

## **Age reporting in the North West Province, South Africa, 1996-2007**

### **Abstract**

The aim this study is to examine the nature and patterns of the reported age statistics in the North West Province using the 1996 and 2001 South African population censuses. First, the enumerated age-sex population distribution from the 1996 and 2001 censuses are examined to highlight the nature and patterns of age misreporting by means of such indices as Whipples, Myers and United Nations Age-Sex Score. Second, essential age-sex features of the population and their implications for development planning are highlighted. The study indicate that the quality of the reported age statistics in North West Province, like in the other provinces in South Africa, is quite good and contrast to findings from most other Sub-Saharan populations. Furthermore, the reported age statistics show a preference of terminal digits 6, 4, 8, 0 and 2, implying a preference of ages ending in even numbers. Further research should establish the factors responsible for this pattern.

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### **Introduction**

Age is one of the most important variables in demographic analysis. It is both affected by and a determinant of fertility, mortality, migration and socio-economic variables. On the one hand, age determines entry into marriage, voting, the labour force and education. In the South African context only those aged 7 years are supposed to enrol in grade one, no children below the age of 18 is supposed to work. On the other hand, high fertility or low infant mortality implies more people below the age of 15 whereas for various reasons high levels of literacy leads to good knowledge and reporting of age statistics.

As a result of this two-way relationship, age not only forms the basis of classification for most demographic variables but also its familiarity is essential for successful social and economic planning. To underline the importance of age United Nations(1980) strongly recommends that LDC should include a question on age in their censuses and demographic surveys; and Shyrock and Siegel(1973) argue that no census is worth the name if it excludes a question on age.

Unfortunately, for various reasons, studies on age statistics from the statistically underdeveloped countries have revealed enormous distortions (Caldwell,1966; Blacker,1967; Van de Walle,1968; Caldwell and Igun,1971; Nagi et al,1973; Ewbank,1981; Byerre and Terera,1981). It has been found out that people tend to round off to the nearest age and some ages like those ending in 0 and 5 are preferred whereas others like 1 and 9 are avoided. The causes of these distortions are many and include people's ignorance of their true age, the instructions given to enumerators, the method used to collect age statistics and various other social, cultural and even political reasons.

There is also a tendency to under-state or over-state one's age in order to suit certain social and biological expectations. In this respect young children below the age of five, found playing with their peers at the time of the enumeration, may be reported as belonging to age

group 5-9 and females in age group 10-14 who have passed puberty (menarche) may be recorded in age group 15-19 especially if it is further observed that they are married and are mothers. Likewise women above the age of 40 who are still rearing (nursing) their own children may be assigned a younger age group. Then, for prestige purposes, perhaps arising from the desire to be granted a senior citizenship status which in some cases exempts them from paying tax, there is a tendency especially among the males to exaggerate their age.

Awareness of these distortions and inaccuracies in reported age statistics have preoccupied demographers so much that evaluation and adjustment of age statistics has become an integral part of demographic analysis. The main purpose of this study is to determine the nature and patterns of age misreporting in North West Province of South Africa.

There are three reasons for undertaking this study. First, the desire to isolate genuine distortions caused by famine and natural disasters from age misstatements. Second, since it is hoped that the characteristics of the reported age distributions will at a later stage be used to estimate levels, trends and differentials in fertility, mortality and migration, the examination of age data was felt to be of paramount importance as a means of providing an in-built mechanism of assessing the plausibility of the derived demographic estimates. In particular, to determine the probable effect of the age-sex distortions on the reported levels of fertility, mortality and mortality. Third, it is further anticipated that age errors may provide clues to other weaknesses in the data.

### **Background information**

The North West Province of South Africa is bordered by the provinces of Gauteng, Limpopo (formerly Northern) Province, the Northern Cape and the Free State, and the Republic of Botswana (Figure 1).

It is the sixth largest of the nine provinces in South Africa covering a total area of 116 320 km<sup>2</sup> (approximately 9,5% of South Africa). The total population in the province increased from 3.3 million in 1996 to 3.6 million in 2001 and it is currently estimated at 3.7 million. The provincial population represents 8% of the national total and about 65%

of the population in the province live in rural areas. The province is divided into four district municipalities as follows: Bophirima, Bojanala, Southern and Central; five cross-border districts and 21 local municipalities (). Both the 1996 and 2001 population censuses indicate that the largest proportion (36%) of the population in NW lived in Bojanala followed by Central (23%), Southern (18%) and Bophirima (13%). The more populated industrial centres include Rustenburg, Brits and Ga-Rankuwa in the eastern region of the Province. Mafikeng is the provincial capital and was the administrative centre of the Bophuthatswana homeland (from 1978 to 1994). It was also the governing centre of the British Bechuanaland Protectorate prior to 1960. Other major towns in the province include Potchefstroom, Klerksdorp, Lichtenburg, Ventersdorp and Vryburg.

The provincial gross geographic product (GGP) is R 3 964 per person against the national average of R 6 498.

