

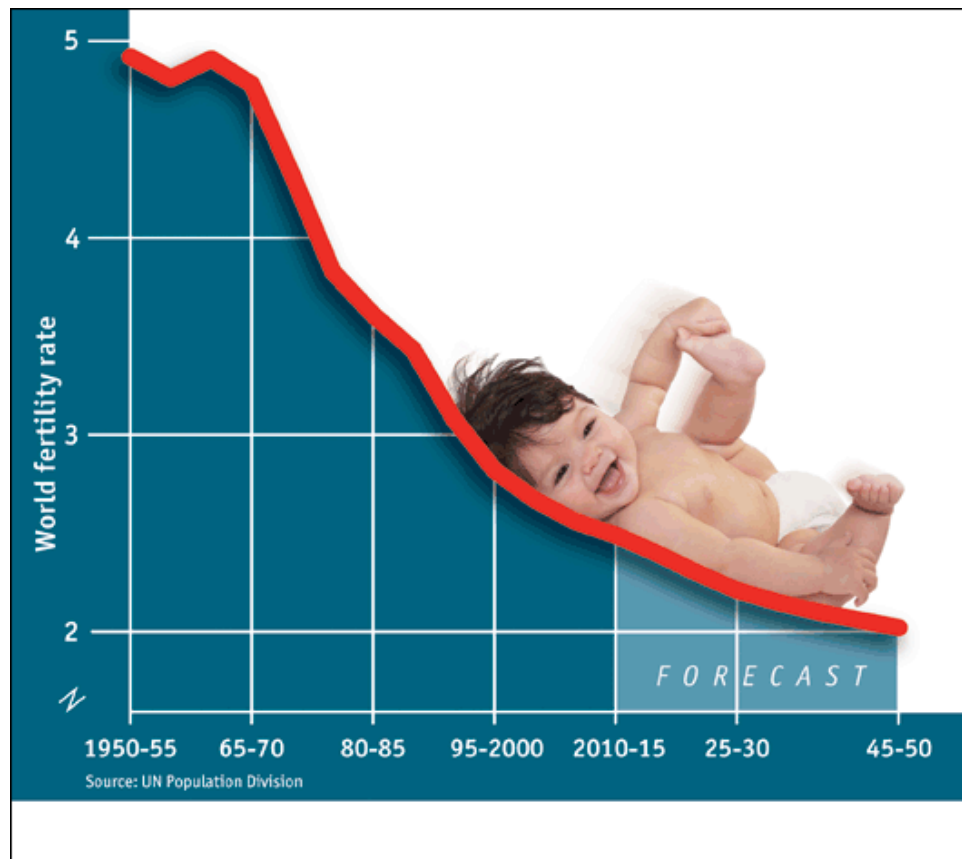
Fertility and living standards

Go forth and multiply a lot less

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Lower fertility is changing the world for the better



SOMETIME in the next few years (if it hasn't happened already) the world will reach a milestone: half of humanity will be having only enough children to replace itself. That is, the fertility rate of half the world will be 2.1 or below. This is the "replacement level of fertility", the magic number that causes a country's population to slow down and eventually to stabilise. According to the United Nations population division, 2.9 billion people out of a total of 6.5 billion were living in countries at or below this point in 2000-05. The number will rise to 3.4 billion out of 7 billion in the early 2010s and to over 50% in the middle of the next decade. The countries include not only Russia and Japan but Brazil, Indonesia, China and even south India.

The move to replacement-level fertility is one of the most dramatic social changes in history. It manifested itself in the violent demonstrations by students against their clerical rulers in Iran this year. It almost certainly contributed to the rising numbers of middle-class voters who backed the incumbent governments of Indonesia and India. It shows up in rural Malaysia in richer, emptier villages surrounded by mechanised farms. And everywhere, it is changing traditional family life by enabling women to work and children to be educated. At a time when Malthusian alarms are ringing because of environmental pressures, falling fertility may even provide a measure of reassurance about global population trends.

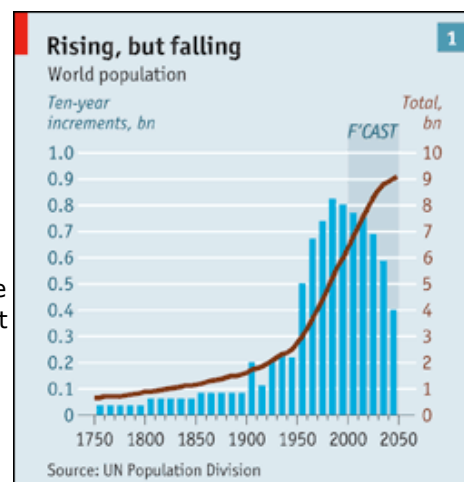
The fertility rate is a hypothetical, almost conjectural number. It is not the same as the birth rate, which is the number of children born in a year as a share of the total population. Rather, it represents the number of children an average woman is likely to have during her childbearing years, conventionally taken to be 15-49.

