

## Completeness of birth registration in South Africa, 1996-2011

Nadine Nannan

*Burden of Disease Research Unit, South African Medical Research Council*

Rob Dorrington

*Centre for Actuarial Research, University of Cape Town*

Debbie Bradshaw

*Burden of Disease Research Unit, South African Medical Research Council*

**Background:** Evaluation of South Africa's civil registration and vital statistics system has tended to focus on the reporting of deaths. These investigations have found a marked improvement in the timely registration of deaths at all ages particularly since 2000, however, the absence of similar efforts to measure completeness of the birth registration is noteworthy. The aim of this study therefore is to examine the completeness of births registered on the National Population Register in the national and provincial vital statistics and identify a mechanism for annual assessment.

**Methods:** The WHO defines completeness as, "a measure of the extent to which births and deaths that occur in a country in a given year are registered by the civil registration system" (WHO 2010).

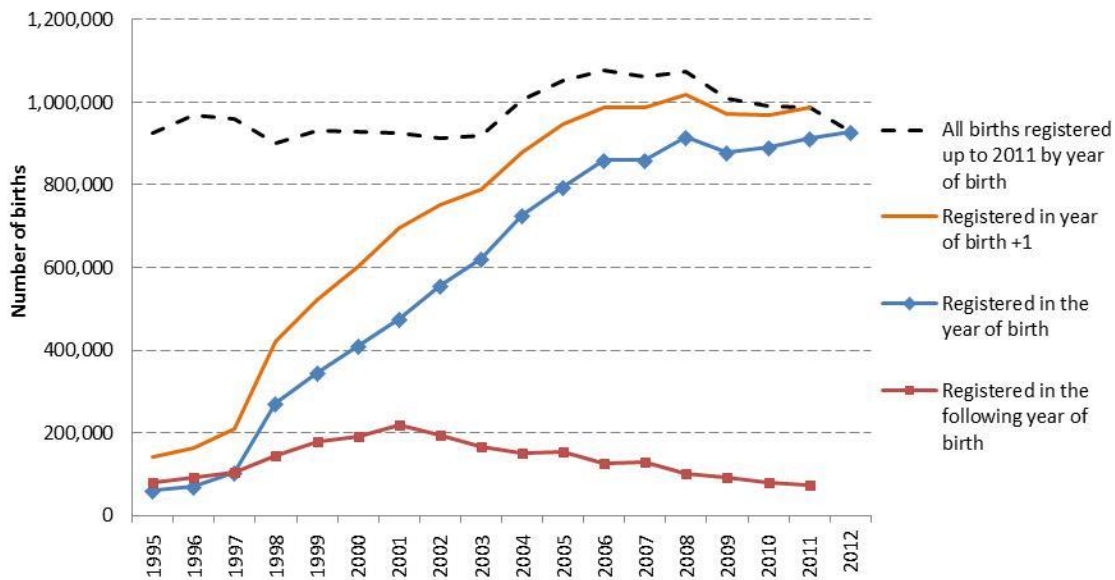
**Registered births:** In South Africa the Department of Home Affairs (DHA) captures information about births on the National Population Register (civil registration) which is then submitted to Statistics South Africa (Stats SA) for statistical purposes. Stats SA defines 'late registration' as a birth registered after the calendar year of birth. Furthermore, data capture for a given year is actually closed at the end of February of the year following the calendar year of birth. Hence, births registered in the calendar year of birth refer to births registered up until 1 March following the calendar year of birth. Births registered by the end of February of the calendar year following the calendar year of birth are referred to as the cumulative total in year of birth +1, year of birth +2 etc.

**Number of births:** A series of estimates of the actual number of births for each province was derived using reverse survival of the population counted in 2011 allowing for interprovincial migration for the period 2001- 2011. The trend was validated by comparison with estimates from the 1996, 2001, 2011 and 2007 Community Survey using the P/F ratio method and the 1998 DHS direct estimate. A national trend was obtained for the period 1996-2011.

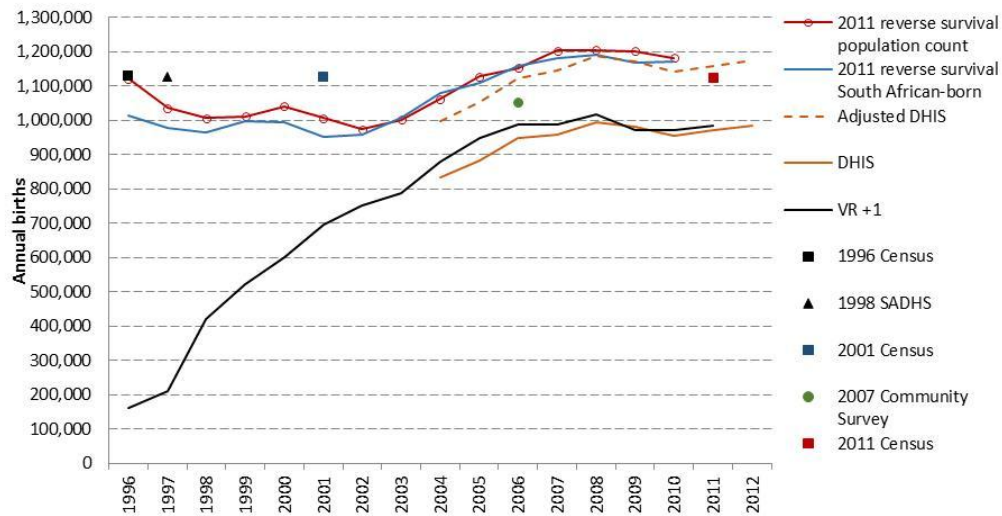
The provincial number of births recorded on the District Health Information System (DHIS) were adjusted to account for the proportion of births occurring in private facilities and the proportion of births occurring at home for the period 2004 onwards and compared with the reverse survival estimates.

