



Marital status and risk of HIV infection in South Africa

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Objective. Available evidence on the relationship between marital status and HIV is contradictory. The objective of this study was to determine HIV prevalence among married people and to identify potential risk factors for HIV infection related to marital status in South Africa.

Methods. A multistage probability sample involving 6 090 male and female respondents, aged 15 years or older was selected. The sample was representative of the South African population by age, race, province and type of living area, e.g. urban formal, urban informal, etc. Oral fluid specimens were collected to determine HIV status. A detailed questionnaire eliciting information on socio-demographic, sex behaviour and biomedical factors was administered through face-to-face interviews from May to September 2002.

Results. HIV prevalence among married people was 10.5% compared with 15.7% among unmarried people (*p*-value

< 0.001). The risk of HIV infection did not differ significantly between married and unmarried people (odds ratio (OR) = 0.85, 95% confidence interval (CI): 0.71 - 1.02) when age, sex, socio-economic status, race, type of locality, and diagnosis of a sexually transmitted infection (STI) were included in the logistical regression model. However, the risk of HIV infection remained significantly high among unmarried compared with married people when only sex behaviour factors were controlled for in the model (OR 0.55; 95% CI: 0.47 - 0.66).

Conclusions. The relationship between marital status and HIV is complex. The risk depends on various demographic factors and sex behaviour practices. Increased prevention strategies that take socio-cultural context into account are needed for married people.

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Increased emphasis on abstinence as one of the main ways to combat the spread of HIV has led to a need to look critically at HIV prevention in different contexts and different kinds of relationships. As early as the 1990s researchers recognised that marriage could be a risk factor in acquiring HIV infection. Since then studies have been conducted, mostly in India, Thailand and some African countries, showing contradictory findings in the relationship between marital status and HIV status.¹⁻³ For example, one study from Zimbabwe¹ associated HIV-positive status with being single. This study was conducted in antenatal clinics, where the population is not representative of the general population. However, another study⁴ conducted in four African cities (namely Cotonou, Yaounde, Kisumu and Ndola), and with representative samples, found a higher HIV prevalence among those who were currently or previously married than among those who were single.

The risk of HIV in marriage is directly linked to non-use of condoms. Some studies have found that married people are

less likely to use condoms as a preventive strategy for HIV. A study in rural Zimbabwe⁵ found that 92% of married women use monogamy or abstinence as a primary means to prevent HIV infection. While these women were taking protective measures by being faithful, the majority of men in the same study admitted to having casual extramarital relationships, thus increasing the risk of HIV transmission to their spouses. Unmarried and divorced women, on the other hand, were more likely than married women to use condoms or abstinence as a preventive strategy. On the question of risk perception, 45% of married women felt at risk of contracting HIV, compared with 53% of divorced and separated women, and 25% of single women.⁵ Cultural practices such as polygyny may increase or decrease a married person's risk of HIV infection. Cultural expectations are also a factor when it is acceptable for a man to have extramarital affairs while the same is not true for women.⁶

Very few studies have examined the risk of infection in married persons and their role in transmitting HIV. The assumption is that once married the risk of HIV infection drops significantly. There is very little empirical understanding of the socio-cultural context and the dynamics that expose the married population, especially women, to the risk of HIV infection. In view of the paucity of literature on the risk factors for married persons, this study was designed to determine the relationship between HIV status and marital status.

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Method

The data collection and laboratory procedures used in this study are described in detail in the 2002 *Nelson Mandela/HSRC Study of HIV/AIDS*,⁷ and therefore only a brief summary will be presented here. The second-generation surveillance approach recommended by the World Health Organisation, UNAIDS and Family Health International was employed. In particular, a cross-sectional study was conducted on a nationally representative complex (i.e. multistage, stratified, cluster) sample consisting of respondents drawn from various age groups (viz. adults aged 25 and older, youth aged 15 - 24 years and children aged 2 - 14 years) that also reflected South Africa's population in terms of race, province and locality type (i.e. formal urban, informal urban, farms and tribal authority areas). The sample took into account the design effects of 3.0 and 4.0, a 70% response rate, and an HIV-positive prevalence rate of 20%. A sample of 14 450 respondents was drawn from the 31 321 people in the sampling frame. However, only 13 518 of them (93.5%) were actually contacted because of logistical constraints such as being denied access by caretakers, or inclement weather which resulted in a few of the selected enumerator areas becoming inaccessible, even to all-terrain vehicles.

