

## Sexual Behaviour, HIV Status, and HIV Risk among Older South Africans

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**ABSTRACT** The aim of this study was to conduct a secondary analysis on sexual behaviour, HIV status and HIV risk and co-morbidity among older South Africans using the South African 2005 HIV prevalence and behaviour survey. A multistage probability nationally representative sample involving 3795 male and female respondents, aged 50 years or older was selected. About 41.1% had been sexually active in the past 12 months and 35.9% in the past month. Men (63.1%) were significantly more sexually active than women (29.8%). Having more than one sexual partner in the past 12 months was significantly more prevalent among men (4.9%) than among women (0.2%) 50 years and above. The overall HIV prevalence was 5.8% and it was significantly higher among the rural and less educated Black African population group than among the urban, educated and non-Black African population group. Among men the HIV prevalence seemed to decline with age, while HIV prevalence was similar across age groups among women. In multiple regression analysis, older age, being female, rural residence, lower educational level, receiving social grants or pension, and low HIV risk perception were associated with HIV risk behaviour. The study contributes to the understanding of the epidemiology of HIV infection in older individuals which is critical for intervention efforts.

### INTRODUCTION

The HIV/AIDS epidemic is aging, as evidenced by the growing number of older persons globally who are affected by or infected with the virus. Analysis of the difference between all adults and adults aged 15–49 shows that around 2.8 million adults, aged 50 years and older, were living with HIV in 2005 (UNAIDS 2006). In the USA, case reporting from 2003 to 2006 shows the proportion of older HIV-positive individuals has climbed from 20% to 25% (Schmid et al. 2009).

Successful treatment regimens allow people to live longer with HIV, but the incidence is also increasing, with older adults accounting for 15% of new HIV cases in 2005 (Simone and Appelbaum 2008). Even in economically disadvantaged countries where antiretroviral medication availability is scarce or less available, the population living with HIV and AIDS includes a growing number of midlife and older adults, a

circumstance suggesting the impact of the newly infected with HIV in older age. As a result, the prevalence of HIV and AIDS among people in midlife and late adulthood is increasing at a time when members of such older generations also are being called on to care for adult children and grandchildren who are infected with or affected by the virus (Levy et al. 2003). Older individuals are rarely included in Demographic Health Surveys (DHS). In the last 5 years, only 13 of 30 surveys included older males and none included older females (Schmid et al. 2009). South Africa's national household HIV survey in 2005 found a prevalence of 10.8% among people aged 50–54, 4.5% among those aged 55–59, and 3.9% among those aged 60 or over (Shisana et al. 2005). The 2008 Kenya AIDS Indicator Survey (KAIS) found that the HIV prevalence among adults aged between 50 and 54 years was 8% compared to 4.1% among young people of ages 15 to 24 years (Okwemba 2008). Kassu et al. (2004) found 5% (35/706) HIV prevalence among elderly in a rural population in north-west Ethiopia. There is a dearth of prevalence data and sexual activity of older individuals in the developing world is barely researched (Schmid et al. 2009). Many older individuals everywhere are sexually active, although interest in sex and frequency of vaginal

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intercourse declines with age (Lindau et al. 2007). A few small studies have identified HIV risk behaviour among adults 50 years and above. Lovejoy et al. (2008) found that 38% of participants in the US were sexually active in the past three months and 33% of whom had at least one occasion of anal or vaginal intercourse that was not condom protected. Sormanti and Shibusawa (2007) found among 1280 US 60 to 64 years-old female clinic patients that 73% reported having sex in the past 6 months, of which 12% reported always using a condom during vaginal sex and 45% reported having been tested for HIV; HIV risk (no condom use) was found to be associated with less education, being unemployed, not living with a partner, and being HIV negative. Jacobs and Thomlison (2009) found among 572 US women 50 years and older, recruited from a community that safer sex behaviours were associated with self-silencing and increasing age, and in bivariate correlation analysis, HIV stigma was inversely associated with safer sex behaviours. Karpiak and Shippy (2006) found among 914 people over the age of 50 living with HIV in New York City that 50% were sexually active in the past 3 months. In Canada, few adults over 50 are routinely tested for HIV because they do not perceive themselves to be at risk for acquiring and transmitting the HIV virus and they lack knowledge about the ways in which the virus is not transmitted, e.g. casual contact, sneezing, coughing and use of the same bathroom facilities. This, therefore, puts them at risk of engaging in activities that transmit HIV. Early symptoms of AIDS may be dismissed as part of the aging process (Eldred and West 2005).

Despite increased recognition of the increasing experience of HIV/AIDS at later stages of the life course, we still know little of how HIV/AIDS affects older adults worldwide in terms of HIV type (type 1 vs. type 2 and different classes within type 1 [e.g., B vs. C]), societal and racial/ethnic diversity, gender distribution, educational level, socio-economic status, across and within age cohorts, over generations, and by specific categories of HIV risk (Levy et al. 2003). Understanding the epidemiology of HIV infection in older individuals can lead to interventions to make these years safer and more enjoyable (Schmid et al. 2009).

