Gender and Racial Differences among elderly South African

(Preliminary results)

Disability reduces the ability of individuals to be integrated into the society by reducing their ability to participate actively in social and economic life. Very little research has been done on the demography of the disabled in Africa although many African censuses contain information on disability, which along with information on individuals and household characteristics, can help advance our understanding of this phenomenon and its correlates. Using the 1996 South Africa census micro data, we examine the prevalence and the patterns of disability by gender and races. We then examine the gender and racial variations in the disability-free life expectancy for the aged.
Women seem to have higher disability rates than men at adolescent ages and at the oldest ages. At the youngest ages and for adults aged, men seem to report higher disability rates than women. As expected women live longer, have higher health expectancies and spend a greater part of their life in poor health than men. Also wealthiest and more urbanized South African provinces such as Western Cape and Gauteng have higher life expectancy and higher disability-free life expectancy. Poorest provinces such as Free State and North West have the lowest life expectancy and higher life expectancy with disability.

Data and Methods

African census micro-data currently archived by the African Census Analysis Project (ACAP) of the University of Pennsylvania provide an opportunity to examine in details the prevalence of disability at the national and sub-national levels in Africa. Many African censuses contain information on disability which, along with information on individuals and household characteristics, can help advance our understanding of the incidence, prevalence, patterns, and correlates of this phenomenon. Because disability is a rare phenomenon, census data are appropriate for a detailed estimation of levels, trends, differentials and spatial variation with fewer concerns on sample size limitations.

This paper uses the micro-data from census of South Africa of October of 1996 to estimate the disability prevalence rates by age, sex, population group, place and province of residence. Respondents were asked to indicate whether there were any people with serious visual, hearing, physical or mental disabilities in the household (Statistics South Africa 2000). Because a person may have more than one disability, the type of disability was classified as follow: sight, hearing, physical, mental disability and multiple. The severity of the disability was not clearly defined, rather the interviewers were instructed to consider as “a serious disability one which prevents the person from performing normal activities of daily living, for example, getting in or out of bed, dressing, washing or even working, without assistance or equipment” (Stat South Africa 2000).

People living in institutions and the homeless were not asked this question and will therefore be excluded from our analysis. We don't expect this to bias our analysis in a substantial way since only 2470 homeless out of 9 059 571 households were surveyed (Statistics South Africa 1998). The institutional population constitutes less than 3 percent of the population and consists mostly of White and Colored children probably in boarding schools and of elderly Whites living in homes for the aged (sees Figure A.1 in Appendix). Most of the elderly living in institutions are probably disabled, thus the disability rates may be underestimated especially for the white and colored population. There are also some individuals for whom information on the disability status is unknown. We dropped these persons with unknown disability status from the analysis. Among those who stated their disability status, ten percent did not specify the type of the disability. The proportions of these persons vary appreciably by sex and racial group (see figures A.3). These differences in unknown disability type are higher among the white population: more than 25 percent of unknown disability type for whites compared to about 10 percent for Africans. The proportion of persons with unknown disability type seems to be higher among females than males for all racial groups except the African population. Given the high levels of unknown disability type, we have decided to keep them in a special "unknown" category for all the analysis.

We combine the prevalence rates observed and mortality rates by selected variables to examine the differentials in the Disability-free Life Expectancy (DFLE) in South Africa. The method used, known as Sullivan method's or observed prevalence-based life table (Sullivan 1971, Cambois 2001) is appropriate for the type of data we have. This method combines the observed disability prevalence with life tables related to each population group by distributing the number of persons years lived within each age group across status according to the age-specific prevalence rates (Sullivan 1971, Cambois 2001). Disability-Free Life Expectancies, measuring the burden of disability in a sub-population are then computed for each population group. The South Africa life tables by selected variables are based on the estimates by Statistics South Africa (1996) and Dorrington et al. (2001) combining both census data and deaths from the civil registration system. All the computations are based on period life table models and all the rates refer to the survival experience of a synthetic population. Other methods such as the double decrement life table method based on the double observation of the occurrence of death and disability (Katz et al. 1983) and the multistate life approach developed by Rogers et al. (1989) can also be used to compute period health expectancies (Crimmins et al. 1994). These methods require the knowledge of the state of health or functioning for each person. Unfortunately we do not have access to longitudinal data on the transitions in and out of the state necessary for the implementation of this method.

Because they are based on self-reported disability status, the estimates may reflect cultural differences in reporting of disability across socioeconomic groups within the society

(Mathers et al. 2001). We evaluate the possible impact of this bias by examining the observed patterns of disability by selected variables.

Results

Overall, more than 6.7 percent of the population (6.4 for men and 7.1 for women) has been reported as disabled, whatever the type of disability (Table 1). As shown in table 1, the reported total disability crude rates are higher in urban than in rural areas; Africans are about 2 times more affected by disability than any other racial group and Whites population have the lowest rate; Free State followed by North West, Mpumalamga and Eastern Cape have the higher prevalence rates while Western Cape is the province with the lowest rate.

Table 1: Total Disability Rates by sex and selected variables (percent)

	Crude Total Disability Rates			Standardized Total Disability Rates			Ratio Males to Females	
Place of residence								
	Male	*Female*	*Total*	*Male*	*Female*	*Total*	*Crude*	*Stand.*
Urban	6.69	7.48	7.12	13.27	13.51	13.43	0.89	0.98
Rural	6.12	6.77	6.46	10.30	11.04	10.67	0.90	0.93
Racial Group								
African	7.15	8.17	7.69	14.08	14.90	14.53	0.88	0.95
Coloured	3.88	3.41	3.64	7.50	6.67	7.07	1.14	1.12
Asian	4.34	3.91	4.12	8.05	7.66	4.94	1.11	1.05
White	3.66	3.21	3.43	5.36	4.56	11.92	1.14	1.18
Province								
Western Cape	3.98	3.66	3.81	6.48	5.84	6.14	1.09	1.11
Eastern Cape	7.07	7.82	7.48	14.15	14.08	14.10	0.90	1.00
Northern Cape	5.96	5.71	5.83	10.28	9.88	10.19	1.04	1.04
Free State	9.41	11.00	10.25	16.28	18.18	17.20	0.86	0.90
Kwazulu Natal	5.80	6.46	6.16	10.45	10.99	10.74	0.90	0.95
North West	8.00	9.13	8.59	15.19	16.66	16.02	0.88	0.91
Gauteng	6.07	6.91	6.49	9.83	10.90	10.44	0.88	0.90
Mpumalanga	7.23	8.14	7.71	12.94	14.37	13.71	0.89	0.90
Northern Province	5.75	6.46	6.14	11.56	11.42	11.50	0.89	1.01
South Africa	6.38	7.11	6.77	*9.73*	*10.29*	*10.06*	0.90	0.95

Source: Computed from the 1996 census micro-data

Table 1 shows that when male total disability rates are low, women total disability rates are also low. Female disability rates are higher than male disability except for Coloured, Asian and White

population who has excess male disability. In Western Cape and Northern Cape female crude disability rates are lower than men. There is an excess female disability rates both sex for urban and rural areas, while the gender gap observed by racial group and province of residence is partially due the difference in the age structure among racial groups and provinces.

Gender and Age Differences in the Age Specific Disability Rates

As expected, the proportion of reported disabled people increases with age confirming the impact of degenerative diseases associated with the aging process and the cumulative effect of infection and accident. As depicted in table 2, women seem to have higher disability prevalence rates than men at adolescent ages (between 15 and 25) and the oldest ages. At the youngest ages (below 10) and for adults aged between 25 and 40, men have reported higher disability cases than women. While the excess female disability rates at adolescent ages is probably related to the reproductive health issues, the excess male disability rates at the adults ages is probably due violence that affect more men than women, especially in urban areas.

