Knowledge, substance use, and gender differences associated with HIV infection risk among youth in a South African township

William DeJanes

william.dejanes@exeter.ox.ac.uk

ABSTRACT

Adolescents and young people account for the majority of new HIV infections in South Africa and those living in townships and informal settlements appear to be most affected. The present study examined the extent to which school-attending adolescents living in a large Black/African township engage in behaviour that places them at risk of HIV transmission, and identifies factors associated with these practices in this community. One hundred and two gender balanced, Xhosa-speaking 9th grade student volunteers (M=15.88 years, range=13-19 years) from 5 randomly selected secondary schools participated in an anonymous survey of HIV-related knowledge, attitudes, beliefs, and practices. Seventy-one percent of the participants reported being sexually active. Of those who reported vaginal sex in the last 12 months, 47% had had multiple sexual partners within this period. Seventy-nine percent of sexually active participants reported unprotected sex during their lifetime and 52% had used condoms during fewer than half of their sexual encounters. Thirty-four percent of participants reported symptoms of an STI in the last 12 months. HIV knowledge was generally low with participants correctly answering an average of 54% of the items. Additionally, participants exhibited a lack of knowledge in a number of areas related to the mythical cure/prevention of HIV/AIDS. No association was found between overall HIV knowledge and being sexually active, having multiple sexual partners in the last 12 months, or frequent condom use. Factors associated with the tendency to engage in HIV risk behaviours included gender, substance use, having been tested for HIV, and having discussed HIV with parents.

Key words

HIV/AIDS, South Africa, adolescent, risk factors, township, prevention

Introduction

South Africa is facing a devastating HIV/AIDS epidemic with nearly 20% of the population aged 15-49 HIV-positive (UNAIDS, undated). It is currently estimated that 5,500,000 South Africans are HIV positive (ibid.). In 2006, 346,000 adults and children died from AIDS in South Africa and by mid 2005 it was estimated that between 1.5 and 2.8 million South Africans had lost their lives to AIDS (Dorrington et al., 2006). In 2006, 71% of all deaths among 15-49 year olds in South Africa were believed to be AIDS-related (ibid.). These statistics do not account for the millions of South Africans affected indirectly by HIV/AIDS through the loss of loved ones, social stigmatisation, and an economy ill-equipped to address the financial burden catalysed by excessive health costs and high rates of unemployment (Benatar, 2001). In order to more closely approximate desired behavioural outcomes, HIV prevention interventions should address factors associated with risky sexual behaviour unique to the members of the community in which this behaviour occurs (Hoppe et al., 2004; Pelzer and Promtussananon, 2005). This study examines risk and protective factors associated with HIV transmission among school-attending adolescents living in Khayelitsha, the largest township in the Western Cape.

Young People and HIV Risk Behaviours

There is a pressing need for HIV prevention interventions to reduce incidence among young South Africans as they represent a primary means for altering the trajectory of the course of HIV (SANAC, 2007). Young people have also been reported to account for the majority of new HIV infections in South Africa (Abt. Associates Inc. South Africa, 2000). Additionally, this is a period in which sexual attitudes and behaviours have generally not yet been firmly established and may offer an opportunity to intervene in groups with more malleable patterns of HIV-related behaviour.

Marston and King (2006) conducted a systematic review of 268 qualitative studies of factors that shape adolescent sexuality. Interestingly, they found that not only is adolescent sexual behaviour strongly influenced by social forces, but that worldwide those forces appeared to vary by degree rather than type. They were able to identify 7 key themes that emerged from the literature: young people assess potential sexual partners as 'clean' or 'unclean'; sexual partners have an important influence on behaviour in general; condoms are stigmatising and associated with lack of trust; gender stereotypes are crucial in determining social expectations and, in turn, behaviour; there are penalties and rewards for sex from society; reputations and social displays of sexual activity or inactivity are important; and social expectations hamper communication about sex (1581).

While many of these can be considered extra-individual factors (i.e. factors beyond individual control that exert influence over individual behaviours), it should be noted that each of these forces interacts with the others in numerous and complex ways leading to the manifestation of a single individual behaviour. Thus, while the authors found cross-cultural commonality in arising themes, it remains essential to conduct in-depth assessments of the immediate needs of a given population and for interventionists to compare the assets and deficits identified within a specific context with the themes posited to be the fundamental forces that shape behaviours within this context. A recent study reported that 60% of new HIV infections in South Africa occur among 15-24 year olds (Abt. Associates Inc. South Africa, 2000). Eaton et al. (2003) conducted a literature review of unsafe sexual behaviour among youth and concluded that by the age of 16 at least 50% of South Africans are sexually active. By the age of 18, generally 80% are sexually active. Perhaps most importantly, 50-60% of sexually active youth reported never using condoms. Pettifor, Rees et al.'s (2004) nationwide study of 11,904 South Africans aged 15-24 years old reported that 69% were sexually active. A total of 65% of sexually active participants reported multiple sexual partners during their lifetime. Of those who reported sexual activity in the last 12 months, 66% reported having had unprotected sex. However, while relevant, broad statements regarding sexuality such as these should be viewed with caution, as rates of sexual activity have been shown to vary widely between settlement type and race.

These data indicate that South African young people are placing themselves at high risk of contracting and transmitting HIV and, alarmingly, this behaviour occurs within the context of relatively high HIV/AIDS-related knowledge (Campbell and MacPhail, 2002; Hoppe et al., 2004; Mabunda, 2004). South Africans under the age of 25 appear to be engaging in high rates of unprotected sex, and many report having multiple sexual partners. The bleak outlook for South Africans in general, and young South Africans in particular, in the context of HIV/AIDS reinforces the need for continued and more advanced prevention and treatment services.

Townships and urban informal settlements

At the aggregate level, South Africa is considered a middle-income country. However, according to the United Nations Development Programme (2003), South Africa has the 8th most unequal income distribution in the world, and 34.1% of the population lives on less than $2USD per day (UNAIDS, undated). It is well established that there is an inverse relationship between socio-

economic status (SES) and health risks (see Farmer, 2001; Gilbert & Soskolne, 2003). For approximately one quarter of the world's population, poverty continues to be the primary determinant of their overall health status, exposure to infectious diseases such as HIV/AIDS, and high levels of fertility (Gilbert & Walker, 2002).

In South Africa, urban informal settlement and township residents experience the highest risk of contracting HIV infection (Pettifor et al., 2004; SANAC, 2007; Shisana & Simbayi, 2002; Shisana et al., 2005). These areas are often characterized by informal property rights, crowded living conditions, makeshift (shack) housing, and are often the refuge of the urban and rural poor. Most formal townships in South Africa contain large sections of informal settlements as rural-urban shift creates a demand for increased housing space (Constas & Colyn, 1996). In fact, there is evidence that the HIV epidemic in South Africa has created a need for the disposal of assets, which in turn has forced some families to relocate into these resource-poor settings in order to meet their basic subsistence needs (Thomas & Howard, 1998).

