PREVALENCE AND ASSOCIATED FACTORS OF MULTIPLE SEXUAL PARTNERSHIPS, GERT SIBANDE DISTRICT, SOUTH AFRICA, 2010

by

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ABSTRACT

Background

Gert Sibande District has the highest HIV prevalence among women attending public antenatal health clinics. Multiple sexual partnerships (MSP) enhance heterosexual HIV transmission, which is the main form of transmission in South Africa. There is need, therefore, to identify important factors associated with MSP for the development of strategic intervention policies and programmes.

Objectives

To determine the prevalence and associated factors of multiple sexual partnerships (MSP) in men and women in Gert Sibande District (GSD) in 2010.

Methods

This is a secondary data analysis of data collected through a cross-sectional multi-stage study using cluster probability sampling technique in GSD in 2010. The study collected data on 750 adult men and women aged 16 to 55 years through an interviewer-administered standardised questionnaire. Simple descriptive statistics and chi square analysis were used to determine the prevalence and patterns of the MSP in the study population. Multiple logistic regression models were built to determine factors that were independently associated with MSP.

Results

The analysis included 592 sexually active respondents: 200 men and 392 women. A fifth of the respondents had had their first sexual encounter before the age of 16 years. Condom use was higher among men than women. Condom use was lowest with most recent partners (56.6%) than in second (74.6%) and third sexual partners (78.6%). Alcohol use was high, with more

men (72.0%) than women (33.2%) having ever consumed alcohol ($p<0.001$) and among these alcohol users, more men (44.5%) than women (8.7%) were involved in risky drinking.

The overall reported MSP prevalence was 22.0%, 95% CI: 19 - 25%. Men (44.0%, 95% CI: 37 - 51%) reported significantly higher levels of MSP than women (10.7%, 95% CI: 8 - 12%). Levels of MSP decreased with age and were highest among young adults, men (20 to 24 years) and women (15 to 19 years), those who were never married, and among men in the intermediate socio-economic group.

There were significant associations between MSP and underlying socio-demographic factors (age, socio-economic status and marital status), and with intermediate sexual behavioural factors (age at first sex, condom use at last sex), sex under the influence of alcohol and transactional sex in the past 12 months). Among men, young age (AOR 3.0, 95% CI: 1.0 - 9.3) socio-economic status (AOR 3.1, 95% CI: 1.7 - 5.6) predicted having MSP. The strongest positive correlation of MSP among men occurred with the sexual behavioural factors, particularly age at first sex (AOR 9.7, 95% CI: 2.3 - 41.4) and having sex under the influence of alcohol (AOR 4.5, 95% CI: 1.9 - 9.7). There was a 4.5 times likelihood of MSP with transactional sex in the past 12 months. Among women, being never married (AOR 10.9, 95% CI: 1.3 – 90.3), condom use at last sex (AOR 2.4, 95% CI: 1.1 – 5.6), transactional sex in the past 12 months (AOR 12.0, 95% CI: 3.9 – 37.1) and having sex under the influence of alcohol (AOR 9.3, 95% CI: 4.4 – 19.6) were significantly associated with increased odds of MSP.

Conclusion

The findings of this study showed a high prevalence of MSP compared to the reported prevalence of MSP in the South African national and sub-national surveys (SABSSM, NCS and DHS). The prevalence was ever higher across some sub-groups of the population. The

findings highlight the need for interventions that will address socio-economic factors influence MSP in GSD, especially among young adults and unmarried adults of GSD. Among this largely black population, the occurrence of several sexual risk factors, including early age at first sex, transactional sex, and high alcohol use, indicate the need for group-specific interventions. This study also provides a basis for future research to allow for the comparison of changes in MSP levels among adults of GSD and for prevention interventions targeting partner reduction.

DECLARATION

I, Babalola Olukemi Solabomi declare that this research is my original work. It is being submitted to the School of Public Health, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa, in partial fulfillment for the degree of Master of Science in the field of Epidemiology and Biostatistics. It has not been submitted either in part or in full for any degree or examination at this or any other university.

09../05./2014

DEDICATION

To His Royal Majesty, His Excellency, His Royal Highness J. G. EMMANUEL

AND

In **memory of my loving father, Chief Jacob Taiwo Babatola,** who left for glory shortly before this work was completed. Without you and mummy under God, I cannot be anywhere near where I am today. You so laboured, you had no education, yet you ensured we were educated well; you were orphaned at a tender age and was left with no inheritance, yet you left mum with no fear for tomorrow and us not in any need for your inheritance though we will continue to protect your legacy. Most importantly, you left us Jesus, a passion unequal as you had to propagate the gospel, helped the needy and took in orphans. It is hard thinking you have actually left, more so I wasn't there to bid you good-bye. You said enough for me to have gotten the hint before I left home, but I was too selfish to let you go, despite knowing how unwarranted staying on this side of eternity is when it's time to go. I like remembering how you resorted to calling me my special names towards the end. I love you more than words can say; forever I will be missing you till we meet again at His feet. Rest my beloved father. The God you have served faithfully for all these years obviously loves you more.

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To His Royal Highness, this is to acknowledge your kind support, love, continual visits and kindness throughout the duration of this course and in particular, the research report. I am forever grateful. Your 'rep' NKB did his very best. I am grateful to him too. The SUPER 5, I love you dearly.

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Finally, I must thank you my brother, Mr. Emmanuel Ojo - you allowed God to use you in so many ways. I acknowledge your wife Tumi, and children, Moraanu and Anuwamiri. God bless you all.

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AOR	Adjusted Odds Ratio
CI	Confidence Interval
DHS	Demographic and Health Survey
DOH	Department of Health
EA	Enumeration Area
GSD	Gert Sibande District
HDA	Health Development Africa
HIV	Human Immunodeficiency Virus
IQR	Inter Quintile Range
MDoH	Mpumalanga Department of Health
MP	Mpumalanga Province
MSP	Multiple Sexual Partnerships
NCS	National Communication Survey
PCA	Principal Component Analysis
PPS	Probability Proportional to Size
PSU	Primary Sampling Unit
ROC	Receiver Operating Characteristic
SA	South Africa
SABSSM	South African National HIV Prevalence, Incidence, Behavioral and Communication Survey
SADC	Southern Africa Development Community
SADHS	South African Demographic and Health Survey
SALGA	South Africa Local Government Association
SSA	Sub-Saharan Africa
SSU	Secondary Sampling Unit
StatSA	Statistics South Africa
STIs	Sexually Transmitted Infections
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
WHO	World Health Organization

DEFINITION OF TERMS

Condom use at last sex	condom use during the last sex the respondents had with each of their sexual partners
Household:	a group of people living and eating from the same pot.
Multiple sexual partnerships:	situation where an individual had two or more sexual partners in the past month twelve months
Risky drinking:	having five or more drinks per day (men) or three or more drinks per day (women).
Sexually active respondents:	respondents who had engaged in full penetrative anal or vaginal sexual intercourse.
Transactional sex:	Having provided sex to the sexual partner in exchange for money or resources or provided money or resources in exchange for sex

CHAPTER ONE

INTRODUCTION

1.1 Background information

Multiple sexual partnerships (MSP) have been shown to aid the spread of sexually transmitted infections (STIs), including human immunodeficiency virus infections (HIV)(1). Evidence abounds in the literatures on the association of multiple sexual partnerships and increased risks of STIs, including gonorrhoea, syphilis, chlamydia and human immunodeficiency virus infections (2-5).

Studies have emphasised the role of social cultural determinants in enhancing sexual network created through these sexual relationships. Moody (2001) indicated that the simplest and most relevant of the sexual network is one involving a high number of sexual partners (6). HIV prevention strategies have therefore focused on the reduction of the number of sexual partners of individuals (7).

Multiple sexual partnerships refer to having more than one sexual partner within a defined period of time. Multiple partnerships defined as having two or more sexual partners over a period of a year refers to MSP in the past twelve months (8). MSP in the past twelve months was captured by Thornton (2009) as a partnership in which people have sex with a number of others within a twelve month period (9). Differing forms of MSP, including having a steady partner as well as other 'side' partners exist (10). Frequency of changing sexual partners within very brief periods (multiple partnerships) and frequency of sexual exposures with

different sexual partners that overlap in time (concurrency) are important factors in the poorly understood dynamics of HIV transmission (1).

Consistent with the literature, MSP have been confirmed as widespread sexual risk behaviour engaged in by many (11, 12). In a study among adults aged 18 to 49 years, preference for the increased use of condoms outweighed the choice of partner reduction (11). In a South African study, men considered not having a sexual partner a worse hazard than the risk of HIV infection (12).

Prevalence of MSP differs between countries (8). The reported prevalence of MSP among men 15 - 59 years from 15 sub-Saharan African (SSA) countries ranged from 1.0% (Ethiopia) to 27.8% (Cameroon) (13). Gender variations in the prevalence of MSP across different countries were reported in another study (14). Other risk factors of MSP identified included early sexual exposure, high levels of education and ethnic variations, as well as economic factors and migration (13, 14).

In the South African 2006 national HIV/AIDS communication survey (NCS), a high prevalence of MSP, with 31.9% among men and 12.2% among women (18 - 30 years), was reported (8). In a sub-district survey of sexually active young adults (15 - 24 years) in Kwazulu-Natal, the prevalence of MSP was higher among men (57.4%) than women (8.7%) (15). In two consecutive South African NCS, the prevalence of MSP dropped from 25.9% in 2006 to 20.1% in 2009 among men, and from 7.0% to 3.0% among women (16, 17).

In 2009, Gert Sibande District (GSD) had the fifth highest HIV prevalence in South Africa with 38.2% among antenatal women (18). In a formative qualitative research carried out in the district, participants blamed the high prevalence on MSP (19). It is therefore important to

determine the prevalence of MSP in GSD as well as to describe its related factors, as no study has been carried out to succinctly understand the dynamics of MSP in this district.

1.2 Statement of the problem

The prevalence of HIV in South Africa is high; and GSD is one of the districts with the highest prevalence in the country. The national average, reported in three consecutive South African National HIV Prevalence, Incidence, Behavioural and Communication Surveys (SABSSM) has remained stable at 11.4% (2002), 10.8% (2005) and 10.9% (2008). In Mpumalanga Province, in the SABSSM, rates of HIV prevalence were consistently above the national average and rose from 14.1% in 2002, 15.2% in 2005, to 15.4% in 2008 (17, 20, 21). In South Africa in 2009, among women attending antenatal clinic for the first time, GSD was shown to have had the fifth highest HIV prevalence at 38.2% (18). Experts have concluded that high levels of MSP by men and women with insufficient condom use form a major part in the HIV epidemic in the southern African region (22).

In the SABSSM, the national prevalence of MSP increased from 13.5% in 2002, to 16.3% in 2005, and remained unchanged in 2008 (16.2%) among men, while the prevalence among women remained at less than 4.0% (17, 21). As reported in the SABSSM, the prevalence of MSP among adults (15 years and above) in Mpumalanga Province showed a slight increase from 7.2% in 2005 to 9.4% in 2008, but the increase was not statistically significant (17). No information on MSP is available for Gert Sibande District. The prevalence of HIV in GSD is higher than the national average HIV prevalence. Although data exist on MSP in Mpumalanga Province, no information on MSP or factors affecting MSP exist for GSD.

1.3 Study aims and objectives

1.3.1 Research question

What are the prevalence and factors associated with MSP in Gert Sibande District, Mpumalanga Province in 2010?

1.3.2 Main aim

To determine the prevalence and patterns of MSP and the socio-demographic and sexual behavioural factors associated with MSP in adults (16 – 55 years) in Gert Sibande district in 2010, in order to understand the drivers of the HIV epidemic in this district.

1.3.3 Study objectives

- To estimate the prevalence of MSP for men and women, in Gert Sibande District among adults aged 16 to 55 years old in 2010.
- To identify associated socio-demographic and sexual behavioural factors influencing MSP in GSD.

1.4 Justification

There is a need to estimate the prevalence of MSP in Gert Sibande District, given its high HIV prevalence. Countries such as Uganda that have managed to achieve a reduction in the prevalence of HIV infection, achieved this through placing priority on partner reduction to gain control of the epidemic (23). There is a possibility that the high prevalence of HIV in the district is due to high levels of MSP in men and women. Also, there is a need to explore specific factors driving MSP in the district. The need for a sub-population understanding of sexual network was implied by Tanser *et al* (2011) who emphasised the role played by sexual behavioural characteristics at local community levels. In light of the complex and dynamic

variations in risks factors of MSP, it is imperative to better understand factors that may be responsible for MSP in Gert Sibande as a sub-population in South Africa.

A cohort study of South African men and women concluded that for HIV prevention messages to be effective, the messages have to be directed towards the reduction of the number of sexual partners, rather than concurrency as a driver of the HIV epidemic (24). The results of this study may help in the development of relevant policies and programmes to influence behavioural change that will be appropriate for this local area.

1.5 Literature review and conceptual framework

1.5.1 Description of Gert Sibande District (GSD)

Gert Sibande is one of the three districts in Mpumalanga Province (Fig. 1.1). It shares a boundary with Gauteng Province to the west, Nkangala District to the North, Swaziland and Ehlanzeni District to the east and Free State and KwaZulu-Natal Provinces to the south (25). It has a large land mass with an area of approximately 31 842km². There are over 120 towns and villages within its seven sub-district/local municipalities namely: Albert Luthuli, Dipaleseng, Govan Mbeki, Lekwa, Mkhondo, Msukaligwa and Pixley Ka Seme (25). According to the 2007 community survey, Gert Sibande was home to 890 699 people and accounted for 24.4% of the Mpumalanga population (26).

The male-female sex ratio in GSD is 97.2:100, with a 51.0% female proportion. In major urban municipalities, there are slightly more men than women, including Govan Mbeki (50.4% men) and Lekwa (50.6% men). Women on the other hand are more prevalent in rural local municipalities, including Albert Luthuli (52.5% women). Seme Municipality (52.0% women), though not a rural municipality, has different areas for different racial sub-

populations. This was as a result of the adoption of the Group Area Act which resulted in the segregation (27). In 2008, Blacks (90.7%), Whites (8.2%), Coloureds (0.5%) and Asians (0.7%) made up the Gert Sibande population (25). In 2008, its urban population was comprised of Whites, Coloureds, Asians, and a little over half were Blacks.