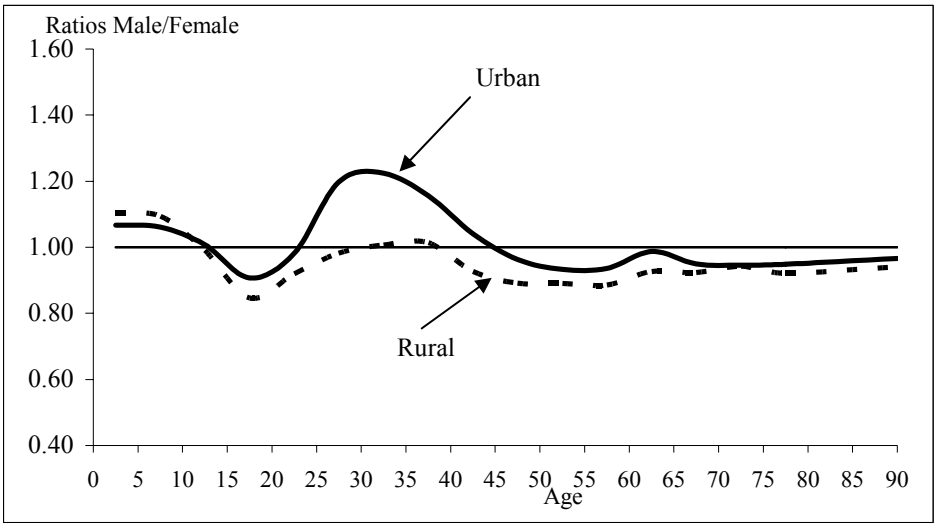
Table 2: Disability Prevalence rates by sex in South Africa (percent)

Age	Male	Female	South Africa	Male/Female
0-4	2.75	2.55	2.65	1.08
5-9	3.70	3.45	3.57	1.07
10-14	4.08	4.09	4.08	1.00
15-19	4.07	4.64	4.36	0.88
20-24	4.68	4.95	4.82	0.95
25-29	5.42	5.14	5.27	1.05
30-34	6.39	5.95	6.15	1.07
35-39	7.38	7.01	7.18	1.05
40-44	8.63	8.98	8.82	0.96
45-49	10.46	11.51	11.02	0.91
50-54	12.56	14.01	13.34	0.90
55-59	14.67	16.31	15.58	0.90
60-64	16.53	17.59	17.18	0.94
65-69	18.09	19.59	18.99	0.92
70-74	20.64	21.97	21.42	0.94
75-79	25.35	27.20	26.50	0.93
80 +	30.67	32.15	31.64	0.95
Crude rates	6.38	7.11	6.77	0.90

Source: Computed from the 30 percent 1996 census micro-data

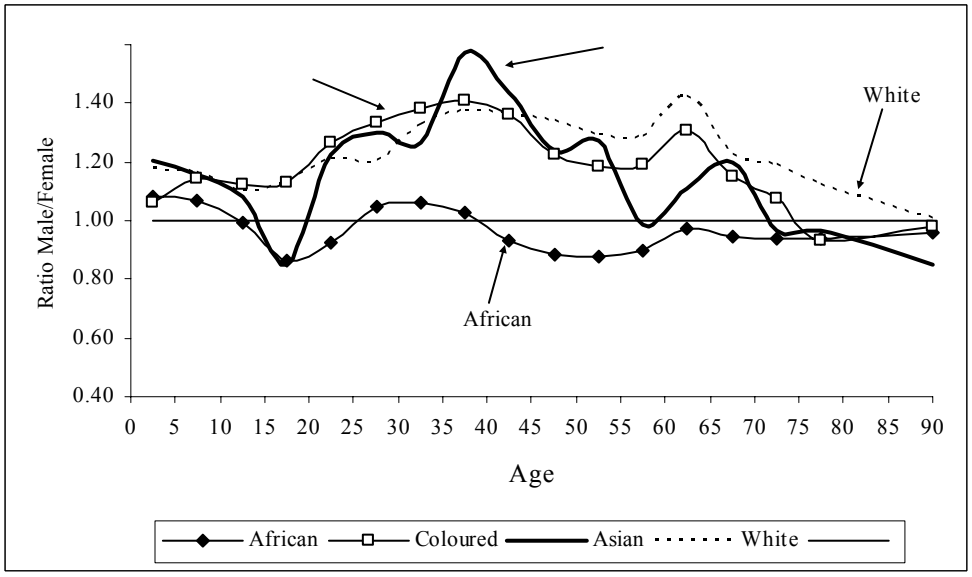
These gender differences seem to have a similar pattern for both rural and urban areas (Figure 1). As depicted in Figure 1, the excess male disability rates among adults seem to be higher in urban areas than in rural areas.

Figure 1: Ratio of Males to Females Age Specific Prevalence Rates by place of residence



These gender differences also have an identical pattern when the racial group is considered (Figure 2). However, among African population where the prevalence rates are also higher, the gender gap appears smaller. The males have higher disability rates than females at all ages among coloreds, Asians and Whites except for teenagers and oldest population where females seem to have higher disability rates than males, especially among Asians. Figure 2 also show that the sex gap is higher among sub-population with lower disability rates.

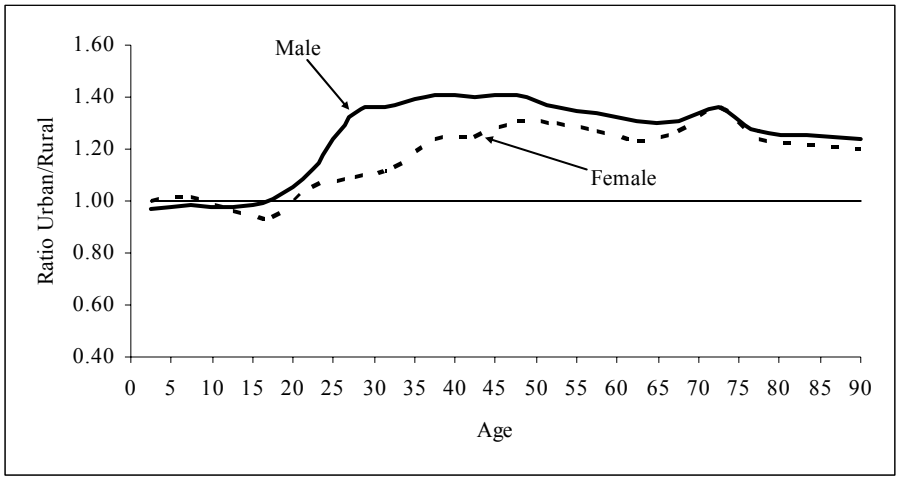
Figure 2: Ratio of Males to Females Age Specific Prevalence Rates by racial group



An identical gender patterns by age is clearly observed by province of residence (Figure 3). As shown in Figure 3, provinces with the lower prevalence rates showed the higher sex gap.

This gender differences that seem to vary across selected variables may reflect biological differences between males and females as well as gender differences in access to health and economic resources.

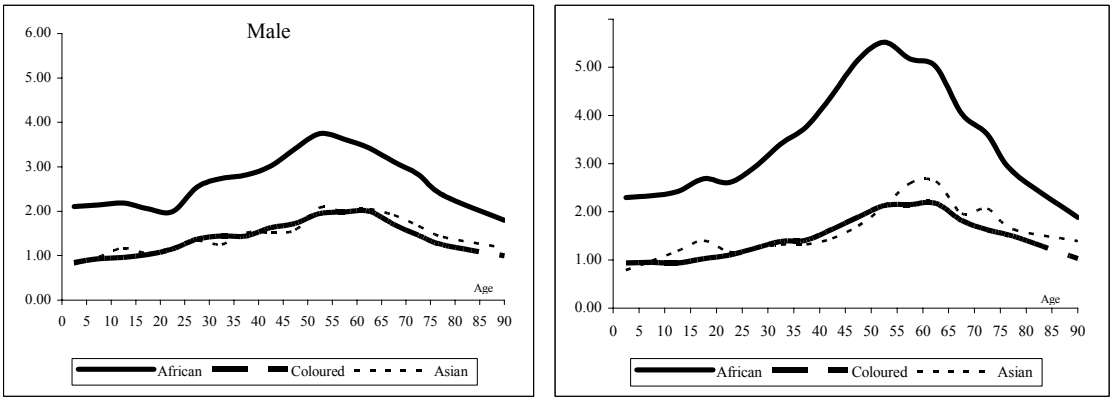
Figure 4: Ratio of Urban to Rural Age Specific Prevalence Rates by sex



Racial differences in the Disability Prevalence

There are important differences in the reported disability status by racial group (Figures 5). Figures 5 graphs the ratio of age specific prevalence rate for each population group to White population. At all ages and for both sex, the disability rates are higher among African population than other racial groups. The colored and Asian populations seem to have a same pattern of the disability prevalence. Because analysis does not include the elderly White population residing in institutions, the excess lower prevalence rates among whites aged about 60 may be due to the underestimation of disability rates among White population.