A number of studies have been conducted highlighting the differential distribution of HIV prevalence relative to settlement type. Shisana and Simbayi (2002) studied 8,804 individuals and found that HIV prevalence among the 15-24 age group in informal urban areas was 20.2%, compared to 9.3% in formal urban areas, 8.6% in formal rural areas (farms), and 7.0% in tribal areas. In a study of 11,904 South Africans, Pettifor et al. (2004) found that HIV prevalence among 15-24 year olds was highest among residents of informal urban areas (17.4%), followed by formal rural areas (13.5%), formal urban (9.8%), and informal rural areas (8.7%). Shisana et al.'s (2005) study of 15,851 individuals reported that prevalence among 15-24 year olds in informal urban areas was 17.8%, compared to 16.7% in rural formal areas, 11.1% in rural informal areas, and 6.9% in urban formal areas[1]. This is in sharp contrast to Shisana et al.'s (2005) estimate of overall HIV prevalence at 10.3% for South Africans aged 15-24, and should caution against generalizing national HIV prevalence findings to unique subgroups of the population.

Gender and HIV

Factors Increasing Female Infectivity

While gender-stratified analysis often suggests that young males place themselves at greater risk than young females, it is important to analyse factors that may accord females a higher risk for HIV contraction than their male counterparts. In South Africa, female gender is a primary risk factor for HIV infection among young people. For example, among 15-19 year-olds, males and females experience a prevalence of 3.2% vs. 9.4%, respectively. This disparity increases in the 20-24 age group, with males and females reaching a respective prevalence of 6.0% vs. 23.9% (Shisana et al., 2005; see fig. 1). In order to understand these disparities it is necessary to explore both biological and socio-behavioural factors that may be responsible.

[1] Informal urban areas include squatter camps with informal property rights, many of which make up large sections of townships; rural formal areas include large commercial farms and small rural settlements; rural informal areas are generally tribal areas; and urban formal areas would be larger cities.

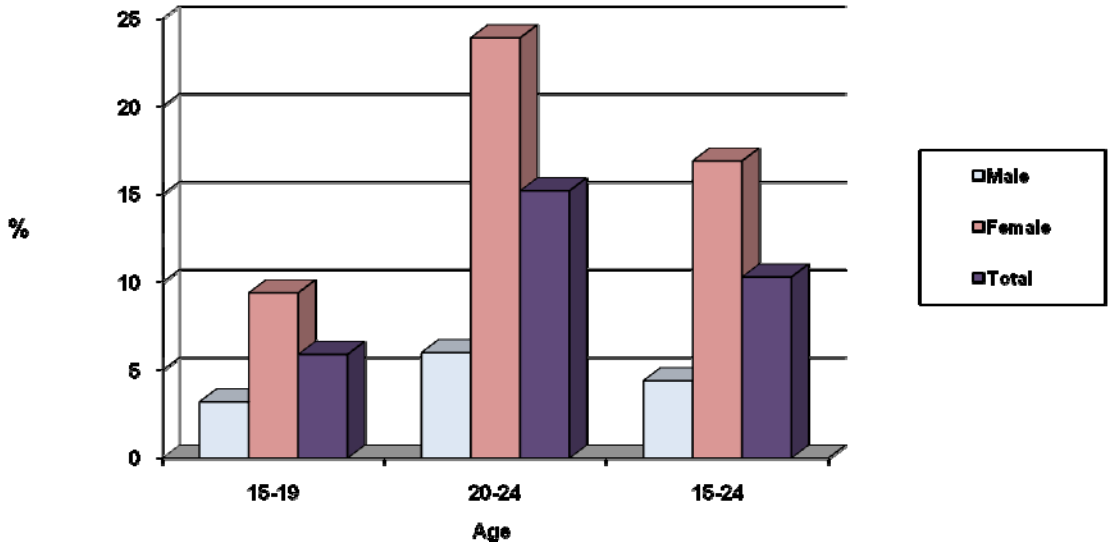

Figure 1 HIV Prevalence among 15-24 year olds by Sex (Shisana et al. 2005)

Inherent biological differences place women at greater risk of transmission per coital act. Semen carries a significantly higher viral load than vaginal secretions. The genital mucosal exposure area is also larger in females allowing a greater number of entry points for the virus. Additionally, the vaginal area acts as a receptacle for infected semen for a longer time than the penis is exposed to the less highly concentrated vaginal secretions (Campbell, 1999; Jackson, 2002). These differences create an increase in probability of contraction per coital act of 2-3 times that of males (UNICEF, undated; World Bank, undated.), but this ratio can significantly increase depending on the state of male infection and the presence of STIs. The biological disadvantage faced by females in the context of HIV transmission suggests that a particular emphasis in HIV prevention should be placed on the unique prevention needs of females.

Gender socialisation and coercive sexual practices

The socialisation of males and females to occupy specific roles and perform specific tasks occurs from the earliest stages of childhood, producing rigid expectations of appropriate behaviour which do not easily lend themselves to change. According to Firestone (1972), sexual oppression and labour inequality are pervasive and are the products of inherent biological differences, which in turn have laid the foundation for all types of inequality and social stratification. In South Africa, labour inequality, and subsequent inequality in economic production has placed men in the role of bread-winners and females often in the role of managing the children or, in the context of AIDS, caring for infected family members – further exacerbating their inability to contribute financially to the household and increasing dependence on their male counterparts.

Similarly, Connell (1987) developed the Theory of Gender and Power to explain gender-related inequities in the division of labour, power, and affective attachments and social norms. These three components exist on two levels – the greater society and the institutional, each of which is susceptible to only gradual change or modification. The *sexual division of power* appears to be particularly relevant to women's ability dictate the nature of sexual relationships. This construct specifies that many heterosexual relationships are characterised by imbalances in control (often based on economic dependence), patriarchy, authority, and coercion (Wingwood and DiClemente, 1999), generally at the expense of female liberty. These characteristics are often deeply embedded in societal norms and institutions and would therefore appear to be difficult to

modify solely at the individual level, thus requiring a more social epidemiological approach encompassing modification at the structural, community, family, dyadic, and individual levels.

Gender inequalities in the expression of sexual power are being increasingly recognised as pivotal agents in the HIV epidemic in South Africa. In traditional South African culture, females' subordinate social and economic status relative to their male counterparts places them at risk for sexual exploitation on multiple levels. Sexual negotiation regarding condom use, faithfulness, and the nature and terms of sexual activity are absent in many heterosexual relationships in South Africa (Eaton, et al., 2003).

Economically disadvantaged females have been reported to engage in transactional sex as a means of acquiring necessary or desired goods or gaining financial security (Eaton et al., 2003; MacPhail and Campbell, 2001). Highlighting this, a study of young people living in a township outside of Cape Town reported that 21% of sexually active females had given sex in exchange for money or goods (Simbayi et al., 2005). Transactional sex appears to be most prevalent in poor townships and rural areas, and may reduce a woman's ability to negotiate condom use during sex and put her at risk of physical abuse (Jewkes and Abrahams, 2002). Gender inequalities also place women at risk of intimate partner violence. Dunkle et al. (2004) recently conducted a study involving 1366 women presenting at antenatal clinics in Soweto and found that intimate partner violence and high levels of male control in a relationship predicted HIV seropositivity. Additionally, young South African women tend to have older sexual partners and South African men tend to have younger sexual partners (Jackson, 2002; Pettifor, Rees et al., 2004). This is problematic as it may expose young women to men who are more likely to be HIV positive as a result of more extensive sexual experience. These male partners are likely to enjoy a superordinate status due to their age and general social constructions of male power, thus limiting the sexual bargaining power of young South African women within these relationships.

HIV prevalence can be viewed as a social barometer as reflected by its disproportionate distribution between race, gender, and socio-economic status (Farmer, 2001). Young South Africans experience high rates of HIV infection, and account for the majority of new HIV infections. Specifically, young South Africans living in townships and informal settlements appear to be at the highest risk of contracting HIV (Pettifor, Rees et al., 2004; Shisana and Simbayi, 2002; Simbayi et al., 2005). Additionally, females and males may experience different risk levels due, in part, to biological and sociocultural influences.