Mining forms the back-bone of the provincial economy, contributing 42% to the GGP and 39% to the employment. The mining sector is dominated by large platinum mines and smelters in the Rustenburg area, as well as the gold mines of the Orkney and Klerksdorp areas. Agriculture is the second-most important sector, with 13% of the GGP and 18% of employment. Maize and sunflowers are the most important crops grown, while cattle and game farming are also well-established. Tourism is widely considered to have a major growth potential as the Province is located adjacent to areas of Gauteng and Botswana.

### **Data Sources and Methodology**

The study will make use of the 1996 and 2001 South African Population Censuses. The 1996 Census was the first census to be conducted in democratic South Africa ().

In terms of methods of analysis, the study will employ the most widely used measures of quality of reported statistics, namely Whipples and Myers Indices and United Nations (UN) Joint Age-Sex Score (also known as UN Accuracy Index). These have been widely

used in the analysis of the reported age statistics in developing countries (Palamuleni, 1996; Poston, 2000; Mba, 2003).

The Whipples Index is a summary measure that gives the extent of age heaping as a result of preference for ages with terminal digits 0 and 5. The index is obtained by calculating the percentage of the total reported on ages ending with 0 and 5 in the 23 to 62 age range divided by one fifth of the total population in the same age range. The index assumes any value between 0 and 500, with a value of 100 indicating no preference and a value of 500 signifying that ages of all people were reported only on ages with terminal digits 0 and 5.

Another index for appraising the quality of single year age data was developed by Myers. Unlike the Whipples Index which looks at preference for ages with end digits 0 and 5, the Myers Index examines the preference (or avoidance) of reporting ages ending with each of the ten digits 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. The index is secured by first calculating the weighted population reported on ages ending with each of the ten digits and then expressing the blended population on each digit as a percentage of the total population, in the absence of any irregularities in the reporting of ages, the sum of the blended population on each digit is expected to be equal to 10 percent of the total blended population. A percentage in excess of 10 percent indicates preference of ages ending with such digit and vice versa.

The quality of reported age-sex distribution in five-year age groups is evaluated using the United Nations Age-Sex Accuracy Index (also known as United Nations Age-Sex Score). This index is calculated as three times the Average Sex Ratio Score plus the Age Ratio Score for males plus the Age Ratio Score for females. Age ratio for any age group is the population in the age group divided by the average of the populations in the preceding and succeeding age groups multiplied by 100 (United Nations, 1952; Arriaga et al, 1994). Shyrock and Siegel (1976) note “barring extreme fluctuations in past births, deaths or migration, the three age groups should form a nearly linear series. Age ratios should ... approximate 100.0 even though actual historical variations in these factors would produce deviations from 100.0 in the age’s ratio for most ages. For each sex, an Age Ratio Score is

calculated by summing the differences of each age ratio from 100, without taking into account the sign and the mean of these differences is what is known as Average Age Ratio Score.

The UN has provided two standards for explaining these scores. United Nations(1952) suggested that if the joint score is less than 20 then the distribution is accurate, if the score lies between 20 and 40 then the distribution is inaccurate, otherwise for scores above 40, the age distribution is highly inaccurate. United Nations(1955) further recommended that the age ratio of 2.6 for males and 2.4 for females and the sex ratio score of 1.5 implying a joint score of 9.5 should be accepted as a minimum standard.

## **Results**

### **Whipples Index**

Table 1 presents Whipples indices for males, females and both sexes for North West Province for the 1996 and 2001 Population Censuses and 2007 Community Survey. In general, the results indicate that there was less pronounced age heaping of the population on ages ending with digits 0 and 5. Whipples index was 97 for both sexes, 97.4 for males and 96.6 for females indicating that preference of ages ending in digits 0 and 5 was slightly more common among male respondents than female respondents. Similar values for 2001 census are 95.2, 95. and 95.3 respectively. Comparisons of Whipples indices for 1996 and 2001 censuses indicate improvement of the reported age statistics. In terms of racial groups, Whipples Index was highest among the Asians, closely followed by the Whites, then Colored and lowest amongst Africans.

The United nations (1990) notes that if the values of Whipple's index less than 105 then the age distribution data are deemed to be highly accurate; if the values are between 105 and 109.9, they are "fairly accurate"; if between 110 and 124.9, "approximate"; if between 125 and 174.9, "rough" and if 175 or more, "very rough" (United Nations, 1990:18-19). This means that the reported age distributions in North West province as measured by Whipple's index can be regarded as "highly accurate".

The United Nations further states that “although Whipple’s Index measures only the effects of preferences for ages ending in 0 and 5, it can be assumed that such digit preference is usually connected with other sources of inaccuracy in age statements and the indexes can be accepted as a fair measure of the general reliability of the age distributions” (United Nations, 1990:20).

