents for the future population of Uganda. In 2019, the UN projected that the population in Uganda

Figure 7.7: Population past and predictions for Germany, France, Italy and Spain, year 1 to 2100

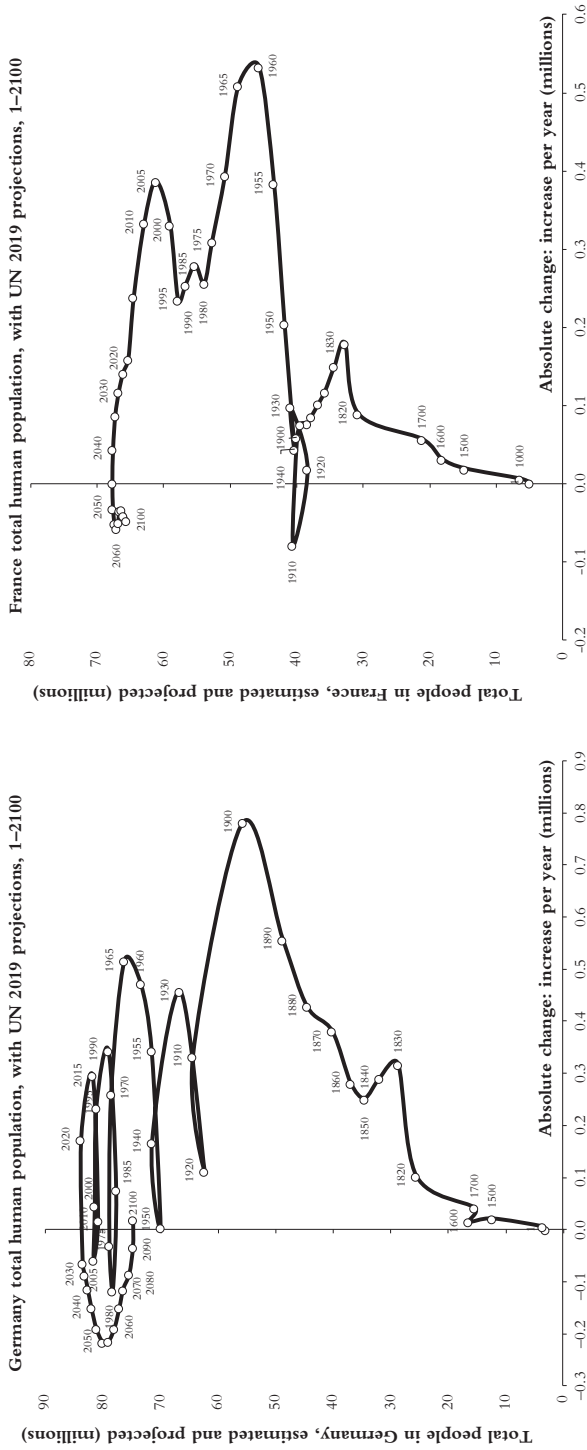


Figure 7.7: Population past and predictions for Germany, France, Italy and Spain, year 1 to 2100 (continued)

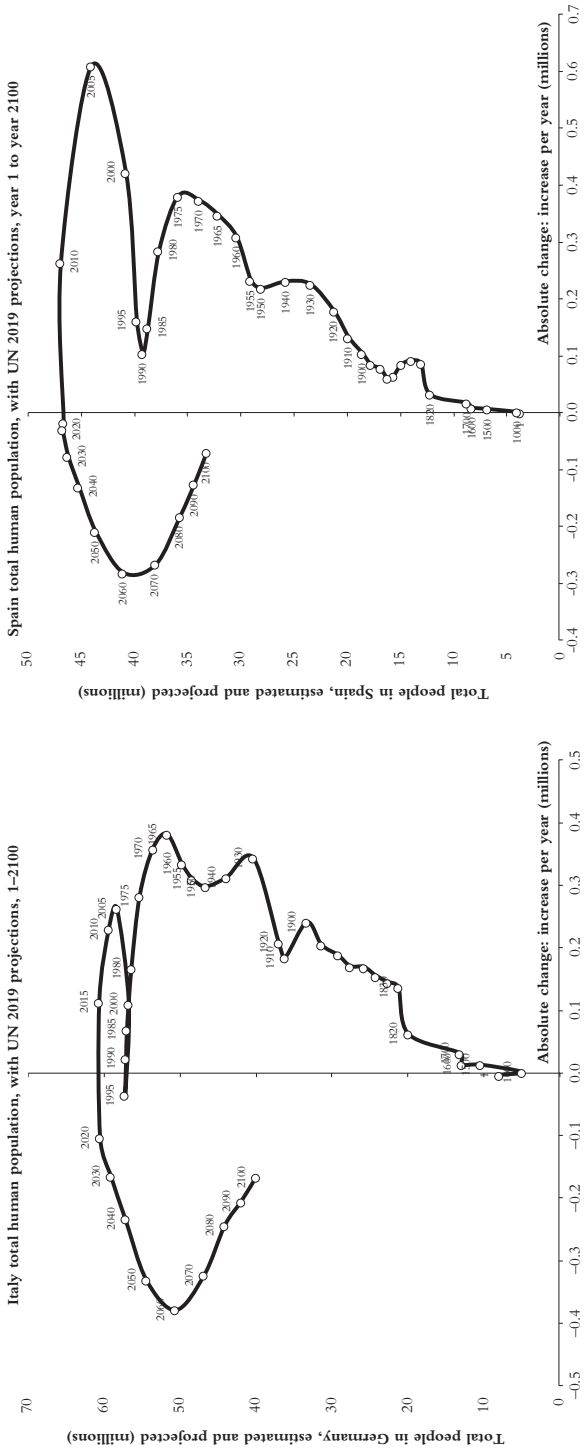


Figure 7.8: Population past and predictions for Egypt, Ethiopia, Nigeria and Uganda, year 1 to 2100