Khayelitsha is the largest township in the Western Cape province with an unofficial estimated population of between 500,000 and 750,000 or more. Although antenatal surveillance estimates reveal that the Western Cape has the lowest rate of HIV/AIDS infection at 15.7%, Khayelitsha has a much higher rate of 33% (SANAC, 2007). This community contains large sections of makeshift housing and much of the population lives in extreme poverty.

In order to reduce the burden of HIV among young people in poverty-stricken areas like Khayelitsha, programme developers and intervention specialists must be well acquainted with the specific needs of the population in which an intervention is being implemented. Furthermore, many large-scale national surveys fail to fully measure dependent variables, provide an adequate racial/geotypical breakdown on key dependent variables, or do not employ statistical analysis sufficient to elucidate the relationship between independent and dependent variables (see Pettifor, Rees et al., 2004; SANAC, 2007; Shisana and Simbayi, 2002; Simbayi et al., 2005).

The present study examines risk and protective factors associated with HIV transmission among Black/African adolescents attending secondary schools located throughout Khayelitsha in order to inform the development of interventions tailored to the needs of young people in this and similar communities. This is of importance as this demographic remains understudied in the South African population and it represents an opportunity to efficiently reach groups at high risk of HIV infection. The following analysis should be viewed within the context of a social epidemiological approach to health and illness in which multiple influences beyond personal

agency are examined.

Method

Design

This was a cross-sectional, school-based survey of HIV-related knowledge, attitudes, beliefs, and practices (KABP) among adolescents living in a large South African township. The target community contained 19 secondary schools at the time of the study. One school was selected for piloting of the study instruments. After modifying the questionnaires based on participant feedback, five secondary schools were randomly selected using a computer-based random numbers generator. A convenience sample of 25 student volunteers was selected from each of the five schools for participation in the study. Key dependent variables included HIV/AIDS-related knowledge, sexual experience, number of sexual partners, condom usage, and substance use.

Participants

The study involved 125 South African adolescents aged 13-19, with a mean age of 15.88 years (SD =1.40). All participants attended secondary school in Khayelitsha, a Black/African township in the Western Cape province. Participants were members of the 9th grade and the schools from which they were selected were located throughout the community. The sample was 49% male and 51% female. All participants were Black/African and 97% spoke Xhosa as a first language, followed by Zulu and Tswana at 2% and 1%, respectively. Thirty-one percent of the participants stated that one or both parents had died.

Research Instrument

This study utilised the Xhosa version of Pettifor, Rees et al.'s (2004) questionnaire which served as the basis for their National Survey of HIV and Sexual Behaviour among 15-24 year olds in South Africa. Written items were presented in English and Xhosa. This measure was used to assess sexual attitudes and behaviour, socioeconomic indicators, cognitive variables and substance use among participants. The survey was verbally administered in Xhosa in group settings of between 19 and 23 participants per group.

A modified form of Carey and Schroeder's (2002) Brief HIV Knowledge Questionnaire (HIV-KQ-18) was used to assess levels of HIV-related knowledge. Six items were added drawing from research conducted by Peltzer and Promtussanon (2005) with a sample of 3,150 junior secondary school students in South Africa. After consulting with students, teachers and other community members, an additional four culturally-relevant items were added. This yielded a 28-item HIV knowledge questionnaire. Items were translated from English into Xhosa and back-translated to ensure comprehension by the participants. Cronbach's alpha for this scale within this sample was .74, which is considered an acceptable level of reliability according to Nunnaly (1978) and DeVellis (1991), among others.

Procedure

The questionnaire was administered in Xhosa by a trained facilitator. The primary investigator was present during administration to maintain quality assurance. Questionnaires were completed during school hours over a period of two visits per site. Due to the sensitive nature of the information being elicited, a number of precautions were taken to minimise potential response (social desirability) bias. Teachers and members of the study team explained to participants that the questionnaire was part of a University study, highlighting the importance of accurate responses and reminding them that all answers were anonymous and confidential. Participants

were evenly spaced, where possible, so that none sat directly next to each other and all were encouraged to cover their answers during completion of the questionnaire. Teachers were not present during the administration of the questionnaire, nor did they handle completed questionnaires at any point. Student names were not present on any collected data

The study protocol and instruments were reviewed and approved by the Ethics Committee of the Department of Social Policy and Social Work of the University of Oxford, as well as the Western Cape Education Department. After a verbal description of the study in both English and Xhosa, a translated informed consent form providing further information about the study was given to each of the potential participants to be signed by themselves, a parent/guardian, and the principal investigator.

Statistical Analysis

An alpha level of .05 was used for all statistical tests. Analysis of key sexual behaviour and HIV/AIDS knowledge variables was conducted at the aggregate level, and subsequently stratified by sex. One-way analysis of variance tests were used to measure potential differences between schools on continuous dependent variables. Pearson chi-square tests were used to analyse between-group differences on categorical dependent variables, and independent samples *t*-tests were used to measure between group differences on continuous dependent variables. Pearson correlations were conducted to analyse bivariate associations between continuous sociodemographic variables, sexual behaviour variables, and HIV-related knowledge.

Results

Sample characteristics

Of the 125 students given informed consent forms, the response rate was 82% (N=102); 4 students stated that they had forgotten to return the completed forms, and 19 students were absent on the day of the study. Eight students who had completed the first section of the questionnaire were absent on the second visit, thus reducing the total number of participants responding to some items to 94.

There were no significant differences between schools in age of participants (f=.41, df=4, p=.80), HIV knowledge (f=2.39, df=4, p=.06), whether or not they had had sex (X^2=.535, p=.91) number of sexual partners in the last 12 months (f=.76, df=4, p=.56), frequency of lifetime condom use (f=1.01, df=4, p=.41), age of sexual debut (f=1.00, df=4, p=.41), age of first sexual partner (f=.285, df=4, p=.89), frequency of alcohol use in the last month (f=.344, df=4, p=.85), or frequency of drug use in the last month (f=.2.024, df=4, p=.12).

At a mean age of 15.88 years (SD=1.40), over two-thirds (71%) of the sample reported being sexually active, and of these 11% reported having had anal sex. Of those who reported having had vaginal sex, 37% were sexually active by the age of 14. Of those who reported vaginal sex in the last 12 months, 47% had had multiple sexual partners within this period. Regarding average lifetime condom use, 21% of sexually active participants reported always using condoms, 18% reported using condoms more than half of the time, 9% reported using condoms half of the time, 32% reported using condoms less than half of the time, and 20% reported never using condoms.

Regarding coercive sexual practices, 21% reported having had sex as a result of being threatened, 14% in exchange for gifts or goods, and 10% as a result of physical force. Thirty-four percent of the sample reported experiencing symptoms of a sexually transmitted infection (STI) within the last 12 months. Eighty percent of those who reported having sex as a result of being threatened also reported symptoms of an STI in the last 12 months, sixty-seven percent who reported having sex in exchange for gifts or goods experienced symptoms of an STI in the last 12 months, and fifty-seven percent of those who reported having had sex as a result of physical force

also reported symptoms of an STI as defined by the presence of abnormal/smelly urinary discharge, or genital ulcer/sore in the last 12 months.

