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## We're all...just little bits of history repeating (Part 1 - History)

13 June 2011

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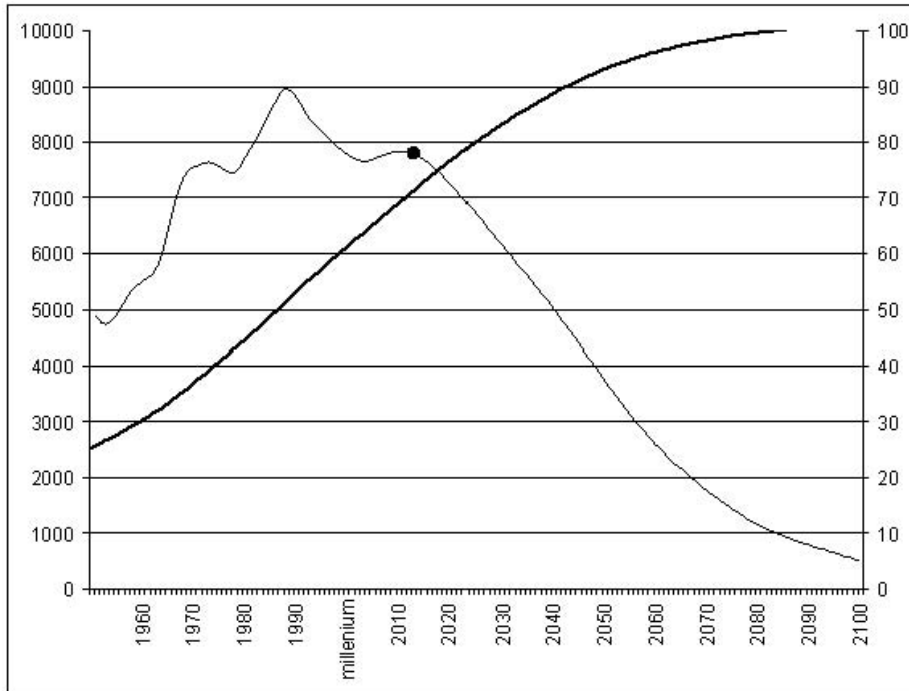


A crowd of people in Washington. Image

by Ben Schumin/[Wikipedia](#).

In May 2011 the United Nations Population Division released "The 2010 Revision" of its world population estimates and projections. The headline story was that the projection was up greatly on the previous medium variant estimate. We were now projected to number 10.1 billion within the next ninety years, 9.3 billion by 2050. The Division's press release came with a health warning "Small variations in fertility can produce major differences in the size of populations over the long run. The high projection variant, whose fertility is just half a child above that in the medium variant, produces a world population of 10.6 billion in 2050 and 15.8 billion in 2100. The low variant, whose fertility remains half a child below that of the medium, produces a population that reaches 8.1 billion in 2050 and declines towards the second half of this century to reach 6.2 billion in 2100."<sup>1</sup>

Why had the medium variant projection gone up, and just how sensitive were the projections to small variations? Well, it turns out they had gone up because there had been a very small and very recent variation. Worldwide we had experienced a mini baby boom during the last decade. Take a look at the graph below. On the left hand axis, and as depicted by the thick line, are shown the new UN medium variant population projections in millions of people. On the right hand axis, and by the thin line, are shown the first derivative of that trend - the change - births less deaths. I've put a black dot on the curve of change in case you miss it. The dot marks the end of previously unexpected mini baby boom. It marks now<sup>2</sup>.



**World population estimates and projections and annual population change (millions)**  
**- UN median variant scenario, change on right hand axis and drawn as thin line.**

Demography is a complex science, but it is also an art. The correct way to look at projections is to calculate life tables and tables of fertility rates by age, to carefully project them forward year on year, to do this for each country, maybe even taking into account international migration trends and their impacts, add up the results and publish your global projection. But there is another way to look at a projection. Just take the past trend and look at the change, and the change in the change, and see if there is a pattern.