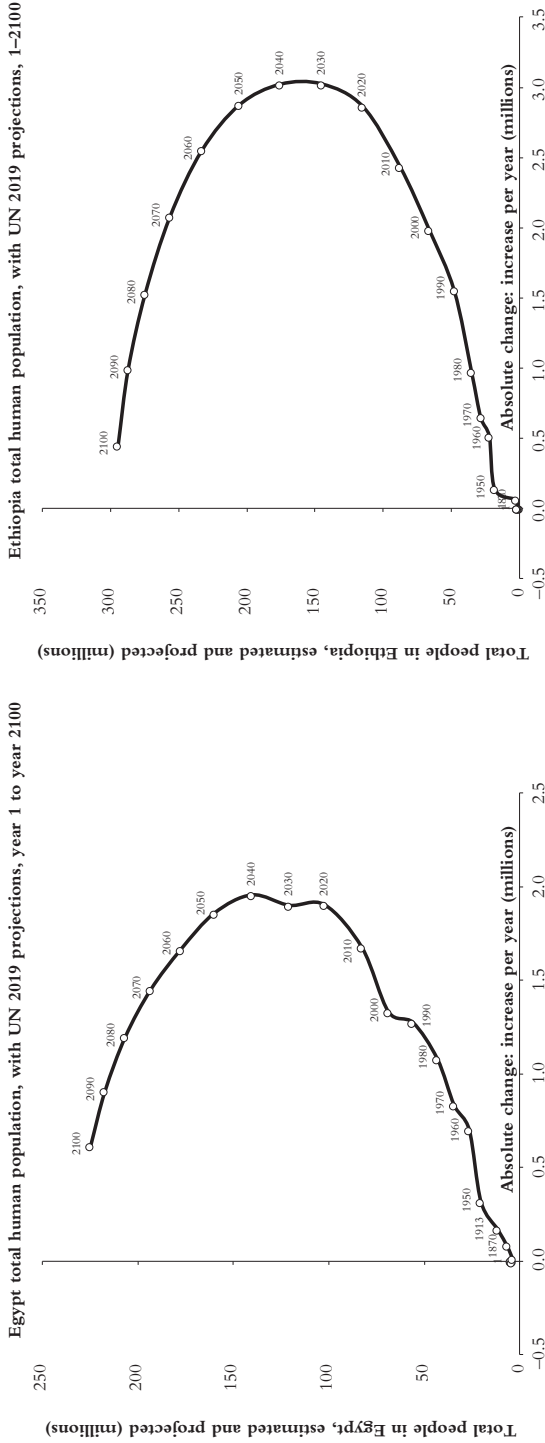
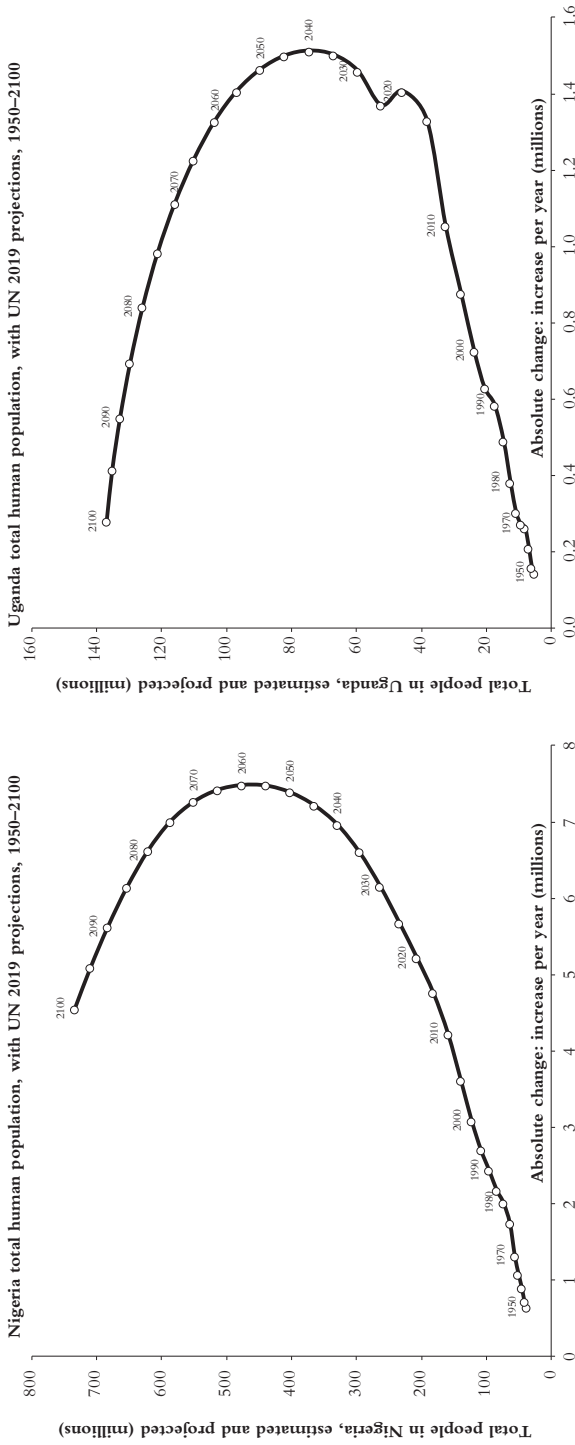