Gert Sibande District has an unemployment rate of 33% (28). Its main economic activity is mining, and it is characterised by vast farming areas (28). The district is located along major trucking routes with migrant labour movement from the neighbouring provinces and countries (28). The composition and location of Gert Sibande may have an implication in the occurrence of a high HIV prevalence in the area.

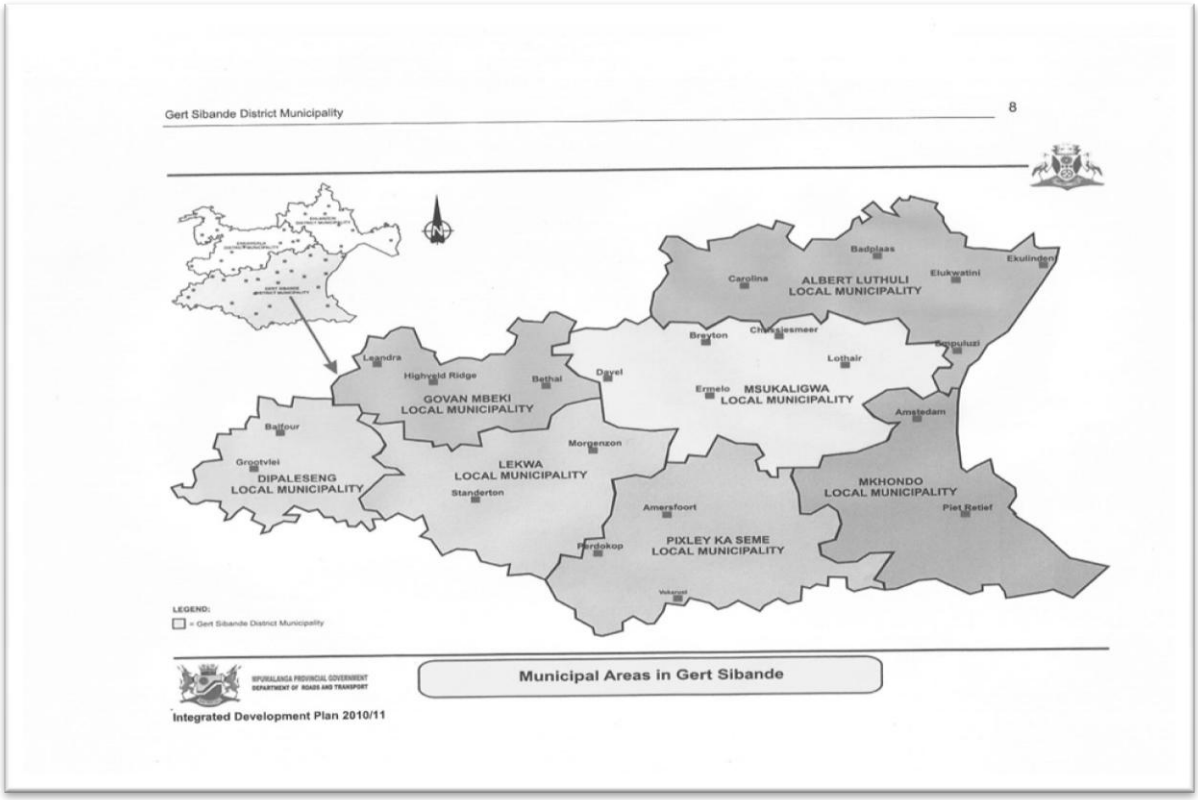

Fig. 1.1: Map of Gert Sibande District showing its municipal areas (2010/11) (29)

1.5.2 HIV infection and associated factors in Gert Sibande District

Few studies have measured factors associated with the high HIV prevalence in Gert Sibande. In a study of factors associated with HIV infection among people visiting HIV counselling and testing (HCT) centres in two districts in Mpumalanga Province (Gert Sibande and Nkangala), having non-regular sexual partners, the lack of consistent use of condoms, meeting sexual partners on the street, transactional sex, the lack of behavioural skill enactment and a history of STIs were reported as prevalent sexual risk factors in the district (30). In another study, factors associated with increased risk of HIV in the district included transactional sex and commercial sex work, which often involve MSP (19).

1.5.3 Multiple sexual partnerships and associated factors

With MSP, a more efficient medium of transmission is made possible through increased sexual networking (31). In age-disparate, intergenerational or cross-generation sexual relationships, young people, especially girls, become involved in sexual relationships with older men (10). The rate at which STIs including HIV are transmitted is increased in situations where people have these types of MSP (8).

Several factors drive MSP. Higher prevalence of MSP has consistently been reported in several studies among men than women both within and outside South Africa (17, 32, 33). Gender roles, gender socialization and cultural involvement favour acceptance of MSP among men (34, 35). Harrison *et al* (2006) has further explained the place of social identity which fuels the desire of men for MSP (36). Men tend to prove their masculinity through having MSP and may even exaggerate their involvement. Among women, focus on women's rights have shifted the gender power resulting in changing patterns of factors influencing MSP (37). Within this milieu, women have become more assertive. In a study among South

African youths, Harrison et al. (2006) described a form of "relationship power" related to gender power that was associated with MSP among women (36).

The prevalence of MSP is affected by important factors such as age and race (38, 39). In South Africa, higher prevalence was observed among Blacks compared to other races (40). This was explained to be due to the differences in the socio-economic status with disproportionate levels of poverty and lower educational status occasioned by the apartheid regime (41). Cultural and social norms also play very important roles in shaping and influencing behaviours. (35). Particularly, among men, age has been shown to be associated with MSP. Young adults are more likely to have MSP than older ones especially when they are men. (34). Young Black people have also been found to initiate sex earlier than their White, Asian or Coloured counterparts (42).

Early age at first sex is associated with MSP, increased risks of STIs including HIV and unwanted pregnancy (31, 43). When an individual initiates sex at an early age, the period during which such an individual gets exposed to sexual acts is longer; hence a higher number of lifetime sexual partners becomes likely (35). The increased sexual risk behaviours of early age at first sex and MSP are also influenced by inadequate exposure to knowledge of HIV prevention, a less perceived risk of HIV and a lack of skills to ensure adequate protection (44).

Lower condom use at last sex was observed among Kenyan men who gave financial or material gifts to women (45). Multiple sexual partnerships involving the exchange of gifts is termed transactional sex and invariably translates to men who do the giving, assuming that the women who accept these gifts have accepted their terms. These terms often involve sex without the use of condom and leave little room to insist on monogamy (46).

Places where alcohol is consumed (including shebeens and taverns), where men and women meet for socials are potential sites for risky sexual partnership formation (1, 47). Alcohol use varies in measures; from occasional use to frequent and risky drinking or problematic use (48). Risky drinking was found to be positively associated with having MSP that were later regretted in a study among persons aged 25 to 44 years in Cape Town, South Africa (49). Alcoholic drinkers are categorized among most-at-risk-populations (MARPS) because of the risky sexual behaviours such as unprotected sex often occurring among sexual partners (50, 51).

1.5.4 Conceptual framework of determinants of multiple sexual partnerships

Many factors have the potential to influence MSP. It is important to conceptualize how these factors link up and interact to influence MSP. A conceptual framework is useful in understanding such inter-relationships. A conceptual framework also helps to understand which factors are potential confounders and which factors are pathway variables. For this purpose, the three-level proximate determinant conceptual framework developed by Boerma and Weir was adapted (52).

According to the proximate determinant framework, underlying factors are social, economic, and environmental determinants which operate through proximate determinants to affect the outcome. Proximal determinants are factors which link directly to and directly influence the outcome, in this case, HIV infection. Proximate determinants (both behavioural such as MSP and biological such as the viral load) serve as the link between underlying (background factors) and a biological system that determine the transmission of HIV (Figure 1.2). Distinguishing between underlying and proximate determinants enables in an understanding of the pathway through which underlying factors may affect the outcome.

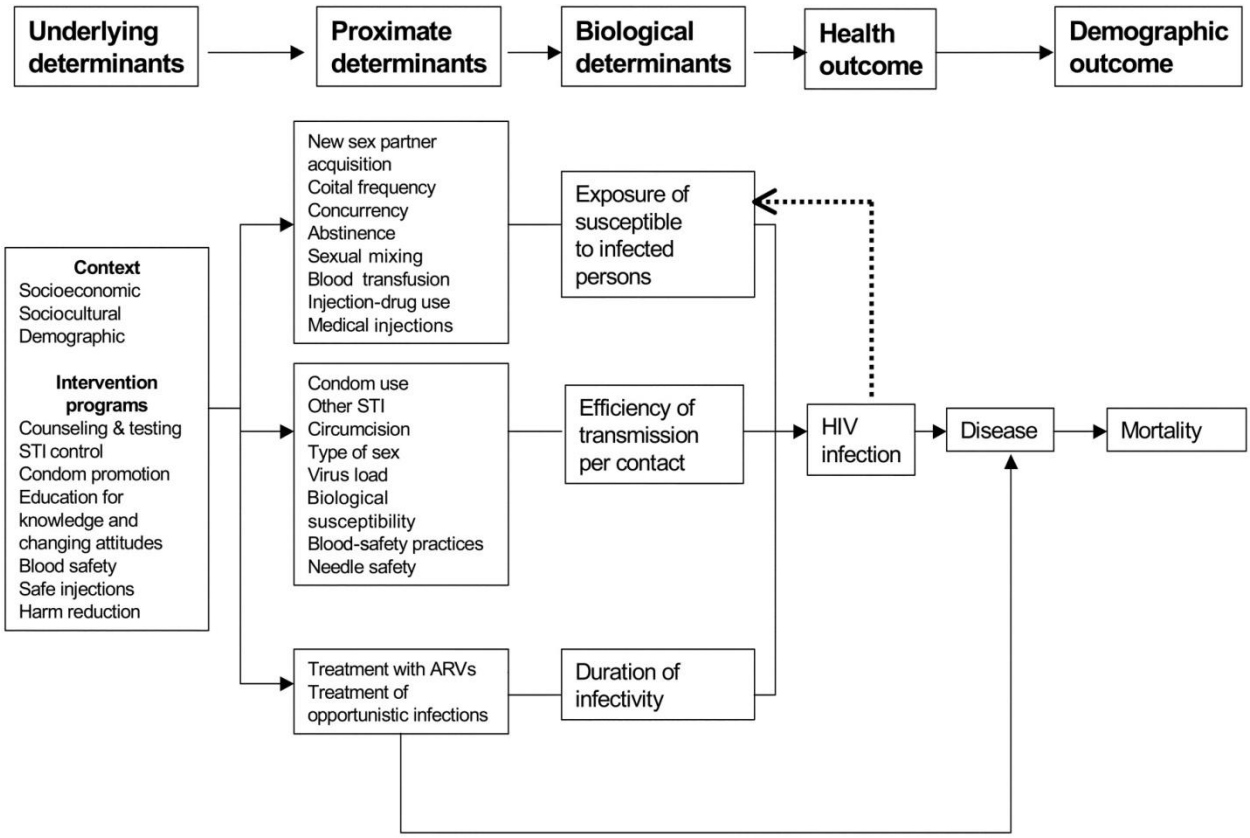

Figure 1.2 Proximate-determinants conceptual framework for factors affecting the risk of sexual transmission of HIV, ARVs, antiretrovirals; STI, sexually transmitted infection.
Boerma J T, and Weir S S J Infect Dis. 2005;191:S61 - S67

By adapting the proximate determinant framework for this analysis, explanatory factors were categorised as background (socio-demographic) and intermediate (sexual behavioural) factors (Figure 1.3). Background factors involved at individual levels include gender, age, levels of education, employment status, socio-economic status, marital status, rural or urban settlement areas and the municipality. Factors at the background level act through intermediate factors to influence MSP. Such intermediate level factors include age at first sex, condom use at last sex, substance use such as alcohol and involvement in transactional sex

Associated background factors can help to know who needs intervention while associated intermediate factors can help to know how interventions should be designed. Ultimately, through the use of the framework, it is hoped that the findings can help with the development of evidence-based approaches to HIV prevention interventions.