Figures 5: Ratio of African, Coloured and Asians to White Age Specific Prevalence Rates

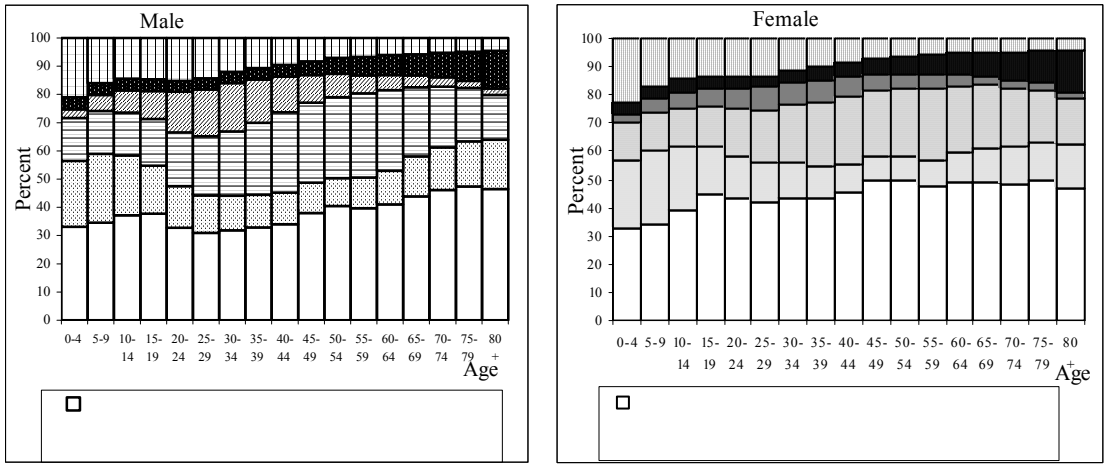


We believe that these large differences are not only data artifacts and data problems, but are probably due to both differences in access to health care systems and probably to the impact of the environment where each segment of the population lives.

Patterns by Types of Disability

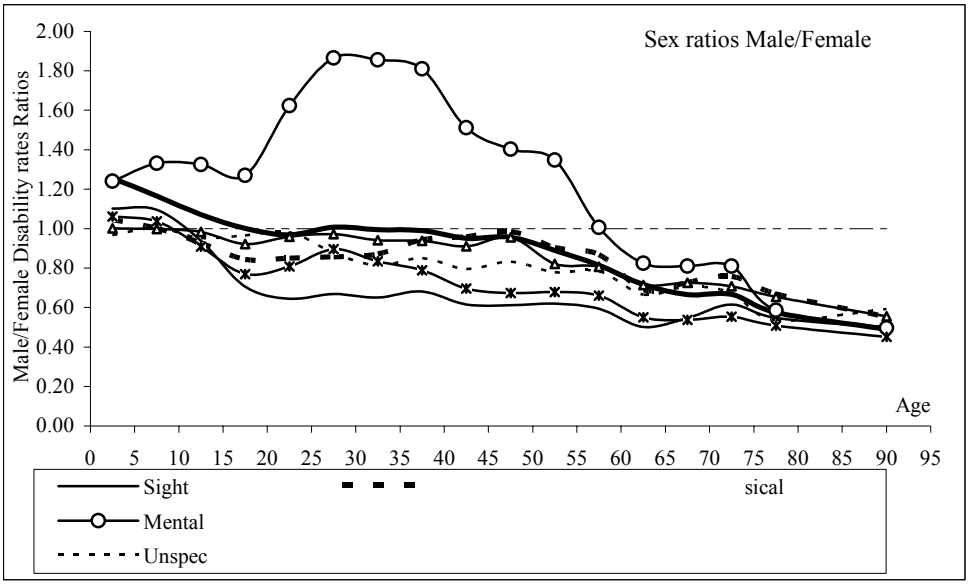
Overall the sight impairment is the most important type of disability reported by both male and female (Figures 7). The sight impairment seems to increase by age and in average, it accounts for 37 percent for male and 45 percent for female (Table 3). Physical impairment appears as the second type of disability (22 percent for male and 20 percent for female) and hearing impairment the third (15 and 20 percent for men and women respectively).

Figures 7: Disability Types by sex and age (Percent)



At youngest ages (under 10) the male children have, for all types of disability higher rates than female and after age 10, the gap between men and women seem to increase with age.

Figures 8: Ratio of Male to Female Disability Age Specific Rate by Type



At older ages (after 60) women have higher disability rates and women disadvantages even increase with age so that, at oldest ages, all types of disability clearly affect more women than men (See Figure 8). Compared to other disabilities type, mental impairment shows an atypical pattern. Between 0 and about 60, men are more affected by mental disability than female. The sex gap is even wider between 20 and 60, with a maximum around 35 where male rates are almost two times higher than female.

Urban areas seem to have higher rates than rural except for the sight impairment for which the rates are higher in rural areas than in urban for both men and women (Table 3). Sight impairments followed by physical impairments appears as leading type of disability for Africans and Asian populations. Among Whites hearing impairment appears as the second cause of disability after sight impairment and before physical impairment. For the colored population physical impairments seems to be the first type of disability among men. The fact that white population has the highest proportions of non specified type of disability (Table 3) is surprising and need further explanations.

Sight impairment followed by the physical impairment is the most important type of disability for all provinces except Western Cape that seems to have a different pattern, especially for male population. In this province, physical impairment is the highest type of disability reported among men (27 percent for physical and about 24 percent for sight). As already stated, the province of Western Cape has the lowest total disability rates. In the provinces with the highest disability rates such as Free State and North West, the sight is by far the most important type of disability with proportions closed to or higher than 50 percent. Gauteng is one of the provinces where the sight impairments seem to be very prevalent (more than 50 percent among disabled female and about 43 percent among disabled male).

Table 3: Disability Types by racial group and place of residence (Percent)

		Sight	Hearing	Physical	Mental	Multiple	Type no specified	Total Percent	Total Number *
African	Male	39.06	14.89	21.93	9.37	5.15	9.61	100.0	988381
	Female	46.52	13.66	20.18	5.07	6.21	8.37	100.0	1284105
	Both sex	43.28	14.19	20.94	6.94	5.75	8.91	100.0	2272486
Coloured	Male	23.23	11.68	28.66	12.90	4.24	19.29	100.0	64260
	Female	31.29	12.82	21.08	9.57	5.37	19.87	100.0	61553
	Both sex	27.18	12.24	24.95	11.27	4.79	19.57	100.0	125812
Indians	Male	32.80	11.81	25.45	11.38	6.39	12.17	100.0	21608
	Female	40.83	11.80	19.88	7.33	7.13	13.03	100.0	20393
	Both sex	36.70	11.80	22.75	9.42	6.75	12.59	100.0	42000
White	Male	21.45	19.96	18.22	7.84	7.75	24.77	100.0	74148
	Female	23.85	19.05	15.76	6.95	7.63	26.76	100.0	68370
	Both sex	22.60	19.52	17.04	7.41	7.69	25.73	100.0	142517
Urban	Male	33.35	16.47	24.13	10.88	5.41	9.75	100.0	550678
	Female	40.89	15.56	22.73	5.97	6.34	8.51	100.0	717879
	Both Sex	37.62	15.96	23.34	8.10	5.94	9.05	100.0	1268557
Rural	Male	39.90	13.48	20.13	8.17	5.13	13.19	100.0	601816
	Female	45.57	11.39	16.21	4.51	5.79	16.54	100.0	762305
South Africa	Male	36.92	14.98	22.13	9.51	5.29	11.18	100.0	1148395
	Female	44.70	13.85	20.00	5.38	6.25	9.81	100.0	1434420
	Both Sex	41.24	14.35	20.95	7.22	5.82	10.42	100.0	2582815
	Both Sex	43.07	12.31	17.94	6.12	5.50	15.06	100.0	1364121

