

## The best of all possible worlds?

*It was once a rule of demography that people have fewer children as their countries get richer. That rule no longer holds true.*



Alamy

One of the paradoxes of human biology is that the rich world has fewer children than the poor world. In most species, improved circumstances are expected to increase reproductive effort, not reduce it, yet as economic development gets going, country after country has experienced what is known as the demographic transition: fertility (defined as the number of children borne by a woman over her lifetime) drops from around eight to near one and a half. That number is so small that even with the reduced child mortality which usually accompanies development it cannot possibly sustain the population.

This reproductive collapse is particularly worrying because it comes in combination with an increase in life expectancy which suggests that, by the middle of the century, not only will populations in the most developed countries have shrunk (unless they are propped up by historically huge levels of immigration) but also that the number of retired individuals supported by each person of working age will increase significantly. If Mikko Myrskylä of the University of Pennsylvania and his colleagues are correct, though, things might not be quite as bad as that. A study they have just published in *Nature* suggests that as development continues, the demographic transition goes into reverse.

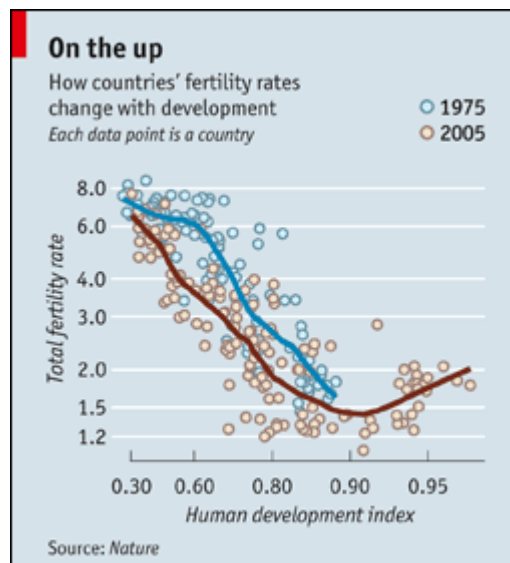
Dr Myrskylä looked at the world as it was in 1975 and as it is now (or, at least, as it was in 2005). He compared two things. One was the total fertility rate (the number of children that would be born to a woman in a particular country over the course of her life if she experienced the age-specific fertility rates observed in that country during the calendar year in question). The other was the human development index for that country. The HDI, a measure used by the United Nations, has three components: life expectancy; average income per person; and level of education. Its maximum possible value is one.

Curiouser and curiouser

Back in the 1970s, no country got anywhere near one. Of the 107 places the researchers looked at, the best was Canada, with an HDI of 0.89. By 2005, however, things had improved markedly. Two dozen of what were now 240 countries had HDIs above nine—and something else remarkable had happened. Back in 1975, a graph plotting fertility rate against the HDI fell as the HDI rose. By 2005, though, the line had a kink in it. Above an HDI of 0.9 or so, it turned up, producing what is known in the jargon as a “J-shaped” curve (even though it is the

mirror image of a letter J). As the chart shows, in many countries with really high levels of development (around 0.95) fertility rates are now approaching two children per woman. There are exceptions, notably Canada and Japan, but the trend is clear.

This result is both important and unexplained. Its importance lies in the change of assumptions that policymakers will have to put into their models of the future. The nadir of fertility appears to be 1.3 children per woman. Not every country drops that low before making the turn, but if those that do were to stay there, they would need to import immigrants equivalent to 1.5% of their population every year, for those populations merely to remain static. With the best will in the world, absorbing that many migrants would be tricky. Dr Myrskylä's data, however, suggest the ultimate outcome of development may not be a collapsing population at all but, rather, the environmentalist's nirvana of uncoerced zero population growth.



Why this change has come about, and why the demographic transition happens in the first place, are matters of debate. There are lots of social explanations of why fertility rates fall as countries become richer. The increasing ability of women in the developed world to control their own reproductive output is one, as is the related phenomenon of women entering the workplace in large numbers. The increasing cost of raising children in a society with more material abundance plays a part. So does the substitution of nationalised social-security systems for the support of offspring in old age. Falling rates of child mortality are also significant. Conversely, Dr Myrskylä speculates that the introduction of female-friendly employment policies in the most developed countries allows women to have the best of both worlds, and that this may contribute to the uptick.

No doubt all these social explanations are true as far as they go, but they do not address the deeper question of why people's psychology should have evolved in a way that makes them want fewer children when they can afford more. There is a possible biological explanation, though. This is that there are, broadly speaking, two ways of reproducing.

One way is to churn out offspring in large numbers, turn them out into an uncaring world, and hope that one or two of them make it. The other is to have but a few progeny and to dote on them, ensuring that they grow up with every possible advantage for the ensuing struggle with their peers for mates and resources. The former is characteristic of species that live in unstable environments and the latter of species whose circumstances are predictable.

Viewed in comparison with most animals, humans are at the predictable-environment and doting-parent end of the scale, but from a human perspective those in less developed

countries are further from it than those in rich ones. One interpretation of the demographic transition, then, is that the abundance which accompanies development initially enhances the instinct to lavish care and attention on a few offspring. Only when the environment becomes super-propitious can parents afford more children without compromising those they already have—and only then, as Dr Myrskylä has now elucidated, does the birth-rate start to rise again.

How far the process will continue, and whether it will spread to holdouts like Japan and Canada, remains to be seen. Indeed, the whole exercise is a warning of the risks of extrapolating the future from present trends. But, on present trends, things do, indeed, look hopeful.

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