ESTIMATING NATIONAL MORTALITY TRENDS AND DIFFERENTIALS IN SOUTH AFRICA

WORK IN PROGRESS

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1. Introduction

Post Apartheid South Africa is in the mist of major social, economic and demographic transformations. During the demise of apartheid before 1994 South Africa was a class society, with major inequalities along inter-ethnic lines. This had a major impact firstly on the reporting of demographic events in the country, and secondly on perpetuating health and socio-economic differentials between racial groups.

This work aims to demonstrate how the history of South Africa has had an effect in the health of the people as measured by mortality. This will be done by examining differentials in mortality in South Africa during the period 1985 - 2001. The analysis will focus on examining trends in mortality by age, sex, area of residence and population group. As a result of this study, it will be possible to identify the segments of the population and areas that have high mortality and how that has been changing. In addition, the gap in mortality between different sub-groups of the population will be observed over time.

The objectives of the project are twofold. Firstly, this study uses the vital registration system, the population census and various national surveys to discuss the quality of mortality statistics in South Africa. Secondly, mortality indices will be estimated. Two types of survivorship probabilities will be computed: childhood mortality and adult mortality. Estimates of childhood mortality indices will be based on the birth history data (if available) or information on children ever born and children surviving. Estimates of adult mortality indices will be derived from the data on survival status of mothers. This method translates the proportions of persons with a surviving mother into conditional probability of surviving to specific ages. It will be possible also to create a lifetable for each population group by linking the childhood and adult survivorship probabilities. Finally, the project intends to develop the mortality map of South Africa.

2. A brief geographic background

South Africa is the southern tip of Africa. The 1996 population census revealed that the population of South Africa was about 40 million. The Apartheid system, which was governing the country from 1910 to 1993, divided people according to population group (race). The system passed the legislation that discriminate against the native Black population. The population was then separated onto four racial groups, i.e. Black, White, Indian and Coloured.[1] According to the 1996 census, the Black population constitutes 77% of the total population of the

[1] Black refers to the native Black population, sometimes it is also called African. Indian includes Asian, these two are used interchangeably in documents including official publications in South Africa.

country; the White population 11%, the Coloured and Indian population forming 9% and 3% respectively.

During the Apartheid era, South Africa had four provinces, which were referred to as the white areas of South Africa. These provinces were Transvaal, Natal, Orange Free State and the Cape. There were also six nation states, i.e. KwaZulu, Kwangwane, Gazankulu, Lebowa, Qwaqwa, and Kwandebele. These states had predominantly the Black population. During the 1970s the demarcation of the country was changed and the four states of Transkei, Buphathatswana, Venda and Ciskei (TBVC) were given a status of independence. These states consisted of about 50% of the Black population in the country. Upon independence these states governed themselves and were not considered as parts of South Africa. Citizens of these states had to get permission to enter the South African soil.

3. Sources of mortality data in South Africa

Vital registration system

Vital registration system is the most important source of data used to give an indication of the size of the population at any given point in time. If collected accurately vital statistics provide accurate information on births and deaths as they occur. However, such an accurate system exists only in theory. Most developing countries have a deficient vital registration system. South Africa is no exception. Kahn *et al* (1999) argued that there are limitations in data on mortality in South Africa. Vital statistics are of poor quality and reflect marked under-reporting of deaths, and misclassification of their causes. Collection and publication of vital statistics in South Africa is highly influenced by the political system. Due to the changing laws that governed the country and changing geographic organisation, collection of vital statistics has been unstable mostly for the Black population. The legislation outlined in table 1 has been presented to give an understanding of the changes that South Africa went through and also to outline that all these changes affected the vital registration system in the country and led to discrepancies notable today.

From information on table 1, it can be concluded that collection and publication of vital registration data is highly dependent on the race of the individual until 1993. It is worth noting that the geographic factor that also exacerbated the variation in vital statistics is also a function of race. To consolidate an account of the trends in fertility and/or mortality in South Africa, one would have to reorganise South Africa boundaries to make them consistent throughout the period from 1910 to 1993. This is because as noted, at different periods, different states or provinces collected and published their own vital statistics and national figures were never compiled. However, as indicated above, the use of vital statistics prior to 1993 cannot be trusted to represent the Black population of South Africa today.