Figure 7.8: Population past and predictions for Egypt, Ethiopia, Nigeria and Uganda, year 1 to 2100 (continued)



The Struggle for Social Sustainability

Figure 7.9: Population predictions for Iran, Russia, Bangladesh and Singapore, to the year 2100

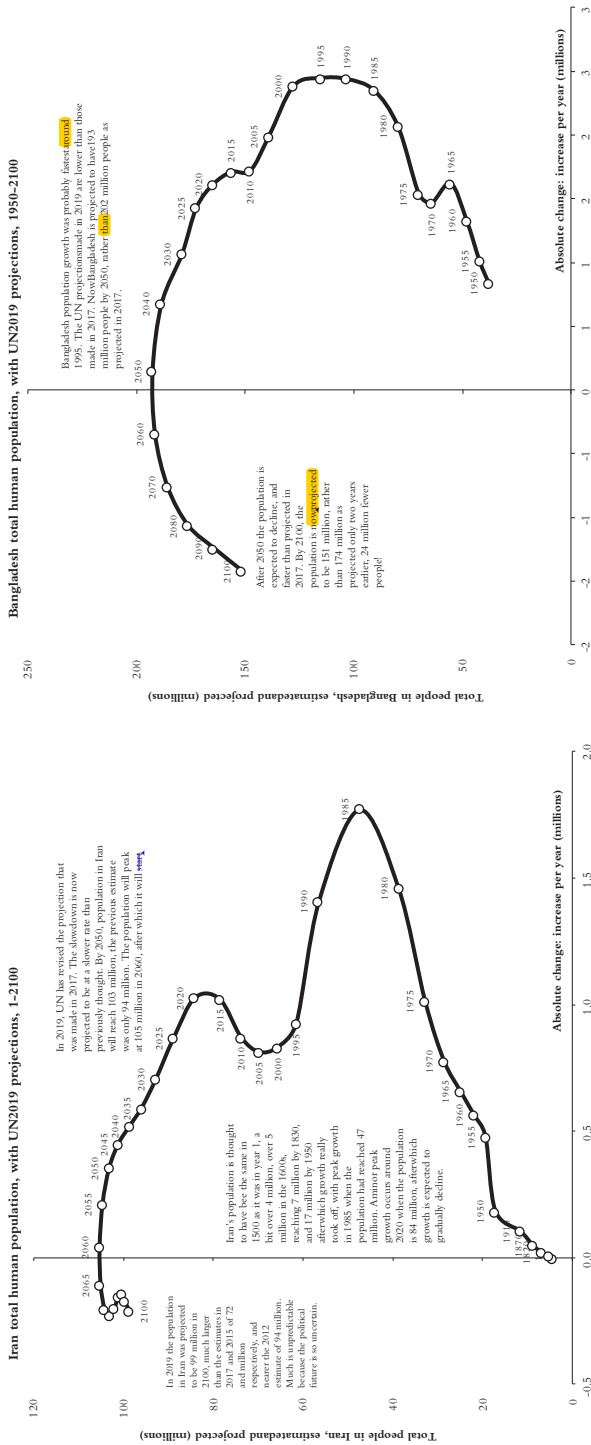


Figure 7.9: Population predictions for Iran, Russia, Bangladesh and Singapore, to the year 2100 (continued)