Fieldwork for the *Nelson Mandela/HSRC Study of HIV/AIDS*⁷ involved 33 teams of recently retired nurses who conducted questionnaire-based face-to-face interviews with 9 963 respondents (73.7%) who agreed to take part in the study. During the same home visit, oral fluid specimens were also collected using the Orasure HIV-1 oral specimen collection device. Antibody testing was done using Vironostika HIV Uni-Form Li Plus test kits. Although 8 840 respondents (65.4% of 13 518) consented to the HIV testing, test results for 8 824 (65.3% of 13 518) were successfully anonymously linked with the behavioural questionnaires via bar codes. This paper focuses on a sub-sample of 6 090 persons aged 15 years and older.

Ethical approval for the study was obtained from the Interim Ethics Committee of the Human Sciences Research Council. The fieldwork took place between March and September 2002.

To gain a better understanding of the socio-cultural context within which behaviour occurs, 39 focus groups discussions were conducted in the nine South African provinces. The 291 participants in these focus groups included persons aged 18 years and older, people from all racial groups, from various religious groupings, and from urban and rural residence. This information was taped and transcribed. It was subsequently analysed using Atlas.ti (a software package used for analysing qualitative data) using a thematic approach.

Data management and statistical analysis

Data were double entered and manipulated using SPSS

software. The analysis was done using both SAS and STATA. The results presented here are based on weighted data with adjustments for clustering. In this analysis, HIV status is a dependent variable while marital status is an independent variable and other socio-demographic, sex behaviour and biomedical factors are covariates. Variables that were significant (p -value < 0.05) in the univariate analysis based on chi-squared tests were included in the multivariate logistical regression model. The 95% confidence intervals (CIs) are reported. Odds ratios (ORs) were used to interpret the strength of the relationship throughout the paper.

Results

Demographic data

Data were obtained for 6 090 married (40.8%) and unmarried (59.2%) individuals. Married people differed significantly from unmarried with regard to certain demographic factors such as age, race place of residence, socio-economic status, educational level and employment status (Table I). As expected, unmarried people were significantly younger than married people (mean (SD) 30.83 (15.60) v. 46.49 (14.98), p -value < 0.001). A higher proportion of unmarried people were black (84.09%), lived in urban formal (46.37%) or tribal authority areas (36.04%), and were more likely to have fewer resources to meet their basic needs (Table I). Married persons, on the other hand, were more likely to be employed (40.40%) than unmarried persons (22.40%, p -value < 0.001). Married persons (45.63%) were more likely to have primary education or no schooling than unmarried persons (33.07%, p -value < 0.001).

Perceived risk of HIV and marital status

The perceived risk of HIV infection varied from definitely not at risk (69.61%), through possibly at risk (24.20%), to definitely at risk (3.97%). A small percentage (2.23%) did not specify their risk perception. About 72.72% of married people perceived themselves to be definitely not at risk of HIV infection compared with 67.46% of unmarried people. On the other hand, 23.8% of married people considered themselves to be possibly at risk, definitely at risk (3.27%) or did not specify their risk perception (0.73%) compared with 24.84%, 4.45% and 3.26% among unmarried persons, respectively. The association between marital status and HIV risk perception was statistically significant (p -value < 0.001).