Aging is a complex set of processes that affect people both socially and biologically. Among older persons who are HIV-positive, such changes can complicate the already challenging medical

decisions that need to be made in successfully managing the disease. Older adults who contract the virus have shorter survival times than their younger counterparts despite treatment with HAART (Levy et al. 2003). Patients living longer with HIV are more likely to develop diseases associated with aging, and at an earlier age, than those without HIV. These include coronary artery disease, dyslipidemia, metabolic syndrome, diabetes, osteoporosis, and dementia. Geriatricians and primary care providers are increasingly responsible for managing these complex issues (Simone and Appelbaum 2008). Magalhães et al. (2007) reviewed the charts of 162 patients with HIV who were 50 years or older who had sought dental treatment from 2000 through 2006 in Brazil. A total of 88.8% of the study subjects had at least one co-morbidity. Co-morbidity prevalence was 44.4% for hepatitis C virus, 41.4% for hypertension, 16.7% for psychiatric disorders, 16.1% for chronic obstructive pulmonary disease, 15.4% for anemia and 14.8% for heart disease.

Therefore, the aim of this study was to conduct an analysis of secondary data on sexual behaviour, HIV status and HIV risk and co-morbidity among older South Africans using the South African 2005 HIV prevalence and behaviour survey.

## METHODS

### Sample and Procedure

The survey targeted all persons over 2 years of age living in South Africa and residing in homes, i.e. excluding individuals living in educational institutions, old-age homes, hospitals and uniformed service barracks but including those living in hostels. The survey applied a multi-stage stratified sampling approach based on a master sample consisting of 1 000 enumerator areas (EAs) used by Statistics South Africa for the national census in 2001. Three persons in each household were potentially eligible to be selected for the survey; however only one was selected from each of the age groups 2 -14 years, 15 -24 years, and 25 years and older. The sample included in this analysis includes the age group 50 years and above (range 50 to 96; median 60 years, IQR 55-67 years), 3795 of which all were interviewed and 2787 also tested for HIV whilst 1008 (22.6%) were interviewed but not tested for HIV. Linked anonymous HIV testing was performed using

dried blood spot (DBS) specimens. Socio-demographic and behavioural information was collected with questionnaires administered by retired nurses trained as field workers. (Further details on methodology and ethics procedure, Shisana et al. 2005).

## Measures

*HIV Antibody Testing:* Using DBS spots all samples were first tested with Vironostika HIV-1 Uniform II Plus O assay (bioMerieux); all HIV positive samples were retested with a second ELISA test (Vitros ECI, Ortho Clinical Diagnostics) (Shisana et al. 2005).

The questionnaire included demographic variables such as age, sex, formal education completed, marital status and socio-economic status.

*HIV Testing History:* The survey included questions concerning history of HIV antibody testing. Participants who reported having been tested for HIV indicated their HIV awareness status of their most recent test, or that they did not know the results.

*HIV Risk Behaviour History:* To assess HIV risk history, participants indicated the number of sex partners they had in the previous 12 months, had symptoms of a sexually transmitted infection (STI), and whether they had ever used a condom, a condom with their last sexual partner and their last sexual non-regular partner. All responses were dichotomous indicating the occurrence or non-occurrence of each risk factor. A HIV risk scale was constructed utilizing six HIV risk items.

*HIV Knowledge:* A 7-item HIV knowledge test was used, e.g. Is it possible to transmit HIV through unprotected sex? Response options were yes, no, does not know. Responses were scored for the number of correct responses; with don't know responses scored incorrect, range 0-7. Scores were coded into three levels low= 5 correct responses; medium=6 correct responses, and high=7 correct responses (Cronbach alpha=0.76).

*HIV Stigma Attitudes:* Five AIDS stigma items were adapted from previous research and developed for use in South Africa, e.g. "I would be willing to care for a family member with AIDS". Response options were yes, no, do not know; "no and do not know were coded one and yes coded 0". A total score was calculated, range 0-5. Score was dichotomised, 1 score accepting attitude and 2-5 scores stigmatizing attitude (Cronbach alpha=0.56).

One question was used to assess HIV risk perception, and classified into Low (won't get infected with HIV), Medium (probably won't get infected with HIV) and High (definitely/probably will get infected with HIV).

*HIV Impact:* Participants responded to three HIV impact items, has anyone in the household ever been diagnosed with HIV-AIDS, is there a person in the household who is bed-ridden with an AIDS related illness, and past year occurrence of AIDS-related death of household member. Response options were "yes or no".

The Alcohol Use Disorders Identification Test (AUDIT) (Babor et al. 2001) was used to specifically identify hazardous and harmful drinking using a cut-off score of 8. Because AUDIT is reported to be less sensitive at identifying risk drinking in women (Freeborn et al. 2000), the cut-off points of binge drinking for women were reduced by one unit as compared with men. Cronbach alpha for the AUDIT was .76 for this sample.