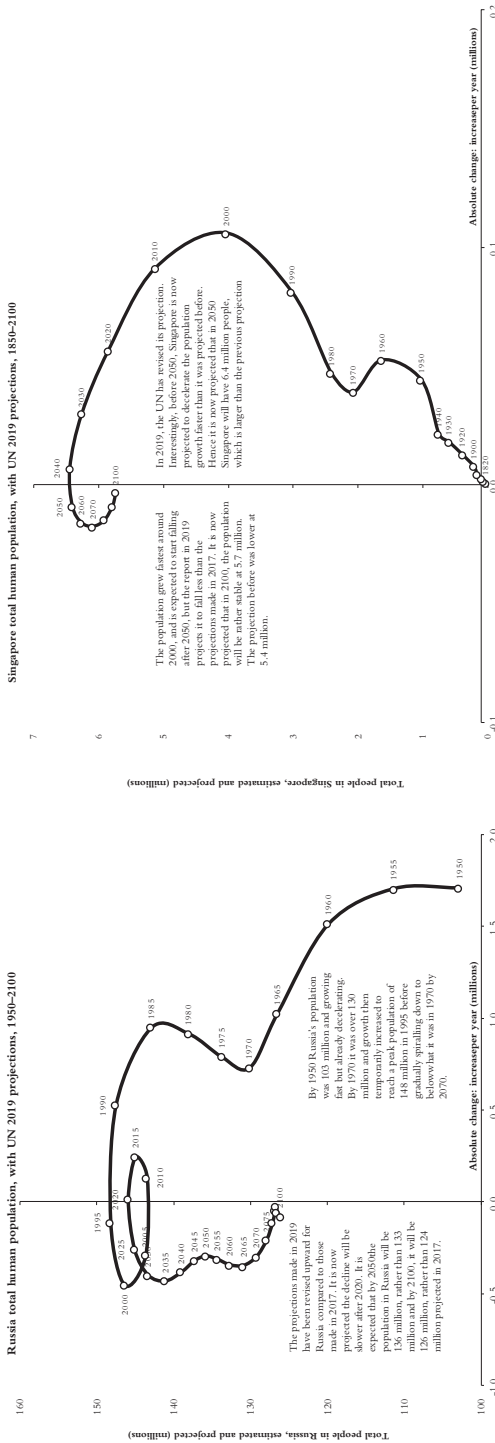


Figure 7.10: Population predictions for Myanmar, Indonesia, Fiji and Mexico, to the year 2100

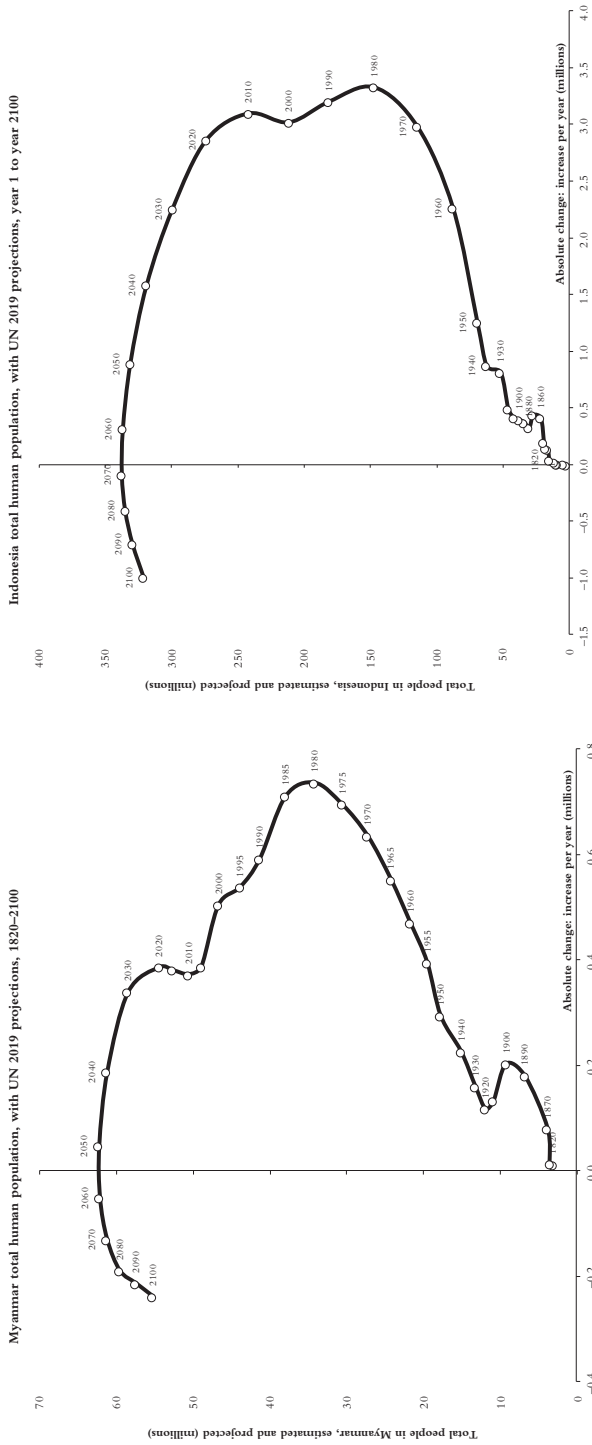
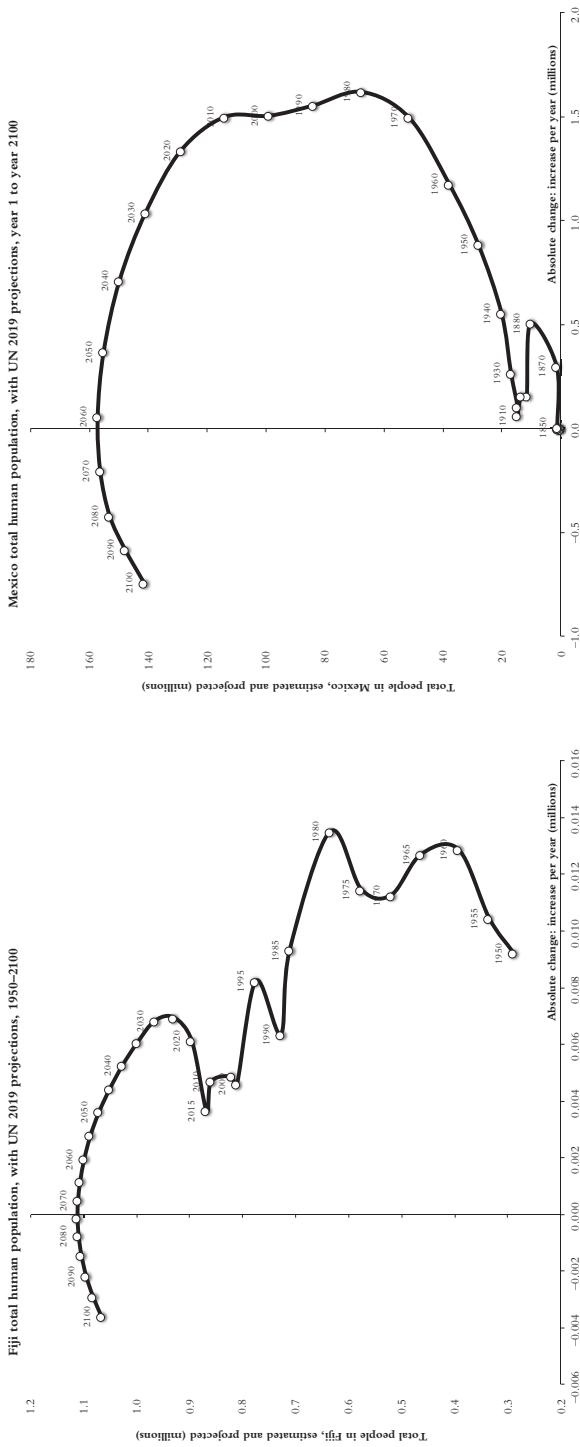