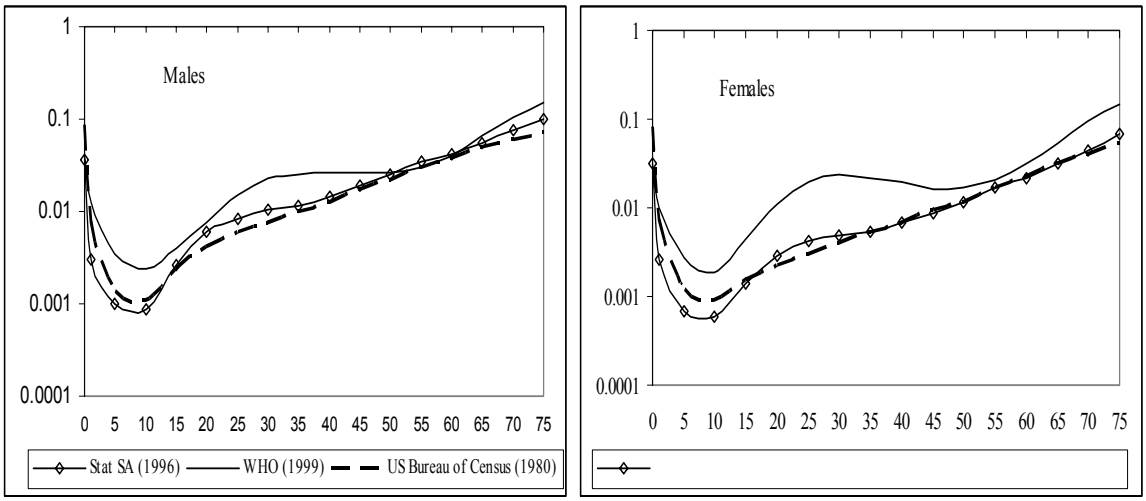
*Persons with non-specified race excluded

Source: Compute from the 30 percent sample

Mortality in South Africa

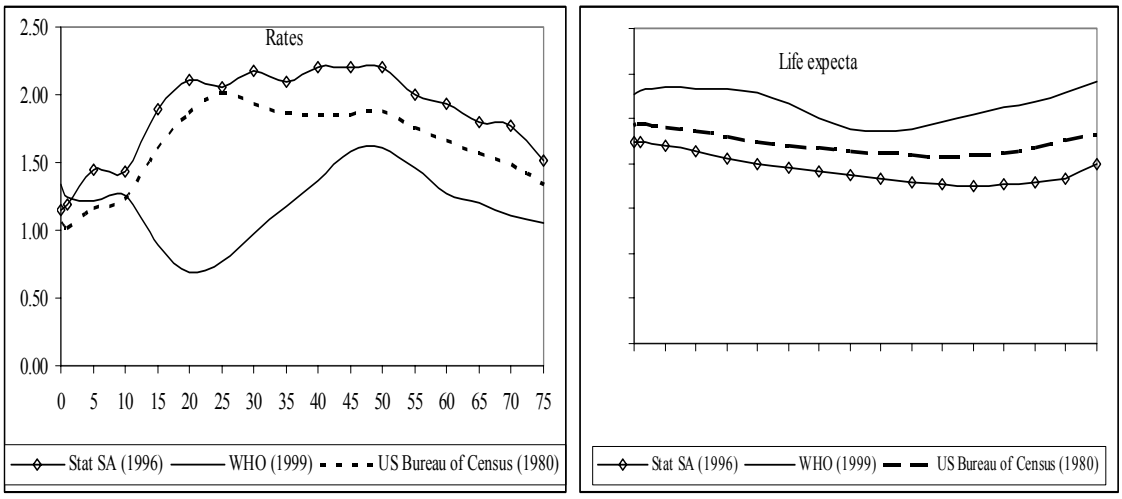
Combining data from surveys, census, and vital registration system compiled by Statistics South Africa as well as data form the national population register, various life tables have been computed for South Africa (Dorrington et al. 2001; Statistics South Africa 2000; US Bureau of Census; Lopez et al. 2000). Previous research has documented a steady increase in mortality in South Africa since the 1990s. Figures 9 show age-specific mortality rates estimated at three different points in time by three sources. The steady increase in mortality may due to a rise in injury related deaths among the young aged between 15 and 30 and to the recent increase in AIDS related deaths (Dorrington et al. 2001).

Figure 9: Log of Age Specific Mortality Rates in South Africa in 1984, 1996 and 1999



The recent increase in mortality rates is probably hitting women harder than men. The excess male mortality apparent at all ages is disappearing and being replaced by an excess female mortality at adolescent and young adult ages (Figures 9). This may be due to the fact that the HIV/AIDS epidemic is worsening the reproductive health issues of young women. However, the 1999 life table produced by WHO may have overestimated the mortality levels. While Statistics South Africa (2000) did not explicitly introduce the effects of HIV/AIDS in the estimation, WHO incorporates the incidence of HIV/AIDS on the life table using prevalence estimates from available sources and models (Lopez et al. 2000).

Figures 10: Ratios Male to Female Age Specific Mortality Rates and Life Expectancy



We use only life tables related to the year 1996 for the estimation of the disability-free life expectancy. For this year, Statistics South has published a series of life tables by sex, place and province of residence. Unfortunately, life tables were not published by racial group because registered deaths are no longer available by population group since the repeal of the Population Registration Act of 1991 (Statistics South Africa 2000).

Disability-free Life Expectancy

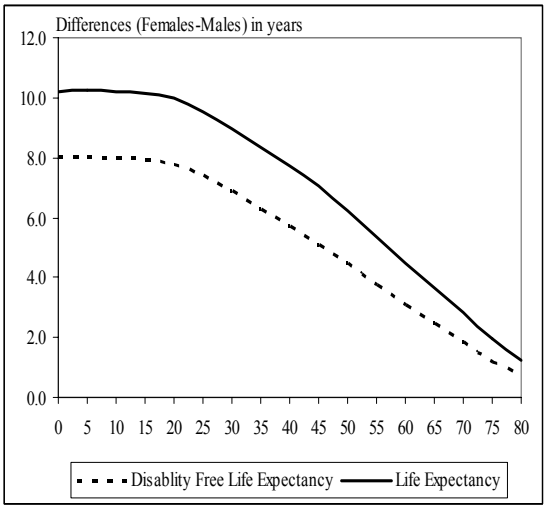
Sex differences

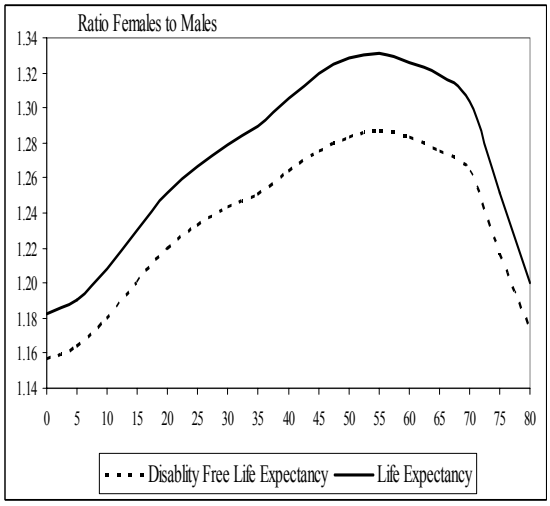
At all ages, the Disability-free Life Expectancy for women is higher than that of men (Table 5). The sex gap is higher for the life expectancy than the disability-free life expectancy (Figure 11) and women lost more years of healthy life due to disability than men (at age 0, women loses about 10 % of total life expectancies while the loss for men is about 8 %). Women live longer and spend more time with disability than men.