Of those reporting a current main partner (boyfriend/girlfriend), 38% believed that their partner was faithful. Twenty-four percent of the participants reported having been tested for HIV. Regarding the presence of HIV/AIDS in the community, 73% indicated that they personally knew someone with HIV/AIDS and 67% indicated that they personally knew someone who had died from AIDS. Twenty-eight percent of females believed teenage pregnancy to be the most important issue facing South African youth compared to two percent of males. Additional sample characteristics and prevalence of risk behaviours can be found in Table 1.

Regarding the most important issue facing youth in their community, 30% responded crime, 28% teenage pregnancy, 21% drug and alcohol abuse, 15% HIV/AIDS, and unemployment, poor education, and poverty at 3%, 2%, and 1% respectively. Sixty-five percent of the participants reported having had an alcoholic drink other than for religious purposes. Of these, 37% indicated that they had been drunk in the last month, and 47% reported either that they could not use a condom or probably could not use a condom during sex after drinking or taking drugs. Thirty percent of the sexually active participants reported having had sex under the influence of drugs or alcohol. Twenty-nine percent of the participants reported having used a drug to feel high. Fifteen percent of those who reported drug use also reported having injected a drug.

Table 1: Sample characteristics

Variable		%	N
Age (mean 15.88)	13-15	39	(40)
	17-19	61	(62)
Sex	Male	49	(50)
	Female	51	(52)
Language spoken at home	Xhosa	97	(91)
	Zulu	2	(2)
	Tswana	1	(1)
Ever had vaginal sex	Yes	71	(71)
	No	29	(29)
Ever had anal sex	Yes	11	(11)
	No	89	(89)
Number of sexual partners in last 12 months[a]	0	34	(34)
	1	35	(35)
	2	20	(20)
	3-5	8	(8)
	6-8	3	(3)
Number of sexual partners in entire life	0	28	(28)
	1	17	(17)
	2-3	25	(25)
	4-6	21	(21)
	7-11	9	(9)
Condom used at first sex	Yes	47	(34)
	No	53	(38)

Variable		%	N
Average condom use with first sexual partner	Always	28	(20)
	More than half of the time	17	(12)
	Half of the time	1	(1)
	Less than half of the time	12	(9)
	Never	42	(30)
Average condom use entire life	Always	21	(14)
	More than half of the time	18	(12)
	Half of the time	9	(6)
	Less than half of the time	32	(21)
	Never	20	(13)
Experienced symptoms of an STI in last 12 months[b]	Yes	34	(35)
	No	66	(67)

NOTE: Some variables do not sum to 102 due to missing values.

a. 'Number of sexual partners' refers to both vaginal and anal sex.

b. 'Symptoms of an STI' refers to presence of abnormal/smelly urinary discharge, or genital ulcer/sore.

HIV/AIDS knowledge

Table 2 presents the distribution of responses to 28 HIV/AIDS-related items. The mean HIV knowledge score was 15.24 correct responses (SD=3.80), with a range of 8 to 23. The mean score on culture-specific[2] HIV knowledge items was 4.84 correct responses (SD=1.90) out of a possible 9, with a range from 0 to 8.

One-way analysis of variance revealed that those who endorsed the statement 'Showering, or washing one's genitals/private parts after sex keeps a person from getting HIV' reported a significantly greater number of sexual partners in the last 12 months than those who disagreed or did not know ($f=4.45$, $p=.01$); those who believed that 'Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex' reported a significantly greater number of sexual partners in the last 12 months ($f=8.45$, $p<.001$); and those who agreed that 'Men from the Bush cannot get HIV/AIDS (male circumcision ceremony)' reported a significantly greater number of sexual partners in the last 12 months ($f=5.37$, $p=.01$).

There was a trend for males to score higher than females (M=15.95, SD=3.52 vs. M=14.56, SD=3.97) on overall HIV knowledge items ($t=1.80$, $p=.08$). There was no association between age and overall HIV knowledge ($r=.06$, $p=.56$). There were no significant differences in HIV knowledge between participants who were sexually active (M=15.40, SD=3.64) and those who had not had sex (M=14.92, SD=4.32) ($t=.532$, $p=.60$); between participants who reported multiple sexual partners in the last 12 months (M=16.00, SD=4.07) and those who reported only one sexual partner (M=15.09, SD=3.44) ($t=.953$, $p=.34$); between those who reported any unprotected sex (M=15.55, SD=3.81) and those who reported no unprotected sex (M=14.95, SD= 3.99) ($t=.726$, $p=.47$); or between participants reporting frequent condom use[3] during their lifetime (M=15.04, SD=4.23) and those reporting infrequent or no condom use (M=15.70, SD=3.37) ($t=-.692$, $p=.49$).

[2] These items are marked with an asterisk in Table 2.

[3] Defined as always or more than half of the time.

Table 2: Responses to HIV Knowledge Measure (correct response in boldface)

Item Statement	Participants' Response		
	True (%)	False (%)	Don't know (%)
Coughing and sneezing DO NOT spread HIV	45.7	35.1	19.1
A person can get HIV by sharing a glass of water with someone who has HIV	3.3%	93.5	3.3
Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex	23.4%	39.4	37.2
A woman can get HIV if she has anal sex with a man	29.3	16.3	54.3
Showering, or washing one's genitals/private parts, after sex keeps a person from getting HIV	5.4	66.7	28
There is a medicine that can cure you of HIV/AIDS*	17.6	**63.7**	18.7
All pregnant women infected with HIV will have babies born with AIDS	51.1	**29.8**	19.1
People who have been infected with HIV quickly show serious signs of being infected	20.4	**51.6**	28
There is a vaccine that can stop adults from getting HIV*	32.6	**29.3**	38
People are likely to get HIV by deep kissing, putting their tongue in their partner's mouth, if there partner has HIV	8.5	**81.9**	9.6
A woman cannot get HIV if she has sex during her period	2.1	**53.2**	44.7
There is a female condom that can help decrease a woman's chance of getting HIV	**73.9**	7.6	18.5
A natural skin condom works better against HIV than does a latex condom	9.6	**39.4**	51.1
A person will not get HIV while taking antibiotics (medicine)*	37.2	**22.3**	40.4
Having sex with more than one partner can increase a person's chance of being infected with HIV	**76.6**	11.7	11.7
Taking a test for HIV one week after having sex will tell a person if he or she has HIV	57.4	**17.0**	25.5
A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV	8.5	**83.0**	8.5
A person can get HIV from oral sex (kissing licking the private parts of a man or woman).	**30.9**	16.0	53.2
Using Vaseline or baby oil with condoms lowers the chance of getting HIV	5.3	**29.8**	64.9
You can get HIV through an open cut or wound	**83.9**	9.7	6.5
One can get HIV through witchcraft*	31.5	**28.3**	40.2

Item Statement	Participants' Response		
	True (%)	False (%)	Don't know (%)
Only Blacks can get HIV*	0.0	**97.8**	2.2
Having sex with a virgin can cure HIV/AIDS*	10.6	**66.0**	23.4
Having sex with a disabled or old woman can cure HIV/AIDS*	7.6	**59.8**	32.6
One can get HIV by sitting next to a person with HIV	4.3	**94.7**	1.1
HIV can be spread by mosquitoes	23.4	**42.6**	34.0
HIV was introduced by Whites in order to infect Blacks*	10.8	**66.7**	22.6
Men from the Bush cannot get HIV/AIDS (male circumcision ceremony)*	9.0	**53.7**	37.3

Gender differences

Table 3 presents gender differences on selected sexual behaviours. A greater number of males reported being sexually active, but this was not statistically significant (76.0% vs. 66.7%; X^2=1.07, p=.30). Males were significantly younger (M=14.51 yrs, SD=1.79) than females (M=15.42 yrs, SD=1.30) at sexual debut (t=-2.41, p=.02). The first sexual partner's age was significantly higher for females (17.12 yrs, SD =1.39) than males (13.21 yrs, SD=1.39) (t=-12.69, p<.001). Females reported more frequent lifetime condom use (M=2.35, SD=1.47) than males (M=1.51, SD=1.38) (t=-2.39, p=.02). Males and females did not differ significantly on reported condom use at last sex (63.2% vs. 58.8%; X^2=.142, p=.71). Males were more likely than females to believe that using condoms is a sign of not trusting your partner (69.6% vs. 41.3%, X^2=7.44, p=.01). Significantly more females had experienced symptoms of an STI in the last 12 months (46.2% vs. 22.0%, X^2=6.60, p=.01).