Figure 7.10: Population predictions for Myanmar, Indonesia, Fiji and Mexico, to the year 2100 (continued)



1 could be expected to reach 89 million in 2050, and then 137 million
2 in 2100. But in its previous 2017 report, these numbers were 106 and
3 214 million respectively. The 2019 UN projections reduced the 2017
4 projection of total world population in 2100 by 309 million. The
5 revision for Uganda alone was down by 77 million.

6 The population growth rate of Ethiopia accelerated fastest in the
7 1980s, during the time of famine. The growth rate of the population
8 of Ethiopia is expected to peak about 2030. In 2019, the UN revised
9 the total projection that was made in 2017 upwards. It is now projected
10 that in 2050, the population in Ethiopia will reach 205 million; the
11 previous estimate was 191 million. In 2019, population in Ethiopia
12 was projected to rise to 294 million in 2100, which is higher than the
13 previous estimation of 250 million. Thus the UN projections can rise
14 as well as fall.

15 16 **The falling populations of Asia**

17
18 But now head west to Iran, north to Russia, south to Bangladesh
19 and east to Singapore. Fly into the near future and towards the rising
20 sun. Just look at [Figure 7.9](#) and imagine what happens when we slow
21 down. What will happen in all these countries as the population falls?

22 Keep flying round the world, into the sunrise and the future. Fly
23 over Myanmar, Indonesia, Fiji and Mexico, all shown in [Figure 7.10](#).
24 Contrast the huge growth and acceleration of the population in almost
25 all these places in the 1950s and 1960s with the declaration that has
26 already begun in each place and the huge population falls to soon
27 come. These examples have not been cherry-picked. They are simply
28 a sample drawn with the help of Qiujie Shi, a postgraduate student the
29 author worked with on this and which has been put up on a website
30 which shows graphs for many other countries.⁴ This is simply what
31 is expected to happen if current trends continue, and there are many
32 reason to believe that all these UN central population projections are
33 overestimates and that populations will fall earlier and faster than this.⁵

34 35 **Population falling from the Indian Ocean to across** 36 **the Pacific**

37
38 The great irony of our times is that we worry about population
39 numbers (Wallace-Wells, 2019; Thunberg, 2019) even though they
40 are now so surely predicted to fall. The UN estimates of the distant
41 future settling at two children per potential couple do this despite
42

1 there being no evidence that when fertility falls below two children
2 per couple it will rise again.

4 **The slowdown in the poorest countries of the world**

6 Take the case of Cuba. Its population is already falling. It is now set to
7 almost halve within the next 80 years because the number of children
8 born is already so low on that island and because there is very little
9 migration to Cuba (Figure 7.11). Cuba is one of the most sustainable
10 places on earth. In a recent academic study it was ranked as the most
11 sustainable of all, just above Costa Rica and Sri Lanka (Hickel, 2020).
12 Its people are best placed to weather the future fall in population.
13 However, Cuba need only fall this fast if there is not, say, increased
14 immigration from some African countries. Furthermore, as Cuba has
15 one of the best records of training doctors worldwide, and countries in
16 Africa have the fewest doctors per head, it would make sense to avert
17 the population fall in Cuba based on that growing need for medical
18 staff training and expertise.