Illness conditions were assessed with the question "Do you currently have any of the following illnesses or conditions" including hypertension or high blood pressure, diabetes, tuberculosis, pneumonia, cancer and sexually transmitted diseases such as syphilis, gonorrhoea or herpes.

## Data Analysis

Data analysis was performed using STATA software version 10.0 using *svy* commands (Stata Corporation, College Station, Texas, USA). The analysis in STATA took into account the multilevel stratified cluster sample design of the study. To investigate the prevalence of the knowledge of HIV test results among participants, odds ratios were used to express the strength of the relationship between demographic, behavioural, HIV knowledge and risk attitudes and knowledge of HIV test result. Univariate and multivariate logistic regression was used for evaluation of the impact of demographic, behavioural, and HIV knowledge and risk attitudes.

## RESULTS

### Sexual Behaviour

From the total sample of 3795 people aged 50 years and above, 41.1% indicated that they had been sexually active in the past 12 months and 35.9% in the past month. Men (63.1%) were

significantly more sexually active than women (29.8%). Proportions significantly reduced with age, to 9.1% of the men and 2.7% of women still being sexually active at the age 70 years and above. Having more than one sexual partner in the past 12 months was significantly more prevalent among men (4.9%) than among women (0.2%) 50 years and above. As expected men had a younger recent sexual partner (71.9% 41-60 years) than women (82.9% 51-70 years). Men had more recent sexual partners who were 20 and more years younger with increasing age, 4.7% of 50 to 59 year-olds, 6.4% of 60 to 69 year-olds and 17.1% of 70 years and above, respectively, likewise, women had more recent sexual partners who were 10 and more years younger with increasing age, 1.7% of 50 to 59 year-olds, 3.8% of 60 to 69 year-olds and 5.2% of 70 years and above, respectively (see Table 1).

#### HIV Status and Demographic Characteristics

The overall HIV prevalence among the

studied age group (50 years and above) was 5.8%. HIV prevalence was significantly higher among the rural and less educated Black African population group than among the urban, educated and non-Black African (Whites, Coloured and Indian or Asian) population group. Among men, the HIV prevalence seems to decline with age (10.9% among 50 to 59 year-olds compared to 1.6% among the 70 or older age group), while HIV prevalence is similar across age groups among women (5.4% in the age group 50 to 59 year-olds and 4.9% among the 70 or older age group). In particular among divorced, separated or widowed men (14.4%) HIV prevalence was much higher than that found among single (6.5%) and married or cohabitating men (5.7%), while among women HIV prevalence did not differ by marital status (see Table 2).

#### HIV Status and Sexual Behaviour Variables

HIV status did not significantly differ by having been sexually active in the past 12 months,

**Table 1: Sexual behaviour by sex and age group among older South Africans**

	All (n=3795) N (%)	50-59 (n=1875) (%)	60-69 (n=1221) (%)	70 and above (n=699) (%)	P*-values
<i>Sexually Active in Past 12 Months</i>					
All	1559 (41.1)				
Men	814 (63.1)	81.3	56	37.7	0
Women	745 (29.8)	45	17.9	3.1	0
<i>Sexually Active in Past Month</i>					
All	3577 (94.3)				
Men	1186 (91.9)	45.9	38.3	15.7	0.979
Women	2391 (95.5)	43.2	32.9	23.9	0.002
<i>More Than One Sex Partner in Past year</i>					
All	63 (1.8)				
Men	59 (4.9)	9.1	6.1	1.2	0.022
Women	4 (0.2)	2	0	0	0.404
<i>Age of Most Recent Sexual Partner</i>					
<i>Men</i>					
14-20	2 (0.2)	0.3	0.2	0	0
21-30	20 (31.6)	2.8	0.7	0	
31-40	80 (6.2)	11.4	3.5	1.8	
41-50	313 (24.2)	42.2	7.9	6.4	
51-60	268 (20.8)	23.1	25.9	4.4	
61-70	98 (7.6)	0.6	15.5	15.1	
71 or more	509 (39.4)	19.7	46.3	72.2	
<i>Women</i>					
14-20	0 (0.0)	0	0	0	
21-30	1 (0.04)	0	0	0	
31-40	14 (0.6)	0.8	0.3	0	
41-50	65 (2.6)	3.1	0.4	0.1	
51-60	394 (15.7)	28.5	1.8	0.2	
61-70	201 (8.0)	9.9	12.2	0	
71 or more	1829 (73.0)	57.6	85.3	99.6	

\*These p-values are compared to Pearson chi-squared statistic.