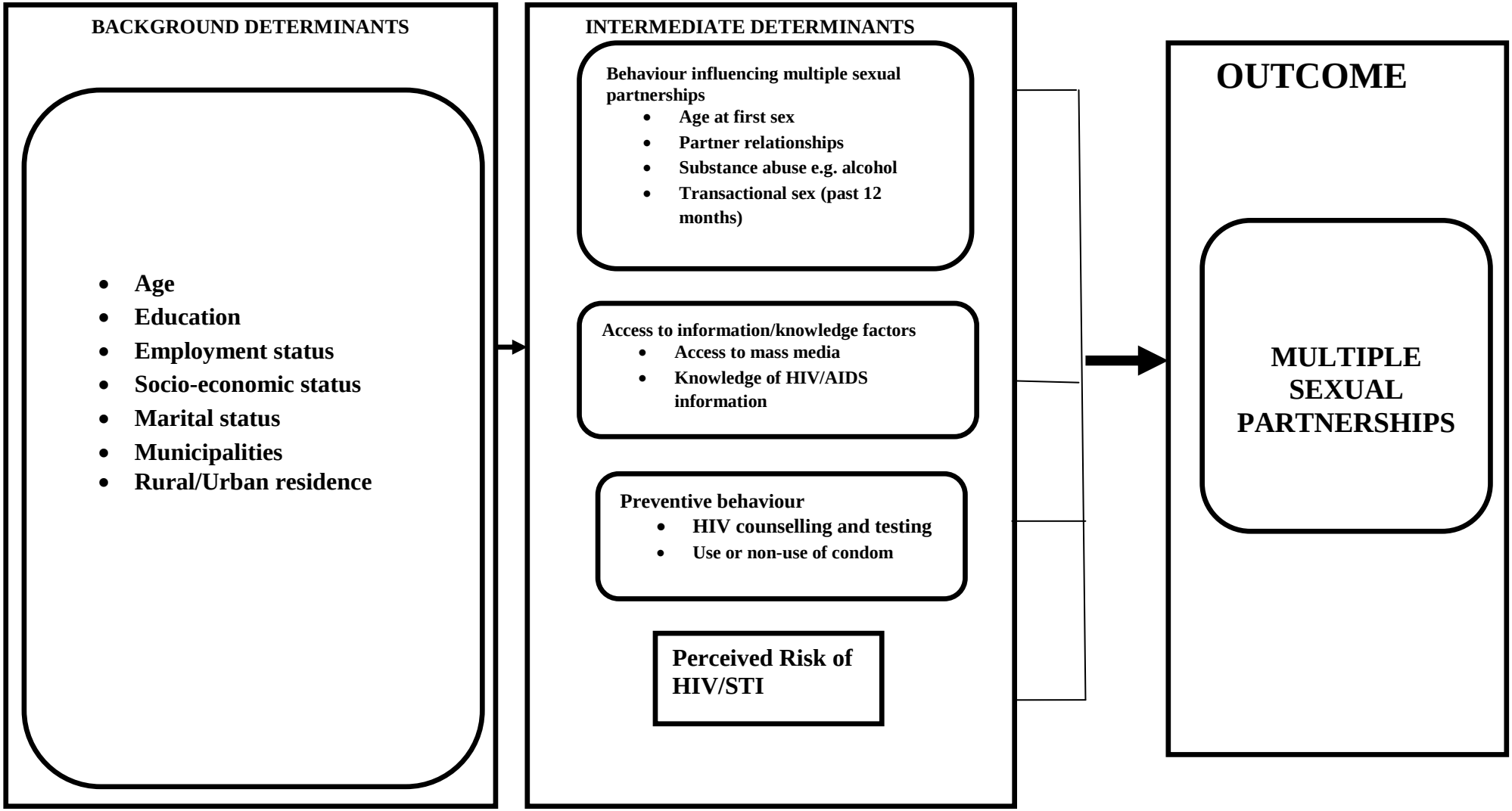

Figure 1.3 Conceptual frameworks of determinants of multiple sexual partnerships

CHAPTER 2

METHODOLOGY

Introduction

Many variables have the potential to influence having multiple sexual partnerships. A conceptual framework adapted from the proximate-determinant framework of Boerma and Weir was used to understand the hierarchical links between potential confounders and to determine important factors to adjust for in modeling.

2.1 Study design

This is secondary data analysis using data collected through a cross-sectional, multi-stage cluster survey conducted by Health Development Africa (HDA) in Gert Sibande District in 2010. The original study was carried out to understand the drivers of HIV epidemic in Gert Sibande District.

2.2 Study population

The study population included all adult respondents aged 16 – 55 years from the seven municipalities of Gert Sibande District.

2.3 Study sample

Of the 750 respondents sampled, 592 were sexually active. That is those who had reported having had sexual intercourse in the past 12 months (sexually active respondents). The criterion for inclusion in this secondary data analysis is that the respondent must have had sexual intercourse in the twelve months preceding the survey.

2.4 Sampling method

The study employed a cross-sectional, multi-staged cluster sampling method using a three-staged sampling process, with all seven municipalities from the Gert Sibande District included. In the first selection stage, from an enumerator area (EA) map (Statistics South Africa (StatSA)), field supervisors randomly selected 30 EAs (primary sampling units) across the seven municipalities of the district. This sampling employed probability proportionate to size (PPS) where the opportunity to be included in the sample was the same for all units. In essence, the sampling was self-weighted.

Next, twenty-five household/dwelling units (secondary sampling units) were sampled by identifying a random starting point from a number of estimated households/dwelling units within each EA. This sampling followed an area scan of the EAs and a calculated sampling interval. The final stage consisted of the selection of one respondent from each household using the KISH grid method (53). The multistage sampling gave a final sample size of 750 respondents from the district.

2.5 Primary data collection methods and quality control

Data was collected using a pre-tested structured questionnaire administered by trained fieldworkers in face-to-face interviews (Appendix 1). The instruments contained, among others, sections on socio-demographic information, knowledge, attitudes and perceptions on HIV/AIDS, alcohol use, self-efficacy for condom use, testing and faithfulness, voluntary counselling and testing, sexual behaviours and practices and circumcision. The questionnaire was translated from English into three local languages, namely IsiZulu, IsiSwati and IsiSotho.

To ensure quality control, no substitution or replacement was allowed at the EA level. Before the commencement of fieldwork, an initial expected response rate per EA was estimated to ensure that the required sample size was achieved as closely as possible. This ensured that the achieved response rate was at an acceptable level.

The survey protocol allowed for substitution at the household levels. Selected individuals were sought for interviews on three occasions, and were then excluded if they could not be interviewed. That household was then substituted with the household to the left of it. Quality control of the work of each interviewer was done by the field supervisor.

2.6 Definitions and measurements of study variables

2.6.1 Definition of the outcome: multiple sexual partnerships

The outcome, multiple sexual partnerships, according to UNAIDS (2003), was defined as having two or more sexual partners in the past twelve months (54). Based on this definition and because of the smallness of data when further stratification is applied, MSP was categorised as "0" for one partner and "1" for two or more partners.

2.6.2 Exposure (explanatory) variables

2.6.2.1 Socio-demographic (underlying) factors

In Table 2.1, the categorisation, definitions, the source and codes of the seven socio-demographic (underlying) factors studied are detailed. The variables include, gender, age, educational level, employment status, socio-economic status, marital status and settlement type (rural or urban). Race (Black or Coloured) could not be included in the analysis because of very small numbers in the Coloured category.

To derive the socio-economic status, household assets were analysed using the principal component analysis (PCA) statistical method. Such household assets included vehicle, radio, television, computer, washing machine, microwave, video cassette player, home telephone and cellular, electricity, kitchen sink, flush toilet, home water and hot water. In PCA, many correlated indicators were summarised into fewer unobserved variables called principal components (PC). Each PC is a weighted average of the underlying indicators. The scores for each component were summed up for individual households and categorised into three proxy wealth index categories used as a matter of convenience. Table 2.1 (55).

Table 2.1 Categories, definitions, source, and codes of socio-demographic variables

Variables	Category	Definition	Source	Code
Background (Socio demographic) variables				
Gender	Men Women	Refers to the social construct in view of the behavioural outcome	Literature	1 2
Age	15 - 19 20 - 24 25 - 29 30 - 34 35 - 39 40 - 55	Categorised ages of respondents on a five-year intervals	Categorised data	1 2 3 4 5 6
Education	Primary or less Secondary uncompleted Matric & above	Categorised based on the completed level of education from the data	Data	1 2 3
Employment status	Unemployed Employed	Respondents indicated whether they were employed, not employed or students. All students were categorised as unemployed for ease of categorisation	Data	1 2
Socio-economic status	High Intermediate Low	Derived using principal component analysis (PCA) statistical method from household assets declared by respondents	Constructed	1 2 3
Marital status	Ever married Never married	Ever married (married, divorced or widowed) Never married	Data	1 2
Settlement types	Urban Rural	Settlement types categorised into urban (urban formal and informal), and rural (peri-urban and rural) due to small numbers	Data	1 2

2.6.2.2 Sexual behavioural (proximate) factors

The four sexual behavioural factors considered for inclusion based on their influence in the formation of MSP are age at first sex, condom use at last sex, transactional sex in the past 12

months and having had sexual intercourse under the influence of alcohol. Details of these variables are shown in Table 2.2.

Table 2.2 Categories, definitions, source, and codes of sexual behavioural variables

Variables	Category	Definition	Source	Code
Intermediate factors (Sexual behaviours characteristics)				
Age at first sex	<16 years 16 -19 years 20+ years	Age of respondents at the first sexual intercourse in their life. Categorised from self indicated age at first sex	Data	1 2 3
Condom use at last sex	No Yes	Use of condom at last sexual intercourse with each sexual partner (only question on condom use captured in the questionnaire)	Data	1 2
Sex under the influence of alcohol	Non drinkers No Yes	Having had sexual intercourse under the influence of alcohol in the past twelve months	Data	1 2 3
Transactional sex (past 12 months)	No Yes	Having provided sex to the sexual partner in exchange for money or resources or provided money or resources in exchange for sex in the past 12 months	Data	1 2
Perceived HIV risk	No Yes No response	Respondents agreed or disagreed with not getting HIV only just because he or she is lucky.	Data	1 2 3
Know HIV status	No Yes	Having tested for HIV and received the result ever (answer not requested for)	Data	1 2

2.8 Data management and analysis

2.8.1 Data management

The Gert Sibande data was received from Health and Development Africa (HDA) in STATA 12.0 format and all analyses were done using this statistical software. To remove the influence of errors that can bias the result, data checking was done. Errors such as inconsistencies of dates, missing values, extreme values, and duplicated data were carefully checked. Variables required to answer the objectives were kept, renamed, cleaned and coded as applicable. All explanatory variables were categorised to reduce the effect of small number observations and to make the analysis and the interpretation more meaningful. Where study variables had invalid or missing responses, such were excluded from the analysis.

2.8.2 Data analysis

2.8.1.1 Descriptive

Proportions reported in frequency tables and graphs were used to describe the socio-demographic characteristics of respondents. Sexual behavioural characteristics as well as the dependent variables were also described using frequency tables and graphs. As a result of the categorical nature of the explanatory variables, chi-square test of association was used to determine the association between the exposure and outcome variables. However, since the graphical display of numerical data (age and age at first sex) showed an asymmetrical distribution, the median and interquartile range (IQR) were reported.

2.8.1.2 Multivariate

2.8.1.2.1 Models building process

- Firstly, a bivariate analysis between MSP and underlying factors was carried out. Then significant factors associated with MSP at a p-value of <0.2 (a commonly used cut-off) were identified.
- To assess for associations between multiple exposures of interest and outcome, multivariate logistic regression of a binomial distribution was used and the results were reported as adjusted odds ratios (AOR) with 95% confidence intervals (CI). The basis of this population parameter estimation uses the method of maximum likelihood (56).
- Using a forward selection technique, three multivariable models were built (Models 1 and 2 and a full model).
- The test of assumptions performed on the models was the Hosmer-Lemeshow Goodness of Fit tests.

2.8.1.2.2 Models that were constructed

To explore the hierarchical relationship between potential determinants and MSP, three models were built separately for men and women, as follows:

- In order to understand what socio-demographic (background) factors were related to MSP, a model was developed (Model 1).
- A second model was built for the association between sexual behavioural factors and MSP (Model 2).
- Then a full model containing significant socio-demographic factors, adjusted for significant sexual behavioural factors was evaluated (Model 3).

Since the sampling was self-weighted, only the effect of clustering was taken into account in this analysis. Since clustering was done at the level of enumeration areas, the EAs was specified as the cluster variable in each model. The robust variance estimates technique provided inflated standard errors.

2.9 Ethical considerations

Ethical clearance was obtained from the University of the Witwatersrand's Human Research Ethics Committee (Ethics reference number: M120859). Permission for dataset use was obtained from the Director, Health and Development Africa (HDA). Permission to conduct the primary study was obtained from the Mpumalanga Provincial Research Committee, while ethical clearance was obtained from the University of the Witwatersrand's Human Research Ethics Committee. All participants in the primary study received an information and consent form.

CHAPTER 3

RESULTS

Introduction

This chapter is structured in line with the study objectives and the results are presented as outlined below:

- Description of socio-demographic and sexual behavioural characteristics of survey respondents
- Prevalence, patterns (socio-demographic and sexual behavioural) and factors associated with multiple sexual partnerships

Seven hundred and fifty respondents were recruited into the Gert Sibande survey. Most respondents, 690 (92%) reported ever having had sex. Among those who had ever had sex, 592 (85.8%) reported having had sexual encounters in the twelve months preceding the survey. Out of the remaining 14.2% who had refrained from sex 12 months prior to the survey, the majority (75%) were women. The following results are based on the 592 (200 men and 392 women) respondents who had had sexual encounters in the twelve months preceding the survey.

3.1 Socio-demographic factors

The socio-demographic characteristics of the study population are described in Table 3.1. Almost all were Black (99.2%). The majority were born in South Africa (98.5%), in Mpumalanga Province (81.1%). Approximately half (48.1%) of the respondents lived in urban areas. Most respondents spoke (77.7%) and read (73.5%) IsiZulu.

Two-thirds (66.2%) of the respondents were women. Age distribution was skewed and ranged from 16 to 55 years, with a median of 28.0 years (interquartile range (IQR): 22.0 – 38.0). The median age showed that the women were older (29.0 years, IQR: 22.0 - 39.5) than men (25.0 years, IQR: 20.0 - 34.0). About a third (36.1%) of the respondents were below 25 years of age.

Levels of education were low, with only 23.6% of women and 32.0% of men reporting high school completion or higher. Significant gender differences were observed in the levels of education (p=0.039), employment (p=0.000), marital status (0.041) and rural-urban settlement types (p=0.024). Most respondents (70.4%) were unemployed, with higher levels of unemployment in women (77.6%) than men (56.5%). Expectedly, respondents were more or less equally distributed among the three socio-economic groups (Table 3.1).The majority (86.5%) of the respondents had never been married; at the time of the survey, more women (15.6%) than men (9.5%) reported having ever been married.