19 Population growth is related to economic inequality. Cuba's
20 population has stabilized so early largely because it is such an equitable
21 country. Nearby, in the USA, population continues to rise, and total
22 fertility rates are only now, finally, falling below two children per couple
23 and only then most surely for the middle class (Ducharme, 2019). Of
24 all the rich nations of the world it is the USA which is most unequal
25 economically; and the USA which has the highest population growth.
26 Inequitable, affluent countries like the USA also suck in migrants
27 because they have so many jobs at the bottom of their economies; so
28 many so very badly paid jobs.

29 Migration to more equitable affluent countries like Japan and
30 the Nordic countries is much lower as there are far fewer low-paid
31 opportunities. Nevertheless, when people migrate to the USA
32 they have, on average, fewer children than they would have had if
33 they had stayed living in a poorer country. Thus even economic
34 inequality can contribute to a smaller global population. However, it is
35 economic equality that is most closely associated with low population
36 growth: affluence, stability and social wellbeing.

37 The projections that the UN make are not always as stable as those
38 for Cuba. For example, for nearby Venezuela, which has experienced
39 turmoil in recent years, including its population almost falling in
40 2015, the pattern is far less smooth. Often there is turmoil, more often
41 than we tend to acknowledge (Scott, 2017). This turmoil is shown
42

Figure 7.11: Cuba's total population and annual change in its population, year 1820 to 2100

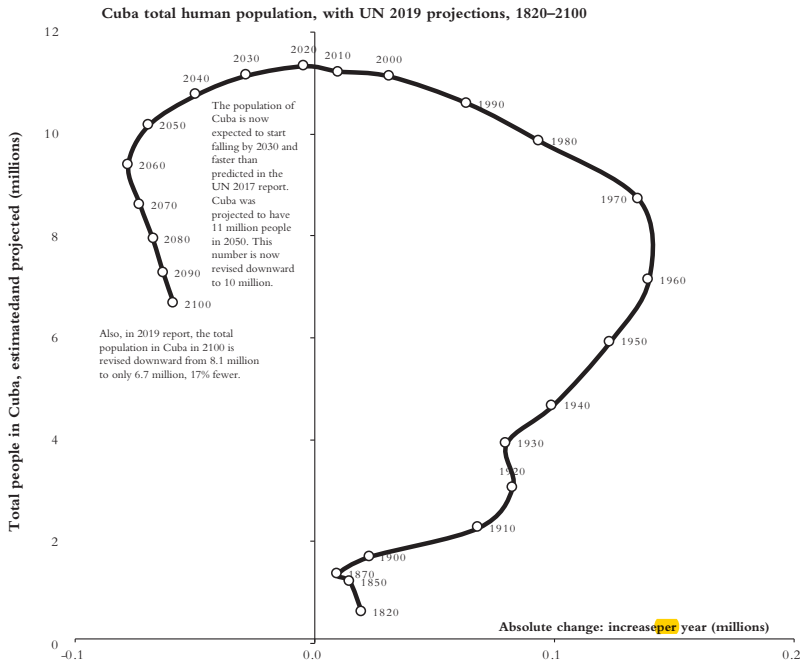


Figure 7.12: Venezuela's total population and annual change in its population, year 1820 to 2100

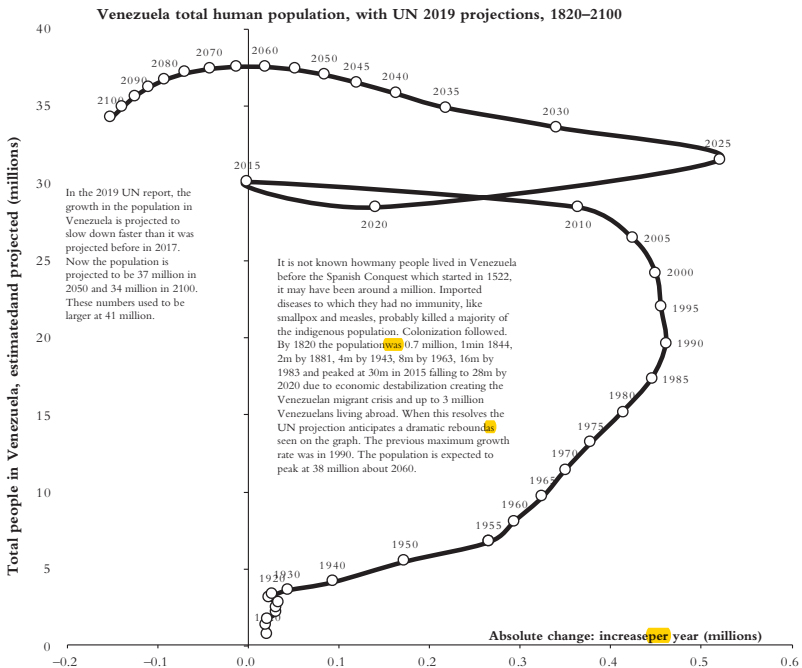
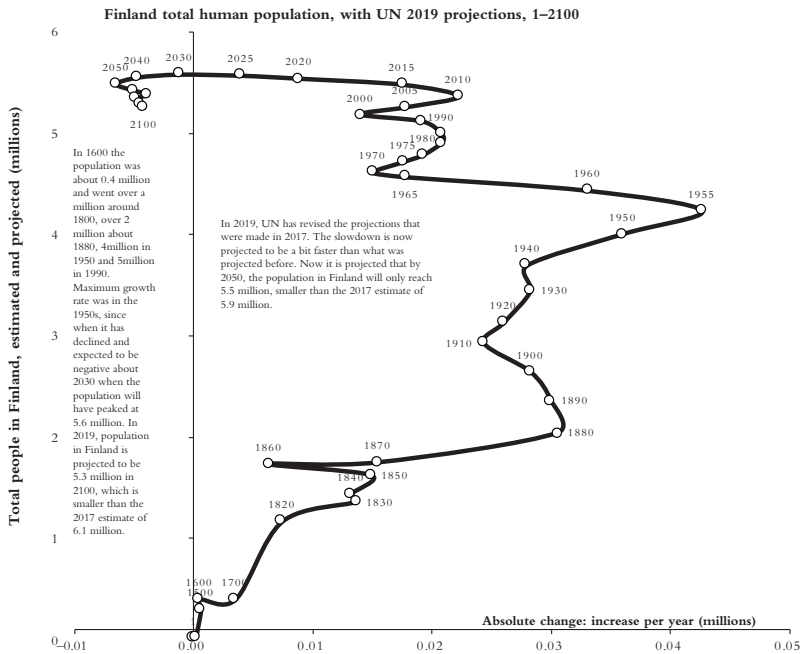