**Table 1 Whipples Indices for North West Province, South Africa in 1996**

		Male	Female	Both sexes
	1996	97.4	96.6	97.0
Total	2001	95.1	95.3	95.2
	2007	96.23	92.71	94.53
	1996	96.9	96.0	96.4
African	2001	94.5	94.6	94.5
	2007	96.17	92.87	94.59
	1996	99.8	100.1	100.0
Coloured	2001	100.2	101.9	101.1
	2007	78.67	80.70	79.73
	1996	103.2	103.1	103.2
Asian	2001	109.3	99.6	105.0
	2007	75.24	105.16	87.02
	1996	103.3	103.0	103.1
White	2001	101.6	101.8	101.7
	2007	101.47	93.03	97.21

### Myers Index

Table 2 presents a summary of the Myers indices for males, females and both sexes and by population group for North West Province for the 1996 and 2001 Population Censuses. In terms of the digit preference of each of the terminal digits Table 2 show that there was over-enumeration of ages ending with digits 6, 4, 8 and 0 while ages with

terminal digits, 1, 2, 3, 5, 7 and 9 were avoided. This pattern was noticed in both male and female populations in North West Province. In 2001, terminal digits 1, 9 and 8 were over-enumerated whereas the other remaining terminal digits were under-enumerated. The female population also shows over-enumeration at terminal digit 6. The 2007 community survey indicate that the digits 9, 5, 8 and 6 were preferred among the male population whereas the female population show a preference of 5, 9, 0 and 2.

Overall the indices are close to the expected minimum value of zero suggesting very little digit preference in the population. Myers index for both sexes declined from 3.92 in 1996 to 3.06 in 2001 and 2.89 in 2007. There are differences by population group and gender. In 1996 Myers Indices are highest among the African, followed by the Asians, then Colored and lowest amongst the Whites. The situation is somewhat changed for 2001 in that Myers indices are highest amongst the African, followed by the coloured, then the Asians and lowest amongst the white population. In 2007 Myers index is highest among the Asian population, followed by the coloured, then the African and lowest among the White population.

In term of gender, Myers indices for males are higher than similar values for females in 1996 with the exception of the Asian population. In 2001 Myers indices for males are higher than similar values for females for Africans and Whites and the opposite is the case for Coloureds and Asians. Myers indices for males declined from 4.19 in 1996 to 2.96 in 2001 whereas Myers index for females declined from 3.7 to 3.18. In addition, Myers indices for males for Coloureds and Asian has increased from 3.29 to 4.14 and 2.64 to 4.27 respectively. In general digit preference was more pronounced amongst the male population than the female population in 1996 and the opposite is true in 2001.



**Table 2 Myers Indices from North West Province by Race: 1996 and 2001**

	1996			2001			2007		
	Male	Female	Both	Male	Female	Both	Male	Female	Both
0	0.21	0.24	0.23	-0.42	-0.55	-0.49	-0.58	0.29	0.24
1	-0.20	-0.03	-0.11	0.89	0.58	0.74	-0.75	-0.08	-0.11
2	-0.09	0.03	-0.03	-0.22	-0.18	-0.20	-0.71	0.08	-0.08
3	-0.33	-0.03	-0.18	-0.06	-0.16	-0.11	-0.15	-0.09	0.05
4	0.42	0.43	0.42	-0.31	-0.47	-0.39	-0.37	-0.57	-0.43
5	-0.65	-0.79	-0.73	-0.23	-0.17	-0.20	0.55	0.84	0.62
6	1.14	0.87	1.00	-0.02	0.13	0.06	0.33	-0.37	-0.15
7	-0.34	-0.32	-0.33	-0.23	-0.05	-0.14	-0.04	-0.53	-0.52
8	0.32	0.29	0.30	0.07	0.32	0.19	0.54	-0.22	-0.15
9	-0.49	-0.69	-0.59	0.52	0.56	0.54	1.18	0.64	0.53
Me	4.19	3.72	3.92	2.96	3.18	3.06	5.20	3.71	2.89

Just like with Whipples Index, there are variations by population groups. In 1996 the Myers indices for African population were higher for males than females indicating that the incidence of digit preference was more pronounced among African males than African females. The same is observed among the White population. The opposite is observed among the Coloured and Asian populations. In 2001 the scenario presented in the preceding sentence is reserved.