Table 3.1 Socio-demographic factors of respondents by gender

Variables	Men (N= 200) n (%)	Women (N=392) n (%)	P-value Gender differences	Total (N=592) n (%)
Race				
Black	198 (99)	389 (99.2)	0.768	587 (99.2)
Coloured	2 (1)	3 (0.8)		5 (0.8)
Migrant status				
Migrated	3 (1.5)	6 (1.5)	0.977	9 (1.5)
Not Migrated	197 (98.5)	386 (98.5)		583 (98.5)
Province of birth				
Mpumalanga	159 (79.5)	321 (81.9)	0.097	480 (81.1)
Others	41 (20.5)	71 (18.1)		112 (18.9)
Age group (Median IQR)	**25.0 (20.0-34.0)**	**29.0 (22.0-39.5)**		**28.0 (22.0-38.0)**
16 – 19	23 (11.5)	37 (9.5)	0.100	60 (10.1)
20 – 24	61 (30.5)	93 (23.7)		154 (26.0)
25 – 29	43 (21.5)	77 (19.6)		120 (20.3)
30 – 34	28 (14.0)	53 (13.5)		81 (13.7)
35 – 44	15 (7.5)	53 (13.5)		68 (11.5)
45 – 55	30 (15.0)	79 (20.2)		109 (18.4)
Education				
Primary or less	50 (25.0)	100 (25.5)	**0.039**	150 (25.3)
Secondary uncompleted	80 (40.0)	192 (49.0)		272 (46.0)
Matric & above	70 (35.0)	100 (25.5)		170 (28.7)
Employment status				
Employed	87 (43.5)	88 (22.4)	**0.000**	175 (29.6)
Unemployed	113 (56.5)	304 (77.6)		417 (70.4)
Socio-economic status				
High	72 (36.0)	130 (33.3)	0.510	202 (34.1)
Intermediate	70 (35.0)	130 (33.2)		200 (33.8)
Low	58 (29.0)	132 (33.7)		190 (32.1)
Marital status				
Ever married	19 (9.5)	61 (15.6)	**0.041**	80 (13.5)
Never married	181 (90.5)	331 (84.4)		512 (86.5)
Municipalities				
Govan Mbeki	37 (18.5)	64 (16.3)	0.102	101 (17.1)
Albert Luthuli	28 (14.0)	75 (19.1)		103 (17.4)
Msukaligwa	23 (11.5)	56 (14.3)		79 (13.3)
Mkhondo	24 (12.0)	58 (14.8)		82 (13.9)
Lekwa	29 (14.5)	44 (11.2)		73 (12.3)
Seme	22 (11.0)	51 (13.0)		73 (12.3)
Dipaleseng	37 (18.5)	44 (11.2)		81 (13.7)
Settlement types				
Rural	90 (45.0)	217 (55.4)	**0.024**	307 (51.9)
Urban	110 (55.0)	175 (44.6)		285 (48.1)

3.2 Sexual behavioural factors

The sexual behavioural characteristics of the 592 respondents who reported having had sexual encounters in the past 12 months are shown in Table 3.2 below.

Table 3.2 Sexual behavioural factors of respondents by gender

Variables	Males (N=200) n (%)	Females (N=392) n (%)	P-value Gender differences	Total (N=592) n (%)
Age at first sex				
<16	54 (27.0)	63 (16.1)	**0.010**	117 (19.8)
16 – 19	117 (58.5)	257 (65.6)		374 (63.2)
20+	29 (14.5)	69 (7.6)		98 (16.5)
Don't know	0 (0.0)	3 (0.8)		3 (0.5)
Condom use at last sex				
No	68 (34.0)	159 (40.6)	0.120	227 (38.3)
Yes	132 (66.0)	233 (59.4)		365 (61.7)
Condom use at last sex by partners				
Most recent sexual partners	116 (**n* = 200,** 58.0%**)**	219 (**n* = 392,** 55.9%**)**	0.620	335 (**n*=592,** 56.6%**)**
2nd most recent sexual partners	65 (**n* = 88,** 73.9%**)**	32 (**n* = 42,** 76.2%**)**	0.776	97 (**n* = 130,** 74.6%**)**
3rd most recent sexual partners	27 (**n* = 34,** 79.4%**)**	6 (**n* = 8,** 75.0%**)**	0.784	33 (**n* = 42,** 78.6%**)**
Transactional sex (past 12 months)				
No	186 (93.0)	377 (96.2)	0.091	563 (95.1)
Yes	14 (7.0)	15 (3.8)		29 (4.9)
Perceived HIV risk				
No	130 (65.0)	240 (61.2)	0.349	370 (62.5)
Yes	69 (34.5)	151 (38.5)		220 (37.2)
No response	1 (0.5)	1 (0.3)		2 (0.3)
Knowledge of HIV status				
No	78 (39.0)	105 (26.8)	**0.007**	180 (30.4)
Yes	122 (61.0)	287 (73.2)		412 (69.6)
Sex under the influence of alcohol				
Non drinkers	56 (28.0)	262 (66.8)	**0.000**	318 (53.7)
No	79 (39.5)	51 (13.0)		130 (22.0)
Yes	65 (32.5)	79 (20.2)		144 (24.3)

n*= Denominator for respondents with most recent, 2nd and 3rd most recent partners

The overall median ages at first sex were the same for men 17 years (IQR: 15 - 18) and women (17 years (IQR: 16 - 19)). For most men (58.5%) and women (65.6%), age at first sex was between 16 to 19 years of age. In a fifth of the respondents, age at first sex occurred below 16 years.

Two-thirds (66%) of men and 59.4% of women used condoms during their last sexual encounters. Condom use with most recent partners (56.6%) was less than with the second most recent (74.6%) and third most recent partners (78.6%).

In the past twelve months, 4.9% of respondents had either provided sex in exchange for money or resources, or provided money or resources for sex, with 7.0% of men and 3.8% of women (p=0.09).

About a third (37.3%) of the respondents perceived themselves to be at risk of HIV infection. Figure 3.1 below shows that the perceived risk of HIV infection was highest in men (46.7%) and women (52.8%) aged 35 - 44 years. The greatest gender differences in perceived HIV risk occurred in those less than 20 years: 46% in women and 21.7% in men.

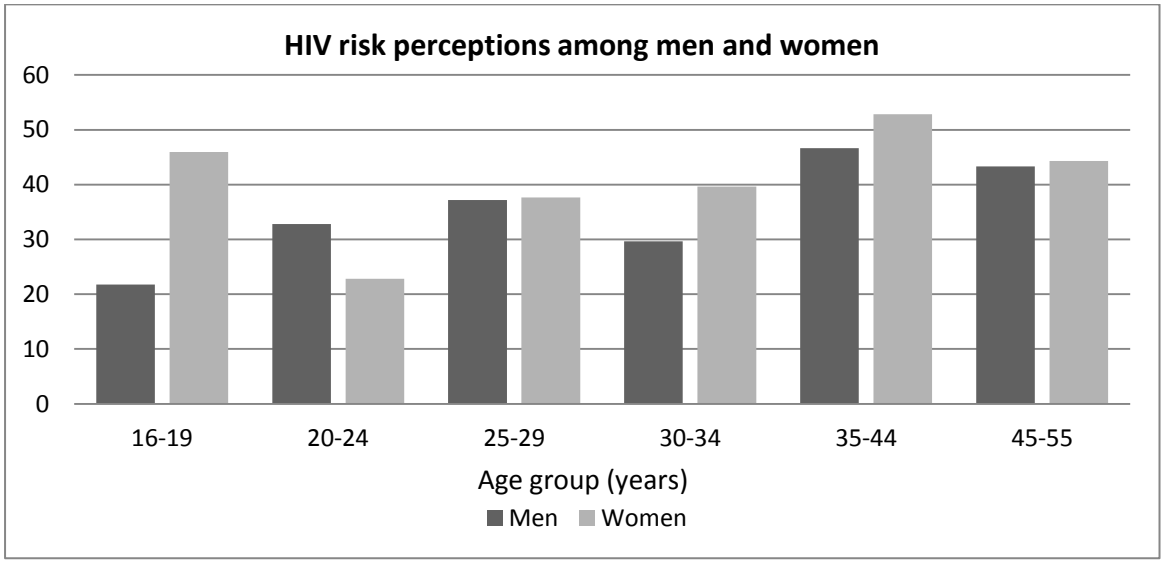

Figure 3.1 HIV risk perceptions among men and women

Among sexually active respondents, a significant gender difference occurred with knowledge of HIV status (p=0.007), with more women (73.2%) than men (61.0%) showing higher knowledge.

More men (72.0%) than women (33.2%) had ever consumed alcohol (p<0.001). Ninety-eight (49.0%) men and 47 (12.0%) women had consumed alcohol in the past month. Among those who ever consumed alcohol, 71.4% men and 70.2% women consumed alcohol at least once a week or more frequently (Figure 3.2). Five times more men (44.5%) than women (8.7%) were involved in risky drinking (having five or more drinks of alcohol at a sitting). Having had sex under the influence of alcohol was significantly more common in men (32.5%) than in women (20.2%), (p<0.001). See Table 3.2.

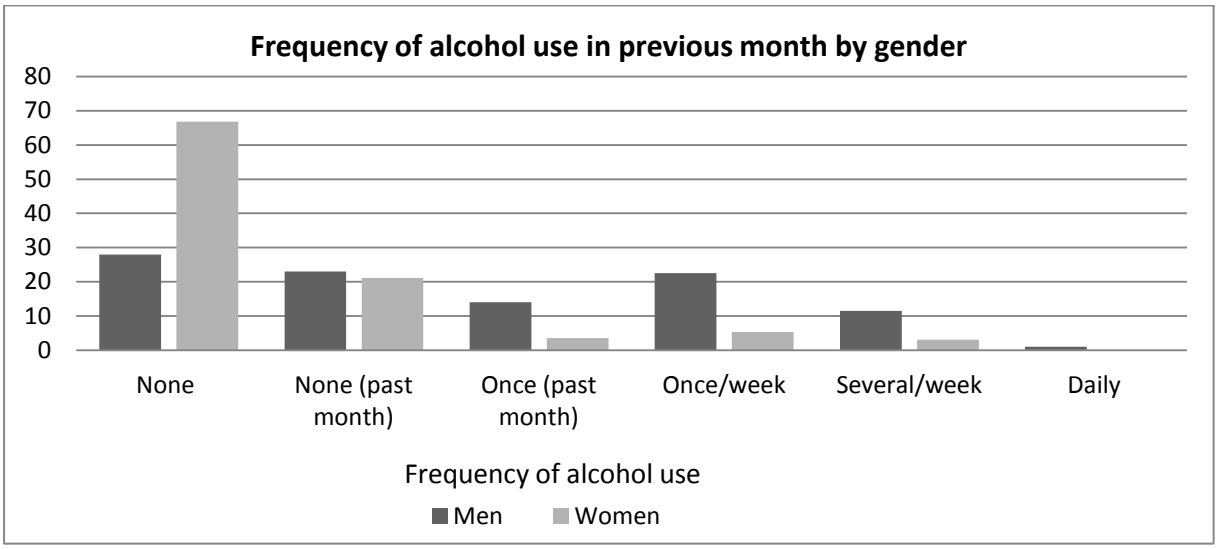

Figure 3.2 Frequency of alcohol use in previous month by gender

3.3 Prevalence of multiple sexual partnerships

Prevalence, patterns and factors associated with MSP were determined for the 592 sexually active respondents (200 men and 392 women) who reported having sexual encounters in the 12 months preceding the survey.

The overall prevalence of MSP in the study population was 22.0% (95% CI: 19 - 25%) and it differed significantly by gender (p<0.001). More men (44.0%, 95% CI: 37 - 51%) than women (10.7%, 95% CI: 8 - 12%) reported having had more than one sexual partner in the past 12 months. See Figure 3.3.

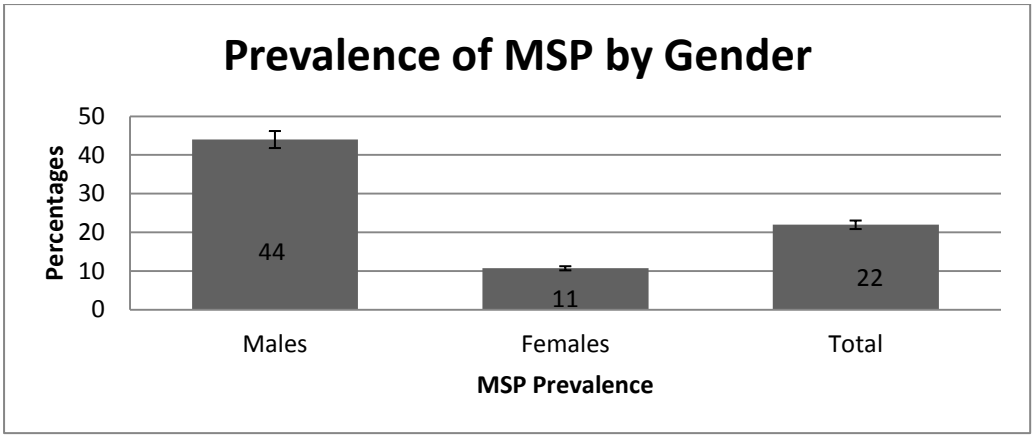

Figure 3.3 Prevalence (%) of multiple sexual partnerships, by gender

3.3.1: Prevalence of multiple sexual partnerships by socio-demographic factors

The patterns of MSP by socio-demographic factors are shown in Table 3.3. Seven socio-demographic factors disaggregated by gender were studied. The results showed that three socio-demographic factors among men (age, socio-economic status and marital status) were significantly associated with MSP. Among men, MSP decreased significantly with increased age ($p=0.038$), with the highest prevalence (57.4%) among 20 to 24 years old (Figure 3.4). Reported percentages of MSP were highest in men in the intermediate socio-economic group (58.6%), ($p=0.01$), and levels of MSP among those who had never married were three times higher than those who had ever married (47.0% versus 15.8%), ($p<0.01$). See Table 3.3.

Among women, only one socio-demographic factor (marital status) showed significant association with MSP ($p<0.001$). The report of MSP was largely by women who had never been married (12.4%). By educational and employment status, a borderline significant level of $p<0.1$ was found among women who did not complete secondary school (13.5%) and those who were unemployed (12.7%). Though not significant, in women, a pattern similar to that in men between age and MSP was observed (Figure 3.3). The prevalence of MSP decreased with increasing age, with the highest prevalence among those aged 16 to 19 years (16.2%). See Table 3.3.

