

What more boy births could reveal about South Africa's health status

November 21 2016, by Gwinyai Masukume



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There are several ways to find out whether a population's health is improving or if people in a particular country, city or region are getting sicker. These measures are known as [sentinel health events](#) or indicators.

One example of such an indicator is a country's [maternal mortality ratio](#)

– the more women who die during pregnancy, child [birth](#) or soon afterwards, the poorer the general population's health. Take the comparative figures from South Africa and Japan. In 2010 it was estimated that 300 women died for every 100,000 live births. In Japan this number was just five.

South Africa's maternal mortality rate has remained high, but the years between 2003 and 2014 were generally good for South Africans' health and the [country's economy](#). Life expectancy rose, and the number of children dying at the age of five or younger dropped.

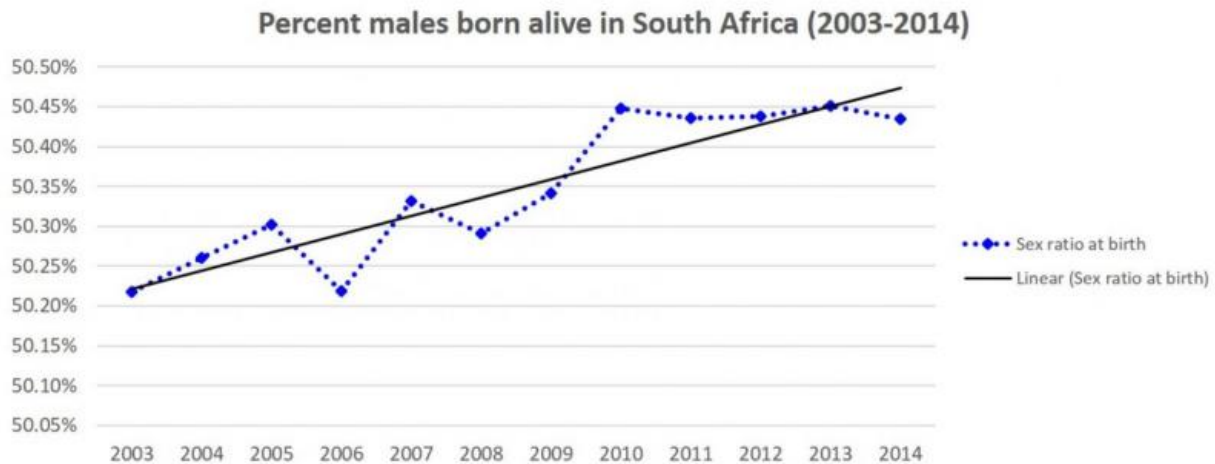
Also during this time, the proportion of boys born in the country increased significantly. Our curiosity was piqued by this fact. So we [set out to establish](#) whether this proportion – sometimes defined as the [sex ratio at birth](#) – might be a sentinel health indicator. We wanted to know whether more boys had been born *because of* the country's improving health and/or economic conditions.

More boys

Our research, published in the journal [Early Human Development](#), showed that the proportion of boys born in South Africa went from approximately 50.2% in 2003 to about 50.4% in 2014. This was the last year for which [Statistics South Africa](#) data was available to us. Although this is only a 0.2 percentage point increase, it is significant: consider that on average one million babies are born alive in the country annually. So that 0.2 percentage point increase translates into thousands of "extra" boys born.

The next step was to determine whether the sex ratio at birth could act as a sentinel health indicator for South Africa. [Similar work](#) has been done [elsewhere in the world](#). But as far as we know we're the first researchers to put the sex ratio at birth head-to-head with established sentinel health

indicators to see how it performs. These established indicators included [life expectancy](#), the total fertility rate (average number of children a woman has during her life), the [infant mortality rate](#) and the under five mortality rate.



The sex ratio at birth in South Africa rose from 2003 – 2010 and then was at a plateau until 2014.

For context, [life expectancy in South Africa rose](#) from about 54 years in 2003 to 62 years in 2014. And [infant mortality declined](#) from 51 deaths per 1,000 live births in 2003 to 35 in 2014.

Our statistical analysis found that as the sex ratio at birth went up – that is, more males were born – so did life expectancy in a strongly related manner. In a similar fashion, as the sex ratio at birth went up the infant and under five mortality rates and total fertility rate went down. Simply put, the degree of statistical correlation between the sex ratio at birth and the other sentinel health indicators was strong and highly significant.

This strongly indicates to us that sex ratio at birth in South Africa may be a sentinel health indicator. [Correlation does not, of course, mean causation](#). However, other evidence from the past decade or so boosts our supposition.

A useful measure

The substantial rise in South African life expectancy and decline in childhood mortality is largely [due to the rollout of anti-retroviral](#) therapy to treat HIV. This process started around 2003. [Previous research](#) has established that the sex ratio at birth is a strong contender for a sentinel health indicator when it comes to measuring the burden of HIV on a population.

Our findings are also consistent with [the hypothesis](#) that more baby boys are born on average when conditions in a society improve, whether this is in terms of its economy, its population's access to nutrition and a general lowering of people's stress levels.

We believe that the sex ratio at birth may be a useful sentinel health indicator. It could be very valuable in assessing South Africa's health in future since sex (male or female) at birth is relatively cheap, quick and easy to determine. Of course, researchers would still need to rely on hospital and clinic records for detailed confirmation. An indicator like [maternal mortality](#) is more complex: women may not die in hospital and the definition of a maternal death is not necessarily straightforward.

South Africa's registration of births is [rapidly improving](#); this tends to be done in a timely fashion and with good detail. Thus, the [sex ratio](#) at birth is a good way for researchers to get a simple, quick feel for the country's health status while waiting for other measures to be calculated.

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