**Table 2: HIV status and demographic characteristics**

	N	Total sample		Men		Women	
		HIV+ (%)	p-values	HIV+ (%)	p-value	HIV+ (%)	P-value
<i>Age</i>							
All	3795	5.8					
50-59	1875 (49.4)	7.9	0.038	10.9	0.023	5.4	0.388
60-69	1221 (32.2)	3.9		4.9		3	
70 and above	699 (18.4)	3.7		1.6		4.9	
<i>Population Group</i>							
Black African	1941 (51.2)	8	0	10.9	0	5.9	0
Non-Black African*	1854 (49.0)	0.8		1.1		0.4	
<i>Locality</i>							
Urban	2563 (67.5)	4.1	0.016	5.3	0.112	2.9	0.013
Rural	1232 (32.5)	7.8		9.9		6.2	
<i>Marital Status</i>							
Single	307 (8.1)	6.9	0.457	6.5	0.032	7.1	0.423
Married/cohabitating	2143 (56.5)	5.1		5.7		4	
Divorced/separated/widowed	1345 (35.4)	6.6		14.4		4.2	
<i>Formal Education</i>							
Grade 7 or less	2013 (53.4)	7.5	0.001	9.8	0	5.7	0.859
Grade 8 to 11	967 (25.7)	3.7		4.7		2.9	
Grade 12 or more	787 (22.9)	1.3		1.3		1.2	
<i>Main Source of Your Household Income</i>							
Formal salary	822 (26.2)	6	0.493	7.8	0.096	3.1	0.442
Contributions by family member	686 (21.9)	5.7		9.1		3.3	
Government pensions/donations/grants	1628 (51.9)	3.9		2.3		4.9	

\*Whites, Colours or Judicans or Africans

ever having had an HIV test, number of sexual partners in the past 12 months, HIV knowledge, HIV stigma attitudes, ever a household member diagnosed with HIV, death from AIDS in household in the past 12 months. From the total sample, 20.1% indicated that they had ever been tested for HIV, 28.7% among men and 15.6% among women. The reasons advanced for not undertaking an HIV test were in descending order of frequency: low risk perception (52.5%), trusting partner (7.1%), others (6.4%), not knowing where to get tested (6.3%), have not gotten around it (6.0%), afraid to find out (1.7%), and concerned about confidentiality (0.2%).

HIV prevalence was associated with not used a condom at last sex, had stayed away from home for more than one month in the past year, high HIV risk perception and having a person in the household who is bed-ridden with an AIDS related illness. Among men, HIV prevalence was associated with high HIV risk perception and having stayed away from home for more than a month in the previous year. Among women, HIV prevalence was associated with having a bed-ridden AIDS patient, not being sexually active in the past 12 months and having two or more sexual partners in the past 12 months (see Table 3).

Comparing HIV knowledge and condom use

among the study of 50 years and above with younger age groups of the same survey, the older age groups had significantly less HIV knowledge and significantly more inconsistent condom use than the younger age groups (see Table 4).

### Correlates of HIV Risk Behaviour

Using a six-item HIV risk scale (including never HIV test, no condom use at last sex, never used a condom, more than one sexual partner in the past 12 months, hazardous or harmful drinker, history of STI), total scale scores were dichotomised into 5 and more as high risk and four and below low or no risk for logistic regression analyses.

In bivariate analyses, older age, being female, rural residence, lower educational level, receiving social grants or pension, low HIV knowledge, and low HIV risk perception were associated with HIV risk behaviour. In multiple regression analysis, older age, being female, rural residence, lower educational level, receiving social grants or pension, and low HIV risk perception were associated with HIV risk behaviour (see Table 5).

### HIV Status and Co-morbidity

HIV prevalence was positively associated

**Table 3: HIV status and HIV knowledge, attitudes and sexual behaviour variables**

	N	HIV infected					
		All (%)	p-values	Men (%)	p-values	Women (%)	P*-values
<i>Sexually Active in Past 12 Months</i>							
Yes	1559	5.9	0.817	7.6	0.63	2.4	0.019
No	2236	5.5		6.3		5.2	
<i>Ever Had an HIV Test</i>							
Yes	718	5.7	0.938	7.5	0.728	4.1	0.618
No	3037	5.6		6.5		4.9	
<i>Number of Sex Partners in Past Year</i>							
0	1973	5.5	0.141	6	0.278	5.4	0.014
1	1462	4.6		5.9		2.3	
2 and more	63	14.2		14.3		11.8	
<i>No Condom Use at Last Sex</i>							
Yes	3623	5.4	0.031	6.7	0.191	4.3	0.063
No	172	12.3		12.9		10.6	
<i>Away From Your Home for More Than One Month in Past 12 Months</i>							
Yes	283	12.8	0.015	19.5	0.008	5	0.807
No	3512	5.1		5.8		4.4	
<i>HIV Knowledge</i>							
Low	119	2.6	0.338	1.9	0.643	3.3	0.122
Medium	948	6.7		7.6		5.9	
High	1095	4.6		6.9		2.8	
<i>HIV Stigma Attitudes</i>							
Accepting	828	4.6	0.501	6.3	0.773	3.2	0.277
Stigmatizing	2967	5.9		7.4		4.8	
<i>Has Anyone in the Household Ever Been Diagnosed with HIV/AIDS</i>							
Yes	156	5.7	0.883	7.7	0.81	4.8	0.846
No	3594	5.4		6.6		4.2	
<i>Has Anyone in This Household Died of HIV/AIDS in the Past 12 Months</i>							
Yes	101	3.5	0.39	9.2	0.732	1.4	0.17
No	3694	5.8		7.1		4.6	
<i>A Person in the Household Who is Bed-ridden with an AIDS Related Illness</i>							
Yes	13	33.9	0.008	14.3	0.491	49.2	0
No	3782	5.6		6.9		4.2	
<i>HIV Risk Perception</i>							
Low	1990	3.7	0.001	2.8	0	4.4	0.859
Medium	939	3.7		3.6		3.8	
High	823	10.6		17.9		4.8	]