HIV prevalence and marital status

The results showed that of the random sample of 6 090 South Africans aged 15 years and older who were interviewed, 13.57% (95% CI: 12.20 - 15.10%) were HIV-positive. Marital status and HIV status were significantly associated. The risk of

**Table I. Comparison of demographic factors for married and unmarried people**

Variable	Married N (%)	Unmarried N (%)	p-value
Sex of respondent			
Male	1 058 (41.83)	1 532 (40.82)	0.433
Female	1 368 (58.17)	2 132 (59.18)	
Age (years)			
≤ 24	106 (3.40)	1 996 (49.34)	< 0.001
25 - 49	1 513 (59.90)	1 188 (36.34)	
≥ 50	807 (36.71)	480 (14.32)	
Race			
Black	1 250 (67.97)	2 402 (84.09)	< 0.001
White	322 (17.46)	236 (5.84)	
Coloured	491 (10.90)	742 (8.59)	
Indian	363 (3.67)	284 (1.48)	
Type of living area			
Urban formal	1 578 (53.31)	2 140 (46.37)	< 0.001
Urban informal	184 (7.25)	431 (10.64)	
Tribal	465 (29.25)	849 (36.04)	
Rural formal	199 (10.19)	244 (6.96)	
Household financial situation			
Not enough money for basic things	868 (41.30)	1 742 (54.32)	< 0.001
Money for food and clothes only	891 (33.97)	1301 (35.04)	
Have most important things and a few luxuries	484 (16.53)	436 (7.12)	
Have some money for extra things	183 (8.20)	185 (3.53)	
Educational level			
No school	326 (18.30)	272 (8.63)	< 0.001
Primary school	667 (27.32)	808 (24.45)	
High school	778 (27.20)	1 646 (44.10)	
Matric	394 (14.64)	725 (17.29)	
Tertiary education	261 (12.53)	213 (5.54)	
Currently employed			
Yes	1 083 (40.40)	988 (22.40)	< 0.001
No	1 343 (59.60)	2 676 (77.60)	

HIV infection was higher among unmarried people (15.70%) than married people (10.48%) (p -value < 0.001). The odds of HIV infection were 1.59 (95% CI: 1.58 - 1.60) times higher among unmarried people than married people. Further analysis of the relationship between marital status and HIV status revealed interesting results. The risk of HIV infection did not differ between unmarried men and married men (11.59% v. 11.41%, p -value 0.891). However, unmarried women (18.53%) were significantly more likely to be HIV- positive than married women (9.82%) (p -value < 0.001). The odds of HIV infection were about two times higher among unmarried than married women (OR 2.09, 95% CI: 1.70 - 2.57). Married men were at significantly higher risk of HIV infection than married women (OR 1.34; 95% CI: 1.02 - 1.77). Furthermore, unmarried women were significantly more likely to be infected with HIV than unmarried men (OR 1.74, 95% CI: 1.43 - 2.11).

About 946 South Africans aged 15 years or older (15.53%) stated that they were 'virgins'. The majority of the virgins ($N = 883$, 93.35%) were aged between 15 and 24 years. The proportion of male virgins (53.72%) was only high in the

middle-aged category. A critical observation that requires further in-depth analysis is the observation that 51 virgins (5.79%) were HIV-positive.

Table II presents the univariate analysis of possible risk factors for HIV. Marital status and other considered possible risk factors for HIV were significantly univariately associated with HIV infection. In general, men were at significantly less risk of infection than women. The risk of infection was highest among individuals aged between 25 and 49 years. The risk of infection was considerably higher among blacks than any other race.

Fig. 1 shows that the relationship between marital status and HIV was influenced by socio-economic status. Firstly, poor people, regardless of their marital status, had a higher HIV prevalence than wealthy people. Secondly, poor married people when compared with poor unmarried people appeared to have lower HIV prevalence. However, wealthy married people compared with wealthy unmarried people appeared to have higher HIV prevalence.