Males reported greater pressure from friends to have sex (M=2.54, SD=1.13) than females (M=2.09, SD=1.09) (t=1.97, p=.05). Females reported significantly less desire to have sex at sexual debut (M=2.69, SD=.86) than males (M=3.15, SD=.66) (t=2.45, p=.02). The number of females who reported having had sex as a result of being threatened did not differ significantly from males (29.4% vs.13.9%, X^2=2.50, p=.10), however, females were significantly more likely to report having had sex as a result of physical force (21.2% vs. 0.0%, X^2=8.50, p=.00), and in exchange for gifts/goods (27.3% vs. 0.0%, X^2=10.13, p=.00).

Although a greater number of males reported alcohol consumption other than for religious purposes (71.7% vs. 58.3%), this difference was not statistically significant (X^2=1.85, p=.17). Males consumed alcohol significantly more frequently in the last month than females (t=2.71, p=.01) and were more likely to report having been drunk in the last month (53% vs. 18%, X^2=8.00, p=.01). Males were significantly more likely than females to have used a drug to feel high (41.3% vs.17.4%, X^2=6.34, p=.01), however, males and females did not differ significantly in the frequency of drug use in the last month (t=-.163, p=.87). Of those who had consumed alcohol, more males reported having engaged in sex under the influence of alcohol (33% vs. 18%), however, this was not statistically significant (X^2=2.22, p=.33). Of those who had consumed drugs, significantly more females stated that they had engaged in sex under the influence of drugs (75.0% vs. 26.3%, X^2=5.93, p=.05).

Table 3: Gender differences in sexual matters

Variable	Total	Male	Female	X^2 *P*-value	*t*-test *P*-value
Ever had vaginal sex	71.3%	76.0%	66.7%	.30	
Ever had anal sex	11.0%	8.2%	13.7%	.37	
Age of sexual debut, years	14.94	14.51	15.42		.02
Age of first sexual partner, years	15.02	13.21	17.12		<.000
Number of sexual partners in last 12 months[a]	1.24	1.54	.94		.06
Number of sexual partners in entire life	3.49	4.34	2.59		.00
Condom used at first sex	47.2%	31.6%	64.7%	.01	
Average condom use with first sexual partner[b]		1.37	2.21		.04
Condom used at last sex	61.1%	63.2%	58.8%	.71	
Average condom use in entire life[b]	1.91	1.51	2.35		.02
Experienced symptoms of an STI in last 12 months[c]	34.3%	22.0%	46.2%	.01	
Pressure from friends to have sex[d]	2.32	2.54	2.09		.05
Circumstances of first sexual experience[e]	1.58	1.43	1.75		.18

a. 'Sexual partner' refers to both vaginal and anal sex
b. 'Average condom use' coded as 0=never, 1=less than half of the time, 2=half of the time, 3=more than half of the time, 4=always
c. 'Symptoms of an STI' refers to presence of abnormal/smelly urinary discharge, or genital ulcer/sore.
d. 'Pressure from friends to have sex' codes as 1=no pressure, 2=not much pressure, 3=some pressure, 4=a lot of pressure
e. 'Circumstances of first sexual experience' coded as 1=willing, 2=persuaded, 3=tricked, 4=physically forced, 5=raped

Correlates of Three HIV Risk Outcomes

Heterosexual activity is the primary mode of HIV transmission in sub-Saharan Africa (Caldwell and Caldwell, 2003; UNAIDS, 2008). Having multiple sexual partners increases one's probability of exposure to HIV by engaging in activities likely to promote fluid/blood exchange with partners of variable or unknown HIV status. This is also problematic as it can promote HIV transmission through multiple channels in a given population. One of the most effective and easily available means of protecting against HIV transmission is the use of male condoms. Although not 100% effective, condoms have been shown to significantly reduce the risk of transmitting HIV. A review of 25 published studies of serodiscordant heterosexual couples conducted by Weller and Davis (1999) revealed a range of condom effectiveness between 60% and 96% depending on incidence among condom nonusers, with the average level of protection approximating 87%. For these reasons, the present study utilises the categories of *being sexually active, having multiple*

sexual partners, and the frequent use of condoms as the primary dependent variables for bivariate analysis.

Table 4: Correlates of three HIV risk outcomes—Sexually active, multiple sex partners, and frequent condom use.

		Sexually active		Multiple sex partners in last 12 months[a,b]		Frequent condom use[c]	
		% Yes	*P*-value	% Yes	*P*-value	% Yes	*P*-value
Total		71		31		41	
Age group	13-15	62	.09	21	.08	39	.97
	16-19	77		37		40	
HIV knowledge	Above average	72	.86	30	.69	39	.92
	Below average	74		26		41	
Ever been tested for HIV	Yes	91	.04	55	.01	39	.94
	No	69		24		40	
Ever spoken to parents about HIV	Yes	66	.03	25	.04	45	.43
	No	89		46		35	
Been drunk in the last month	Yes	86	.10	64	.00	29	.27
	No	69		26		45	
Regular alcohol use[d]	Yes	82	.20	57	.00	24	.05
	No	69		21		50	
Ever used a drug to feel high	Yes	85	.08	70	<.001	29	.15
	No	67		16		48	
Regular drug use[e]	Yes	94	.03	77	<.001	43	.81
	No	68		21		39	

Note. All *P* values are associated with Chi-square tests.

a. Includes those who have not had sex
b. "Multiple sex partners" defined as 2 or more sexual partners
c. "Frequent condom use" defined as always or more than half of the time
d. "Regular use" defined as several times per week or daily in the last month – analysis includes those who have not had alcohol
e. "Regular drug use" defined as several times per week or daily in the last month – analysis includes those who have not used drugs

Sexually Active

Table 4 reports bivariate associations between selected variables and three HIV risk outcomes. Being sexually active was more commonly reported among those who had been tested for HIV (90.8% vs. 68.7%, X^2=4.28, p=.04), those who had consumed alcohol other than for religious purposes (80.3% vs. 59.4%, X^2=4.69, p=.03), and those who had regularly used drugs in the last month (94.1% vs. 68.4%, X^2=4.67, p=.03). Sexual activity was less commonly reported by those who had ever spoken to their parents about HIV (66.2% vs. 88.5%, X^2=4.28, p=.03).