There are racial and geographic factors that instigate for the lack of good and coherent vital registration data in South Africa. Table 2 outlines the history of vital registration in South Africa. South African reports on vital statistics since 1910 were exclusively on the White population. Coloured population were included in 1937, and Indians in 1938. During these periods there was no systematic recording of vital statistics on the Black population. Computerised population registers introduced in 1972 also did not have particulars for Blacks. The processing of information on the Black population that began in 1979 was discontinued in 1981 due to under-registration, and late registration of births for this group. It should also be noted that from 1991 until 1996, mortality statistics published did not state the population group of the deceased (Dorrington et al, 2001).

Although death reports were issued covering the Black population throughout the country from 1978 to 1990, these reports did not incorporate the TBVC (Transkei, Bophuthatswana, Venda, and Ciskei) States. South African mortality data incorporating these states were published by the Central Statistical Services (CSS) only from 1994. It is also important to note that these reports released by the National Statistical Agency excluded information on infant deaths for this population group. This geographic factor, Bah (1998) argues, preceded the racial segregation discussed above, although race later accounted for all of the differentiation.

Census data

With the lack of good registration of deaths it is possible to use census data to produce estimates of mortality in a population. However, as outlined in table 3, due to under-coverage, South African census data undermines the population base necessary for calculation of rates particularly for the Black population, rural areas and former 'homelands'. No mid-year demographic estimates for these areas have been available other than for the census year, this limits estimation on mortality and drawing of trends (Kahn *et al,* 1999).

Unfortunately, South Africa's census taking, like the vital statistics, is also inconsistent. The changing geographic boundaries in the country meant that for some years, parts of the Black population were not enumerated. The accuracy of the census reporting is also an issue related to politics. Sadie (1988) points out that it is difficult to capture the magnitude and the processes that take place to a highly mobile population. Furthermore, under-enumeration of the Black population in urban areas was also a product of the political situation at that time. Due to influx control, it was difficult to enforce reporting on the Black population since some of them were in urban areas illegally and would not report themselves.

Nonetheless, censuses have been used by researchers to derive estimates of demographic processes taking place in the country. Sadie (1988) and Bah (1998) used censuses from 1936-1991 to make estimates of mortality in South Africa for population projections. For the White population, census data have been reliable except that quality has been deteriorating since 1970, which showed some level of incomplete coverage for this population. Despite this, Sadie (1988) argues that there is no reason to suspect that mortality and fertility data of the White population are not accurate. For the Black population, censuses between 1936 and 1970 are considered as the least unreliable sources of information and the best available source for estimation of demographic parameters. The 1980 and 1985 census data provided disappointing quality. Firstly, it excluded the four former TBVC states. Secondly there is a high level of incomplete coverage of the Black population in some areas within South Africa because some people did not want their presence in those areas (mostly urban) be known. Although the TBVC states did conduct censuses on their own, adding these to the South African census proved to be unsuccessful.

Population census 1996 is the first census conducted after South Africa became a democratic country. It is the first census that is considered to be truly representative of the whole South African population. Udjo (2000) in an analysis of mortality trends, argued that South African censuses before 1996 under-enumerated the Black population, and population less than 5 years of age. A further analysis of mortality based on the 1996 census data was also done by Udjo and Lestrade-Jefferis (2000). The national statistical reports released by the Statistics Office prior to 1992 do not indicate the infant mortality rates of the Black population, and no nationally representative surveys were conducted to capture mortality in South Africa at that time.