Table II. Univariate analysis of possible risk factors for HIV among 6 090 South Africans aged 15 years and older

Variable	Total	HIV prevalence (%)	OR (95% CI)	p-value
Marital status				
Unmarried	3 664	15.71	1.59 (1.36 - 1.86)	< 0.001
Married	2 426	10.48	1	
Sex of respondent				
Male	2 590	11.51	0.74 (0.63 - 0.86)	0.001
Female	3 500	15.01	1	
Age (years)				
≤ 24	2 102	9.25	1.38 (1.06 - 1.79)	0.004
25 - 49	2 701	19.86	3.36 (2.67 - 4.21)	< 0.001
≥ 50	1 287	6.88	1	
Race				
Black	3 652	15.93	10.56 (3.02 - 36.97)	< 0.001
White	558	5.24	3.08 (0.84 - 11.29)	0.689
Coloured	1 233	6.53	3.89 (1.07 - 14.20)	0.476
Indian	647	1.76	1	
Type of living area				
Urban formal	3 718	13.95	1.59 (1.15 - 2.20)	0.997
Urban informal	615	26.15	3.48 (2.43 - 4.98)	< 0.001
Tribal	1 314	10.58	1.16 (0.83 - 1.63)	< 0.001
Rural formal	443	9.24	1	
Educational level				
No school	598	10.20	1.43 (0.95 - 2.15)	0.109
Primary school	1 475	13.05	1.89 (1.31 - 2.72)	0.153
High school	2 424	16.05	2.40 (1.69 - 3.42)	< 0.001
Matric	1 119	14.53	2.14 (1.46 - 3.12)	
Tertiary education	474	7.37	1	
Currently employed				
Yes	2 071	15.22	1.22 (1.04 - 1.42)	0.016
No	4 019	12.87	1	
Diagnosed with STI in the last 3 months				
At least one STI	127	33.15	3.29 (2.30 - 4.71)	< 0.001
No STI	5 963	13.10	1	
Aware of own HIV status				
Yes	1 258	16.83	1.38 (1.16 - 1.65)	0.001
No	4 832	12.81	1	
Sexually active in the last 12 months				
Active	4 090	15.88	2.54 (1.93 - 3.34)	< 0.001
Abstinent	1 008	9.96	1.49 (1.07 - 2.07)	0.585
Virgin	992	6.92	1	
Number of sexual partners				
More than one	353	18.49	2.42 (1.77 - 3.32)	0.001
One partner	3 737	15.64	1.98 (1.65 - 2.38)	0.009
Abstinent	2 000	8.56	1	
Use condom during last sexual contact				
Yes	1 278	22.12	2.21 (1.88 - 2.60)	< 0.001
No	4 812	11.37	1	
Perceived risk of HIV infection				
Definitely not at risk	4 244	12.27	2.75 (1.24 - 6.09)	0.444
Possibly at risk	1 527	15.50	3.60 (1.61 - 8.05)	0.128
Definitely at risk	209	29.38	8.17 (3.53 - 18.92)	< 0.001
Did not specify risk perception	110	4.84	1	

STI = sexually transmitted infection.

To investigate the relationship between HIV status and marital status further, various models were fitted to these data controlling for demographic characteristics, biomedical factors

and sex behaviour factors. Table III presents a multivariate analysis of HIV infection controlling for marital status, sex, race, geotype (type of living area, e.g. urban formal, urban

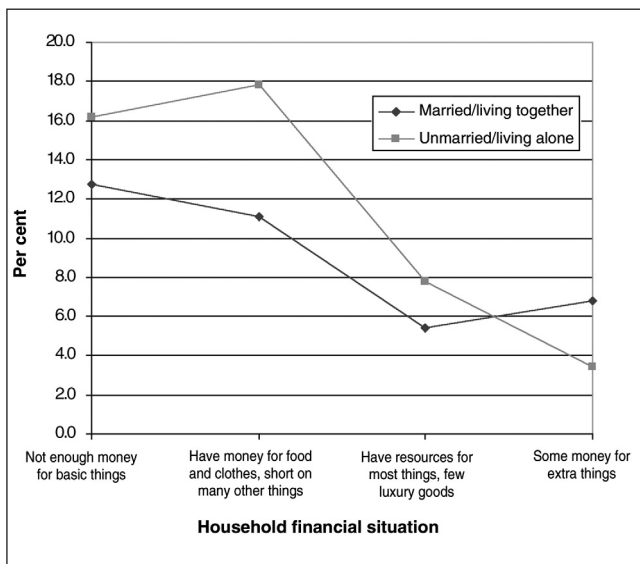


Fig. 1. HIV prevalence by socio-economic status and marital status, South Africa 2002.

informal, etc.), socio-economic status and self-reported diagnosis of sexually transmitted infections (STIs). All these variables except marital status were significantly associated

with HIV status. The relationship between marital status and HIV infection diminished when socio-demographic and biomedical factors were included in the model, which indicates confounding.