Figure 7.13: Finland's total population and annual change in its population, year 1 to 2100

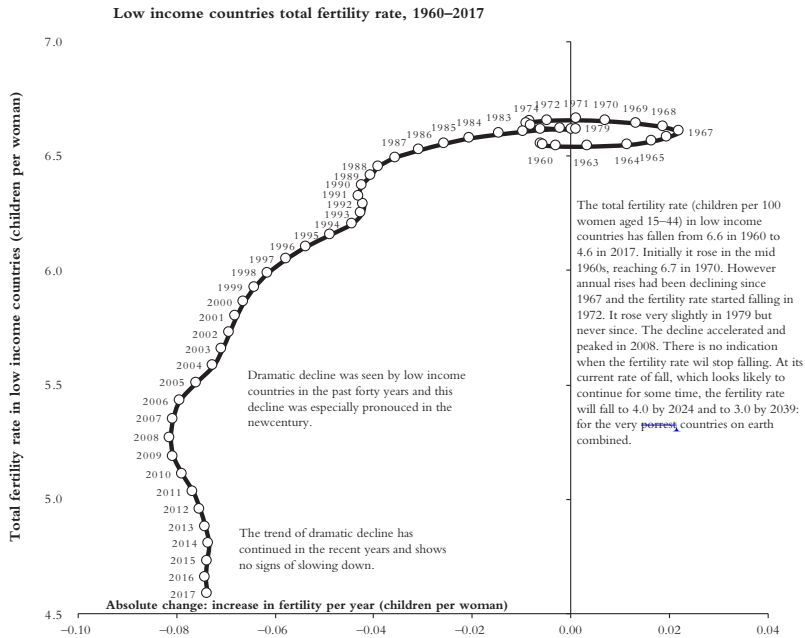


in Figure 7.12. And yet even for Venezuela future stability and then a fall are forecast.

Finally consider Finland, the most successful country worldwide in terms of the happiness of its people, very low homelessness, extremely high-quality education, amazing infant health and a host of other factors to be proud of. Finland is also the most equitable country in the world. Surely, you might think, people would be flocking to Finland? Well, some are, in greater and greater numbers; but even given the recent growth in migration to Finland, its population is set to fall shortly after 2025 because its fertility rate is now so very low. Women in Finland cannot be persuaded to have more children, no matter how generous both maternity and paternity pay and conditions are made.

When a country is equitable, like Finland, people do not have to think of having more children in future to help pay for their old age (see Wilkinson and Pickett, Chapter 14 in this volume). They have decent pensions. They don't have to have children to provide cheap labour in their corner-shops, or to help tend the farm, or in case just one might be lucky; people are treated well enough regardless of how many children they have, or whether they have none at all. It may seem impossible that that will ever happen to some of the poorest and most

Figure 7.14: Fertility rates in the poorest countries on earth, 1960 to 2017



inequitable countries in the world, but not long ago Finland was also one of the poorest and more inequitable of countries in the world; just a century ago in fact.

Figure 7.14 ends this chapter and the time series of graphs with a different graph, this time of fertility rates themselves for the lowest income countries in the world, and the ones which currently have the highest fertility rates. There are now only 34 such countries: Afghanistan, Benin, Burkina Faso, Burundi, the Central African Republic, Chad, the Comoros islands, the Democratic People’s Republic of Korea, the Democratic Republic of the Congo, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Haiti, Liberia, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Rwanda, Senegal, Sierra Leone, Somalia, South Sudan, the Syrian Arab Republic, Tajikistan, Togo, Uganda, the United Republic of Tanzania, Yemen and Zimbabwe. On average, across all of these, by the time this book is published the average number of children a woman gives birth to in her lifetime will be the same as the current queen of England gave birth in her lifetime (four). And it is still falling.