If there were no early deaths, the replacement rate would be 2.0 (actually, fractionally higher because fewer girls are born than boys). Two parents are replaced by two children. But a daughter may die before her childbearing years, so the figure has to allow for early mortality. Since child mortality is higher in poor countries, the replacement fertility rate is higher there, too. In rich countries it is about 2.1. In poor ones it can go over 3.0. The global average is 2.33. By about 2020, the global fertility rate will dip below the global replacement rate for the first time.

Modern Malthusians tend to discount the significance of falling fertility. They believe there are too many people in the world, so for them, it is the absolute number that matters. And that number is still rising, by a forecast 2.4 billion over the next 40 years. Populations can rise while fertility declines because of inertia, which matters a lot in demography. If, because of high fertility in earlier generations, there is a bulge of women of childbearing years, more children will be born, though each mother is having fewer children. There will be more, smaller families. Assuming fertility falls at current rates, says the UN, the world's population will rise from 6.8 billion to 9.2 billion in 2050, at which point it will stabilise (see chart 1).

Behind this is a staggering fertility decline. In the 1970s only 24 countries had fertility rates of 2.1 or less, all of them rich. Now there are over 70 such countries, and in every continent, including Africa. Between 1950 and 2000 the average fertility rate in developing countries fell by half from six to three—three fewer children in each family in just 50 years. Over the same period, Europe went from the peak of the baby boom to the depth of the baby bust and its fertility also fell by almost half, from 2.65 to 1.42—but that was a decline of only 1.23 children. The fall in developing countries now is closer to what happened in Europe during 19th- and early 20th-century industrialisation. But what took place in Britain over 130 years (1800-1930) took place in South Korea over just 20 (1965-85).

Things are moving even faster today. Fertility has dropped further in every South-East Asian country (except the Philippines) than it did in Japan. The rate in Bangladesh fell by half from six to three in only 20 years (1980 to 2000). The same decline took place in Mauritius in just ten (1963-73). Most sensational of all is the story from Iran.



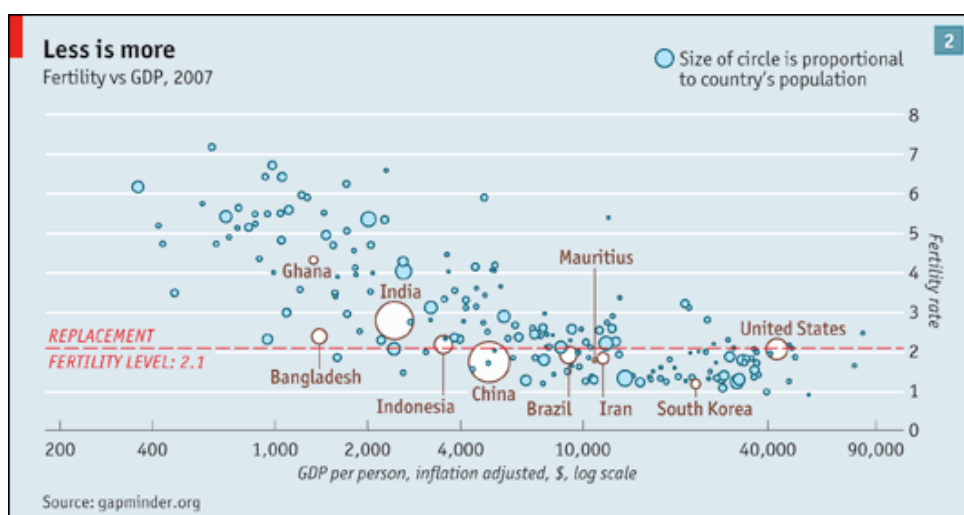
When the clerical regime took over in 1979, the mullahs, apparently believing their flock should go forth and multiply, abolished the country's family-planning system. Fertility rose, reaching seven in 1984. Yet by the 2006 census the average fertility rate had fallen to a mere 1.9, and just 1.5 in Tehran. From fertility that is almost as high as one can get to below replacement level in 22 years: social change can hardly happen faster. No wonder the explosion on the streets of Iran this year seemed like a clash between two worlds: 15-29 year-olds, one-third of the population, better educated and with different expectations, against the established regime and the traditionalists.