National Surveys

As indicated in Table 4, the national surveys that collected mortality data can be categorised as follows:

- South African Demographic and Health Survey (SADHS) of 1987 -1989,
- 1993 Living Standards Development Survey (LSDS),
- October Household Surveys (OHS) 1995, 1996, 1997, 1998 and 1999
- SADHS 1998

(a) Demographic and Health Survey (DHS)
The first SADHS was conducted in 1987-1989 under the responsibility of the Human Sciences Research Council (HSRC) of South Africa. However as a result of sanctions in the country at the time, this survey did not receive assistance from Macro International and thus was not part of Measure DHS as it is the case with the other such surveys in other developing countries. Furthermore, "political circumstances inhibited the dissemination of the data and minimal efforts went towards the documentation of the survey design, sampling, or fieldwork"

(Kaufman, 1997). This is thus the first data that is expected to give necessary information for the estimation of mortality in South Africa during the 1980s. The total number of women interviewed were 22,000. The second SADHS (which is often marked as the first) was conducted in 1998 by the national Department of Health (DoH) with assistance from Macro International. This survey interviewed 11,735 women in their reproductive ages. Both these two SADHSs collected information on the complete birth history of women in their reproductive ages. This information is used to derive childhood mortality.

(b) October Household Surveys (OHS)
The OHS is an annual survey based on a large probability household sample of 30 000 in 1995, 16 000 in 1996, 30 000 in 1997, 20 000 in 1998, and 30 000 in 1999. The survey covers a range of development and poverty related indicators. " The OHS represents an official attempt to provide certain insights into and perspectives on the most important elements on the unemployment profile. The OHS also provides certain perspectives on those who are not (only) accommodated in the formal labour market and are thus (also) active in the so-called informal sector." (South African Data Archives, 1998). OHS has since been administered annually from 1993 until 1999. However, 993 and 1994 OHS are no longer used due to high levels of data problems encountered by Statistics South Africa.

OHS 1995 has been used by Udjo (1999) to make mortality estimates in South Africa. One of the advantages of this survey is that it is administered annually. This is not a longitudinal study that follows households over time, rather independent samples are taken every year. However, efforts have been made to standardise the questions, which makes it possible to make estimates of trends. The OHS provides various sets of mortality statistics, which are outlined in Table 4.

(c) Living Standards and Development Survey 1993 (LSDS)
Another national survey that provides mortality estimates is the LSDS of 1993, conducted by South Africa Labour Development Research Unit (SALDRU) in conjunction with the World Bank. The survey also provided information related to social, economic and health status of the country. This survey made attempts to include the TBVC states to enable creation of indicators that include the whole of South Africa as is today. LSDS has information necessary for the generating estimates of childhood mortality, but lacks information on adult mortality. Mencarini (1999) used this data to indirectly estimate childhood mortality.

4. Mortality trends and differentials: the story so far

The literature indicates that as with most countries in the world, South Africa's infant and child mortality has been gradually declining over the years (since the early 1960s) until recently when an upward trend was observed by Udjo (1999),

and Department of Health (2002). Chimere-Dan (1993) used indirect methods and estimated that infant mortality rate of the African population for the period (1968-1974) was 79 per 1,000 births, and 81 per 1000 for the period 1973-1979. The same story applies with adult mortality. Mortality among adults has been fairly stable and constant for the period 1989 - 1995, but substantially higher after that (Department of Health, 2002). This increase in adult mortality in the country is due to HIV/AIDS and according to the projections the pick will be reached in 2010 (Dorrington et al, 2001).

(a) Racial differences

Several studies have confirmed that race determine the level of wellbeing in South Africa. Mencarini (1999) in his analysis of fertility and infant mortality in South Africa concluded that race is the most important factor that accounts for economic, social and demographic differences in the country. Therefore, using infant mortality as an indicator of wellbeing of the population indicates that the White population has living standards that resemble that of Western countries, while that of Coloured and Black populations reflect low socio-economic levels.