Please stop worrying about population, if you ever did!

Notes

- 1 ¹ For a good summary see Darrell Bricker and John Ibbitson (2019).
- 2 ² The introduction to this chapter is based on a blog post original written for the
- 3 Intergenerational Foundation and published on 8 July 8 2019: [www.if.org.uk/2019/](http://www.if.org.uk/2019/07/08/the-smaller-generation-to-come-worldwide/)
- 4 [07/08/the-smaller-generation-to-come-worldwide/](http://www.if.org.uk/2019/07/08/the-smaller-generation-to-come-worldwide/) and in Italian on 8 October
- 5 2019: [https://open.luiss.it/2019/10/08/sempré-meno-giovani-nel-mondo-il-](https://open.luiss.it/2019/10/08/sempré-meno-giovani-nel-mondo-il-pensiero-di-danny-dorling/)
- 6 [pensiero-di-danny-dorling/](https://open.luiss.it/2019/10/08/sempré-meno-giovani-nel-mondo-il-pensiero-di-danny-dorling/).
- 7 ³ ‘9.7 Billion on Earth by 2050, but Growth Rate Slowing, Says New UN Population
- 8 Report’, UN News, 17 June 2019, [https://news.un.org/en/story/2019/06/](https://news.un.org/en/story/2019/06/1040621)
- 9 [1040621](https://news.un.org/en/story/2019/06/1040621).
- 10 ⁴ See www.dannydorling.org/books/SLOWDOWN/.
- 11 ⁵ For more details, see the book these graphs were produced to illustrate; they could
- 12 not be included in that book as it contains so many graphs already (Dorling, 2020).

References

- 13
- 14 Bregman, R. (2020) *Humankind: A Hopeful History*, London: Bloomsbury.
- 15 Bricker, D. and Ibbitson, J. (2019) *Empty Planet: The Shock of Global*
- 16 *Population Decline*, London: Robinson.
- 17 Dorling, D. (2013) *Population 10 Billion: The Coming Demographic Crisis*
- 18 *and How to Survive It*, London: Constable.
- 19 Dorling, D. (2020) *Slowdown: The End of the Great Acceleration—and*
- 20 *Why It’s Good for the Planet, the Economy, and Our Lives*, New Haven,
- 21 CT: Yale University Press.
- 22 Dorling, D. and Gietel-Basten, S. (2017) *Why Demography Matters*,
- 23 Cambridge: Polity.
- 24 Ducharme, J. (2019) It May Not Be a Bad Thing Fewer U.S. Babies
- 25 Were Born in 2018 than in Any Year since 1986, *Time*, 15 May,
- 26 <http://time.com/5588610/us-birth-rates-record-low/>.
- 27 Hickel, J. (2020) ‘The Sustainable Development Index: Measuring the
- 28 Ecological Efficiency of Human Development in the Anthropocene’,
- 29 *Ecological Economics*, 167: 1–10.
- 30 Rodriguez, A. (2019) ‘The World’s Population Could Stop
- 31 Growing by 2100, UN Report Finds’, *USA Today*, 17 December,
- 32 [https://eu.usatoday.com/story/news/nation/2019/06/18/](https://eu.usatoday.com/story/news/nation/2019/06/18/world-population-could-peak-2100-united-nations-report-finds/1490136001/)
- 33 [world-population-could-peak-2100-united-nations-report-finds/](https://eu.usatoday.com/story/news/nation/2019/06/18/world-population-could-peak-2100-united-nations-report-finds/1490136001/)
- 34 [1490136001/](https://eu.usatoday.com/story/news/nation/2019/06/18/world-population-could-peak-2100-united-nations-report-finds/1490136001/).
- 35 Scott, J. C. (2017) *Against the Grain: A Deep History of the Earliest States*,
- 36 New Haven, CT: Yale University Press.
- 37 Thunberg, G. (2019) *No One Is Too Small to Make a Difference*,
- 38 London: Penguin.
- 39
- 40
- 41
- 42

_____ 1
_____ 2
_____ 3
_____ 4
_____ 5
_____ 6
_____ 7
_____ 8
_____ 9
_____ 10
_____ 11
_____ 12
_____ 13
_____ 14
_____ 15
_____ 16
_____ 17
_____ 18
_____ 19
_____ 20
_____ 21
_____ 22
_____ 23
_____ 24
_____ 25
_____ 26
_____ 27
_____ 28
_____ 29
_____ 30
_____ 31
_____ 32
_____ 33
_____ 34
_____ 35
_____ 36
_____ 37
_____ 38
_____ 39
_____ 40
_____ 41
_____ 42

UN DESA Population Division (2019) *World Population Prospects 2019: Highlights*, New York: UN, ST/ESA/SER.A/423, https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf.

Wallace-Wells, D. (2019) *The Uninhabitable Earth: A Story of the Future*, London: Allen Lane.