\*These p-values are compared to Pearson chi-squared statistic.

with hazardous or harmful drinking, tuberculosis and sexually transmitted diseases and negatively associated with hypertension and cancer. Having diabetes or pneumonia was not significantly associated with being HIV positive. Hazardous or harmful drinking was very significantly associated with being HIV positive among women but not among men. Lower HIV co-morbidity of diabetes, hypertension and perhaps cancer may be a function of age, the median age of HIV infected was 55 years (IQR 51-63) and of HIV uninfected was 61 years (IQR 55-67) (see Table 6). In addition, it was found that 50% of the participants with an HIV infection also had at least one other illness condition and 38% had at least two other illness conditions, in addition to HIV infection.

## DISCUSSION

This nationally representative study in South Africa found that 41.1% of 3795, 50 years or older had been sexually active in the past 12 months and 35.9% were sexually active in the past month. Similar and higher results of sexual activity have been reported among aged populations in previous studies. For instance, Lovejoy et al. (2008) found that Americans aged 50 years and above were sexually active in the past 3 months (38%) and 33% of whom had at least one occasion of anal or vaginal intercourse that was not condom protected. Sormanti and Shibusawa (2007) found that 73% of US 60-64 years old females had been sexually active in the past 6 months of which 12%

**Table 4: Comparison of age groups with HIV knowledge and condom use (Percentages are column totals)**

Age Group	High	Low	Total (N)
<i>Knowledge of HIV</i>			
15 to 24	33.5	33.4	4220
25 to 49	49.5	48.3	4732
50+	17.1	18.3	2162
Total (N)	5191	5923	11114
<i>Did You Use a Condom at Last Sex?</i>			
15 to 24	41.3	27.2	5708
25 to 49	55.1	45.9	6892
50+	3.6	26.9	3795
Total (N)	3520	12875	16395
<i>Ever Used a Condom?</i>			
15 to 24	31.5	30.2	5708
25 to 49	59.0	40.3	6892
50+	9.5	29.5	3795
Total (N)	6314	10081	16395
<i>Did You Use a Condom with Last Non-regular Partner?</i>			
15 to 24	44.5	33.4	619
25 to 49	51.1	59.2	666
50+	4.3	7.4	122
Total (N)	590	817	1407

reported always using a condom during vaginal sex and 45% reported having been tested for HIV. Karpiak and Shippy (2006) found that 50% of individuals aged 50 years and above living with HIV in New York City had been sexually active in the past three months. Like in the study of Nicolosi et al. (2004) in 29 countries, where more than 80% of the men and 65% of the women aged 40 to 80 had been sexually active in the past 12 months, men were, as in this study, significantly more sexually active than women. We conclude that older individuals are sexually active although the extent may vary by gender and engagement in sexually risky behaviours.

The overall HIV prevalence among the studied age group (50 years and above) was 5.8%. HIV prevalence was associated with not having used a condom at last sexual encounter, had stayed away from home for more than one month in the past year, high HIV risk perception and having a person in the household who is bed-ridden with an AIDS related illness. Among men, HIV prevalence was associated with high HIV risk perception and having stayed away from home for more than a month in the previous year. Among women, HIV prevalence was associated with having a bed-ridden AIDS patient, not being sexually active in the past 12 months and having two or more sexual partners in the past 12 months. The 2008 Kenya AIDS Indicator Survey (KAIS) found that the HIV prevalence among adults aged

between 50 and 54 years was 8% (Okwemba 2008). Kassu et al. (2004) found 5% HIV prevalence among elderly in a rural population in north-west Ethiopia. UNAIDS estimates that around 2.8 million adults aged 50 years and older were living with HIV in 2005, representing 7% of all cases (UNAIDS 2006). It is evident that a substantial proportion of people aged 50 years and older are living with HIV. Like in the current study, Kassu et al. (2004) found a decreasing pattern of HIV prevalence as client's education level increases. Among illiterate and able to read clients, HIV prevalence was found to be 33% and 34.5% respectively, whereas it was only 11.3% among clients with tertiary educational level. In this study, HIV prevalence was found to be high particularly among divorced, separated or widowed men (14.4%). Similarly, Korra et al. (2005) found that ever married VCT clients were more likely to be HIV positive than never married ones. HIV prevalence for never married clients was estimated at 17.6% as opposed to currently married 30.9%. A significantly higher prevalence was found among clients whose marriages doom ended by divorce/separation (42.9%) and death of partner (61.8%). Van Landingham and Knodel (2007) suggest a fair amount of behaviour in older people could expose both unmarried older men and their sexual partners to HIV because they do not use condoms.