Due to high levels of inequalities adopted during the Apartheid era, major differentials that exist in the country are directly or indirectly racial in nature. The infant mortality rate of Coloured population is also high but slightly lower than that for the Black population. Between 1955 and 1975, Coloureds had infant mortality rate higher than that of the Black population, and ultimately highest in the country. When the rates for all race groups in South Africa were declining during these periods, the coloured rate stayed constant at 120 deaths per 1,000 births for periods between 1955 and 1970 (Sadie, 1988). The White population as expected has the lowest infant mortality compared to the other population groups in the country. In 1990, the reported rate was 8.6 per 1000 births, which indicates that the white population has infant mortality rates, which is similar to that prevailing in the developed world. Indians are slightly behind whites with a rate of 10.6 per 1,000 births in 1990. The Coloured population on the other hand infant mortality rates that is 3 times higher than the Asian population (39.4 per 1,000 births) in 1990. This alone indicates great disparity between these racial groups in the country (Mencarini, 1999). According to the SADHS 1998, Blacks have an infant mortality rate of 47 per 1000, this is higher for Blacks in non-urban settings (53.6), and lower for those in urban areas (38.7). The Coloured and White population have rates of 18.4 and 11.4 respectively (Department of Health, 2002).

(b) Province

In 1994 the political organisation of South Africa was changed to include the former independent TBVC states. The country has 9 provinces as opposed to the former 4 "White provinces" it used to have. Mortality in these different provinces is also associated with how well that province is compared to others. Eastern Cape, Northern Province and KwaZulu-Natal are the poorest provinces, likewise,

they have the highest infant mortality rates in the country. Western Cape on the other hand has the lowest infant mortality rate of 8.4 per 1000, which is even lower than the average for the total White population (Department of Health, 2002). The rates for other provinces indicate that infant mortality increased during the period 1991-1996, and decreased substantially in 1998.

For mortality of adults, the current trend shows that KwaZulu-Natal has the highest mortality rate due to the high HIV prevalence rate (Dorrington et al, 2001).

(c) Rural/urban residence

Due to outlined poor vital registration system, the trends in mortality for the Black population living in rural areas has not been explored carefully. The Health Systems Trust (1990) released infant mortality rates for the period between 1987-1989 by residential area. The rates for metropolitan, other urban and rural residents are 33, 44 and 53 per 1,000 births respectively. This is to be expected since the level of development in these areas is not the same; i.e. the urban areas have a developed infrastructure and better access to health care facilities, and are expected to have the lowest infant mortality rate.

The results from the 1998 SADHS also have estimates by residential area. The estimates indicated infant mortality rate of 32.6 per 1,000 births in urban areas and in non-urban areas it was calculated to be 52.2 per 1,000 births (Department of Health, 2002). However, It is also important to treat reported rates per residential areas with caution, as the definition of these areas differs. Some areas are characterised differently by different studies, especially since some reports separate semi-urban areas from urban residential areas.

(d) sex differentials

Male mortality has been a concern in South Africa since very early periods in the 1930s. Sadie (1988) also reported that mortality of males is higher than that of females, particularly for the Black and Coloured population. There are a number of reasons for this ranging from increasing male deaths due to political violence from mid 1960s to 1994. Also, it has been shown that males are more prone to accidents than women in South Africa (Herbst, 2001). However, women seem to be catching up. More recently, the effect of HIV/AIDS is reported to be felt more by women in South Africa. As projected by Dorrington et al (2001), mortality of women is expected to increase in the future.

5. Data quality

(a) Vital Registration System

The discussion in Section 3 has indicated that there are a lot of gaps in the vital registration system in South Africa. It is clear that the degree of completeness of registration of deaths for different segments of population is very different. This

makes this data source not very useful for mortality data analysis especially if it is for comparison purposes. However, a thorough evaluation is needed so that these data can somehow be used. One area of which vital registration data can be used is to verify estimates obtained by using indirect methods of estimation where registration of deaths is found to be efficient.

(b) Population Census

All population censuses worldwide are affected by both coverage and content errors. However, the magnitude of these errors differs from one country to another. Whilst in some countries the errors are minimal and hence they do not need major adjustments, censuses in some countries are subject to massive errors. The questions to address are:

(i) to what extent a census is subject to errors?
(ii) what biases do these errors cause to the estimation of demographic parameters?
(iii) what adjustments can be done to improve the estimates?