Table 5: Disability-Free Life Expectancy in South Africa by Sex

	Disability-free Life Expectancy (DFLE)		*Life Expectancy (LE)*		*Ratio Females/Males*		*Ratio LE/DFLE*		*Differences Females-Males*		*Percent of years "lost" due disability*	
Age	Male	Female	Male	Female	DFLE	LE	Male	Female	DFLE	LE	Male	Female
0	51.3	59.4	55.9	66.0	1.16	1.18	1.09	1.11	8.0	10.2	8.12	10.09
5	49.0	57.0	53.6	63.8	1.16	1.19	1.09	1.12	8.0	10.2	8.62	10.68
10	44.4	52.4	48.9	59.0	1.18	1.21	1.10	1.13	8.0	10.2	9.13	11.29
15	39.8	47.7	44.1	54.2	1.20	1.23	1.11	1.14	7.9	10.2	9.70	11.96
20	35.5	43.3	39.6	49.6	1.22	1.25	1.12	1.15	7.8	10.0	10.42	12.70
25	31.7	39.1	35.7	45.2	1.23	1.27	1.13	1.16	7.4	9.5	11.23	13.56
30	28.2	35.1	32.1	41.1	1.24	1.28	1.14	1.17	6.9	9.0	12.16	14.60
35	25.0	31.2	28.8	37.1	1.25	1.29	1.15	1.19	6.3	8.3	13.19	15.78
40	21.7	27.4	25.3	33.0	1.26	1.31	1.17	1.21	5.7	7.7	14.37	17.13
45	18.6	23.7	22.0	29.1	1.28	1.32	1.19	1.23	5.1	7.0	15.73	18.55
50	15.7	20.2	19.0	25.2	1.28	1.33	1.21	1.25	4.5	6.2	17.18	19.98
55	13.2	17.0	16.2	21.6	1.29	1.33	1.23	1.27	3.8	5.4	18.71	21.41
60	11.0	14.1	13.8	18.3	1.28	1.33	1.25	1.30	3.1	4.5	20.31	22.87
65	8.9	11.4	11.5	15.1	1.28	1.32	1.28	1.33	2.5	3.6	22.16	24.72
70	7.1	8.9	9.4	12.2	1.26	1.30	1.33	1.37	1.9	2.8	24.68	27.00
75	5.5	6.7	7.7	9.6	1.22	1.25	1.39	1.43	1.2	1.9	27.93	29.94
80	4.3	5.1	6.2	7.5	1.17	1.20	1.44	1.47	0.8	1.2	30.67	32.15

Figures 11: Difference Females-Male and ratios Female to Male LE and DFLE





This result is consistent with prior studies where women have been found to have higher life expectancies and higher healthy-life expectancies than men (Mathers et al. 2001). Women live

longer than men, spend more years in good health, but also spend "a greater part of their life in poor health" (Cambois et al. 2001). At least two factors have been advanced to explain this male/female differences. Men are more subject to fatal diseases while women are more subject to chronic diseases (Cambois et al. 2001; Verbrugge 1989). A longer survival in poor health followed by higher prevalence of disability may also explained the sex differences in healthy-life expectancy rather than the differences in the type of diseases (Cambois et al. 2001; Crimmins et al. 1994).

Regional differences

Generally, provinces with higher life expectancy also have higher healthy-life expectancy for both women and men (Tables 6 and 7; Figure 12). Provinces such as Western Cape, and Gauteng where life expectancy is higher (life expectancy at birth is greater than 57 and greater than 66 respectively for men and women) also have the higher disability-free life expectancy (greater than 54 and greater than 60 respectively for men and women).

Table 6: Disability-free Life Expectancy in South Africa by Sex and Province (Male)

	Disability-free Life Expectancy			*Life Expectancy with disability*			*Percent of years "lost" due disability*		
Province	*at 0*	*at 35*	*at 60*	*at 0*	*at 35*	*at 60*	at 0	at 35	at 60
Western Cape	55.10 [55.10-55.10]	27.95 [27.94-27.95]	12.00 [11.98-12.02]	2.74 [2.74-2.74]	2.23 [2.22-2.34]	1.48 [1.46-1.50]	4.73	7.39	10.99
Eastern Cape	48.11 [48.11-48.11]	21.14 [21.13-21.15]	94.74 [9.71-9.77]	4.87 [4.87-4.87]	4.21 [4.20-4.21]	3.19 [3.17-3.22]	9.19	16.59	24.69
Northern Cape	51.69 [51.69-51.69]	26.08 [26.06-26.10]	11.22 [11.7-11.27]	4.05 [4.05-4.05]	3.50 [3.48-3.52]	2.40 [.2.44-2.54]	7.27	11.83	18.18
Free State	46.85 [46.85-46.86]	22.55 [22.54-22.56]	9.12 [9.08-9.16]	6.02 [6.02-6.02]	5.07 [5.05-5.08]	3.50 [3.46-3.54]	11.39	18.34	27.72
Kwazulu Natal	51.37 [51.37-51.38]	25.57 [25.56-25.57]	12.13 [12.11-12.15]	4.29 [4.28-4.29]	3.64 [3.64-3.65]	2.67 [2.65-2.68]	7.70	12.48	18.02
North West	50.56 [50.56-50.56]	23.96 [23..95-23.97]	9.93 [9.90-9.96]	5.85 [5.85-5.85]	4.98 [4.97-4.99]	3.80 [3.77-3.83]	10.37	17.22	27.69
Gauteng	54.17 [54.17-54.17]	27.88 [27.87-27.88]	11.92 [11.90-11.93]	4.31 [4.31-4.31]	3.58 [3.58-3.59]	1.91 [1.88-1.94]	7.37	11.02	16.97
Mpumalanga	50.26 [50.26-50.27]	23.95 [23.94-23.97]	10.18 [10.14-10.21]	4.99 [4.99-4.99]	3.95 [3.94-3.96]	2.97 [2.94-3.01]	9.03	14.15	22.61
Northern Province	50.23 [50.23-50.23]	22.17 [22.16-22.18]	9.86 [9.83-9.89]	4.15 [4.15-4.15]	3.22 [3.21-3.23]	2.43 [2.40-2.46]	7.62	12.68	19.78
Total Male Population	*51.32 [51.32-51.32]*	24.96 [24.96-24.97]	10.99 [10.99-11.00]	*4.53 4.53-4.53]*	*3.79 [3.79-3.80]*	*2.80 [2.79-2.81]*	*8.12*	*13.19*	*20.31*

Source: 1996 South African census micro-data

Confidence interval in brackets (p=0.5)

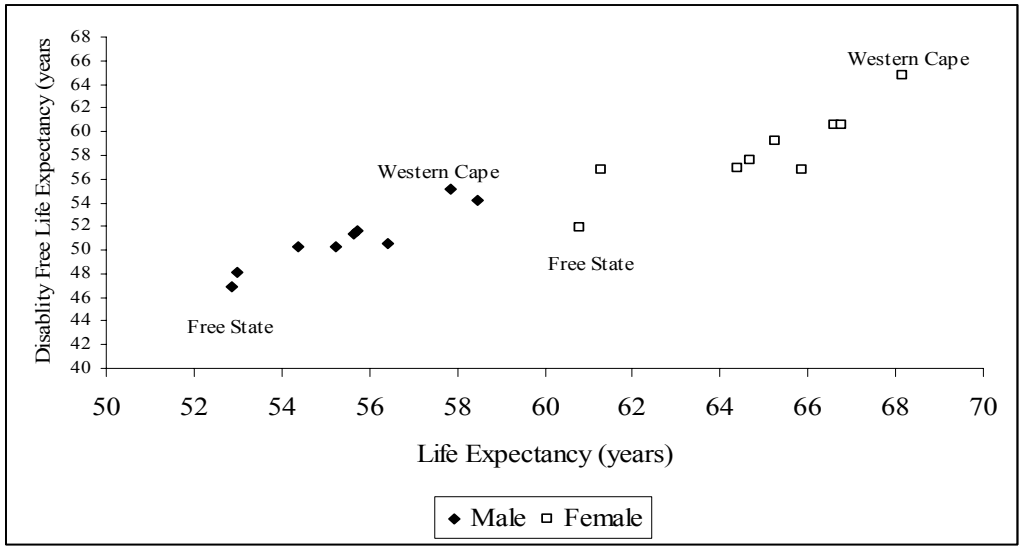
Table 7: Disability-free Life Expectancy in South Africa by Sex and Province (Female)