The current study also found age disparity in sexual activity: Men had more recent sexual partners who were 20 and more years younger with increasing age, 4.7% of 50 to 59 year-olds, 6.4% of 60 to 69 year-olds and 17.1% of 70 years and above, respectively, likewise, women had more recent sexual partners who were 10 and more years younger with increasing age, 1.7% of 50 to 59 year-olds, 3.8% of 60 to 69 year-olds and 5.2% of 70 years and above, respectively. Age mixing (cross-generational sex or intergenerational sex) has become common. For instance, in a review of 45 quantitative and qualitative studies in sub-Saharan Africa, Luke (2003) found that these relationships were common. There is ample evidence that suggests that age-disparity relationships are associated with risky sexual behaviour and increased risk of HIV infection due to low risk perception and inability and fear to negotiate sex among others (Longfield et al. 2004; Shisana et al. 2005; Leclerc-Madlala 2008).

Using a six-item HIV risk scale older age, being female, rural residence, low educational level,

**Table 5: Multivariate analysis of determinants of HIV risk**

<i>Socio-demographic and HIV Variables</i>	<i>Crude OR (95% CI)</i>	<i>P-Value</i>	<i>Adjusted OR (95% CI)</i>	<i>P-Value</i>
<i>Age Categories</i>		0.0212		
50-59	1		1	
60-69	0.62 (0.18-2.09)	0.44	1.21 (0.30-4.82)	0.79
70 and above	0.11 (0.02-0.52)	0.006	0.36 (0.069-1.82)	0.214
<i>Sex</i>		0		
Male	1		1	
Female	0.11 (0.039-0.31)	0	0.19 (0.059-0.57)	0.004
<i>Race Group</i>		0.2791		
Black African	1		-	
Non-Black African	0.31 (0.23-0.43)	0.279		
<i>Geographical Type</i>		0.2969		
Urban	1		-	
Rural	2.14 (0.51-8.98)	0.297		
<i>Marital Status</i>		0.9222		
Single	1		-	
Married/cohabitating	0.78 (0.18-3.42)	0.746		
Divorced/separated/widowed	0.99 (0.18-5.31)	0.988		
<i>Highest Educational Qualification</i>		0		
Grade 7 or less	1		1	
Grade 10 to 11	0.0092 (0.001-0.07)	0	0.013 (0.002-0.10)	0
Grade 12 or more				
<i>Main Source of Household Income</i>		0.0476		
Formal salary	1		1	
Contributions by family member	1.43 (0.32-6.37)	0.64	1.16 (0.26-5.20)	0.843
Government pensions/donations/grants	0.30 (0.08-1.14)	0.077	0.28 (0.089-0.89)	0.032
<i>Knowledge of HIV</i>		0.176		
Low	1		-	
Medium	1.1 (0.13-10.30)	0.905		
High	0.17 (0.01-2.56)	0.199		
<i>HIV Risk Perception</i>		0.4572		
Low	1		-	
Medium	2.63 (0.53-13.01)	0.235		
High	1.87 (0.54-6.44)	0.32		
<i>Attitudes Towards PLHIV</i>		0.0549		
Accepting	1		1	
Stigmatizing	4.26 (0.97-18.71)	0.0055	2.23 (0.54-9.15)	0.264

**Table 6: HIV status and current illness conditions by gender**

	<i>N (%)</i>	<i>HIV infected</i>					
		<i>All (%)</i>	<i>P*-values</i>	<i>Men</i>	<i>P*-values</i>	<i>Women</i>	<i>P*-values</i>
<i>Hazardous or Harmful Drinking</i>							
Yes	183 (5.5)	9.2	0.004	7.3	0.988	17.8	0
No	3612 (94.5)	5.6		7.3		4.3	
<i>Hypertension or High Blood pressure</i>							
Yes	1592 (43.0)	2.8	0	1.9	0.001	3.2	0.093
No	2112 (57.0)	7.3		8.9		5.5	
<i>Diabetes</i>							
Yes	456 (12.4)	2.4	0.06	4.9	0.557	0.5	0
No	3224 (87.6)	5.8		6.8		4.8	
<i>Tuberculosis</i>							
Yes	82 (2.2)	20.9	0	20.6	0.006	21.9	0.002
No	3598 (97.8)	4.9		5.9		4.1	
<i>Pneumonia</i>							
Yes	32 (0.9)	7	0.791	18.8	0.256	0	0.523
No	3642 (99.1)	5.4		6.6		4.5	
<i>Cancer</i>							
Yes	39 (1.1)	0.5	0.004	0	0.62	0.7	0.034
No	3634 (98.9)	5.5		6.7		4.4	
<i>Sexually Transmitted Disease</i>							
Yes	14 (0.4)	31.4	0.011	53.9	0.001	16.7	0.147
No	3654 (99.6)	5.4		6.5		4.4	