Evaluation of coverage errors is beyond the scope of this study. However, as Nzimande et al (2002) noted, coverage errors are more serious in rural remote areas. But, the coverage errors are unlikely to cause serious bias to mortality estimates. Census data are collected retrospectively, they are therefore subjected to mis-reporting and memory-lapse errors. It is possible to perform consistency checks for various variables that are used for estimating both adult and childhood mortality (i.e. checking for content errors). This was done to the 1996 population census of South Africa, which was the only census data available at the time of writing this paper.

Reporting of age in African censuses is usually affected by mis-reporting and memory lapse. South Africa is no exception. A plot of age in single years by the population in each age does not indicate preference of certain digits (figure not shown). The five-year grouping of ages during analysis will further remove the fluctuations observed for single years. However, the age distribution of the population suggests a possibility of missing children under five years of age.[2] The bias created by this error in distorting childhood mortality estimates has not been assessed as yet.

A number of errors were observed when assessing reporting of children ever born and children surviving. First, presence of a high proportion of women who were recorded to be in the "not stated" category. Overall, 13% of South African women aged between 15 and 49 years did not state the number of their children ever born. This proportion varied from one segment of the population to another. But, in general this proportion was too high indicating a possibility of the "zero parity effect". El badry (1961 cited in United Nations, 1983) argued that some enumerators failed to fill a 0 for women who stated their parity as zero during fieldwork. These women are then mis-classified as not stated during coding

[2] Under-enumeration of young children during the 1996 census has been documented elsewhere. See for example, Udjo (2000).

stage and hence inflating the number of women in the “not stated” category. The method to overcome this problem was developed and will be applied in this analysis.

Second, the high number of women in “impossible” cells. This arises when the number of children ever born does not biologically match with the age of women (see Table 5). For instance, a woman aged 18 years old cannot have 15 children. Since reporting of age was not a suspect, it was decided that those errors were associated with reporting the number of children ever born. It should be noted however that we were unable to identify reasons that caused this error at this stage. But this error affected mainly young women. Several measures were decided in order to reduce the magnitude of this error. We restricted the number of children ever born to 15 for any woman by assuming that a negligible number of women in South Africa bear more than 15 children. And, we decided to restrict the maximum number of children in each age group. That is, a woman in age group 15-19 can only have 3 children, those aged 20-24 can only have 5 children, etc. Details of the restrictions are presented in Table 6. This adjustment deletes very fertile women who are genuinely in the specified age groups. But, it is assumed that the bias created by deleting those women is much less than the bias created by letting the parities stay in the original form. It should also be noted that the number of children surviving follows restrictions given to the children ever born.

The 1996 population census of South Africa collected data for the purpose of estimating mortality indices. These are: the survival status of mother, the survival status of father, the survival status of spouse, and the distribution of deaths in households. Of these, reporting of deaths in the household for the year prior to the census is least accurate. The deaths are under-reported such that the death rates computed are very low (not shown). The response to the survival status of a parent or a spouse has a high number of respondents who are in the “not stated” category. The bias that will be created by this error is still unknown. Preliminary assessment of the data suggests that the survival status of the mother – usually referred to as maternal orphanhood method - performs better in estimating adult mortality using the census data. Bah (1999) has given a detailed diagnostic tests to the 1996 census data and suggested possible sources of errors that need to be taken into account when analysing these data. Our analysis will examine very closely the possible errors for applying the maternal orphanhood method especially the possibility of the “adoption effect”. That is, respondents who report their adopted parents as their biological parents.

(d) National Surveys

The errors for surveys are categorised into two broad categories: sampling and non-sampling errors. Sampling errors address matters related to representativeness of the sample to the population intended. These are not addressed in this paper. The analysis attempts to examine non-sampling errors especially reporting of the data used for estimating mortality indices. We

performed consistency checks to the 1993 LSDS, 1995-1999 OHS, and 1998 DHS. Kaufman (1997) has done a rigorous data assessment for the 1987-89 DHS. It can be concluded that national surveys provide better quality of data than censuses in South Africa. However, national surveys have a disadvantage of failing to provide enough cases to study mortality estimates for the variables of interest. In other words, it is not possible to estimate mortality indices for some categories because number of cases are too few for that exercise.