	Disability-free Life Expectancy			*Life Expectancy with disability*			*Percent of years "lost" due disability*		
Province	*at 0*	*at 35*	*at 60*	*at 0*	*at 35*	*at 60*	*at 0*	*at 35*	*at 60*
Western Cape	64.80 [64.80-64.80]	34.78 [34.77-34.79]	16.09 [16.08-16.11]	3.35 [3.34-3.35]	2.77 [2.76-2.77]	1.92 [1.90-1.93]	4.91	7.37	10.65
Eastern Cape	57.54 [57.54-57.54]	28.66 [28.65-28.66]	12.75 [12.73-12.77]	7.16 [7.16-7.16]	6.49 [6.48-6.49]	4.61 [4.59-4.63]	11.07	18.46	26.56
Northern Cape	56.72 [5671-56.72]	29.51 [29.49-29.52]	13.29 [13.25-13.33]	4.55 [4.55-4.55]	4.04 [4.02-4.06]	3.05 [3.01-3.09]	7.43	12.04	18.68
Free State	51.95 [51.94-51.95]	26.55 [26.53-26.56]	11.35 [11.32-11.38]	8.85 [8.85-8.86]	7.94 [7.92-7.95]	5.48 [5.44-5.51]	14.56	23.01	32.54
KwaZulu Natal	59.24 [59.24-59.24]	31.97 [31.97-31.98]	14.65 [14.63-14.66]	6.02 [6.02-6.03]	5.37 [5.36-5.37]	3.71 [3.69-3.72]	9.23	14.38	20.20
North West	56.80 [56.80-56.80]	29.16 [29.15-29.17]	12.78 [12.76-12.81]	9.06 [9.06-9.06]	8.28 [8.27-8.29]	6.21 [6.18-6.23]	13.76	22.12	32.68
Gauteng	60.53 [60.53-60.53]	32.15 [32.15-32.16]	14.10 [14.08-14.11]	6.09 [6.09-6.09]	5.04 [5.03-5.05]	3.44 [3.43-3.46]	9.14	13.55	19.63
Mpumalanga	56.86 [56.86-56.87]	29.14 [29.13-29.15]	12.90 [12.87-12.93]	7.52 [7.51-7.52]	6.47 [6.46-6.49]	4.57 [4.54-4.60]	11.67	18.18	26.17
Northern Province	60.55 [60.55-60.56]	31.25 [31.24-31.25]	13.99 [13.97-14.01]	6.20 [6.20-6.21]	5.32 [5.31-5.32]	3.74 [3.72-3.76]	9.29	14.54	21.09
Total Female Population	*59.37 (59.37-59.37)*	*31.22 (31.22-31.23)*	*14.11 (14.10-14.12)*	*6.66 [6.66-6.66]*	*5.85 [5.85-5.85]*	*4.18 [4.18-4.19]*	*10.09*	*15.78*	*22.87*

Source: 1996 South African census micro-data

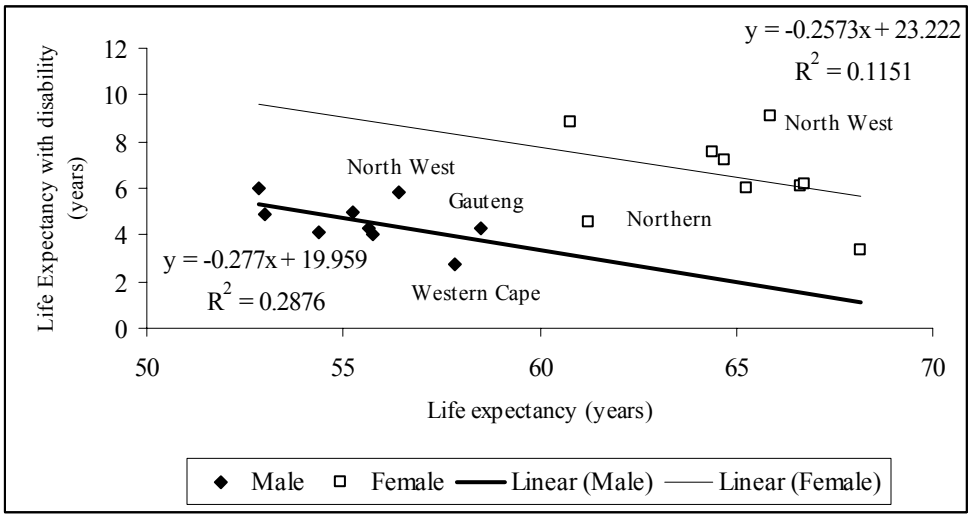
Confidence interval in brackets (p=0.5)

Figure 12: Disability-free Life Expectancy by Total Life Expectancy at birth by sex in 9 South African Provinces



Both life expectancy and disability-free life expectancy (DFLE) are higher for women than men in all provinces and the differences between the sexes seem to increase as women's life expectancy increases (LE). Also the range for men's life expectancy is only 5.6 years while for women the range is 12.9 years. There is a linear relationship between LE and DFLE at birth for both men and women (Figure 12). The difference between LE and DFLE or life expectancy with disability (DLE) seems to decline when LE increases (Figure 13).

Figure 13: Life Expectancy with disability by Total Life Expectancy at birth by sex in 9 South African Provinces



Given the level of mortality, DLE seems especially high for men and women in North West province, while DLE seems especially low in Northern Province for women and in Western Cape for the two sexes. North West and Free State are the provinces with more years lost due to disability for both male and female (more than 10 percent of total life expectancy at birth), while Western Cape has the lower years lost (less than 5 percent of total life expectancy at birth). With Gauteng, Western Cape is the wealthiest province in South Africa (Central Statistics 1997) and has the largest proportion of urban population after Gauteng (86 percent of the population of Western Cape resides in urban areas). It is the only province where Africans are a minority (about 18 percent). The majority of people residing in the province are Coloured (about 57 percent), followed by the White population (24 percent). In term of education and income, Africans living in Western Cape are better off than those living in others provinces (Central Statistics 1998a). Theses factors explain why the life and healthy-life expectancy are so high in Western Cape. On the contrary, the population of Free State as well as North West province is predominantly African living in non urban areas. Free State with Eastern Cape is the poorest provinces of the country.

Conclusion

Although the analysis of disability is necessary to generate health indicators of the people and to evaluate the progress toward universal health and rehabilitation, very little research has been done on the demography of the disabled in Africa. This paper illustrates how

questions on disability collected in some African censuses can be used for the understanding of disability in Africa. Based on information on perceived or reported disability collected during the 1996 census, this paper examines the prevalence and the patterns of disability in South Africa by selected variables. It also estimates and discusses gender and regional variations in the disability-free life expectancy using Sullivan method's (Sullivan 1971, Cambois 2001). Although based on self-reported disability, results obtained seem to reflect socioeconomic differences more than cultural differences in reporting of disability across socioeconomic groups within the society.

Our analyses show that, overall, women have reported more disability than men (6.4 percent of men have been reported disabled compared to 7.1 for women). Women seem to have higher disability prevalence rates than men at adolescent ages (between 15 and 25) and at the oldest ages. At the youngest ages (below 10) and for adults aged between 25 and 40, men seem to report higher disability rates than women. This pattern is practically constant when racial groups, province and place of residence are considered. The excess female disability rates at adolescent ages is probably related to sight impairment rates clearly higher among women age 15 and more than men (see Figure A.4 in the appendix). The excess male disability rates at youngest ages are consistent with the higher men rates for all types of disability, especially physical impairment, at this age. The excess male disability rates for Physical impairments at the youngest age are probably due to accidents that may affect more boys than girls. At adult ages, the excess male disability rates may be due to hearing impairment since the difference between male and female rates for others types of disability, especially physical impairment, seems negligible at this age.