Multiple Sex Partners

Having had multiple sexual partners was more common among those who had been tested for HIV (54.5% vs. 23.9%, X^2=7.22, p=.01), had consumed alcohol other than for religious purposes (41.0% vs. 12.5%, X^2=7.94, p=.01), those who had been drunk in the last month (63.6% vs. 26.3%, X^2=8.09, p=.00), those who had regularly consumed alcohol in the last month (57.1% vs. 21.0%, X^2=11.56, p=.00), those who had ever used a drug to feel high (70.4% vs. 15.6%, X^2=26.21, p<.001), and those who had regularly used a drug in the last month (76.5% vs. 21.1%, X^2=19.88, p<.001). Having had multiple sexual partners in the last 12 months was significantly less common among those who reported ever having discussed HIV with parents (24.6% vs. 46.2% , X^2=4.04, p=.04).

Frequent Condom Use[4]

Frequent condom use was more common among those who had discussed condoms with their first sexual partner (59.0% vs. 14.8%, X^2=12.87, p<.001). Frequent condom use was less common among those who had consumed alcohol other than for religious purposes (32.6% vs. 63.2%, X^2=5.17, p=.02) and those who had regularly consumed alcohol in the last month (23.8% vs. 50.0%, X^2=3.96, p=.05). Frequent condom use was also significantly associated with degree of pressure from friends to have sex (X^2=9.86, p=.02), and degree of perceived risk of contracting HIV (X^2=11.51, p=.01).

Discussion

Social Epidemiology

Many currently employed psychosocial theoretical models of HIV prevention focus primarily on the determinants of individual-level behaviour and behaviour change. This has often been referred to as a 'rational decision-maker approach' and neglects to account for behavioural influences that lie outside the realm of individual control. For example, personal agency is constrained through numerous and complex mechanisms that exist at the individual, dyadic, family, community, and structural levels (Farmer, 2001). It has become increasingly clear to social and biological scientists alike, that a more comprehensive, social epidemiological approach should be taken to more effectively address the spread of adverse health conditions. Cwikel (2006) defines social epidemiology as:

> …the systematic and comprehensive study of health, well-being, social conditions or problems, and diseases and their determinants, using epidemiology and social science methods to develop interventions, programmes, policies, and institutions that may reduce the extent, adverse impact, or incidence of a health or social problem and promote health. (4)

According to this definition, successful disease intervention will require the cooperation of medical scientists, social and behavioural scientists, programme implementers, and policy makers to ensure that change conducive to health and well-being occurs at multiple levels within society. Thus, relying solely on individual-level mechanisms of change may be an unrealistic option in areas suffering from poverty, gender imbalances in sexual power and decision-making, poor healthcare infrastructure, political dysfunction, and high rates of infection. Without an integration of multiple levels of behavioural influence, it may be increasingly difficult to alter the

[4] 'Frequent condom use' defined as always or more than half of the time

distribution and trajectories of adverse health outcomes such as HIV, other STIs, and AIDS-related opportunistic infections such as TB and pneumonia, among others.

HIV Knowledge

The extent to which knowledge alone is an effective mediator of sexual behaviour has been debated, and there is a general consensus that knowledge is necessary but insufficient by itself to effect a widespread change in HIV-related behavioural outcomes (Fisher and Fisher, 2000; Peltzer and Promtussanon, 2005). HIV/AIDS related knowledge in this sample was generally low with respondents correctly answering an average of 54% of the items. The study found no significant association between overall HIV knowledge and age, gender, being sexually active, having multiple sexual partners, regularly using condoms, or ever having had any unprotected sex. This study supports the position that general HIV-related knowledge may be a necessary but insufficient prerequisite to the adoption of safer sex behaviours and suggests that additional mediators will likely need to be targeted in order to effect positive behavioural change in this community.

The HIV knowledge questionnaire used in this study included a number of prevention/cure-related items. These items consistently elicited incorrect responses and suggest that deficiencies exist among these youth in a potentially hazardous domain of HIV-related knowledge.

Encouragingly, most of these items were not related to frequency of condom use or having multiple sexual partners in the last 12 months. Optimism should be cautioned, however, as participants who believed that pulling out the penis before a man ejaculates prevents a woman from contracting HIV, showering or washing one's genitals/private parts after sex keeps a person from contracting HIV, or men who have attended a traditional circumcision ceremony cannot contract HIV were statistically significantly more likely to have had multiple sexual partners in the last 12 months in comparison to participants who disagreed or did not know the answer to these items.

It has been hypothesised that the belief that having sex with a virgin will cure one of HIV/AIDS may be the impetus for HIV positive males to rape younger South African women. While this study revealed that 11% of the participants endorsed this item (23% responded 'Don't Know'), it was not possible to examine this belief as it relates to male-female rape. As suggested by Jewkes and Abrahams (2002), it may be more likely that young South African females will be pursued by older males as a result of male perceptions that females with limited or no sexual experience are less likely to be HIV positive. However, this dynamic has dire consequences for females engaging in these relationships as they will likely be exposed to more sexually experienced males who are, as a result, more likely to be HIV positive.

Of additional note, the majority responded incorrectly to the item 'One can get HIV through witchcraft.' This is of importance for two reasons: individuals endorsing this belief may be less likely to equate HIV infection with risky sexual behaviour, and those who believe that HIV can be transmitted through witchcraft may perhaps believe the opposite – namely that HIV can be cured through witchcraft or traditional healing.

The results of this study indicate that whilst overall HIV knowledge was not related to risky behaviour, deficiencies exist in potentially hazardous domains of HIV-related knowledge. Despite large-scale governmental and non-governmental efforts to increase HIV-related knowledge among young people, further efforts are clearly needed to reduce the tendency for youth in this community to endorse false beliefs relating to the mythical cure and/or prevention of HIV/AIDS.

Gender Differences

This study found that males were significantly younger than females at sexual debut. This is in

accordance with much of the published literature which suggests that males tend to become sexually active earlier than females (Eaton et al., 2003; Peltzer and Promtussanon, 2005; Pettifor, Rees et al., 2004). The age of sexual debut reported in this sample is very low, particularly among those aged 14 or younger as compared to previous South African studies (see Health Systems Trust, undated; Shisana et al., 2005). The age of sexual debut in this sample has potentially important implications for HIV transmission as well as intervention efforts. A recent study of women in Zimbabwe reported that early sexual debut (15 years or younger) predicted HIV infection, as well as risk profile including number of lifetime partners and not completing school. It is unclear whether the act of early sexual debut in itself increases risk, or whether it may lead to a risk profile more conducive to HIV transmission. However, as with many sub-Saharan African cultures, a woman's ability to negotiate the circumstances of sexual intercourse (i.e. condom use or sexual aggression) is often limited by pervading norms of male-dominance and it would seem that this disparity would be even more pronounced among younger girls (Pettifor, van der Straten et al., 2004).

Sexual activity within this sample occurs within the context of high levels of unprotected sex and, frequently, multiple sexual partners. This suggests that participants are placing themselves at risk of HIV infection at a very early age. This study also found that females tend to seek significantly older partners at sexual debut than males. Previous research has highlighted the tendency for females to have older sexual partners whereas males tend to have younger partners (Aggleton and Rivers, 1999; Jackson, 2002; Pettifor, Rees et al., 2004). This has important consequences as it may expose young females to males who are at elevated risk of HIV as a result of more extensive sexual experience.