Table IV presents the relationship between HIV status and marital status, having controlled for factors associated with sexual behaviour. The results show that when sexual activity in the last 12 months and condom use are controlled for, the relationship between marital status and HIV status is statistically significant. Married persons are at significantly less risk of HIV infection than unmarried persons (OR 0.552, *p*-value < 0.0001). Having more than one sexual partner or having only one sexual partner did not seem to affect the risk of HIV infection when other sex behaviour risk factors were controlled for. Condom use during the last sexual intercourse seems to be associated with an increased risk of HIV infection (OR 1.607, 95% CI: 1.347 - 1.916). The finding that the use of a condom in the last sexual intercourse increased the risk of HIV infection could be attributed to the high proportion of those who were aware of their HIV-positive status and used a condom during the last sexual intercourse (27.16%) compared with only 12.72% among those who were aware of their HIV-positive status but did not use a condom during the last sexual intercourse (*p*-value < 0.001).

Table III. Multivariate analysis of HIV infection and marital status controlling for other factors

Variable	OR	95% CI	<i>p</i> -value
Marital status			
Married	0.853	0.711 - 1.024	0.086
Unmarried	1		
Sex of respondent			
Male	0.698	0.595 - 0.819	< 0.001
Female	1		
Respondent's age			
Age in years	0.991	0.986 - 0.996	< 0.001
Race			
Black	9.765	2.761 - 34.534	< 0.001
White	3.742	1.012 - 13.836	0.046
Coloured	3.433	0.936 - 12.590	0.061
Indian	1		
Type of living area			
Urban formal	1.640	1.176 - 2.286	0.003
Urban informal	2.281	1.577 - 3.300	< 0.001
Tribal	0.792	0.559 - 1.120	0.184
Rural formal	1		
Household financial situation			
Not enough money for basics	1.655	0.939 - 2.917	0.079
Money for food and clothes only	1.759	1.002 - 3.087	0.047
Have most important things and a few luxuries	0.944	0.520 - 1.714	0.848
Have some money for extra things	1		
Diagnosed with STI in the last 3 months			
At least one STI	2.679	1.842 - 3.896	< 0.001
No STI	1		

STI = sexually transmitted infection.

**Table IV. Multivariate analysis of HIV infection and marital status controlling for sexual behaviour**

Variable	OR	95% CI	p-value
Marital status			
Unmarried	0.552	0.465 - 0.657	< 0.0001
Married	1		
Sexually active during last year			
Yes	2.173	1.776 - 2.658	< 0.0001
No	1		
Sexual partners			
More than one	0.953	0.713 - 1.274	0.7454
Only one partner	1		
Use condom during last sexual contact			
Yes	1.607	1.347 - 1.916	< 0.0001
No	1		

Discussion

The purpose of this study was to examine the relationship between HIV status and marital status, and to identify the risks for HIV infection. The study demonstrated that there is a relationship between marital status and HIV. Similar to the results of the Zimbabwean study,¹ this study found that married people were less likely than unmarried people to be infected with HIV. However, the relationship between HIV infection and marital status is complex and deserves further comment. The relationship between HIV and marital status diminished when controlling for other socio-demographic risk factors for HIV. These socio-demographic factors acted as confounding factors and suppressed the relationship between HIV and marital status. However, sex behaviour acted as an intervening variable between HIV and marital status, as marital status became statistically significant only when sex behaviour was considered in the statistical model. Contributing to the complexity of this relationship is the observation that on the one hand poor married people had lower HIV prevalence than poor unmarried people, and on the other wealthy married people had higher HIV prevalence than wealthy unmarried people. These findings suggest that having money and being married, compared with having money and being unmarried increases the chances of being infected. Since this study found that married people were less likely than unmarried people to have used condoms during most recent sexual intercourse, it suggests that married people who had extramarital affairs were less likely to have used condoms and hence were at risk of contracting HIV.