Using life tables constructed by Statistics South Africa by sex and province, we then examine sex and regional variations in the Disability-Free life expectancy. With about 8 and 10 percent of years lost due to disability for men and women respectively, women seem to have higher life expectancies and higher healthy-life expectancies than men. Women seem to live longer than men, spend more years in good health, but also spend a greater part of their life in poor health. Wealthiest and more urbanized provinces such as Western Cape, and Gauteng with higher life expectancy also have higher disability-free life expectancy. On the other hand, the poorest provinces such as Free State and North West have the lowest life expectancy and higher life expectancy with disability.

These results are consistent with previous research conducted in developing world (Cambois et al. 2001; Mathers et al. 2001). And at least two factors have been advanced to explain this male/female differences. Men are more subject to fatal diseases while women are more subject to disabling diseases (Cambois et al. 2001; Verbrugge 1989). A longer survival in poor health followed by higher prevalence of disability may also explained the sex differences in the health expectancy rather than the differences in the type of diseases (Cambois et al. 2001; Crimmins et al. 1994). Previous research has also shown that disability is associated with poverty, education, place of residence (Cambois et al. 2001; Crimmins et al. 1996, Guralnik et al. 1993). As noted by Cambois and colleagues (Cambois et al. 2001), factors associated to disability are also correlated with socioeconomic resources, work conditions, behavior and habits, availability and access to the health care system and the environment. Census data provide the raw materials that can used to find weights for some of these factors.

References

Cambois E. 1998. "La mesure des inégalités sociales face à la santé: problème méthodologiques." Pp. 422-32 in *Morbidité, Mortalité: problèmes de mesure, facteurs d'évolution, essai de prospective: Colloque International de Sinaia*, Septembre 1996. Paris, AIDELF/PUF.

Cambois E., J. M. Robine, and M. D. Hayward. 2001. "Social inequalities in disability-free life expectancy in the French male population, 1980-1991." *Demography*, vol. 38 (4) pp. 513-524.

Central Statistics. 1997. *Earning and spending in South Africa. Selected findings of 1995 income and expenditure survey*. South Africa.

Central Statistics. 1998a. *Living in Western Cape. Selected findings of 1995 income and expenditure survey*. South Africa.

Central Statistics. 1998b. *Living in Free State. Selected findings of 1995 income and expenditure survey*. South Africa.

Central Statistics. 1998c. *Living in North West. Selected findings of 1995 income and expenditure survey*. South Africa.

Crimmins. E. M., Y. Saito, and D. Ingegneri. 1989. "Changes in Life Expectancy and Disability-Free life Expectancy in the United States." *Population and Development Review* 15:235-67.

Crimmins. E. M., M.D. Hayward, and Y. Saito. 1994. "Changing mortality and morbidity rates and the health status and life expectancy of the older population." *Demography* 31:159-75.

Crimmins. E. M. 1997. "Trends in the Disability-Free life Expectancy in the United States." Population and Development Review 23:555-72.

Dorrington R., D. Bourne, D. Bradshaw, R. Laubscher, I. Timaeus. 2001. *The Impact of HIV/AIDS on Adult Mortality in South Africa.* Technical Report, Burden of Disease Research Unit, Medical Research Council (MRC), South Africa.

Ebrahim, GJ. 1987. "Disability: its prevention and Rehabilitation". Journal of Tropical Paediatrics, 33 (1).

Gage, Anastasia J., A. Elisabeth Sommerfelt, and Andrea L. Piani, 1996. *Household Structure, Socioeconomic Level, and Child Health in Sub-Saharan Africa*. DHS Analytical Reports No. 1, Calverton, Maryland: Macro International Inc.

Long, J. Scott, 1997, Regression models for categorical and limited dependent variables, Thousand Oaks, California, Sage.

Lopez, Alan, O, Ahmad, C. JL Murray and D. J. Salomon. 2000, "WHO System of Model Life Tables", GPE Discussion Paper Series: No.8 EIP/GPE/EBD, World Health Organization.

Lopez, Alan D. J. Salomon, O, Ahmad, C. JL Murray and D. Mafat. 2000, "Life tables for 191 countries for 2000: data, methods, results", GPE Discussion Paper Series: No.9 EIP/GPE/EBD, World Health Organization.

Mathers C. D., R. Sadena, J. A. Salomon, C. JL Murray and A. D. Lopez. 2001. Healthy Life Expectancy in 191 Countries, 1999. *The Lancet*, 357:1685-91.

McDaniel, A., 1994, "Historical Racial Differences in Living Arrangements of Children", *Journal of Family History*, (19)1: 57-77.

McDaniel, Antonio and S. Philip Morgan. 1995. "Racial differences in mother-child co-residence in the past," *Journal of Marriage and the Family* (58): 1011-1017.

McDaniel, Antonio and Eliya Zulu. 1996. "Mothers, fathers, and children: Regional patterns in child-parent residence in sub-Saharan Africa," *African Population Studies* 11: 1-28.

Morgan, S. Philip, Antonio McDaniel, Andrew T. Miller, and Samuel Preston, 1993, "Racial Differences in Household And Family Structure at the Turn of Century", *American Journal of Sociology*, 98 (4): 798-828.

Navrongo Health Research Centre (NHRC). 1999. Survey on Disability in Upper East Region (Ghana). A Report Submitted to The Department of Social Welfare (Accra), June 1999.3.

Robine, Jean-Marie and I. Romieu. 1998. "Healthy active ageing: Health expectancies at age 65 in different parts of the world," Reves paper No. 318, a paper contributed to the World Health Organization, Division of Health Promotion Education and Communication, Aging and Health.

Statistics South Africa. 2000. *South African Life Tables: 1985-1994 and 1996*. Report N0. 02-06-04 (1985-1994 and 1996).

Statistics South Africa. 1998. *The people of South Africa: Population census, 1996*, The Count and how it was done, Report No 03-01-17(1996), Pretoria: Statistics South Africa.

Statistics South Africa. 2000. *The people of South Africa: Population census, 1996*, Summary Report, Report No 03-01-12(1996), Pretoria: Statistics South Africa.

Sullivan D. F., 1971. "A single index of mortality and morbidity." HSMHA Health Rep 86:347-354.

Udjo, E. O. and Petsoane. 1998. Living in Free State: Selected Findings of the 1995 October Household Surveys. Central Statistics Service (Statistics South Africa), Pretoria.

US Bureau of Census, International Data Base http://www.census.gov/ipc/www/idbnew.html

UNDP 1993. Human Development Report, Oxford University Press, USA.

Appendices

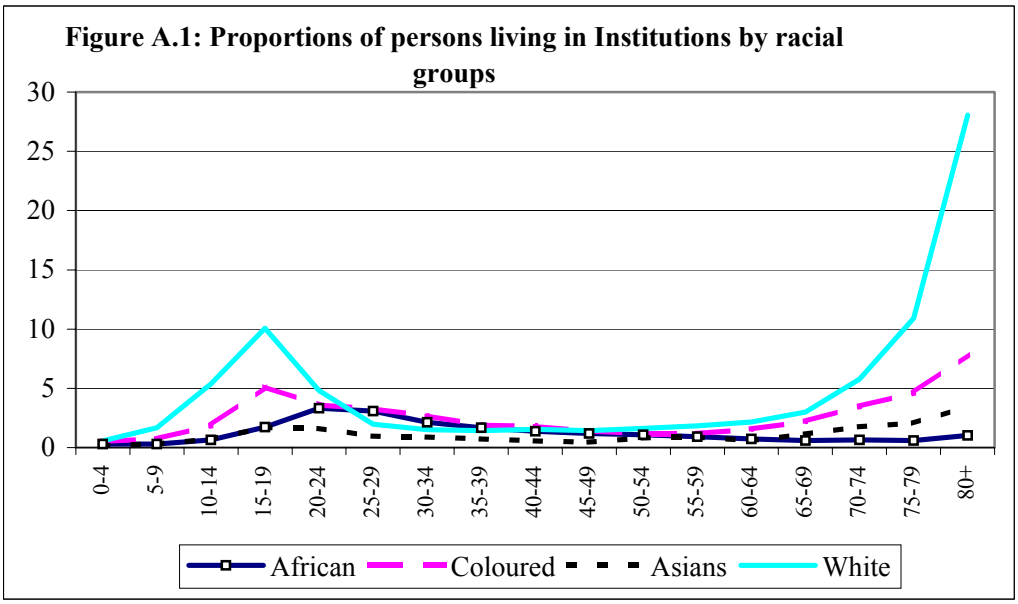


Figure A.1: Proportions of persons living in Institutions by racial groups
30
25
20
15
10
5
0
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80+
African
Coloured
Asians
White