Potential risk of HIV infection increases with the number of sexual partners one has. This study found that 76% of sexually active participants reported having two or more sexual partners in their lifetime. Sexually active males reported significantly more lifetime sexual partners than females. Previous South African literature has reported similar gender differences in number of sexual partners (Peltzer and Promtussanon, 2005; Pettifor, Rees et al., 2004; Shisana and Simbayi, 2002). Additionally, males reported significantly less frequent lifetime condom use than females. Regarding recent sexual activity, however, condom use at last sexual encounter did not significantly vary by gender.

It should be noted that these findings regarding condom use are not in accordance with much of the South African literature. Larger studies of sexual behaviour and practices in South Africa have reported that males more frequently use condoms than females (Pettifor, Rees et al., 2004; Shisana and Simbayi, 2002). However, not all studies have produced similar results. For example Peltzer and Promtussanon's (2005) study of 3150 junior secondary school students found that females were significantly more likely to report condom use at first and last sex. Additionally, Auvert et al. (2001) found that a greater number of females reported condom use at first sex. It is likely that the cultural climate in which the individual operates, including dyadic and community-level influences, will affect the decision to use condoms and that unique cultural factors should be explored to identify which may be associated with condom use.

It may be the case that possible impregnation acted as a stronger motivator for condom use among females in this sample. Indeed, 28% of the females in this sample believed that teenage pregnancy was the most important issue facing South African youth compared to only 2% of male participants. Additionally, this study revealed that participants who had consumed alcohol other than for religious purposes and participants who had regularly consumed alcohol in the last month were significantly less likely to frequently use condoms. A greater proportion of males in this study had consumed alcohol and males consumed alcohol significantly more frequently in the last month which may also partially explain some of the gender differences in condom use. A third possible explanation for these findings is that males underreported the consistency of their condom use. It has been reported that male South Africans experience frequent peer pressure

discouraging the use of condoms (MacPhail and Campbell, 2001). In this study, male reporting of condom use may have been influenced by a social desirability bias. Although self-report data is always subject to potential response bias, considerable care was taken to reduce the likelihood that social desirability would bias reporting (see *Method*).

Young South African women are often objects of coerced sexual encounters in which their behaviour is constrained by unequal social constructions of gender roles in the expression of sexual power (Jewkes and Abrahams, 2002; Jewkes, Levin, and Penn-Kekana, 2003). Female participants in this study were significantly more likely than males to report having had sex as a result of being forced and in exchange for gifts/goods. The ability of females to successfully negotiate condom use under coercive circumstances is likely to be compromised, and thus exposes them to increased risk of HIV infection. It is widely acknowledged that efforts to reduce the incidence of HIV infection in Sub-Saharan Africa should focus on reformulating the extent to which males endorse and act upon unequal gender roles in sexual relationships (Jackson, 2002**;** Jewkes and Abrahams, 2002; Eaton et al., 2003). The results of this study support this and suggest that the modification of gender roles as a potential mediator of HIV infection warrants further study among school-attending adolescents in this and similar communities.

It is well documented that the presence of an STI significantly increases one's probability of contracting HIV per coital exposure. Furthermore, HIV-positive individuals suffering from a co-occurring STI are significantly more likely to transmit HIV infection to others (Auvert et al., 2001; Dallabetta, Serwadda, and Mugrditchian, 1999; Gray et al., 2001; Jackson, 2002). Overall, 34% of participants reported symptoms of an STI in the last 12 months. Females were significantly more likely than males to experience these symptoms. This high prevalence of recent STI symptoms within the context of infrequent condom use suggests that attempts to reduce HIV transmission within this community should include early detection and treatment of STIs.

The disproportionate number of females reporting symptoms of an STI is an interesting finding given that females reported more frequent lifetime condom use and reports of condom use at last sexual encounter did not differ significantly between genders. As a biological explanation for this, it has been reported that many STIs are more efficiently transmitted from males to females during sex with an infected partner (Wong et al., 2004). This may account for the differential distribution of STI symptoms, but this difference may also be related to circumstances of sexual activity. For example, a greater number of females in this sample reported having sex in exchange for gifts/goods, as a result of being threatened, and as a result of physical force. Females engaging in sex under these circumstances may be unable to successfully negotiate the use of condoms or the physical nature of the sexual experience (Eaton et al., 2003; Jewkes and Abrahams, 2002). This may increase the possibility of fluid/blood exposure through unprotected sex and possible rupturing of the vaginal lining if the sex act were to occur under physically adverse conditions.

Prevalence and Correlates of Risky Sexual Behaviour

Seventy-one percent of the adolescents participating in this study were sexually active. This proportion is higher than has been previously reported in much of the South African literature (Peltzer and Promtussanon, 2005; Pettifor, Rees et al., 2004; Shisana and Simbayi, 2002), but is similar to Auvert et al.'s (2001) study of township youth in which 68% of participants aged 15-19 were sexually active. As previously stated, early sexual debut is a significant predictor of HIV risk, as well as an increased risk profile such as more lifetime partners and less frequent school completion. This suggests that efforts to delay sexual initiation should receive a prominent focus in HIV prevention interventions.

Forty-seven percent of the sexually active participants reported two or more sexual partners in

the last 12 months. This is especially dangerous as sexual activity in this sample occurs within the context of infrequent condom use. A recent study suggested that concurrent sexual partnerships vs. serial monogamy, as is generally found in the West, was partially responsible for the disproportionate prevalence of HIV in sub-Saharan Africa (Halperin and Epstein, 2004). It was hypothesised that if an individual is involved in a network of sexual relationships and becomes infected with HIV, he/she will also be more likely to infect others within this network due to increased infectivity resulting from a higher viral load during the initial weeks of infection.

It has been reported that South African young people are unlikely to have been tested for HIV (Pettifor, Rees et al., 2004). Only 24% of this sample had ever been tested for HIV. This suggests that adolescents in this study may be engaging in unprotected sex with multiple sex partners without knowing their (and likely their partners') HIV status, thus placing them at particularly high risk of HIV transmission.

Bivariate analyses (see table 4) revealed that participants who had been tested for HIV were significantly more likely to be sexually active and to have multiple sexual partners in the last 12 months. This is a point of some encouragement as it seems to suggest that some participants may have internalised the link between sexual behaviour and possible HIV transmission. Unfortunately, however, there is no indication that this has translated into safer sexual practices (e.g. frequent condom use).

Participants reporting that they had discussed HIV with their parents or guardians were significantly less likely to have been sexually active or to have had multiple sexual partners in the last 12 months in comparison to those who had not. Previous research has reported positive outcomes associated with parent-child communication about sexual issues, including HIV. In a recent literature review, Miller and Benson (2001) reported that open communication about sexual activity was associated with not having sex, the delay of sexual debut, and having fewer sexual partners. The relationship between parent-child communication and the use of contraceptives appears to be less robust, and studies reviewed by Miller and Benson presented mixed results. This may explain why this study found no relationship between having discussed HIV with parents and the regular use of condoms. These results suggest that HIV prevention programmes may need to consider the context of parent-child communication as a potential mediator of risky sexual behaviour.