**Table 3 Myers Indices for North West by Population Group and Sex for NW, 1996**

	African			Coloured			Asian			White		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
0	0.18	0.21	0.20	0.11	0.45	0.29	0.26	0.65	0.45	0.58	0.62	0.60
1	-0.18	0.01	-0.08	-0.23	-0.63	-0.44	-0.23	-1.20	-0.69	-0.50	-0.25	-0.37
2	-0.06	0.07	0.01	-0.55	-0.15	-0.34	0.03	0.36	0.19	-0.28	-0.42	-0.35
3	-0.32	0.00	-0.16	-0.02	-0.01	-0.02	0.06	-0.39	-0.16	-0.51	-0.40	-0.45
4	0.48	0.47	0.48	0.11	0.58	0.35	-0.47	1.15	0.31	-0.23	-0.17	-0.20
5	-0.73	-0.88	-0.81	-0.37	-0.29	-0.33	0.39	-0.44	-0.01	0.20	0.15	0.18
6	1.21	0.92	1.06	0.96	0.51	0.73	0.24	1.33	0.76	0.42	0.30	0.36
7	-0.38	-0.34	-0.36	0.14	0.09	0.12	-0.56	0.35	-0.12	0.16	-0.20	-0.02
8	0.31	0.28	0.30	0.32	0.03	0.17	0.34	-1.19	-0.39	0.49	0.42	0.46
9	-0.50	-0.75	-0.63	-0.48	-0.57	-0.53	-0.07	-0.62	-0.33	-0.34	-0.06	-0.20
Me	4.36	3.94	4.08	3.29	3.31	3.30	2.64	7.69	3.41	3.71	2.99	3.19

Table 4 Myers Indices for North West by Race and Sex, 2001

	African			Coloured			Asian			White		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
0	-0.49	-0.66	-0.57	0.54	0.41	0.48	1.40	-0.22	0.65	0.16	0.49	0.33
1	0.97	0.64	0.80	0.72	0.50	0.61	-0.45	0.90	0.17	0.02	-0.01	0.01
2	-0.20	-0.18	-0.19	-0.23	-0.34	-0.29	-0.10	0.10	-0.01	-0.47	-0.13	-0.30
3	-0.04	-0.13	-0.08	-0.47	-0.24	-0.35	-0.74	-0.85	-0.79	-0.20	-0.44	-0.33
4	-0.32	-0.50	-0.41	-0.38	-0.48	-0.43	0.51	-0.54	0.03	-0.17	-0.15	-0.16
5	-0.25	-0.18	-0.22	-0.43	0.22	-0.10	0.02	0.41	0.20	0.08	-0.16	-0.04
6	-0.02	0.11	0.05	-0.02	-0.14	-0.08	-0.33	-0.19	-0.27	-0.03	0.36	0.17
7	-0.25	-0.06	-0.15	-0.55	0.01	-0.27	-0.26	0.05	-0.12	0.06	-0.03	0.01
8	0.05	0.35	0.20	0.27	-0.05	0.11	0.21	-0.14	0.05	0.31	0.08	0.19
9	0.54	0.61	0.58	0.53	0.12	0.32	-0.26	0.49	0.08	0.23	0.00	0.11
	3.12	3.42	3.26	4.14	2.51	3.04	4.27	3.89	2.36	1.72	1.87	1.65

Table 4 Myers Indices for North West by Race and Sex, 2007

	African			Coloured			Asian			White		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
0	-0.58	0.26	0.23	-1.14	1.83	0.83	-0.94	1.85	0.55	-0.52	0.30	0.20
1	-0.74	-0.11	-0.11	-1.70	-0.91	-0.90	-3.01	-2.89	-2.02	-0.53	0.56	0.21
2	-0.71	0.12	-0.07	-0.89	1.29	0.43	-1.86	-1.36	-1.27	-0.57	-0.57	-0.33
3	-0.20	-0.11	0.02	0.11	0.32	0.46	-3.57	4.35	-0.07	0.66	-0.18	0.36
4	-0.38	-0.70	-0.50	0.25	0.34	0.20	-1.47	3.53	0.16	-0.37	0.45	0.19
5	0.58	0.86	0.65	3.01	0.59	1.72	2.62	-1.21	0.69	-0.44	0.81	0.17
6	0.33	-0.33	-0.14	-0.13	0.75	0.07	3.03	-1.31	1.20	0.32	-0.87	-0.42
7	-0.07	-0.54	-0.55	0.75	-1.31	-0.46	4.67	0.91	2.93	-0.05	-0.39	-0.38
8	0.48	-0.20	-0.18	0.66	-2.79	-1.41	-0.09	-2.76	-1.59	1.27	0.24	0.48
9	1.30	0.76	0.66	-0.90	-0.11	-0.94	0.61	-1.12	-0.56	0.23	-0.35	-0.49
	5.38	3.99	3.10	9.55	10.24	7.41	21.87	21.28	11.04	4.97	4.71	3.22

### United Nations Joint Age-Sex Score

The United Nations Joint Age-Sex Accuracy Index allows the examination of the sex ratios and age ratios for each sex.