\*These p-values are compared to Pearson chi-squared statistic.



receiving social grants or pension, and low HIV risk perception were associated with HIV risk behaviour in this study. These results lend support to those of previous studies. Sormanti and Shibusawa (2007) found among 1280 US aged 60 to 64 years-old that HIV risk was associated with less education, being unemployed, not living with a partner, and being HIV negative. In Canada, few adults over 50 are routinely tested for HIV because they do not perceive themselves to be at risk for acquiring and transmitting the HI virus (Eldred and West 2005). Results show that those individuals who are in age group 70 years and above are 2 times more likely to be at higher risk than those in age group 50-59 years. Females are more likely to be at higher risk than males. This may be attributed to the fact that many older people think the idea that they may be at risk of contracting HIV in later life is an alien one because prevention information is targeted almost exclusively at younger people and awareness of risk factors amongst older people is low. Older people are therefore less likely to take measures to reduce their risk of contracting HIV when having sex with a new partner.

From the total sample, 20.1% indicated that they had ever been tested for HIV, 28.7% among men and 15.6% among women. The most important reasons advanced for not undertaking an HIV test included low risk perception. HIV testing for older people should be encouraged at all times.

HIV prevalence was positively associated with hazardous or harmful drinking (in particular among women), tuberculosis and sexually transmitted diseases and negatively associated with hypertension and cancer. Having diabetes or pneumonia was not significantly associated with being HIV positive. Lower HIV co-morbidity of diabetes, hypertension and perhaps cancer may be a function of age, the median age of HIV infected persons was 55 years (IQR 51-63) and of HIV uninfected persons was 61 years (IQR 55-67). Half of those participants with HIV infection also had at least one other illness condition and 38% had at least two other illness conditions, in addition to HIV infection. Other studies seem to have found higher co-morbidities for PLHIV, e.g., 88.8% at least one co-morbidity and 41.4% for hypertension in Brazil (Magalhães et al. 2007). Prevention, treatment and care efforts should not only target HIV but also other health issues affecting older adults (Graber et al. 2004). The additional diagnoses with other chronic diseases

increase the challenge of self care management. When they intersect, the treatment regimens required for HIV and other chronic diseases can be overwhelming for patients and may create heavy demands on the health care system. Age and then presence of co-morbidities should not be a deterrent to the use of HAART (Simone and Appelbaum 2008; Paul et al. 2007).

## CONCLUSION

The study found a high HIV prevalence and HIV risk behaviour among older South Africans. The target group 50 years and above is neglected in South Africa in as far as HIV/AIDS is concerned. There is currently no national health campaigns regarding STD/HIV prevention, testing, transmission and treatment that are tailored towards this target group; prevention and treatment efforts ignore specific needs of individuals aged 50 years and above. Education and prevention programmes mainly target young people. Health-care professionals are less likely to suspect a diagnosis of HIV/AIDS in symptomatic older men and woman than in younger people (Hillman 2008; Lekas et al. 2005). Prevention efforts should include focusing on this target group including education about risk factors, prevention methods and symptoms of HIV and AIDS to ensure early recognition and timely treatment when necessary. Prevention programmes, specifically for elderly can contribute to changes in personal behaviour that leads to risk education. New methods of reaching this target group should be considered. New venues for prevention programmes such as old age pay points, churches, churches, and health care facilities need to be considered. Curbing AIDS among older populations demands both preventive and intervention efforts that address multiple levels of society from individuals to the macro levels (Levy et al. 2003).

## LIMITATIONS

Caution should be taken when interpreting the results of this study due to certain limitations. Since this was a cross-sectional study, causality between the compared variables cannot be concluded. Some constructs contributing to HIV risk, sexual behaviour and HIV and health status were not included in this assessment, e.g. quality of life (Westaway et al. 2007), subjective sexual well-being (Laumann et al. 2006). Some measures

in this study were limited in length, e.g. HIV risk perception was only measured with one item.