It is widely believed that perceived risk of contracting HIV is inversely related to the tendency to engage in risky sexual behaviour. A number of theoretical models applied to HIV risk reduction incorporate the construct of perceived risk/susceptibility, to varying degrees, as a key component of positive behavioural change, including the Health Belief Model (Rosenstock et al., 1994), Social Cognitive Theory (Bandura, 1994), the AIDS Risk Reduction Model (Catania et al., 1990), and the IMB model (Fisher and Fisher, 1992). Participants in this study who reported high perceived risk of HIV contraction were significantly more likely to frequently use condoms than those who reported moderate or low risk. This appears to support the hypothesis that perceived risk is inversely related to at least some forms of risky sexual behaviour. However, those who perceived themselves to be at high risk of contracting HIV were significantly less likely to frequently use condoms than those who perceived themselves to be at no risk at all. At first glance this latter finding may seem counterintuitive; however it may be that those who frequently used condoms were more likely to perceive themselves as experiencing no risk of contracting HIV as a result of this behaviour. Again, this provides some encouragement, as it suggests the possibility that some of the participants in this study may have successfully internalised the link between unprotected sexual intercourse and HIV transmission, and that this internalisation has translated into the adoption of safer sexual practices.

Previous South African studies have revealed that young South Africans are exposed to pervasive social pressures influencing their sexual behaviour (MacPhail and Campbell, 2001; Wood et al., 1996). Fisher et al. (1992) suggest that adolescent peer pressure and norms generally

encourage risky sexual behaviour and discourage concerns about sexual health. This study found that participants reporting high levels of peer pressure to have sex were significantly less likely to frequently use condoms than those reporting some, little or no pressure. Although this item did not directly refer to condom use, it seems unlikely that sustained pressure from peers to have sex would occur within a context that was supportive of safer sexual behaviour. This is especially the case in South Africa where peer norms discouraging condom use are especially pervasive (MacPhail and Cambell, 2001). Efforts to combat the spread of HIV within this community would likely benefit from an analysis and reformulation of dominant peer norms and pressures regarding sex and healthy sexual practices.

Participants who reported discussing condoms with their first sexual partner were significantly more likely to report frequent lifetime condom use. Discussion of condom use with one's partner has been shown to predict actual condom use with that partner (Adetunji and Meekers, 2001). Individuals who discuss condoms with sexual partners are likely to be more concerned about sexual health risks and motivated to engage in behaviour that may serve to protect them against those risks. Factors hindering condom use in South Africa have been well studied. These are often related to peer pressure and gender imbalances in the expression of sexual power (MacPhail and Campbell, 2001). This study suggests that those individuals who are motivated to discuss condom use at the time of sexual debut may be able to maintain this motivation in the presence of persistent countervailing peer pressures and gender norms.

This study identified a number of statistically significant associations between substance use variables and HIV risk variables. These data indicate that alcohol consumption and drug use are strongly associated with the tendency to engage in high-risk sexual behaviour in this sample. These findings are supported by previous studies indicating that drug and alcohol use are positively associated with risky sexual behaviour (Graves and Leigh, 1995; Lowry et al. 1994; Thompson et al., 2005). Indeed, 47% of the participants in this study who had consumed alcohol other than for religious purposes reported either that they believed that they could not or probably could not use a condom during sex after drinking or taking drugs.

However, rather than interpreting these findings in the context of substance use as a causal factor, it is plausible that some substance use and forms of risky sexual behaviour are linked to common personality traits. For example, Zuckerman (1994) defined *sensation-seeking* as a biosocial personality trait manifesting itself as:

> …the seeking of varied, novel, complex, and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such experience. (27)

It is possible that the tendency to engage in risky sexual behaviour is at least partially the product of the disinhibitive effects associated with substance use (Seloilwe, 2005), as well as other factors including sensation-seeking and risk-taking behavioural tendencies (Leigh and Morrison, 1991). This dynamic has not been explored among school-attending adolescents in South African townships and warrants further attention to identify potential discrete and interactional associations with HIV-related risk behaviours among youth in this community.

Limitations

The present study provides new information relating to the HIV-related knowledge, attitudes, beliefs, and practices of school-attending adolescents in Khayelitsha. However, there are a number of important limitations that should be considered when interpreting these results. This was a cross-sectional study design and does not allow causal or temporal inferences to be made when interpreting the findings. This study was based on self-report data which introduces the possibility that participants responded in a socially desirable manner. However, a substantial number of precautions were taken to minimise potential response bias. This was a study of

school-attending adolescents and certain high-risk groups may have been excluded from analysis. Whilst this is a shortcoming, this population was selected as the school setting offers a promising avenue of promoting HIV-preventive practices among large groups of high-risk adolescents. The relatively small sample size was also a limitation as it could compromise external validity. As this was a small pilot study, the purpose of which was to provide initial data on a unique population which would likely be followed by a much larger randomised cluster study, only basic statistical analyses were employed. This introduces the possibility that some findings may have been confounded by other variables not controlled for through more sophisticated statistical analyses, thus findings should be interpreted with caution. Additionally, although schools were randomly selected, participants were members of a convenience sample. This limits the generalisability of the findings as the sample was not entirely representative. For example, students who chose not to volunteer, or who were absent during the days of the study may have been systematically different from those who took part. However, the impact of this may be of lesser consequence in this study for two reasons: the number of participants in each class represented the majority of potential participants based on class number, and no significant differences were found on key variables between schools, indicating a lack of systematic difference in response patterns between independent samples. Despite these limitations, this study highlights the elevated risk of HIV infection among participants and could serve to inform the development and implementation of HIV prevention interventions in this community.

Conclusion

This study reveals many things: important deficiencies in HIV-related knowledge; frequent unprotected sex with multiple sexual partners; high prevalence of STIs; significant gender differences in HIV-related risk; and risk and protective factors among school-attending adolescents in a South African township. Many of the risk behaviours reported in this study appear to occur more frequently in this sample than among youth participating in larger-scale studies encompassing multiple localities. This suggests caution against the over-reliance on data relating to socioculturally dissimilar groups in South Africa. Given the frequency of risk behaviours in an area with antenatal HIV prevalence of 33% (SANAC, 2007), culturally appropriate HIV prevention interventions are urgently needed to help reduce the incidence of HIV infection in this and similar communities. There have been few studies of HIV risk and protective factors among school-attending adolescents in townships in the Western Cape. This study adds to the knowledge base pertaining to the specific needs of this demographic and is of particular relevance to the field of behavioural HIV prevention as the school context provides an already intact infrastructure capable of supporting the delivery of interventions to large groups of young people at risk of HIV transmission.

It is necessary that these findings be viewed within a social epidemiological framework. This paper has highlighted the importance of extra-individual factors that may affect individual behaviour in the context of HIV. For example, the reformulation of sociosexual norms in South Africa is of paramount importance in reducing the disparity of HIV prevalence between sexes. Empowering females to contribute financially or remain self-sufficient through microeconomic finance or entrepreneurship programmes may help reduce gender oppression and patriarchal views towards sexual relationships. On a more structural level, the role of poverty in perpetuating the HIV pandemic for both males and females has been established, and should suggest the need for multiple levels of intervention in areas that have been historically disadvantaged in order to attenuate the negative health outcomes associated with poverty and underdevelopment. A more prominent focus on substance use should be incorporated into interventions, as well as more critical study of the underlying mechanisms that may lead to substance use. Finally, this study should lay the foundation for more robust tests of risk and protective factors in South African townships which could potentially lead to randomised controlled trials more capable of achieving

their intended results.

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William DeJanes is a research student in the Department of Social Policy and Social Work, Oxford University. His past research has focused on the HIV prevention needs of school-attending adolescents living in low-income South African townships. He is currently researching the validity and transportability of a revised information-motivation-behavioural skills (IMB) model of HIV prevention incorporating culturally-appropriate extra-individual constructs among youth in Khayelitsha – a Black/African township in the Western Cape.

william.dejanes@exeter.ox.ac.uk