Table 3.3: Prevalence of multiple sexual partnerships by socio-demographic factors

	Men (N=200)			Women (N=392)			Total (N=592)	
Variables	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**
Age group								
16 – 19	23	10 (43.5)	**0.038***	37	6 (16.2)	0.404	60	16 (26.7)
20 – 24	61	35 (57.4)		93	13 (14.0)		154	48 (31.2)
25 – 29	43	20 (46.5)		77	9 (11.7)		120	29 (24.2)
30 – 34	28	12 (42.9)		53	5 (9.4)		81	17 (21.0)
35 – 44	15	5 (33.3)		53	5 (9.4)		68	10 (14.7)
45 – 55	30	6 (20.0)		79	4 (5.1)		109	10 (9.2)
Education								
Primary or less	50	18 (36.0)	0.411	100	5 (5.0)	0.081†	150	23 (15.3)
Some secondary	80	38 (47.5)		192	26 (13.5)		272	64 (23.5)
Matric & above	70	32 (45.7)		100	11 (11.0)		170	43 (25.3)
Employment status								
Employed	87	35 (40.2)	0.346	88	5 (5.7)	0.083†	175	40 (22.9)
Unemployed	113	53 (46.9)		304	37 (12.7)		417	90 (21.6)
Socio-economic status								
High	72	26 (36.1)	**0.010****	130	15 (11.5)	0.907	202	41 (20.3)
Intermediate	70	41 (58.6)		130	14 (10.8)		200	55 (27.5)
Low	58	21 (36.2)		132	13 (9.9)		190	34 (17.9)
Marital status								
Ever married	19	3 (15.8)	**0.009****	61	1 (1.6)	**0.013***	80	4 (5.0)
Never married	181	85 (47.0)		331	41 (12.4)		512	126 (24.6)

	Men (N=200)			Women (N=392)			Total (N=592)	
Variables	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**
Municipalities								
Govan Mbeki	37	17 (46.0)	0.840	64	4 (6.3)	0.290	101 (17.1)	21 (20.8)
Albert Luthuli	28	9 (32.1)		75	11 (14.7)		103 (17.4)	20 (19.4)
Msukaligwa	23	10 (43.5)		56	6 (10.7)		79 (13.3)	16 (20.3)
Mkhondo	24	10 (41.7)		58	3 (5.2)		82 (13.9)	13 (15.9)
Lekwa	29	15 (51.7		44	7 (15.9)		73 (12.3)	22 (30.1)
Seme	22	11 (50.0)		51	4 (7.8)		73 (12.3)	15 (20.6)
Dipaleseng	37	16 (43.2)		44	7 (15.9)		81 (13.7)	23 (28.4)
Settlement types								
Rural	90	38 (42.2)	0.647	217	22 (10.1)	0.681	307 (51.9)	60 (19.5)
Urban	110	50 (45.5)		175	20 (11.4)		285 (48.1)	70 (24.6)

***p≤ 0.05 **p≤ 0.01 ***p≤ 0.001 †p<0.1 (Borderline)**

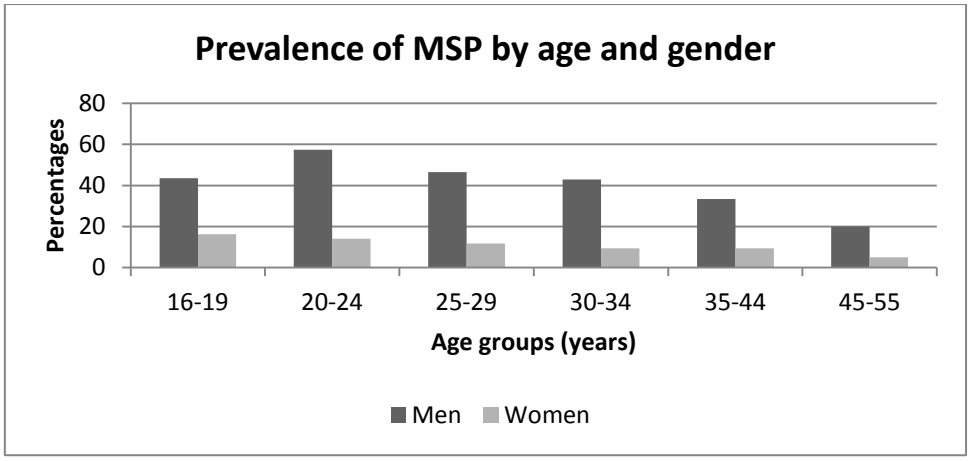

Figure 3.4 Prevalence of multiple sexual partnerships by age and gender

3.3.2: Prevalence of multiple sexual partnerships by sexual behavioural factors

The patterns of MSP by the six sexual behavioural factors studied are shown in Table 3.4. Of the six factors studied, three each in men and women showed significant association with MSP. Condom use at last sex and sexual intercourse under the influence of alcohol were associated with MSP in both men and women. Additionally, age at first sex was significant in men while transactional sex was significant in women.

Higher levels of MSP (52.0%) were reported among men whose age at first sex was 15 years or less ($p<0.001$). Prevalence of MSP was higher in men who used condoms at last sex (49.2%) than those who did not (33.8%), ($p=0.037$). Having had sex under the influence of alcohol (63.3%) was also significantly associated with MSP in men ($p<0.001$).

Similar to the findings among men, the prevalence of MSP doubled in women who used condoms at last sex (13.3%) compared with those who did not (6.9%), ($p=0.045$). Similarly, women who had had sexual intercourse under the influence of alcohol had three times higher levels of MSP compared with those who had not and seven times higher levels of MSP than non-drinkers ($p<0.001$). Levels of MSP were highest in women involved with transactional sex in the past 12 months (53.3%), ($p<0.001$).

Table 3.4: Prevalence of multiple sexual partnerships by sexual behavioural factors

	Men (n=200)			Women (n=392)			Total (N=592)	
Variables	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**	**p-value**	**N (Denominator)**	**MSP n (%)**
Age at first sex								
<16	54	28 (51.9)	**0.000*** **	63	11 (17.5)	0.217	117	39 (33.3)
16 – 19	117	57 (48.7)		257	25 (9.7)		374	82 (21.9)
20+	29	3 (10.3)		69	6 (8.7)		98	9 (9.2)
Don't know	0	-		3	0 (0.0)		3	0 (0.0)
Condom use at last sex								
No	68	23 (33.8)	**0.037***	159	11 (6.9)	**0.045***	227	34 (15.0)
Yes	132	65 (49.2.)		233	31 (13.3)		365	96 (26.3)
Transactional sex (past 12 months)								
No	186	79 (42.5)	0.113	377	34 (9.0)	**0.000*** **	563	113 (20.1)
Yes	14	9 (64.3)		15	8 (53.3)		29	17 (58.6)
Perceived HIV risk (a)								
No	130	59 (45.4)	0.650	240	29 (8.1)	0.280	370	88 (23.8)
Yes	69	29 (42.0)		151	13 (8.6)		220	42 (19.1)
No response	1	0 (0.0)		1	0 (0.0)		2	0 (0.0)
Knowledge of HIV status								
No	78	30 (40.0)	0.377	105	15 (14.4)	0.167	180	45 (25.0)
Yes	122	58 (46.4)		287	27 (9.3)		412	85 (20.6)
Sex under the influence of alcohol								
Non drinkers	56	15 (26.8)		262	14 (5.3)		318	29 (9.1)
No	79	23 (35.4)	**0.000*** **	51	10 (12.3)	**0.000*** **	130	33 (22.9)
Yes	65	50 (63.3)		79	18 (35.7)		144	68 (52.3)

***p≤ 0.05 **p≤ 0.01 ***p≤ 0.001 †p<0.1 (Borderline)**

(a) Indicates no response, respondents without response who were not sexually active in the past 12 months were not included in this analysis.

3.4 Multivariate logistic regression analysis of independent factors of MSP

3.4.1 Introduction

- At the multivariate level, variables which were significant in the bivariate analysis at a significance level of 0.2 were assessed for their independent effects.
- Three socio-demographic and four sexual behavioural factors significant at $p<0.2$ were considered for inclusion in building the respective multivariate models in men, out of which two socio-demographic and three sexual behavioural factors remained significant at 0.05 in the respective models. In women, three socio-demographic and three sexual behavioural factors were considered. Of these, one socio-demographic and three sexual behavioural factors remained significant at 0.05.
- For the full model, Goodness of Fit tests for men ($p=0.556$) and women ($p=0.838$), linktests for men ($p=0.938$) and women ($p=0.646$) showed that the models predicted the outcome well and that the independent variables specified conditional on the outcome (MSP) were specified correctly.
- The results for logistic regression models, both at the univariate and multivariate levels, and for men and women separately, are shown in Table 3.5 to 3.7.

3.4.2 Multivariate analysis

3.4.2.1 Association between socio-demographic factors and MSP (Model 1)

In Model 1 (underlying factors model), (Table 3.5), two socio-demographic variables among men (age and socio-economic status) and only one (marital status) among women remained significant at 0.05.

Men younger than 45 years were more likely to have MSP compared to men aged 45 – 55 years, with the highest odds among those aged 20 - 24 years (AOR 5.2, 95% CI: 2.0 - 13.5). Being in the intermediate socio-economic group was associated with the highest odds of MSP (AOR 2.6, 95% CI: 1.5 - 4.6) relative to men in the high socio-economic group. In women, only marital status emerged as the only significant correlate in the multivariate underlying model. There was a higher likelihood of MSP among women who were unmarried (AOR 7.9, 95% CI: 1.0 - 60.8), compared to women who had ever married. The confidence interval for the effect estimate was however very wide due to small numbers.

Table 3.5 Logistic regression analysis showing unadjusted and adjusted odds ratios of associated factors of MSP disaggregated by gender for Model 1 (underlying factors model)

	MALES (N=200)			FEMALE (N=392)		
VARIABLES	MSP n/N (%)	UNIVARIATE UOR 95% CI	MULTIVARIATE AOR (95% CI)	MSP n/N (%)	UNIVARIATE UOR 95% CI	MULTIVARIATE AOR (95% CI)
Socio-demographic Factors						
Age group						
16 – 19	10/23 (43.5)	3.1 (0.9 – 10.4)†	**3.8 (1.2 – 12.2)***			
20 – 24	35/61 (57.4)	**5.4 (1.9 -15.0)*****	**5.2 (2.0 -13.5)*****			
25 – 29	20/43 (46.5)	**3.5 (1.1 – 10.7)***	**3.5 (1.2 – 10.2)***			
30 – 34	12/28 (42.9)	**3.0 (1.1 – 8.2)***	**3.2 (1.3 – 7.2)***			
35 – 44	5/15 (33.3)	2.0 (0.5 – 7.9)	2.4 (0.6 – 2.7)			
45 – 55	6/30 (20.0)	Ref	Ref			
Education						
Primary or less				5/100 (5.0)	Ref	
Some secondary				26/192 (13.5)	**3.0 (1.0 – 8.6)***	
Matric & above				11/100 (11.0)	2.4 (0.9 – 6.5)†	
Employment status						
Employed				5/88 (5.7)	Ref	
Unemployed				37/304 (12.7)	2.3 (0.9 –6.1)†	
Socio-economic status						
High	26/72 (36.1)	Ref	Ref			
Intermediate	41/70 (58.6)	**2.5 (1.4 – 4.4)*****	**2.6 (1.5 – 4.6)*****			
Low	21/58 (36.2)	1.0 (0.5 – 2.1)	1.3 (0.6 – 2.7)			
Marital status						
Ever married	3/19 (15.8)	Ref		1/61 (1.6)	Ref	Ref
Never married	85/181 (47.0)	**4.7 (1.6 –13.9)****		41/331 (12.4)	**8.5 (1.1 –64.0)***	**8.5 (1.1 –64.0)***

***p≤ 0.05 **p≤ 0.01 ***p≤ 0.001 †p<0.1 (Borderline)**
UOR: Unadjusted odds ratio. AOR: Adjusted odds ratios, adjusting for other variables in the model

3.4.2.2 Association between sexual behavioural factors and MSP (Model 2)

In Model 2 (proximate factors model), (Table 3.6), three sexual behavioural factors each among men (age at first sex, sex under the influence of alcohol and transactional sex) and women (sex under the influence of alcohol, transactional sex and condom use at last sex) remained significant at 0.05.

Men who had early age at first sex less than16 years (AOR 10.7, 95% CI: 3.4 – 33. 8) and between 16 to 19 years (AOR 11.8, 95% CI: 3.4-40.3) were more likely to have MSP relative to men whose age at first sexual intercourse was 20 years or more. Among men (AOR 4.6, 95% CI: 2.1 – 10.0) and women (AOR 4.8, 95% CI: 2.3 – 9. 8), having had sex under the influence of alcohol was associated with higher odds of MSP compared with non drinkers. Similarly, the highest odds of MSP occurred both in men (AOR 4.9, 95% CI: 1.3 – 18.2) and women (AOR 3.2, 95% CI: 1.0 – 9.5) who were involved in transactional sex in the past 12 months. Condom use at last sex among women increased the likelihood of MSP twofold compared to those who had not used condoms.

Table 3.6 Logistic regression analysis showing unadjusted and adjusted odds ratios of associated factors of MSP disaggregated by gender for Model 2 (proximate factors model)

	MALES (N=200)			FEMALE (N=392)		
VARIABLES	**MSP n/N (%)**	**UNIVARIATE UOR 95% CI**	**MULTIVARIATE AOR (95% CI)**	**MSP n/N (%)**	**UNIVARIATE UOR 95% CI**	**MULTIVARIATE AOR (95% CI)**
Sexual-behavioural Factors						
Age at first sex						
<16	28/54 (51.9)	**9.3 (2.8 – 30.7)*** **	**10.7 (2.4 – 33.8)*** **			
16 – 19	57/117 (48.7)	**8.2 (2.6 – 26.5)*** **	**11.8 (3.4 – 40.3)*** **			
20+	3/29 (10.3)	Ref	Ref			
Condom use at last sex						
No	23/68 (33.8)	Ref		11/159 (6.9)	Ref	Ref
Yes	65/132 (49.2.)	**1.9 (1.1– 3.2)***		31/233 (13.3)	**2.1 (1.0– 4.3)***	**2.1 (1.1– 3.9)***
Transactional sex (past 12 months)						
No	79/186 (42.5)	Ref	Ref	34/377 (9.0)	Ref	Ref
Yes	9/14 (64.3)	2.4 (0.8 – 7.6)	**4.9 (1.3 – 18.2)***	8/15 (53.3)	**11.5 (5.0 – 26.6)*** **	**3.2 (1.0 – 9.5)***
Sex under the influence of alcohol						
Non drinkers	15/56 (26.8)	Ref	Ref	14/262 (5.3)	Ref	Ref
No	23/79 (35.4)	1.5 (0.7 – 3.1)	1.3 (0.6 – 2.8)	10/51 (12.3)	**2.6 (1.2 -5.3)***	1.3 (0.6 -3.0)
Yes	50/65 (63.3)	**4.7 (2.3 – 9.7) *** **	**4.6 (2.1 – 10.0) *** **	18/79 (35.7)	**9.7 (4.7 – 20.0)*** **	**4.8 (2.3 – 9.8)*** **

***p≤ 0.05 **p≤ 0.01 ***p≤ 0.001 †p<0.1 (Borderline)**
UOR: Unadjusted odds ratio. AOR: Adjusted odds ratios, adjusting for other variables in the model

3.4.2.3 Association between socio-demographic factors and MSP after adjusting for sexual behavioural factors (Full model)

Only those factors significant at 0.05 were retained in the full multivariate model (Table 3.7), with five factors among men (age, socio-economic status, age at first sex, transactional sex and sex under the influence of alcohol) and four among women (marital status, condom use at last sex, transactional sex and sex under the influence of alcohol) remaining significant.