### Sex Ratio Analyses

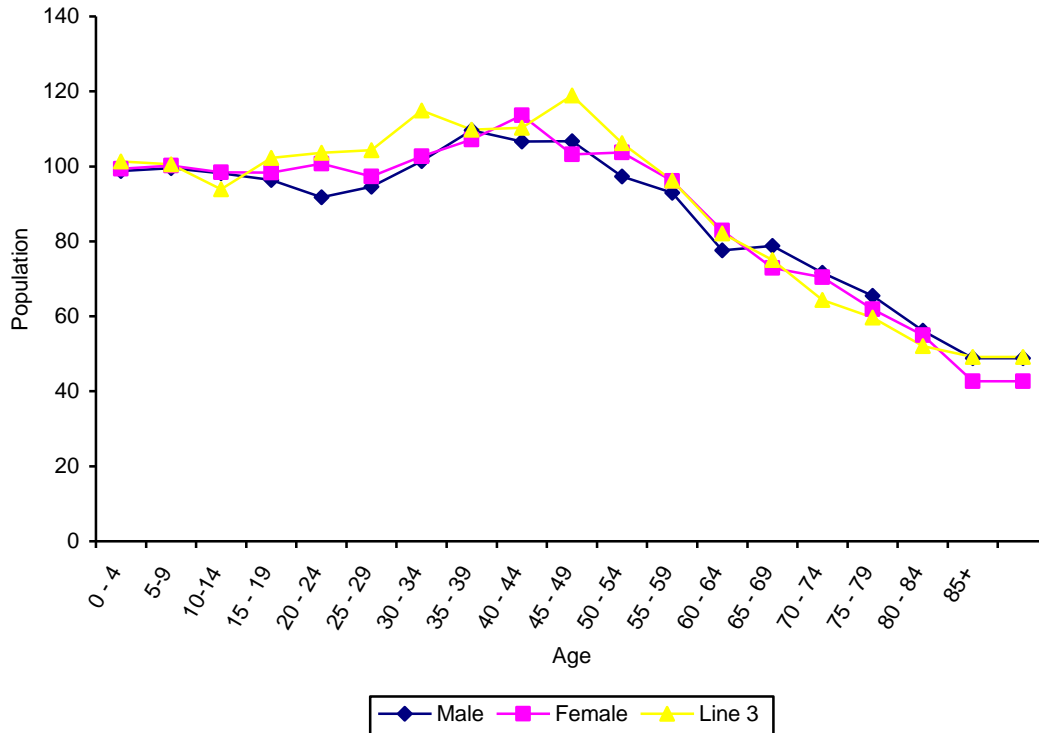
Table 5 and figure x presents the age specific sex ratios for North West province obtained from the 1996 and 2001 censuses and 2007 Community Survey. Variations in sex provide

an opportunity for assessing the extent of age misreporting in a population by five-year age groups. Under normal circumstances, it is expected to have a slightly higher number of males at young ages and a consistently greater number of females at older ages since females live longer than males (United Nations 1973). The age-specific sex ratios reveal an excess of females over males in all age-groups with exception to age range 25-54. The deficit of females in the age range 25-54 may be attributed to migration of a substantially higher proportion of males in these prime working age groups in search of jobs and other opportunities in life. The 1996 and 2001 census data also show a decreasing trend in the sex ratio with the advancement of age, reaching its lowest level in the oldest age-group, 85 years and older (see figure 2). The increasing excess of females with the advancement of age is also due to a lower risk of death among females than males with the advancement of age (see figure 6), as there is no evidence to show that males more often than females tend to move out of the province in the older age groups. The table, however, indicates some fluctuating sex ratios that can be attributed to errors in age data. The sex ratio for the province increased from 96.8 in 1996 to 98.6 in 2001 and to 101.2 in 2007. The increase in the sex ratio could be due to the interplay of an improvement in male mortality, an increase in female mortality, over reporting of males, underreporting of females, in-migration of males and out migration of females or a combination of any of these.

Table 5 Age Specific sex ratios for north west, south Africa, 1996-2007

Age groups	1996	2001	2007
0 – 4	98.8	99.4	101.3
5 – 9	99.5	100.2	100.6
10 – 14	98.2	98.4	93.9
15 – 19	96.4	98.3	102.3
20 – 24	91.8	100.7	103.6
25 – 29	94.6	97.3	104.3
30 – 34	101.4	102.7	114.9
35 – 39	109.6	107.1	109.8
40 – 44	106.6	113.6	110.3
45 – 49	106.7	103.2	118.9
50 – 54	97.3	103.7	106.2
55 – 59	93.0	96.1	96.2
60 – 64	77.6	82.9	82.1
65 – 69	78.8	72.9	75.0
70 – 74	71.6	70.4	64.4
75 – 79	65.5	61.9	59.7
80 – 84	56.2	55.0	52.1
85+	48.8	42.7	49.2

Figure x Age ratios for North West, South Africa, 1996



**Age ratios and age accuracy indexes**

Age ratio is computed in this study as the percentage of the population in a given five-year age group to the average of the preceding and following age groups (Shryock and Siegel 1976). According to the scheme of evaluation 100 is the point of balance; age ratios higher than 100 indicate an over-enumeration of the particular age group, while an age group is deemed under-enumerated if its age ratio goes below 100. The results presented in Table 6 and illustrated in figures x show that there are distortions in the reported age data of North West province.