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### REFERENCES

- Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG 2001. *AUDIT: The Alcohol Use Disorders Identification Test. Guidelines for Use in Primary Care*. World Health Organization, Geneva, Department of Mental Health and Substance Dependence. WHO/MSD/MSB/01.6a.
- Eldred S, West L 2005. Call to action. HIV prevalence in older adults: Based on the progressive increase of HIV in the older adult population, it is reasonable to predict that the incidence of HIV in this age group may continue to rise if steps are not taken to prevent HIV transmission. *Can Nurse*, 101(9): 20-23.
- Freeborn DK, Polen MR, Hollis JF, Senft RA 2000. Screening and brief intervention for hazardous drinking in an HMO: Effects on medical care utilization. *J Behav Health Serv Res*, 27(4): 446-453.
- Grabar S, Kousignian I, Sobel A 2004. Immunologic and clinical responses to highly active antiretroviral therapy over 50 years of age. Results from the French Hospital Database on HIV. *AIDS*, 18(15): 2029-2038.
- Hillman J 2008. Sexual issues and aging within the context of work with older adult patients. *Prof Psychol Res Pr*, 39(3): 290-297.
- Jacobs RJ, Thomlison B 2009. Self-silencing and age as risk factors for sexually acquired HIV in midlife and older women. *J Ageing Health*, 21(1): 102-128.
- Karpiak SE, Shippy RA 2006. *Research of older adults with HIV*. New York: AIDS Community Research Initiative of America.
- Kassu A, Mekonnen A, Bekele A, Abseno N, Melese E, Moges F, Wondmikun Y, Ota F 2004. HIV and syphilis infection among elderly people in North-west Ethiopia. *Jpn J Infect Dis*, 57(6): 264-267.
- Korra A, Bejiga M, Tesfay S 2005. Socio-demographic profile and prevalence of HIV Infection among VCT clients in Adis Ababa. *Ethiopian J Health Development*, 19(2): 109-116.
- Laumann EO, Paik A, Glasser DB, Kang JH, Wang T, Levinson B, Moreira EDJr, Nicolosi A, Gingell C 2006. A cross-national study of subjective sexual well-being among older women and men: Findings from the global study of sexual attitudes and behaviors. *Arch Sex Beh*, 35(2): 145-161.
- Leclerc-Madlala S 2008. Age-disparate and intergenerational sex in Southern Africa: The dynamics of hyper-vulnerability. *AIDS*, 22(4): 17-25.
- Lekas H-M, Schrimshaw EW, Siegel K 2005. Pathways to HIV testing among adults aged fifty and older with HIV/AIDS. *AIDS Care*, 17(6): 674 -687.
- Levy JA, Ory MG, Crystal S 2003. HIV/AIDS interventions for midlife and older adults: Current status and challenges. Editor's overview. *J Acquir Immune Defic Syndr*, 33(2): 59-67.
- Lindau ST, Schumm LP, Laumann EO, Levinson W, O'Muirheartaigh CA, Waite LJ 2007. A study of sexuality and health among older adults in the United States. *N Engl J Med*, 357(8): 762-774.
- Longfield K, Glick A, Waithaka M, Berman J 2004. Relationships between older men and younger women: Implications for STIs/HIV in Kenya. *Stud Fam Plann*, 35(2): 125-134.
- Lovejoy TI, Heckman TG, Sikkema KJ, Hansen NB, Kochman A, Suhr JA, Garske JP, Johnson CJ 2008. Patterns and correlates of sexual activity and condom use behavior in persons 50-plus years of age living with HIV/AIDS. *AIDS Behav*, 12(6): 943-956.
- Luke N 2003. Age and economic asymmetries in the sexual relationships of adolescent girls in sub-Saharan Africa. *Stud Fam Plann*, 34(2): 67-86.
- Magalhães MG, Greenberg B, Hansen H, Glick M 2007. Comorbidities in older patients with HIV: A retrospective study. *J Am Dent Assoc*, 138(11): 1468-1475.
- Nicolosi A, Laumann EO, Glasser DB, Moreira EDJr, Paik A, Gingell C 2004. Sexual behavior and sexual dysfunctions after age 40: The global study of sexual attitudes and behaviors investigators' group. *Urology*, 64(5): 991-997.
- Okwemba A 2008. Older generation now face the wrath of HIV/AIDS African woman and child feature service. *The Nation*. From <<http://www.nation.co.ke>> (Retrieved July 28, 2009).
- Paul SM, Martin RM, Lu S-E, Lin Y 2007. Changing trends in human immunodeficiency virus and acquired immunodeficiency syndrome in the population aged 50 and older. *J Am Geriatr Soc*, 55(9): 1393 -1397.
- Schmid GP, Williams BG, Garcia-Calleja JM, Miller C, Segar E, Southworth M, Tonyan D, Wacloff J, Scott J 2009. The unexplored story of HIV and ageing. *Bull World Health Organ*, 87(3): 161-244.
- Simone J, Appelbaum J 2008. HIV in older adults. *Geriatrics*, 63 (12): 6-12.
- Shisana O, Rehle T, Simbayi LC, Parker W, Zuma K, Bhana A, Connolly C, Jooste S, Pillay V 2005. *South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey*. Cape Town: HSRC Press.
- Sormanti M, Shibusawa T 2007. Predictors of condom use and HIV testing among midlife and older women seeking medical services. *J Ageing Health*, 19(4): 705-719.
- UNAIDS 2006. *Understanding the Latest Estimates of the 2006 Report on the Global AIDS Epidemic*. Geneva: UNAIDS.
- Van Landingham M, Knodel J 2007. Sex and the single (older) guy: Sexual lives of older unmarried Thai men during the AIDS era. *J Gen Intern Med*, 22 (4): 375 - 388.
- Westaway MS, Olorunju SAS, Rai L-CJ 2007. Which personal quality of life domains affect the happiness of older South Africans. *Qual Life Res*, 16 (8): 1425-1438.