In the full model, after adjusting for age at first sex, transactional sex and having had sex under the influence of alcohol in men, age and socio-economic status remained correlated with MSP. Among women, only marital status remained independently associated with MSP after adjusting for condom use at last sex, transactional sex and having had sex under the

influence of alcohol. The relationships between socio-economic status and MSP in men as well as marital status in women were strengthened in these models.

Table 3.7 Logistic regression analysis showing unadjusted and adjusted odds ratios of associated factors of MSP disaggregated by gender for the full model adjusted for socio-demographic and sexual behavioural factors

	MALES (N=200)			FEMALE (N=392)		
VARIABLES	MSP n/N (%)	UNIVARIATE UOR 95% CI	MULTIVARIATE AOR (95% CI)	MSP n/N (%)	UNIVARIATE UOR 95% CI	MULTIVARIATE AOR (95% CI)
Age group						
16 – 19	10/23 (43.5)	3.1 (0.9 – 10.4)†	2.9 (0.7 – 11.7)			
20 – 24	35/61 (57.4)	**5.4 (1.9 -15.0)*** **	**3.0 (1.0 -9.3)***			
25 – 29	20/43 (46.5)	**3.5 (1.1 – 10.7)***	2.5 (0.7 – 9.3)			
30 – 34	12/28 (42.9)	**3.0 (1.1 – 8.2)***	1.9 (0.6 – 6.0)			
35 – 44	5/15 (33.3)	2.0 (0.5 – 7.9)	1.4 (0.3 –6.5)			
45 – 55	6/30 (20.0)	Ref	Ref			
Socio-economic status						
High	26/72 (36.1)	Ref	Ref			
Intermediate	41/70 (58.6)	**2.5 (1.4 – 4.4)*** **	**3.1 (1.7 – 5.6)*** **			
Low	21/58 (36.2)	1.0 (0.5 – 2.1)	1.7 (0.7 – 4.1)			
Marital status						
Ever married	3/19 (15.8)	Ref		1/61 (1.6)	Ref	Ref
Never married	85/181 (47.0)	**4.7 (1.6 –13.9)** **		41/331 (12.4)	**8.5 (1.1 –64.0)***	**10.9 (1.3 –90.3)***
Age at first sex						
<16	28/54 (51.9)	**9.3 (2.8 – 30.7)*** **	**9.0 (2.7 – 30.1)*** **			
16 – 19	57/117 (48.7)	**8.2 (2.6 – 26.5)*** **	**9.7 (2.3 – 41.4)** **			
20+	3/29 (10.3)	Ref	Ref			
Condom use at last sex						
No	23/68 (33.8)	Ref		11/159 (6.9)	Ref	Ref
Yes	65/132 (49.2.)	**1.9 (1.1– 3.2)***		31/233 (13.3)	**2.1 (1.0– 4.3)***	**2.4 (1.1– 5.6)***
Transactional sex (past 12 months)						
No	79/186 (42.5)	Ref	Ref	34/377 (9.0)	Ref	Ref
Yes	9/14 (64.3)	2.4 (0.8 – 7.6)	**4.5 (1.3 – 15.2)***	8/15 (53.3)	**11.5 (5.0 – 26.6)*** **	**12.0 (3.9 – 37.1)*** **
Sex under the influence of alcohol						
Non drinkers	15/56 (26.8)	Ref	Ref	14/262 (5.3)	Ref	Ref
No	23/79 (35.4)	1.5 (0.7 – 3.1)	1.0 (0.5 – 2.2)	10/51 (12.3)	**2.6 (1.2 -5.3)***	**2.1 (1.0 -4.2)***
Yes	50/65 (63.3)	**4.7 (2.3 – 9.7) *** **	**4.5 (1.9 – 9.7) *** **	18/79 (35.7)	**9.7 (4.7 – 20.0)*** **	**9.3 (4.4 – 19.6)*** **

***p≤ 0.05 **p≤ 0.01 ***p≤ 0.001 †p<0.1 (Borderline)**
UOR: Unadjusted odds ratio. AOR: Adjusted odds ratios, adjusting for other variables in the model

CHAPTER 4

DISCUSSION

4.1 Introduction

The main objective of this study was to determine the prevalence and factors associated with MSP in the past twelve months in Gert Sibande District (GSD), South Africa. As a country, South Africa is faced with the challenge of a global HIV epidemic. Major achievements in the fight against the high HIV prevalence have been reported in South Africa in recent years. However, in GSD, HIV prevalence, higher than the national and provincial averages, persists. A reduction of the number of sexual partners tops the list of HIV prevention efforts as the issue of MSP is believed to be a key driver of the epidemic.

Few significant differences occurred in the factors influencing MSP among men and women in this study. Among men, age and socio-economic factors remained significantly associated with MSP. That no socio-demographic factor, except marital status, emerged significantly associated with MSP among women was unexpected. However, given the low percentage of women (<2.0%) who practised MSP, as well as the small sample size, this finding is unsurprising. Similar significant sexual behavioural factors of MSP in men and women included transactional sex and having had sex under the influence of alcohol. The significant differences found between men and women were age at first sex among men and condom use at last sex among women.

4.2 Prevalence of multiple sexual partnerships

The overall prevalence of MSP found in this study was 22.0% (95% CI: 19 - 25%) and varied in the various sub-groups of the GSD population with four times in men (44.0%) than women (10.7%). This prevalence was much higher than MSP prevalence reported in various national South African surveys. In the South African National HIV Prevalence, Incidence, Behavioural and Communication Surveys (SABSSM), the overall South African MSP prevalence increased from 13.5% in 2002 to 16.3% in 2005 and 16.2% in 2008 among men, while that of women remained at less than 4% (17, 21). Levels of MSP found in this study were also higher than the 7.2% (2005) and 9.4% (2008) reported for Mpumalanga Province in the SABSSM (17). It was also higher than the 11% found in adult men aged 15 to 59 years and the 1.6% found in adult women aged 15 to 49 years in Mpumalanga Province in the DHS, (2003) (57). The prevalence of MSP in GSD was also higher than the results in the National Communication Survey (NCS), which reported a drop from 16.5% in 2006 to 11.4% in 2009. The high levels of MSP found in this study were high enough to strongly suggest a link between the high HIV prevalence in the district

Studies have suggested that the heterogeneous spread of HIV may have been as a result of the varying levels of MSP among subgroups (58). To better understand the dynamics of the high MSP prevalence in this study, an understanding of the complex inter-relationship between contextual, structural factors and behavioural factors becomes important.

4.3 Significant socio-demographic factors of multiple sexual partnerships

Two socio-demographic variables among men (age and socio-economic status) and only one (marital status) among women remained as significant factors of MSP in the models

Age was a positive correlate of MSP among men after adjusting for other factors. Men aged 20 - 24 years (AOR 3.0, 95% CI: 1.0 – 9.3) showed an increased likelihood of MSP compared with men aged 45 - 55 years. Several studies have shown that MSP is more common among young people than older adults (8, 17, 42, 59, 60). This possibly may be because young people are less likely to perceive themselves to be at risk of contracting HIV infection as shown by findings of this study. Young people are also at a stage of life when experimentation and risk-taking is generally high. This implies that age appropriate prevention interventions must be targeted towards young men with an early exposure to life skills programmes at schools and community-based programmes for out-of-school youths. Such interventions must include particular, accurate knowledge of the HIV risks of MSP.

The finding, after adjusting for other factors, that men of GSD in the intermediate socio-economic group are three times (AOR 3.1, 95% CI: 1.7 – 5.6) more likely to have MSP than those in the high socio-economic group is rather interesting. This is because MSP has often been associated with affluence (61, 62). In this study, MSP was least reported among men in the high socio-economic group. In a South African survey among young men and women, MSP was also least reported among men in the high socio-economic group (40). To explain a similar finding, it was suggested that people in the lower socio-economic group, compared with the higher socio-economic level, may preferentially spend more of their income on relationships (63). Another explanation was hinged on the proxy used in deriving socio-economic levels, that it may not be an appropriate yardstick to explain the role that financial exchange may be playing between sexual partners (64). Other researchers offered that men in the high socio-economic group may, through better access to health information and healthcare services mostly resulting from a higher educational and employment status, reduce sexual risk behaviours (40, 65). There is a need for a clear unambiguous message to address

partner reduction prevention interventions among men. In South Africa, structural interventions, such as the social grants system, have been shown to have considerable measure of success in the prevention of HIV infections particularly among women (66). Such interventions may need to be strengthened and extended to men to enhance higher access to education and consequently, better access to HIV prevention knowledge and opportunities.

Marital status (never married) strongly correlated with MSP among women and remained stronger after adjusting for sexual behavioural factors (AOR 10.9, 95% CI: 1.3 – 90.3) in this study. Though the estimate is difficult to interpret due to the small sample size, the consistency of this finding, in the light of other studies, makes it a very important finding. This is particularly important within the context of low levels of marriage among the respondents: 9.5% men and 15.6% women were married. In South Africa, there is evidence of low marriage levels among Blacks (67). It is also a worrisome finding since MSP tend to be higher among young adults with whom relationships tend to be unstable and subject to frequent change (68, 69). From an ecological study of 33 sub-Saharan countries, evidence supported the hypothesis that when there is a delayed average age at marriage, premarital sexual intercourse and frequent partner changes become common (70).

The fact that there were few independent correlates of MSP in this study might be due to the small numbers. The finding of a significant association of marital status with MSP at the bivariate level among men and a significant independent association among women underscores the need for an intensified HIV prevention communication messaging that targets unmarried young men for partner reduction efforts. The borderline significant association of education and employment status with MSP among women may require that

structural interventions programmes be strengthened to reduce the involvement of women in transactional sex as a means of livelihood.

4.4 Significant sexual behavioural factors of multiple sexual partnerships

In exploring the proximate determinants of MSP, three sexual behavioural factors each among men (age at first sex, sex under the influence of alcohol and transactional sex) and women (sex under the influence of alcohol, transactional sex and condom use at last sex) respectively remained significantly associated with MSP.

The high level of MSP reported by men in this study correlated significantly with early age at first sex. Compared with men aged 20 years or older at first sex, those who were aged less than 16 years at first sex showed a strong association (AOR 9.0, 95% CI: 2.7 - 30.7) with MSP, even in the adjusted model. Several studies have confirmed the association between age at first sex and MSP (42, 71). In Mpumalanga Province, reported levels of early age at first sex (below 16 years) in the SABSSM among young adults (men and women) increased from 4.9% in 2002 to 10.1% in 2005 and 15.0% in 2008 (17, 21). Early age at first sex creates an avenue for an increased number of lifetime sexual partners over time and often occurs along with other high risk behaviours, such as transactional sex, that increase the risks of HIV (31, 43, 58, 72). Educational messages to emphasise delayed age at first sex as well as a reduction of sexual partners are needed in this population.

Men and women involved in transactional sex in this study, had fourfold and 12-fold increased likelihood of MSP respectively. Transactional sex, whereby men and women engage in sex for money, goods or favours, is one of the ways through which adults with high and low sexual risk behaviour link up. Although the prevalence of transactional sex in this study is small, in transactional sex, however, the possibility of negotiating for safer sex

through the use of condom is reduced. The opportunity for MSP with transactional sex may also be encouraged with the influence of alcohol.

In this study, about a third of men and a fifth of women had sex under the influence of alcohol. Men (AOR 4.6, 95% CI: 2.1 - 10.0) and women (AOR 4.8, 95% CI: 2.3 - 9.8) were more likely to have MSP if they had had sex under the influence of alcohol. Adverse effects of alcohol, including sexual risk behaviours, have been documented in many studies in South Africa (49, 51). Alcohol impairs judgment and reduces a sense of inhibition, resulting in poor decisions such as risky sexual behaviour, including MSP and inconsistent condom use. Interventions targeting places where alcohol is served must be built into HIV prevention programmes to address the HIV risk related to alcohol use.

The findings in this study revealed that women (AOR 2.1, 95% CI: 1.1 - 3.9) who had used condoms at last sex were more likely to have MSP than those who had not used condoms. The proportion of respondents in this study who had used condoms at last sex was 61.7%, more men (66.0%) than women (59.4%) had used condoms. This figure appeared relatively high and comparable to that reported in the SABSSM of 62.4%, with more men (64.6%) than women (60.4%) having used condoms at last sex (17). With MSP, having unprotected sex increases the risk of HIV infection. However, since the extent of the correct and consistent use of condom, which unfortunately was not captured by the data used for this analysis, is not known, there is a limitation to the appropriate interpretation of this finding.

4.5 Links between independent socio-demographic factors and independent sexual behavioural factors

According to the conceptual framework adapted for this study, the hierarchical or multi-level structuring of independent socio-demographic and sexual behavioural factors and MSP

provided a better approach to modelling and interpretations of associations. After adjusting for sexual behavioural factors, age and socio-economic factors among men and marital status among women remained associated with MSP. This emphasises the importance of age and socio-economic factors as contextual risk factors for HIV. Being married appeared to be a protective factor against the likelihood of women engaging in MSP among the Gert Sibande population.