In 1996 over enumeration took place at age groups 5-9, 10-14, 20-24, 30-34, 35-39, 65-69, 75-79 among the male population and age groups 5-9, 10-14, 20-24, 30-34, 75-79 among the female population. In 2001 over enumeration was observed in age groups 10-14, 15-19, 35-39, 40-44, 70-74 among the male population and age groups 10-14, 15-19, 25-29, 35-39, 40-44, 45-49, 60-64 among the female population. In 2007 the following

age groups were over enumerated: 5-9, 15-19, 20-24, 30-34, 40-44, 45-49, 50-54 in the case of males and 15-19, 20-24, 40-44, 50-54, 60-64, 70-74 in the case of females.

Table 6: Age ratios for North West Province, South Africa, 1996, 2001 and 2007

Age group	1996		2001		2006	
	Male	Female	Male	Female	Male	Female
0 – 4						
5 – 9	103.0	102.0	100.7	99.3	103.0	100.0
10 – 14	102.4	102.2	104.2	105.1	92.7	100.1
15 – 19	99.6	98.4	103.7	105.0	106.5	102.6
20 – 24	101.4	105.6	98.3	95.4	102.4	102.1
25 – 29	97.0	98.4	99.3	103.7	95.3	99.2
30 – 34	101.5	101.0	97.5	96.5	106.7	99.2
35 – 39	105.6	99.8	103.3	103.7	94.7	97.3
40 – 44	98.5	100.3	107.7	100.1	101.1	104.4
45 – 49	95.4	92.1	95.2	101.4	108.4	99.0
50 – 54	96.9	100.7	95.1	92.2	100.2	103.9
55 – 59	98.0	94.0	96.9	95.8	91.1	91.9
60 – 64	91.3	102.5	98.6	103.0	94.3	101.0
65 – 69	105.1	100.4	91.9	98.6	95.5	95.9
70 – 74	93.3	96.4	101.9	100.0	94.5	102.2
75 – 79	104.6	107.2	89.7	94.6	90.4	91.2
80 – 84	68.1	72.8	91.9	92.7	88.5	94.9
85+						