It should be noted that all adjustments (explained above) done to the census data are also applied to the national surveys so as to get rid of "odd" cases.

6. Method of Analysis and Mortality Indicators

(a) Childhood Mortality

Childhood mortality will be estimated using the proportions of children dead out of those ever born (Brass, 1975). This information is collected in censuses and surveys by asking women of childbearing ages the following questions:

1. How many children ever born do you have?
2. Out of those ever born, how many are still alive?
3. Out of those ever born, how many have died?

The computation procedure is elaborated in United Nations (1983). It is based on the equation:

$$Q(x) = K(i).D(i)$$

where:

D(i) is the proportion of children dead for women in age group i, i=1 stands for 15-19, i=2 stands for 20-24, etc.

K(i) is a set of multipliers (adjustment factors) that converts D(i) into survivorship probabilities, and

Q(x) is the probability of dying for children aged x.

Two childhood mortality indicators will be derived: infant mortality rate ($_1q_0$) – the probability of dying before celebrating the first birthday – and child mortality rate ($_4q_1$) – the probability of dying between age 1 and age 5.

(b) Adult Mortality

Adult mortality will be estimated based on the proportion of respondents who reported that their mother is alive (maternal orphanhood method). This method is based on a simple question – *is your mother still alive?* The method can give robust estimates of conditional probability of surviving to specific adult ages (Brass and Hill, 1973). United Nations (1983) provides the detailed computational procedure. The method is based on the following equation:

$$l(25+n)/l(25) = W(n).S(n-5) + (1-W(n)).S(n)$$

where:

S(n) is the proportion of respondents with mother alive in age group n, n=15

stands for 15-19, n=20 stands for 20-24, etc.

W(n) is the weighting factor employed to make allowance for typical age pattern of fertility and mortality,

l(25+n)/l(25) is the probability of surviving from age 25 to age 25+n.

Four indicators will be computed for estimation of adult mortality. The probability of surviving from age 25 to ages (i) 45 (ii) 50 (iii) 55 and (iv) 60.

(c) Lifetables

The estimation of childhood mortality and adult mortality depends on the model lifetables. The first exercise for this data analysis is therefore to choose the best family of model lifetable to represent South Africa. Many authors have used West family of Coale and Demeny model lifetables but we are unable to find the justification for their choice. It will be possible to link the lifetable implied to adult mortality to that implied by childhood mortality to obtain a lifetable for each sub-group of the population considered.

(d) Mortality Map

We intend to borrow expertise from the geographical information systems (GIS) so that we can create a mortality map for South Africa. Given the importance of infant mortality rate as a development indicator, we intend to have a map of South Africa according to the levels of infant mortality rate. The map will also associate socio-economic factors with infant mortality rate by geographical areas.

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Table 1: Legislation passed governing collection of vital statistics in South Africa

Year	Legislation
Prior to 1910	This is a period before the Union of South Africa. Each of the Colonies (Cape, Natal, Orange Free State and Transvaal) collected and published their own separate reports in births and deaths.
1914	Establishment of the collection of vital statistics was decentralized
1923	*Births, Deaths and Marriages Registration Act 17* made it compulsory for all races in urban areas to collect vital statistics but was voluntary for Africans in rural areas
1936	The *Representation of Natives Act* as passes, allocating 13% of South African land to Africans
1937	Official vital statistics became available for Coloureds
1938	Official vital statistics became available for Indians
1950	*National Registration Act* recorded race to every person in the country Group Areas Act led to physical separation between races
1951	*Bantu Authorities Act*, provided for the establishment of black homelands and regional authorities
1972	Computerised population register was started for whites, Indians and Coloureds
1976-1990	Breakdown of the country into TBVC (Transkei, Bophuthatswana, Venda and Ceskei) States. Other African states, i.e. Each of these states gained independence and was excluded from the South African statistical system. Others simultaneously, the stratification of vital statistics according to population group was underway.
1986	Particulars of Africans were entered into the computerised system
1991	The system of racial segregation according to population group in the collection of births and deaths was stopped. The population group of the deceased was collected for the 4 provinces and 6 independent states combined.
1993	South Africa changed its provincial boundaries districts, and was divided into 9 provinces that included the TBCV states.
1997	The Department of Home Affairs in collaboration with Department of Health revised the births and deaths form and included population group.