4.6 Strengths and Limitations

4.6.1 Strengths

The major strength of this study is the use of a conceptual framework which allowed for the understanding of how risk factors act at different levels to influence respondents having multiple sexual partnerships.

In Gert Sibande District, South Africa, this is the first study carried out to determine the patterns and associated factors of multiple sexual partnerships over a twelve-month period. This study has the advantage of providing a closer look at factors of MSP operating at the district level, and which fuel the increasing rates of HIV in the province.

Based on the multi-staged cluster sampling approach used in the selection of its final study population of 750 respondents across most adult age groups (16 to 55 years), gender, and localities (including urban and rural localities), this ensures its representativeness to a large extent across the district. Generalisation is applicable with caution to communities, districts and provinces with similar population profiles to GSD.

4.6.2 Limitations

The analysis of this study relied on data of sexual behavior obtained through self-report. Such reports are prone to measurement bias. Reports of sexual behaviour and sexual activities tend to be exaggerated by men while women under-report them as a result of several factors, including socio-cultural perceptions, educational level or even socio-economic status. To reduce this bias, trained interviewers were matched by age and sex to the respective respondents. Privacy and confidentiality was ensured. Use of structured questionnaires that were validated for use in similar surveys were also used.

Being a cross-sectional study, it was difficult to establish causality between MSP and its associated factors. Determining temporal sequence is a major drawback in all cross-sectional studies. Such difficulty between MSP and its potential risk factors was a limitation of this study.

Although the study sample was big enough for many outcomes, it was small for analysing MSP by explanatory factors in women due to the small proportion of women who reported MSP in the past 12-month period. The extreme odds and wide confidence intervals were also due to small sample sizes.

Since this is a secondary data analysis, some questions that could have added to the explanation of MSP in this district were not captured; this includes the question related to the correct and consistent use of condoms.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The major aim of this study was to determine the prevalence and factors associated with multiple sexual partnerships among men and women, in GSD, South Africa. Major findings included a high prevalence of MSP in this multi-staged probability sample of adults in GSD, South Africa.

The levels of MSP found in this study were compared with findings from SABSSM (2002, 2005, 2008), DHS (2003) and NCS (2006, 2009). The higher MSP findings in this study compared with others in South Africa, indicate the possibility of a sufficiently large enough sexual network to increase the risk of HIV and STIs in this district. Multiple sexual partnerships are associated with an enhanced risk of HIV transmission (51). Strengthening strategic intervention programmes designed for a positive influence on MSP at multiple sub-group levels of GSD is therefore necessary.

Important determinants fuelling MSP in this district included men aged 20 - 24 years, those in the intermediate socio-economic group, unmarried women, men with early age at first sex and where sexual encounters in men and women occur under the influence of alcohol or involved exchange of resources or gift for sex (transactional sex).

From the review of literature, key issues to be considered in the relationship between MSP and its associated factors beside behavioural issues, include the need for geographically defined-context and the society within which MSP takes place. Specific interventions are

therefore needed in GSD and should include the enactment of schools-based life-skills, and community-based-interventions, to address having accurate knowledge of risk factors of HIV infections by men and women. Structural interventions that target low educational status, unemployment and poverty, particularly among Black African youths and women, are crucial to ensure effective prevention efforts.

5.2 Recommendations

There is an urgent need for comprehensive combination interventions to reduce MSP in GSD. This urgency stems from the high prevalence of HIV, which, in turn, has a great probability of continuing because of the high prevalence of MSP and its associated risk behaviours, as found in this study. With effective HIV prevention combination services, notable achievements have been recorded in South Africa with the reversal of the HIV epidemic, this can be built upon to achieve similar success within this district.

The finding of a predominance of young adults and the unmarried involved in the high prevalence of MSP in GSD underscores the significance of partner reduction strategies. Clear messages through the mass media, both electronic and print, should offer unambiguous messages on the limitation of sexual partners, in addition to other HIV prevention programmes.

Schools-based interventions, including delayed age at first sex and condoms promotion as well as a concerted focus on behavioural interventions to limit the number of sexual partners, is critical for GSD.

Structural interventions to enhance opportunities for employment as well as financial grants should be created to target unemployed men and women and those with low educational

attainments to ensure access to means of livelihood, thereby reducing the need for transactional sex among those who see it as their only means of livelihood.

The GSD has a large land mass with scattered development and poor access roads. This has potential to limit the delivery of educational materials into areas where informal drinking places, such as shebeen or taverns may be less monitored. Use of traditional approaches to communicating messages on the knowledge of HIV transmission and prevention must be scaled up to include these venues that serve alcohol.

5.3 Future research

To gain a better understanding of the socio-cultural context within which behaviour occurs in GSD, mixed method research, integrating qualitative and quantitative methods, is recommended.

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APPENDICES

Appendix.1 JHHESA GERT SIBANDE SURVEY QUESTIONNAIRE – 2010

ADMINISTRATION – THIS SECTION IS NOT TO BE ASKED OF THE RESPONDENT

A. Municipality 1=Govan Mbeki 2=Albert Luthuli 3=Msukaligwa 4=Mkhondo 5=Lekwa 6=Seme 7=Dipaleseng		**B. WARD number**			
C. Settlement type 1 = Urban formal (built up or city area) 2 = Urban informal 3 = Peri-urban (mostly informal/ small holding) 4 = Tribal settlement 5 = Farming		**D. Dominant housing type in WARD** 1 = Formal housing 2 = Mostly formal housing 3 = Mostly informal housing 4 = Squatter housing/ impoverished area 5 = Traditional housing 6 = Hostels Other			
E. Area name		**F. Household roster number**		**G. Person code of selected person**	
H. Stand number		**I. Address**			
J. Telephone Number: Best number to contact you on even if not your personal phone.					
K. Name of fieldworker		**L. Date of interview [dd/mm/yy]**			
M. Interviewer age		**N. Interviewer sex**	**1= Male 2= Female**		
O. Name of supervisor		**P. Date corrections checked [dd/mm/yy]**			
Q. Name of quality controller		**R. Date checked [dd/mm/yy]**			
S. Selected for callback	**1=Yes 2=No**	**T. Callback record number**			
X. Name of 1st capturer		**Y. Date captured [dd/mm/yy]**			
Z. Name of 2nd capturer		**ZA. Date captured [dd/mm/yy]**			

A1. The respondent is in the room with no others present except for the interviewer	**1=Yes 2=No**	
A2. I have read the individual information sheet, statement of confidentiality and informed consent form	**1=Yes 2=No**	
A3. If the participant agreed to participate, did he/she sign the consent form?	**1=Yes 2=No**	
A4. Has the participant retained a copy of the information sheet?	**1=Yes 2=No**	

SECTION 1: DEMOGRAPHICS

Sex of the respondent Do not read out	**1 Male 2 Female**	
Race of the respondent Do not read out	**1= Black 2= Coloured 3= White 4= Indian Other (Specify)_**	
**Type of dwelling Do not read out **[CODE BY OBSERVATION: ONLY ONE response possible	**FORMAL** 1 = House or brick structure on a separate stand or yard 2 = Traditional dwelling/hut/structure made of traditional materials 3 = Flat in a block of flats 4 = Town/cluster/semi-detached house (simplex, duplex)	

	5 = House/flat/room in backyard **INFORMAL** 6 = Informal dwelling/shack in backyard 7 = Informal dwelling/shack NOT in backyard 8 = Room/flatlet not in backyard but on a shared property 9 = Caravan or tent Other (Specify)_____	
PRESENT age of the respondent today	**Years**	
Date of birth [dd/mm/yyyy]	**D D M M Y Y Y Y**	
Were you born in South Africa?	**1=Yes ▶SKIP TO Q 1.9** **2=No**	
In which country were you born? **Do not read out**	**1 = Angola** **3 = Botswana** **4 = Lesotho** **5 = Malawi** **6 = Mozambique** **7 = Namibia** **8 = Swaziland** **9 = Zambia** **10 = Zimbabwe** **Other (Specify)___**	
Which country do you consider home to be? **Do not read out**	**1 = South Africa** **2 = Angola** **3 = Botswana** **4 = Lesotho** **5 = Malawi** **6 = Mozambique** **7 = Namibia** **8 = Swaziland** **9 = Zambia** **10 = Zimbabwe** **Other (Specify)**	**THEN SKIP TO Q1.11**
In which province were you born? **Do not read out**	**1=Eastern Cape** **2=Free State** **3=Gauteng** **4=KwaZulu-Natal** **5=Limpopo** **6= Mpumalanga** **7= North West** **8= Northern Cape** **9= Western Cape**	
Which province do you consider to be "home"? **Do not read out**	**1=Eastern Cape** **2=Free State** **3=Gauteng** **4=KwaZulu-Natal** **5=Limpopo** **6= Mpumalanga** **7= North West** **8= Northern Cape** **9= Western Cape**	

Which language do you most often speak at home? [ONE RESPONSE ONLY] **Do not read out**	**1 = isiZulu** **2 = isiXhosa** **3 = isiNdebele** **4 = isiSwati** **5 = English** **6 = Afrikaans** **7 = Sesotho sa borwa** **8 = Sepedi** **9 = Setswana** **10 = Tshivenda** **11 = Xitsonga** **Other (Specify)**	
Which languages do you understand on radio? [MORE THAN ONE RESPONSE POSSIBLE] **Do not read out**	**1 = isiZulu** **2 = isiXhosa** **3 = isiNdebele** **4 = isiSwati** **5 = English** **6 = Afrikaans** **7 = Sesotho sa borwa** **8 = Sepedi**	

	9 = Setswana **10 = Tshivenda** **11 = Xitsonga** **Other (Specify)**	
Which languages can you read? [MORE THAN ONE RESPONSE POSSIBLE] **Do not read out**	**1 = isiZulu** **2 = isiXhosa** **3 = isiNdebele** **4 = isiSwati** **5 = English** **6 = Afrikaans** **7 = Sesotho sa borwa** **8 = Sepedi** **9 = Setswana** **10 = Tshivenda** **11 = Xitsonga** **Other (Specify)**	

What is your marital status? (Marital status referring to legal, traditional or common-law) [ONLY ONE response possible] **Do not read out**	**1 = Not married** **2 = Not married or living together but in a steady relationship lasting more than 3 months** **3 = Not married, but living with sexual partner/boyfriend/girlfriend** **4 = Married, living with husband/wife** **5 = Married, NOT living with husband/wife** **6 = Divorced/Widowed** **Other (Specify**	

What is your present employment status? [ONLY ONE response possible] **Do not read out**	**1 = Unemployed, not looking for work** **2 = Unemployed, looking for work** **3 = Working for someone else – mainly in informal sector** **4 = Working for someone else – mainly in formal sector** **6= Self-employed – mainly in informal sector** **7= Self-employed – mainly in formal sector** **8 = Full-time student / pupil / learner at SCHOOL** **9 = Full-time student at COLLEGE / TECHNIKON / UNIVERSITY** **10 = Pensioner** **11 = Living on disability or other grant** **Other (Specify)__**	

Please tell me which of the following are presently in your household that are in working order [THIS HOUSEHOLD HERE] READ OUT EACH IN TURN		
Hot running water	**1 Yes** **2 No**	
Microwave oven	**1 Yes** **2 No**	
Flush toilet in house or on plot	**1 Yes** **2 No**	
Video cassette recorder (VCR) in home/ DVD player in home	**1 Yes** **2 No**	
Washing machine – automatic/semi-automatic/twin tub	**1 Yes** **2 No**	
Personal Computer at home	**1 Yes** **2 No**	
One or more television set(s) in household	**1 Yes** **2 No**	
A Telkom home telephone/land line telephone	**1 Yes** **2 No**	
Built-in kitchen sink 1=Yes	**1 Yes** **2 No**	
Water in home or on stand	**1 Yes** **2 No**	
Electricity in the household	**1 Yes** **2 No**	
One or more motor vehicles in household	**1 Yes** **2 No**	
One or more cellular phone(s) in household	**1 Yes** **2 No**	

One or more radios in household	**1 Yes** **2 No**	

What is the HIGHEST level of education you have completed? [ONLY ONE response possible] **Do not read out**	**1 = No schooling** **2 = Grade 1 to Grade 7 (Standard 5)** **3 = Grade 8 to Grade 11 (Standard 9)** **4 = Grade 12 / Standard 10 / Matric** **5 = Diploma, certificate AFTER Matric** **6 = Bachelor's degree from a University** **7 = Post graduate degree (eg. Honours, Masters, PhD)** **X = Other [specify]:**	

Do you listen to the radio?	**1 Yes** **2 No**	
Do you watch television?	**1 Yes** **2 No**	
Do you read newspapers?	**1 Yes** **2 No**	
Do you read magazines	**1 Yes** **2 No**	

SECTION 2: PERSONAL ATTITUDES TOWARDS HEALTH

Interviewer read out loud: I am now going to ask you some questions about your attitude towards your health		
How much do you agree with this statement? READ OUT		
If I do not get HIV it is just because I am lucky.	**1 = Strongly agree** **2 = Somewhat agree** **3 = Somewhat disagree** **4 = Strongly disagree**	

SECTION 3: KNOWLEDGE, ATTITUDES AND PERCEPTIONS ABOUT HIV/AIDS

Interviewer read out loud: Some of these questions are about your personal experiences, but please remember that we are asking these questions so that in the future we can give people the health information they need.		
How much do you agree with this statement? READ OUT		
Is anybody in your immediate family (father, mother, brothers, sisters) HIV-positive?	**1 = Yes** **2 = No**	
I do not want to know what it is, but do you know your HIV status?	**1 = Yes** **2 = No**	
Can you tell me all the ways that you know that HIV infection can be prevented? **[DO NOT READ OUT. MULTIPLE RESPONSES possible]**	**0 = It can't be prevented** **1 = Using condoms** **2 = Sticking to one sex partner / being faithful to one sex partner** **3 = Reducing number of sex partners** **4 = Abstaining from sex** **5 = Avoiding contact with blood** **6 = Using drugs to prevent HIV transmission from mother to child** **7 = Male circumcision (as an HIV prevention method)** **Other (Specify)_____**	
Can you tell me all the signs and symptoms of AIDS? **[DO NOT READ OUT. MULTIPLE RESPONSES possible]**	**0 = None** **1 = Swollen lymph nodes in the neck / armpit / groin** **2 = Weight loss** **3 = Respiratory tract infections / Pneumonia / Bronchitis /** **4 = Sinusitis** **5 = Herpes Zoster / Shingles / Belt / Band** **6 = Dermatitis / Skin lesions / Skin rashes / Skin sores** **7 = Diarrhoea** **8 = Night sweats / Chronic cough / Weight loss / TB** **9 = Lethargy / Tiredness / Loss of Energy** **10 = Genital sores** **11 = Cancer** **Other (Specify)_____**	