Fig:exAgeratiosfor North West, South Africa, 1996

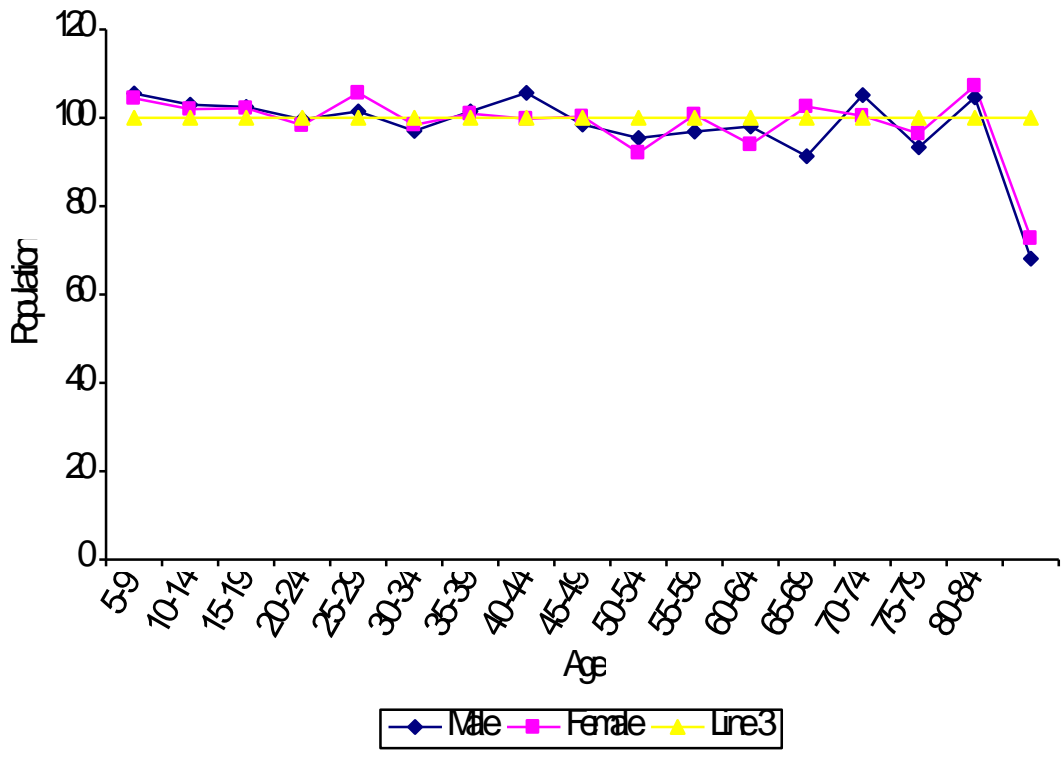


Fig:exAgeratiosfor North West, South Africa, 2001

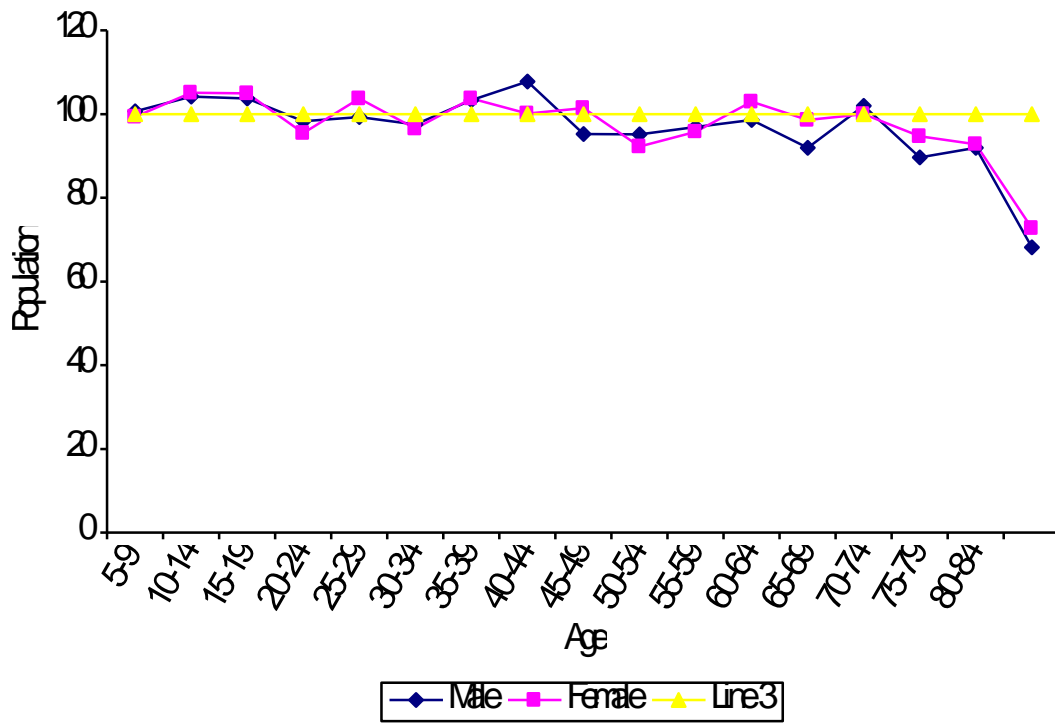




Figure 7: Age ratios for North West, South Africa, 2001

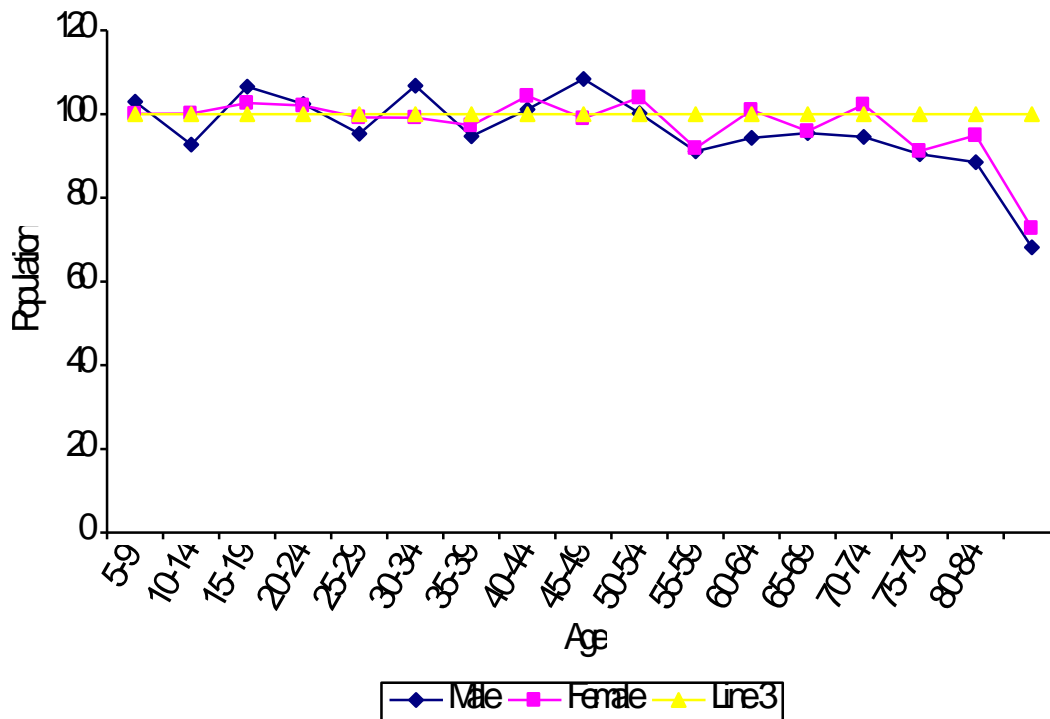


Table 7 presents average average sex ratio score, age ratio score for males and females and the summary UN Joint Age-Sex Score by population group for North West Province for the 1996 and 2001 Population Censuses.