## Results

**Registered births:** We report births according to the year of occurrence. Summary tables of year of occurrence vs year of registration were obtained from the Stats SA website. The number of births registered by year of birth increased from 92,4207 in 1995 to peak at around 1,080,000 between 2006 and 2008 (Figure 1). The slight but continuous decline thereafter is the result of late registrations, missing from the data. From 1997 up until 2005 there is substantial annual improvement in the timely registration of births and remains stable up to 2012.



**Figure 1: Trends in birth registration by calendar year of birth, Stats SA 1995-2012.**



**Figure 2: Comparison of empirical estimates of births and births registered in the year following the calendar year of birth (VR +1), 1996-2012.**

**Number of births:** Investigation of the actual number of births (Figure 2) shows five point estimates based on the number of births from fertility rates as reported by women and imply a fairly level trend ranging from 1,130,571 in 1996 to 1,124,000 in 2011. The estimate of the number of births from the reverse survival of the population count (red circle) is very similar to the estimate from the count of the South African-born (blue line), although the difference is greater earlier in the period. The DHIS data (orange line) are adjusted to allow for births occurring in private health facilities and births delivered at home – adjusted DHIS (orange dotted line), which by 2008 is practically identical to the reverse survival and plateaus through to 2012. The births registered in the vital statistics by year following the calendar year of birth (VR+1) (black line), illustrates the remarkable improvement in registration over the seventeen year period, and simultaneously highlights the persistent under registration.

**Completeness over time:** Examination of the pattern of completeness by the number of years since birth over time implied by comparison with the estimate of births derived from back-projecting the census counts, demonstrates substantial improvement in registration between birth and the fifteenth birthday, which up to 2004 occurred under age one. Against the estimate of the total number of births from the Census, the comparison suggests that in 1996, about 25% of registrations took place before the first birthday and 33% took place by the second birthday. By 2008, these proportions had improved to 76% and 84% respectively, and in 2011, 77% of children under age one and 83% of children under age two were registered.

**Provincial differences:** The number of births estimated by back-projecting the provincial population counts according to the individuals' province of birth revealed interesting differences in fertility levels and trends over time. The total number of births over the last decade ranged from 25,000 in the Northern Cape to around 250,000 in KwaZulu-Natal. Evaluation of the completeness of VR in the year of birth and in the year of birth +1 show considerable improvement over the past decade and also that the inequalities by geographical setting have narrowed over time. For instance in 2001, 33% of births in the Eastern Cape were registered in the calendar year of birth vs 77% in the Western Cape, but by 2011 these proportions were 79% and 80% respectively. A surprising finding was that the Free State and the North West contributed higher proportions of completeness of births than the national average and Gauteng contributed the lowest. Completeness in the North West exceeds 100% in the year of birth +1, perhaps suggesting movement between the province of birth and the province of birth registration.

**Discussion:** The significant increase in birth registration after 1995 is due to amendments to the Birth and Deaths Registration Act (1992) to include the former homelands accompanied by efforts to strength vital registration. In 1996 at a national level only 33% of birth registrations occurred before the second birthday. However, by 2011, the vast majority of registrations (83%) take place between birth and the second birthday and if the estimate of births derived from back-projecting census numbers is to be believed, about 90% of registrations occurred by the 15<sup>th</sup> birthday. The provinces also experience the same cumulative pattern of registration over time and the relative differences in completeness between the provinces has narrowed markedly, so that in 2011 the range of completeness was 70% in Gauteng to 88% in the North West.

The analysis raises important questions around the measurement and monitoring of births at a provincial level. The need to utilize an independent empirical estimate of births to measure completeness of vital statistics revealed a dearth of this essential information on a continuous basis both for the country, and even more so for the provinces. This analysis has identified two important considerations around monitoring provincial births. The first is the challenge of estimating the total number of births in an environment where the contribution of non-South African births is not well understood but appears to be non-negligible. The second challenge in the interpretation of provincial completeness of birth registration is the movement between the province of birth and the province of birth registration, suggesting migration of young children since birth to a different province of residence, although this is more acute in some provinces than in others.