Why has fertility fallen so fast, so widely? Malthus himself thought richer people would have more children and, as any biologist will tell you, animal populations increase when there is more food around.

To understand why wealthy people differ from well-fed animals, imagine yourself a dirt-poor (male) peasant 50 years ago. Your fields are in the middle of nowhere. Your village has no school, hospital or government services, certainly no pensions. Few goods come into it from outside, though disease is rampant and security fragile. Ploughing and reaping are done by hand. But if the harvest is normal, you usually have enough to go round. In these circumstances, the benefit of an extra pair of hands to gather the harvest outweighs the cost of feeding an extra mouth (which anyway falls on your wife more than you). And when you can no longer work in the fields, your children will be the only ones to look after you. In such a society, all the incentives point to having large families.

The abandoned hamlet

Now imagine you are a bit richer. You may have moved to a town, or your village may have grown. Schools, markets and factories are within reach. And suddenly, the incentives change. A tractor can gather the harvest better than children. Your wife may get a factory job—and now her lost wages must be set against the benefits of another baby. Education, thrift and a stake in the future become more important, and these middle-class virtues go hand in hand with smaller families. Education costs money, so you may not be able to afford a large family. Perhaps the state provides a pension and you no longer need children to look after you. And perhaps your wife is no longer willing to bear endless offspring. Higher living standards, better communications and more education enable you to rely on markets and public services, not just yourself and your family.



Macroeconomic research bears out this picture. Fertility starts to drop at an annual income per person of \$1,000–2,000 and falls until it hits the replacement level at an income per head of \$4,000–10,000 a year (see chart 2). This roughly tracks the passage from poverty to middle-income status and from an agrarian society to a modern one. Thereafter fertility continues at or below replacement until, for some, it turns up again (see [article](#)).

The link between living standards and fertility exists within countries, too. India's poorest state, Bihar, has a fertility rate of 4; richer Tamil Nadu and Kerala have rates below 2. Shanghai has had a fertility rate of less than 1.7 since 1975; in Guizhou, China's poorest province, the rate is 2.2. So strong is the link between wealth and fertility that the few countries where fertility is not falling are those torn apart by war, such as Congo, Liberia and Sierra Leone, where living standards have not risen.

Family research adds detail to this sketch. Indonesia's Family Life Survey showed that, on average, each birth reduced by a fifth the likelihood that a woman would have a job—lowering household income and pushing some families into poverty. So smaller families made middle-class status more likely. Between 1974 and 1996, Bangladesh turned a district called Matlab into a giant demographic experiment: some villages and households got family planning, others did not. According to one study of the results, fertility in the areas that received help declined by around 15% more than in those that did not. And over the two decades of the experiment, indicators of the well-being of women and their children—health, earnings, household assets and so on—were all higher in the villages that got the planning. Does this suggest that lower fertility causes wealth, or that wealth lowers fertility? It would be better to say that the two things go together.

What parents want

The link between wealth and fertility does not explain everything. In some countries, poor women have the same number of children as rich ones. This suggests that other factors are at work. The most obvious is that many people in poor countries want fewer children, and family planning helps them get their wish.

A surprising amount is known about how many children parents want, thanks to a series of surveys by the Demographic and Health Surveys programme. The picture it paints is of huge numbers of unplanned pregnancies. In Brazil, for example, the wanted fertility rate in 1996 (the most recent year available) was 1.8; the actual fertility rate then was 2.5. In India the wanted rate in 2006 was 1.9, the actual one, 2.7. In Ghana the figures for 2003 were 3.7 and 4.4. The rule seems to be that women want one child fewer than they are having (except in some rich countries, where they say they want more).

One study in 2002 estimated that as many as a quarter of all pregnancies in developing countries in the 1990s were unintended. Yet another found that more African women say they want to use contraceptives but cannot get them (25m) than actually use them (18m). Unmet demand in turn implies that fertility in some countries could be even lower than it actually is if more family planning were available. The proportion of women using contraception in Latin America and East Asia is four times the African rate.