SECTION 4: ALCOHOL USE

I would now like to ask you some questions about alcohol use		
Have you ever had an alcoholic drink OTHER than for a religious ceremony or just to sample or taste?	**1 = Yes** **2 = No**	
During the PAST MONTH, how many times did you have an alcoholic drink?	**1= Never** **2= Daily** **3= Several times per week** **4= Once a week** **5= Once a month**	
During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?	**1 = Never** **2 = 1 day** **3 = 2 days** **4 = 3- 5 days** **5 = 6 – 9 days** **6 = 10 -19 days** **7 = 20 days or more**	
Have you ever had sexual intercourse when you were under the influence of alcohol?	**1 = Yes** **2 = No**	

SECTION 5: SOCIAL NORMS AND SOCIAL CAPITAL

Interviewer read out loud: I am now going to ask you some questions on how you think HIV/AIDS and other issues affect the people in your community, including your family and friends.		
In your opinion, what is the main reason that some men around here would have more than one sexual partner at a time? **[SPONTANEOUS MENTION. CHOOSE ONE MAIN REASON ONLY]**	**1 = Because of physical distance from main partner (like living far apart)** **2 = Because of curiosity, fun or variety** **3 = Because they are angry about something their main partner has done or not done** **4 = Because their main partner withholds sex** **5 = Because of money or gifts that their sexual partner provides** **6 = Because men should have a spare partner** **7= Because men cannot control their sexual urges** **8= Because he gets drunk** **Other (Specify)_____**	
In your opinion, what is the main reason that some women around here would have more than one sexual partner at a time? **[SPONTANEOUS MENTION. CHOOSE ONE MAIN REASON ONLY]**	**1 = Because of physical distance from main partner (like living far apart)** **2 = Because of curiosity, fun or variety** **3 = Because they are angry about something their main partner has done or not done** **4 = Because their main partner withholds sex** **5 = Because of money or gifts that their sexual partner provides** **6 = To get food or clothes for herself or children** **7= Because she drinks 8= Because her partner abuses or neglects her** **Other (Specify)_____**	

SECTION 6: VOLUNTARY COUNSELLING AND TESTING (VCT)

Interviewer read out loud: These questions will be about voluntary counselling and testing.		
Have you ever been tested for HIV?	**1 = Yes** **2 = No**	

SECTION 7: SEXUAL BEHAVIOURS AND PRACTICES

Now I am going to ask you some personal questions about sex. The answers you give are very important for helping to design better HIV/AIDS campaigns for your community and we appreciate your help. We know that some people have had sexual intercourse and some have sexual intercourse with more than one person. Please feel comfortable to answer questions honestly; you will not be judged and there is no right or wrong answer. Your answers are confidential and will not be known by anyone else.		
Have you ever had sex with anyone? (that is to say when the penis was in the vagina/anus)	**1 = Yes** **2 = No**	
How old were you when you first had sex with someone (that is to say when the penis was in the vagina/anus)? WRITE AGE IN YEARS. NOTE: If respondent is unsure, they can estimate approximate age.	**_____ Years**	

Have you had sex with anyone within the last 12 months? (that is to say when the penis was in the vagina/anus)	**1 = Yes** **2 = No**	

I would like to ask you a few questions about the person that you most recently had sex with. Let's identify her (him) by his/her initials: ONLY ASK IF HAD VAGINAL OR ANAL SEX: we are now going to talk about the MOST RECENT PERSON you had sex with						
How old is she/he now? PROBE FOR ESTIMATE	**_____ Years**					
Is this person a man or a woman?	**1 = Male** **2 = Female**					
When was the first time that you had sex with him/her? PROVIDE AN ESTIMATE [mm/yyyy]	**M**	**M**	**Y**	**Y**	**Y**	**Y**
How long had you known this person before first having sex with him/her the first time?	**1 = A week or less** **2 = 2-4 weeks** **3 = 1-6 months** **4 = more than 6 months**					
How would you describe your relationship with him/her? [READ OUT]	**1 = Married** **2 = Living together** **3 = Main partner** **4 = A friend** **5 = Casual acquaintance** **6 = Someone I just met** **7 = One night encounter** **Other (Specify)_____**					

In the past year, have you provided sex to this person/partner in exchange for money or resources?	**1 = Yes** **2 = No**					
In the past year, have you provided money or resources to this person/partner in exchange for sex?	**1 = Yes** **2 = No**					
How often do you usually have sex with him/her? [READ OUT; ONE RESPONSE ONLY]	**1 = Just this once** **2 = Once in while** **3 = 2-3 times per month** **4 = 2-3 times per week or more often**					
When was the most recent/last time that you had sex with him/her?	**M**	**M**	**Y**	**Y**	**Y**	**Y**
Sometimes people like to drink before they have sex. Did you have too much to drink when you had sex with this person the last time?	**1 = Yes** **2 = No**					
Did XX [insert initials] have too much to drink when he/she had sex with you the last time?	**1 = Yes** **2 = No**					
During the last time you had sex with this person, what did you do to prevent infection from HIV? [DO NOT READ OUT. MULTIPLE RESPONSES POSSIBLE]	**0 = Nothing** **1 = Used condoms** **2 = Was Faithful to one partner** **3 = My partner and I know our HIV status** **4 = Stopped before ejaculation (withdrawal)** **5 = Thigh sex** **6 = Anal sex** **7 = Oral sex** **8 = Used contraceptives (pill, IUD/loop, injection, etc.)** **9 = Use the natural method / safe period** **-5 =Other (Specify)_____**					
Did you use a condom the last time you had sex with this person?	**1 = Yes** **2 = No**					
Do you expect to have sex with him/her again?	**1 = Yes** **2 = No**					
Do you think he/she currently has other sex partners?	**1 = Yes** **2 = No**					

[INTERVIEWER: BEFORE ASKING ABOUT ANY ADDITIONAL SEXUAL PARTNERS, READ THE FOLLOWING.] Some people have more than one partner in a twelve month period. We are also interested in other sexual relationships you might have had in the past twelve months, regardless of the nature, timing or duration of the relationships. As mentioned, there are no right or wrong answers. Please do not feel shy or embarrassed about talking to us; you will never be judged and all your answers will be private.

Have you had more than one partner in the past 12 months?	**1 = Yes** **2 = No**	

If no to above, were there any other times (before a year ago) in your life when you had more than one sexual partner at the same time? Can you tell me more about it? [Probe for age, circumstances, reasons] [OPEN ENDED] **IF YOU ANSWER IN THIS BLOCK; Then skip to Section 9**

IF YES TO more than one sexal partners, How many DIFFERENT PEOPLE have you had sex with in THE LAST 12 MONTHS? (including the one we have just talked about / including your most recent sexual partner) WRITE NUMBER BUT DON'T RESTRICT.	***WRITE NUMBER BUT DON'T RESTRICT.***	
How many sexual partners have you had in the past month? WRITE NUMBER BUT DON'T RESTRICT.	***WRITE NUMBER BUT DON'T RESTRICT.***	
How many main partners do you have right now? [Main partner refers to someone you have sex with who you care about or love and expect to have a longer-term relationship with] WRITE NUMBER BUT DON'T RESTRICT.	***WRITE NUMBER BUT DON'T RESTRICT.***	
During the last year, did you have sex with more than one person within the same month?	**1 = Yes** **2 = No**	

[INTERVIEWER: READ THE FOLLOWING.] Now let's talk about other sexual partners that you have had in the last year. THIS EXCLUDES THE PERSON YOU JUST TOLD US ABOUT AS YOUR MOST RECENT PARTNER!!! [IF NECESSARY, SHOW VISUAL AID CALENDAR TO ASSIST RESPONDENTS]

	2nd Most recent Sex Partner	**3rd Most recent Sex Partner**	**4th Most recent Sex Partner**	**5th Most recent Sex Partner**
What is this person's Initials?				
How old is she/he now? PROBE FOR ESTIMATE	**Years**	**Years**	**Years**	**Years**
Is this person a man or a woman? **1 = Male** **2 = Female**				
When was the first time that you had sex with him/her? PROVIDE AN ESTIMATE	**MM/YY**	**MM/YY**	**MM/YY**	**MM/YY**
How would you describe your relationship with him/her? [READ OUT] **1 = Married** **2 = Living together** **3 = Main partner** **4 = A friend** **5 = Casual acquaintance** **6 = Someone I just met** **7 = One night encounter** **-5 = Other [Specify]**				
In the past year, have you provided sex to this person/partner in exchange for money or resources? **1 = Yes** **2 = No**				
In the past year, have you provided money or resources to this person/partner in exchange for sex? **1 = Yes** **2 = No**				
How often do you usually have sex with him/her? [READ OUT; ONE RESPONSE]				

1 = Just this once 2 = Once in while 3 = 2-3 times per month 4 = 2-3 times per week or more often				
When was the most recent/last time that you had sex with him/her?	**MM/YY**	**MM/YY**	**MM/YY**	**MM/YY**
Sometimes people like to drink before they have sex. Did you have too much to drink when you had sex with this person the last time? 1 = Yes 2 = No				
Did XX [insert intials] have too much to drink when he/she had sex with you the last time? 1 = Yes 2 = No				
During the last time you had sex with this person, what did you do to prevent infection from HIV? [DO NOT READ OUT. MULTIPLE RESPONSES] 0 = Nothing 1 = Used condoms 2 = Was Faithful 3 = My partner and I know our HIV status 4 = Stopped before ejaculation (withdrawal) 5 = Thigh sex 6 = Anal sex 7 = Oral sex 8 = Used contraceptives (pill, IUD/loop, injection, etc.) 9 = Use the natural method / safe period -5 = Other [Specify]				
Did you use a condom the last time you had sex with this person? 1 = Yes 2 = No				
Do you expect to have sex with him/her again? 1 = Yes 2 = No				
Do you think he/she currently has other sex partners? 1 = Yes 2 = No				
Does he/she know that you have had other sex partners during this year? 1 = Yes 2 = No				

Filter A Y= Yes N= No	**2. IF you end up in this block – Place a X in the [___] And ask the respondent to talk about another sex partner they had sex with in the past year. and go to 3rd most recent partner at the start of**
1. Check more than one sexual partner if Respondent has had 3 or more sexual partners in the last 12 months [__] If Y go to next block of this filter → →→ → If N go	

to NEXT SECTION	**the grid**

Filter B Y= Yes N= No **2. Check more than one sexual partner if Respondent has had 4 or more sexual partners in the last 12 months [__] If Y go to next block of this filter → →→ → If N go to NEXT SECTION**	**2. IF you end up in this block – Place a X in the [___] And ask the respondent to talk about another sex partner they had sex with in the past year. and go to 4th most recent partner at the start of the grid**

Filter C Y= Yes N= No **3. Check more than one sexual partner if Respondent has had 4 or more sexual partners in the last 12 months [__] If Y go to next block of this filter → →→ → If N go to NEXT SECTION**	**2. IF you end up in this block – Place a X in the [___] And ask the respondent to talk about another sex partner they had sex with in the past year. and go to 5th most recent partner at the start of the grid**

SECTION 8: PLACES

We want to know where people meet new persons with whom they have sex. This includes new lovers, new boyfriends and new girlfriends. This includes places where people find a sexual partner for one night as well as places where people meet someone they will know for a long time. Places can be indoor locations where people socialize such as bars and churches; outdoor locations such as parks and street corners; and places that are actually events such as weddings, funerals or parties.

Can you tell me where people in this community go to meet their potential sex partners? DO NOT READ OUT. SPONTANEOUS MENTION ; ONE ANSWER [PROBE]	**1 = Shebeen, tavern** **2 =Nightclub** **3 = Brothel** **5 =Hotel, bed and breakfast,** **6 = Hostel** **7 = Overnight truck stop** **8 = Other eating/drinking/sleeping places** **9 = Bus, train, metro stop or station, Taxi Stand** **10 = Truck stop** **11 = Street or Street Corner** **12 = Parks** **13 = Markets** **14 = Church/temple /mosque** **15 = Nearby or on school, university campus** **16 = Sports venue** **17 = Store, Liquor Store, Mall, shopping center** **18 = Construction site** **19 = Cultural events** **20 = Wedding** **21 = Funeral** **22 = Sports events** **-5= Other (specify)**	

SECTION 9: SEXUAL AND REPRODUCTIVE HEALTH

Now I am going to ask you some reproductive health questions		
The first time you had sexual intercourse did you or your partner use any protection?	**1 = Yes** **2 = No**	

Appendix 3: University of the Witwatersrand Human Research Ethics Committee (Medical) Approval

I CERTIFY THIS TO BE A TRUE COPY OF THE ORIGINAL HEREOF
18/3/2013
Names DOREEN ROOS
Commissioner of Oaths Republic of South Africa
Ex officio Title ADMISSIONS CONSULTANT
Faculty/Office STUDENT ENROLMENT CENTRE
University of the Witwatersrand, Johannesburg
1 Jan Smuts Avenue, Johannesburg 2001

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG
Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Babalola O Solabomi

CLEARANCE CERTIFICATE	**M120859**
PROJECT	Prevalence and Associated Factors of Multiple Sexual Partnerships in Gert Sibande District, South Africa, 2010
INVESTIGATORS	Dr Babalola O Solabomi.
DEPARTMENT	School of Public Health
DATE CONSIDERED	31/08/2012
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 31/08/2012 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Braimoh Bello

DECLARATION OF INVESTIGATOR(S)
To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...