Table 2: Reports on Vital Statistics published by National Statistical Agency

	Whites	Indians	Coloureds	Africans
Prior to 1910	√	×	×	×
1910 - 1936	√	×	×	×
1937	√	×	√	×
1938	√	√	√	×
1968	√	√	√	Separate mortality reports were issued for Africans in selected magisterial districts
1978	√	√	√	New series of reports were issued covering deaths of Africans throughout the country
1989	√	√	√	Collection of African data was reinstated but due to low registration, figures were not published
1991	New series was published by Stats SA, this series no longer reported the population group of the deceased			
1994				Mortality data including the former TBVC states was published

Table 3: History of census coverage in South Africa

	Census details
1904, 1911, 1921, 1936, 1951 and 1960	Not much has been documented about population censuses conducted prior to 1970.
1970	Covered the former 4 provinces of South Africa, i.e. Cape, Orange Free State, Transvaal and Natal. It also included the 6 national states, i.e. Ciskei, KwaZulu, Kwangwane, Gazankulu, Lebowa, Qwaqwa, and Kwandebele, Transkei and Bophuthatswana.
1980	Covered the former 4 provinces of South Africa and the 6 national states. Excluded areas of Transkei and Bophuthatswana.
1985	Covered the former 4 provinces of South Africa, i.e. Cape, Orange Free State, Transvaal and Natal. It also included the 6 national states. It excluded the independent TBVC states. 5 separate censuses were conducted.
1991	De facto, excluded TBVC states
1996	The first national democratic national census. This census includes all boundaries of South Africa. This census is the first to collect information on mortality. It has both information for childhood and adult mortality.

Table 4: National surveys that collected mortality data

Source	Brief description	Infant and childhood mortality questions	Adult mortality questions asked
Demographic and Health Survey, 1987-1989	The survey interviewed almost 22,000 women in their reproductive age.	The survey has complete birth history for women in their reproductive ages	Parent's survival status
Living Standards and Development Survey 1993	The sample consists of approximately 9,000 households in 360 clusters	Complete birth history	No questions on parent's and sister's survival status
October Household Survey (OHS) 1995	Conducted by Statistics South Africa. The survey interviewed 30 000 households	Complete birth histories from all women under 55 who have given birth	Parent's and spouse's survival status. There is also a section on deaths in the household, that gives age at death, sex and other information of the deceased.
OHS 1996	16 000 households 73 000 individuals	Complete birth histories from all women under 55 who have given birth	Same as OHS 1995
OHS 1997	30 000 households 140 015 individuals	Complete birth histories from all women who have given birth	Same as OHS 1995
OHS 1998	30 000 households 139 000 individuals	Complete birth history from all women who have given birth	Same as OHS 1995
Demographic and Health Survey 1998	12, 247 households and interviewed 11,735 women between 15 and 49 of age	Complete birth history from women between ages 15 and 49	Parent's and spouse's survival status. There is also a section on deaths in the household, that gives age at death, sex and other information of the deceased.
OHS 1999	30 000 households	Birth history was discontinued. Collected information on births in the last 12 months	Same as OHS 1995

Table 5: Crosstabulation of children ever born by age of women

Table 6: The maximum number of children ever born restricted for each age group

Age group	Maximum children
15-19	3
20-24	5
25-29	7
30-34	9
35-39	11
40-44	13
45-49	15