

Will Nico's grandson reach an age of 100 years?

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On 24 August 2013 Nico was interviewed by the Dutch national newspaper *de Volkskrant* about demographic forecasts. In the interview Nico pointed out that life expectancy has increased strongly and that this increase will continue in the future. He expects that his recently born grandson has a 50 per cent chance of living to be 100 years or older.

This forecast is typical for Nico for several reasons. First, Nico's forecast is based on his interpretation of projections made by other experts rather than on his own calculations. Nico is very good in translating results from demographic analyses in a language that is understandable for policy makers and journalists. Rather than discussing differences in life expectancy based on period and cohort life tables, Nico simply talks about the chances of young children of living to be 100. And to make information even more accessible, he does not talk about an arbitrary child, but about his own grandson who was born in the summer of 2013. This personal interpretation of demographic data makes statistics much easier to digest.

Another way the forecast is typical of Nico is that he is an optimist. Nico sees challenges where others see problems. In the debate on the future of longevity experts do not agree about the rate of progress. Jim Vaupel is the best known advocate of the optimistic school. He claims that life expectancy has been increasing steadily during the last 150 years or so and that there is no indication whatsoever that this trend will come to an end in the foreseeable future. He projects that a large proportion of new born children will reach the age of 100.

Other experts think that the rate of increase in life expectancy will slow down. In the past, life expectancy at birth has increased very strongly due to a decrease in mortality at very young ages, but the increase in future life expectancy has to come from a decline in mortality at advanced ages. Since the decrease in mortality at advanced ages has been smaller than at the very young ages, those experts expect that the increase in life expectancy will slow down.

It is only natural for Nico to adopt the optimistic view and thus to project that his grandson born in 2013 will have a considerable chance of living to be 100. Is this forecast realistic? Let's have a look at the figures.

Figure 1 shows that the development in life expectancy at birth of Dutch boys has been about linear since 1980. Thus a linear projection into the future seems plausible. This is Vaupel's approach. According to this projection life expectancy will increase to 100 years in the year 2110. So life expectancy of men could increase to 100 years but not in this century. Does this mean that Nico's projection is too optimistic?

What Nico did was not projecting life expectancy, but the so-called median age at dying, *i.e.* the age to be reached by 50 per cent of new born boys. The median age can be calculated from the so-called survival curve. *Figure 2* shows the survival curve of Dutch men in 1980

Figure 1. Life expectancy at birth, Dutch men, 1950-2110

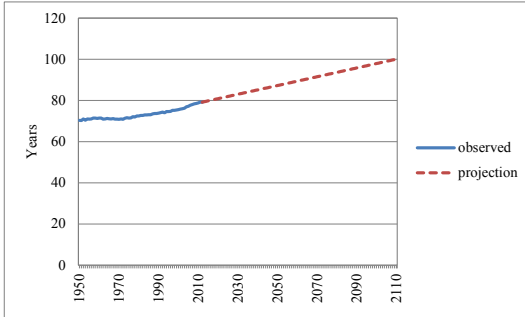
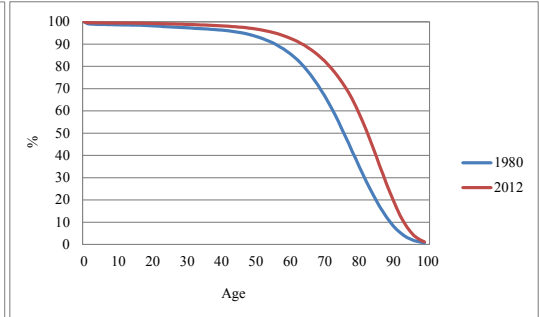


Figure 2. Survival curve for Dutch men, 1980 and 2012



and 2012. According to the survival curve for 2012 the median age equals 82 years, *i.e.* 50 per cent of men reaches the age of 82 years. In 1980 this was 75 years. Thus in 32 years the median age has increased by 7 years, or 0.2 years per year.

Figure 3 shows that the median age has followed a gradual increase since the early 1980s. If we assume that this rate of increase will continue, the median age will reach the level of 100 in the year 2090. Thus Nico’s projection that his young grandson has a fifty-fifty chance of living to be 100 does not seem to be overly optimistic.

However, in order to assess the validity of Nico’s projection we should look at life tables for birth cohorts rather than period life tables. Nico’s projection in August stimulated me to calculate projections of longevity of young generations. One month after Nico’s projection, I published two scenarios. Following Nico’s approach I focused on the probability of younger generations to reach the age of 100 years or over rather than on their life expectancy. This turned out to be a very useful strategy: The scenarios received a lot of media exposure.

One scenario assumes that the survival curve of young generations can be projected by shifting the survival curve of older generations to the right. This is the so-called delay scenario. It

Figure 3. Median age at dying, Dutch men, 1950-2110

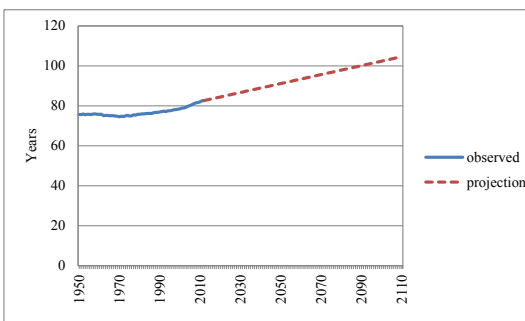
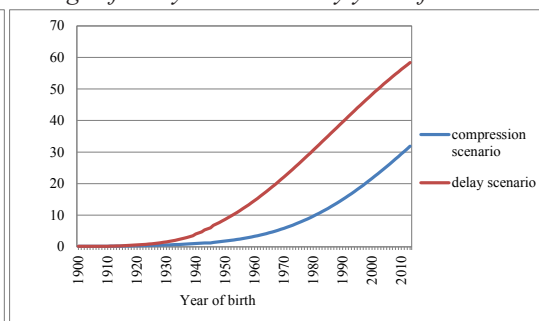


Figure 4. Percentage of men that will reach an age of 100 years or over by year of birth



assumes that the age at death can be delayed to older ages. According to this scenario 60 per cent of the boys born in 2013 will reach the age of 100 years (see *figure 4*). This is even higher than Nico's projection!

But this scenario may be overly optimistic. Figure 2 shows that for men aged 90 years or over, the movement of the survival curve to the right has been smaller than for men in their 70s or 80s. If it is assumed that this development will continue in the future, the increase in the percentage of young generations reaching an age of 100 or over will be smaller. This is the so-called compression scenario. Figure 4 shows that according to this scenario one third of recently born boys will reach the age of 100. Even though this is slightly lower than Nico's projection, the increase in the percentage is still substantial.

All in all, I have to conclude that Nico's projection that his grandson's will have a fifty-fifty chance of living to be 100 years or over may be a bit optimistic, but it is certainly not an unrealistic scenario.

This is only one example to demonstrate Nico's contribution to demography. Nico is an all-round demographer with a very well developed intuition about the kind of information that is interesting for policy makers, journalists and the general public. I have enjoyed working together with Nico very much and I hope that many years of collaboration will follow.