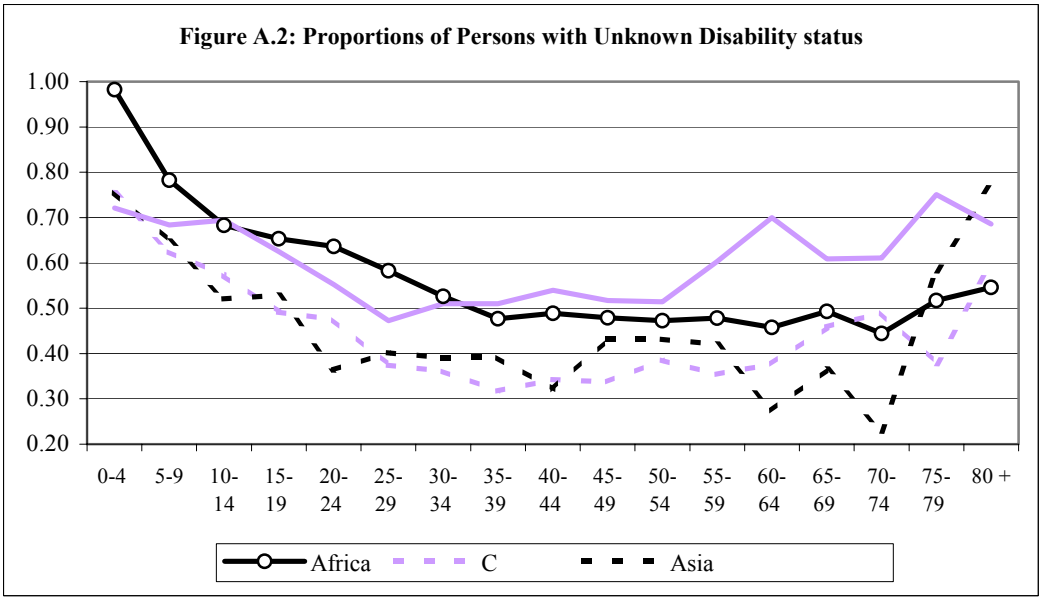
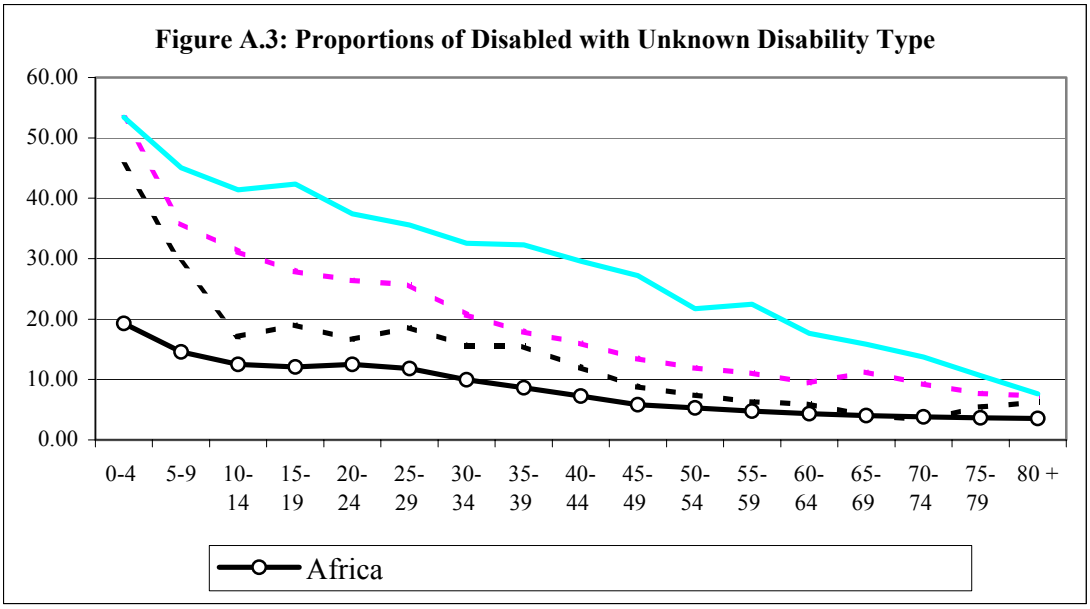


Figure A.2: Proportions of Persons with Unknown Disability status
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80 +
Africa
C
Asia



Age Specific Mortality rates and Life Expectancy by StatSA, WHO and IDL (Males)

	Stat SA (1996)		WHO (2000)		IDL (1980)	
Age	mortality rates	Life expectancy	mortality rates	Life expectancy	mortality rates	Life expectancy
0	0.0371	55.9	0.0390	47.3	0.0865	54.4
1	0.0030	56.9	0.0125	48.2	0.0075	58.2
5	0.0010	53.6	0.0034	46.5	0.0014	55.9
10	0.0009	48.9	0.0024	42.3	0.0011	51.3
15	0.0026	44.1	0.0040	37.8	0.0025	46.6
20	0.0060	39.6	0.0077	33.5	0.0042	42.1
25	0.0085	35.7	0.0149	29.7	0.0061	37.9
30	0.0106	32.1	0.0226	26.8	0.0077	34.0
35	0.0114	28.8	0.0249	24.7	0.0099	30.3
40	0.0147	25.3	0.0263	22.7	0.0127	26.7
45	0.0193	22.0	0.0259	20.5	0.0175	23.3
50	0.0251	19.0	0.0268	18.0	0.0221	20.2
55	0.0345	16.2	0.0302	15.2	0.0302	17.2
60	0.0422	13.8	0.0404	12.3	0.0375	14.6
65	0.0562	11.5	0.0652	9.5	0.0501	12.1
70	0.0772	9.4	0.1036	7.2	0.0596	9.9
75	0.1017	7.7	0.1523	5.6	0.0737	7.5
80	0.1604	6.2	0.2104	4.4	0.2104	4.8
85			0.2790	3.6		

Age Specific Mortality rates and Life Expectancy by StatSA, WHO and IDL (Females)

Stat SA (1996)	WHO (2000)	IDL (1980)

Age	mortality rates	Life expectancy	mortality rates	Life expectancy	mortality rates	Life expectancy
0	0.0322	66.0	0.0291	49.7	0.0818	61.5
1	0.0026	67.2	0.0100	50.1	0.0073	65.6
5	0.0007	63.8	0.0028	48.1	0.0012	63.5
10	0.0006	59.0	0.0019	43.7	0.0009	58.9
15	0.0014	54.2	0.0045	39.1	0.0015	54.2
20	0.0028	49.6	0.0111	35.0	0.0022	49.6
25	0.0041	45.2	0.0194	31.8	0.0030	45.1
30	0.0049	41.1	0.0233	29.8	0.0040	40.7
35	0.0055	37.1	0.0212	28.2	0.0053	36.5
40	0.0067	33.0	0.0192	26.0	0.0069	32.4
45	0.0088	29.1	0.0164	23.4	0.0095	28.5
50	0.0114	25.2	0.0166	20.2	0.0118	24.7
55	0.0173	21.6	0.0206	16.7	0.0172	21.1
60	0.0218	18.3	0.0319	13.3	0.0225	17.7
65	0.0312	15.1	0.0542	10.2	0.0320	14.5
70	0.0438	12.2	0.0936	7.6	0.0402	11.6
75	0.0672	9.6	0.1436	5.7	0.0549	8.7
80	0.1336	7.5	0.2206	4.3	0.1770	5.7
85			0.2776	3.6		

Figure A.4: Ratio of Male to Female Disability Age Specific Rate by the Three Leading Types