It is important to understand the role of gender in HIV infection. In this study, married women were found to be at significantly less risk of HIV infection than unmarried women. However, the risk of HIV did not differ between married and unmarried men. Irrespective of marital status, some men may

have been having sexual contact with multiple partners and/or sex workers.⁸ Furthermore, men may have had serial partners even before marriage and thus whether they were married or not would have had no effect. The results of the focus group discussions revealed that there were different expectations for men and women with regard to sexual practices. In South African society it is acceptable for men to have extramarital affairs. For example, one young Venda man said '*munna ndi ndou, hali muthihi fhedzi*' (man will never be satisfied by a single woman) and a rural Ndebele man said 'A man cannot be stabbed by one spear' meaning that a man must have more than one partner.

Extramarital sex is generally condoned in men, but in women it is considered taboo. For example, one Xhosa man said, 'If it were a man going out (meaning having an affair), they'd say he's not outing, but he's gone to gain strength so he can come and perform his duties here. So our culture gives us an advantage in so far as that is concerned.' However in the case of women, men argued that 'Married or unmarried, it is bad for women to be unfaithful.' Another man said 'It is better to go to a prostitute (than to an unfaithful wife) at least they use condoms.' Yet these men do not use condoms with their wives because they fear being questioned about infidelity.

Clearly, the risk of HIV infection in marriage is directly related to sexual practices.⁹ Marriage is likely to be more protective if both partners are practising what has been termed 'zero grazing' (i.e. they are in a monopartner relationship). Marriage may be protective if the partners know their serostatus before marriage and protect each other thereafter. The 10.5% HIV prevalence rate among married people in South Africa is very high by international standards. Married men are more likely than married women to be HIV- positive. Indirectly, this may suggest that married men are more likely to become infected outside their marital relationships, thus increasing the risk of passing the infection to their wives. Here



there is conflicting evidence. Some believe that because HIV prevalence is high among single women there is therefore a possibility that married men are infected by their wives early in marriage.¹⁰ We believe that women face a risk of infection in marriage because they do not use condoms, believing that their partners are faithful and do not engage in extramarital affairs.¹ This is to be expected because condoms are largely used for contraceptive purposes and seldom for prevention of HIV or STIs in a marriage.

The observation that some people who said they were virgins were HIV-positive requires further investigation. Attempts were made to validate whether these virgins were truly virgins. Only 2 of the 946 people who stated that they were virgins also said that they had been pregnant in the last 12 months. Furthermore, only 44 (4.44%) of those who said they were virgins also said that they had at least one natural child. These people were excluded from the analyses. Presuming that the remainder were likely to be true virgins, the mechanism of infection in these cases needs further research.

Conclusion

The risk of HIV for married persons is complex. It depends on several socio-demographic and sex behaviour determinants that are related to both marital status and HIV. Demographic variables such as age, sex of the respondent, race, and socio-economic status nullify the relationship between marital status and HIV status. However, when behavioural variables such as condom use during last sexual intercourse, multiple partnerships and engaging in sex in the last twelve months are taken into account, the relationship between marital status and HIV remains important. Therefore, it is critical that married

people are also targeted for prevention interventions focusing on behavioural determinants. It is recommended that HIV prevention campaigns include a special focus on married people with a view to sensitising them to the risk of HIV infection. Such messages have to be contextualised within the socio-cultural milieu to increase effectiveness of prevention strategies. Furthermore, married persons should be encouraged to know their HIV status so that they can take appropriate precautions to prevent and control the spread of HIV infection.

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