That points to another big reason why fertility is falling: the spread of female education. Go back to the countries where fertility has fallen fastest and you will find remarkable literacy programmes. As early as 1962, for example, 80% of young women in Mauritius could read and write. In Iran in 1976, only 10% of rural women aged 20 to 24 were literate. Now that share is 91%, and Iran not only has one of the best-educated populations in the Middle East but the one in which men and women have the most equal educational chances. Iranian girls aged 15-19 have roughly the same number of years of schooling as boys do. Educated women are more likely to go out to work, more likely to demand contraception and less likely to want large families.

Lastly, a special case: China's one-child policy, which began nationwide in the early 1970s. China's population is probably 300m-400m lower now than it would have been without it. The policy (which is one of population control, not birth control) has had dreadful costs, including widespread female infanticide, a lopsided sex ratio and horrors such as mass sterilisation and forced abortions. But in its own terms, it has worked—20m people enter the workforce each year, instead of 40m—and, to the extent that China is polluting less than it would have done, it has benefited the rest of the world.

The Goldilocks moment

Higher standards of living, then, reduce fertility. And lower fertility improves living standards. This is what China's government says. It is also the view that has emerged from demographic research over the past 20 years.* In the 1980s, population was regarded as relatively unimportant to economic performance. American delegates told a UN conference in 1984 that "population growth is, in and of itself, neither good nor bad; it is a neutral phenomenon." Recent research suggests otherwise.

Cutting the fertility rate from six to two can help an economy in several ways. First, as fertility falls it changes the structure of the population, increasing the size of the workforce relative to the numbers of children and old people. When fertility is high and a country is young (median age below 20), there are huge numbers of children and the overall dependency ratio is high. When a country is ageing (median age above 40), it again has a high dependency ratio, this time because of old people.

But the switch from one to the other produces a Goldilocks generation. Because fertility is falling, there are relatively few children. Because of high mortality earlier, there are relatively few grandparents. Instead, countries have a bulge of working-age adults. This happened to Europe after the baby boom of 1945-65 and produced *les trente glorieuses* (30 years of growth). It is happening now in Asia and Latin America. East Asia has done better than Latin America, showing that lower fertility alone does not determine economic success. Eventually developing countries will face the same problems of ageing as Europe and Japan do. But for the moment, Asians and Latinos are enjoying fertility that is neither too hot, nor too cold. According to David Bloom of the Harvard School of Public Health, the "demographic dividend" (his term) accounted for a third of East Asian growth in 1965-90.

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Slowing fertility has other benefits. By making it easier for women to work, it boosts the size of the labour force. Because there are fewer dependent

children and old people, households have more money left for savings, which can be ploughed into investment. Chinese household savings (obviously influenced by many things, not just demography) reached almost 25% of GDP in 2008, helping to finance investment of an unprecedented 40% of GDP. This in turn accounted for practically all the increase in Chinese GDP in the first half of this year.

Lastly, low fertility makes possible a more rapid accumulation of capital per head. To see how, think about what happens to a farm as it is handed down the generations in a country without primogeniture. The more children there are, the more the farm is divided. Eventually, these patches become so tiny they cease to be efficient. This is occurring in Bangladesh.

The importance of tackling such problems, which go by the ugly name of “capital shallowing”, was discounted in the 1980s but has recently made a comeback. Hu Angang of Tsinghua University estimates that half of Chinese growth per person in 1978-98 can be attributed to the increase in capital stock per head.

This link between growth and fertility raises awkward questions. In the 1980s the link was downplayed in reaction to Malthusian alarms of the 1970s, when it was fashionable to argue that population growth had to be reined in because oil and natural resources were running short. So if population does matter after all, does that mean the Malthusians were right?

Not entirely. Neo-Malthusians think the world has too many people. But for most countries, the population questions that matter most are either: do we have enough people to support an ageing society? Or: how can we take advantage of having just the right number for economic growth? It is fair to say that these perceptions are not mutually exclusive. The world might indeed have the right numbers to boost growth and still have too many for the environment. The right response to that, though, would be to curb pollution and try to alter the pattern of growth to make it less resource-intensive, rather than to control population directly.

The reason is that widening replacement-level fertility means population growth is slowing down anyway. A further reduction of fertility would be possible if family planning were spread to the parts of the world which do not yet have it (notably Africa). But that would only reduce the growth in the world’s numbers from 9.2 billion in 2050 to, say, 8.5 billion. To go further would probably require draconian measures, such as sterilisation or one-child policies.

The bad news is that the girls who will give birth to the coming, larger generations have already been born. The good news is that they will want far fewer children than their mothers or grandmothers did.



* For a full list of sources used in this article, see economist.com/fertilitysources