Overall the UN Joint Age-Sex Score in the NW Province was 25 in 1996 declining to 23 in 2001 and increasing to 29.6 in 2007. According to the UN, this indicates that the reported age distribution in the region could be described as “inaccurate”. The results also suggest an improvement in the reporting of age-sex data between 1996 and 2001.

Thus, by any standard, the age distributions for the province are distorted reflecting that there was misreporting of age. The overall quality however, is better than that found in neighbouring countries and is expected for a developing country.

The values are significantly lower than what is found in many African populations but are comparable with those from Southern Africa. For instance, the UN Joint Age-Sex Score for Botswana in 2001 was xx, Malawi in 2008, Nigeria in 2006 was 50.

In terms of race the UN Joint Age-Sex Score indicate that the reporting is better for the white, followed by Africans, then colored and lastly Asians. The high accuracy index for the Asia population is probably due to the high sex ratio score which is in turn influenced by the dominance of males in the Asian population.

Table 6: UN Joint Age-Sex Score for North West Province for South Africa, 1996, 2001 and 2007

Province / population Group	Year	ASRS	AARSm	AARSf	UN Score	Percentage change
	1996	5.11	5.32	4.42	25.05	
Total	2001	5.28	4.19	3.54	23.58	-5.8
	2007	6.8	5.7	3.0	29.2	+23.8
	1996	5.35	5.84	4.92	26.83	
African	2001	5.57	4.17	3.54	24.43	-8.94
	2007	7.057	5.733	3.326	30.2	+23.61
	1996	8.00	8.52	5.20	37.72	
Coloured	2001	4.90	6.85	6.18	27.73	-26.48
	2007	32.099	42.062	23.096	161.5	
	1996	11.21	5.27	9.90	48.81	
Asian	2001	14.12	10.96	7.22	60.54	
	2007					
	1996	4.92	5.42	3.82	24.00	
White	2001	4.77	6.04	5.90	26.26	
	2007	12.998	15.177	9.623	63.8	

These so-called “inaccuracies” in the age and sex data are based on the assumption that “accurate” age data are rectangularly distributed, and that age-specific sex ratios decline over the life cycle in an even manner. Departures from these patterns will result in “inaccurate” data patterns.

Moreover, the UN Joint Age-Sex Score has other limitations as a summary measure of the accuracy of age sex data. Among these are “the failure to take account the expected decline in the sex ratio with increasing age, and of real irregularities in age distribution due to migration, wars, and epidemics, as well as normal fluctuations births and deaths ... also, the considerable weight given to the sex ratio component in the formulae... (Shyrock and Siegel, 1976,126). Despite these and other limitations, the measure is useful for making rough comparisons and distinctions between and among populations regarding the accuracy in the censuses of reporting age by sex (Shyrock and Siegel, 1976,126).

## **Conclusion**

This paper has explored the quality of the reported age statistics for North West Province in South Africa. The accuracy was determined by calculating Whipples' and Myers indices of digit preference for single year distributions and the United Nations Joint Age and Sex Score for grouped data. The analysis was carried out for the total provincial population, and the four population groups.

The results do confirm that the reported age statistics are distorted and that the nature and pattern of age mis-reporting are similar to those found in other developing countries.

The reported age structure closely resembles what is expected in a developing country going through fertility transition. The reported age distribution reveal a young age structure and further indicate that the population of North West Province is getting older with the passage of time. The elderly population show a modest increase overtime. The proportion of the population below age 15 is also on the decrease whereas, the economically active population (population in age range 15-64) appears to be increasing.

The consequences of the above-described population structure on the social and economic development of North West Province are gloomy. At a family or household level, given the high proportion of population below the age 15, the age structure suggests that the head of the family or household have the enormous responsibility to see to it that there is enough food, clothing and shelter for everyone. At the national level the high and increasing dependency burden implies a lot of pressure on the government to make available such social services as schools and health facilities and create employment for the young population. All this indicates at both levels, more effort will be on consumption rather than on investment.

Lastly, the examination of the reported age distribution further revealed the preponderance of females in the population. This was reflected by the low overall sex ratios and low ASSRs, and raises the question "where do our men go?". A number of factors were suggested to account for this anomaly and these included such variables as sex differentials in enumeration, labour migration and high male mortality.

The government of South Africa should pay more attention to improving vital registration system in the country. This is because the records produced by this system serves two essential purposes. First, the individual records establish a person's civil status and the facts on which it is based. Proof of these facts such as age, place of birth or death are essential documents required for many official purposes in the society in which a person lives or has lived. Second, the information collected through vital registration system provide the basis for computation of indices of fertility, mortality and migration, among others, showing changes in population size and composition and important features regarding the health of a population. Third, information on the registration records provide an independent database on which census results can be matched and assessed

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