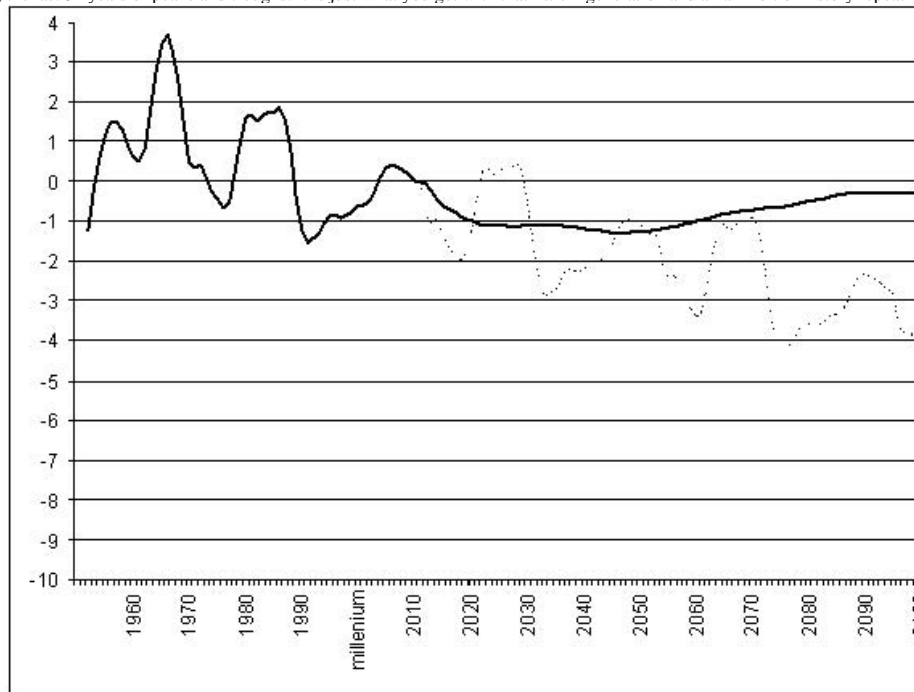
The graph below shows the change in the change that the UN Division *both* estimates to have occurred and projects to occur in future, all in one thick line. It is the second derivative of population. It is births in one year less births the year before plus deaths the year before less the deaths this year. It is the degree to which population numbers are accelerating (change in change above zero) or decelerating (change in change below zero). The UN Division does not now estimate population change to decelerate as quickly in future as it did in its previous revision. Instead, based on the most recent evidence, it suggests the greatest deceleration will be by at most about one million people a year and that itself will flatten out towards no change in change by the century's end.

But what if the future is as spiky as the past? Look at the trend below of what we think occurred before 2011. Compare that to what is projected to come after. The projection is very smooth as compared to its precedent. Perhaps change in change is just too hard to project and the UN demographers are sensible to suggest an asymptotic turn towards stability. However, we know something about what we are predicting here. These are people, but they are being treated as if they were drops of water flowing in and out of a bathtub.

The length of time between the most recent peak in the graph below (2006) and the one before it (1986) is 20 years, the one before that (1966) is 20 years. Do these lengths of time ring a bell? Remember, it's people we are talking about, not baboons or fruit-flies and not water running in and out of the

tub. What is it that people tend to do every... 20 odd years? The answer: it's have more people, on average, worldwide. It is the current compressed length of a generation across most of the world.

So what if those peaks and troughs were to repeat? That is what the faint dotted line below illustrates. It is a projection based simply on repeating, from 2012 onwards, the last 32 years of peaks and troughs. It is just what you get with that little – generation and a half - bit of history repeating.



World population estimates and projections annual change in population change (millions) - UN median variant scenario in thick line, Alternative scenario drawn as thin dotted line.

It suggests that what we have just experienced globally is a mini baby boom, because many of the children of 1986 have recently become parents. They in turn, were more numerous because of the worldwide boom of 1966. And so we should expect a further smaller boom around 2026, 2046 and on, perhaps becoming more spaced out, hopefully damping down as compared to the strict repetition shown by the dotted line below.

The children of 1986 in turn, were more numerous than their offspring of 2006, because they were echos of the worldwide boom of 1966. Contraception has become more popular worldwide, especially where infant mortality has fallen most recently. And so we should expect a further smaller boom around 2026, 2046 and on, perhaps becoming more spaced out, hopefully damping down as compared to the strict repetition shown by the dotted line below.

Tomorrow, in the second half of this piece, I'll show you what effect that tiny change in the future trajectory of the trend would have.

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## References

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