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Factors Associated with Concurrent Sexual Partnerships in four Provinces, South Africa-2008

Research Report

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05-Feb-13

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Research report submitted in partial fulfilment for MSc (Med) in Epidemiology and Biostatistics in the School of Public Health

DECLARATION

I declare that this research report is my own work. It is being submitted in partial fulfilment of the requirements for the Degree of Master of Science in Medicine in the field of Epidemiology and Biostatistics, in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.



Muntasir Mohammed Osman Elhassan

DEDICATION

I dedicate this work to my parents who have been looking after me since birth, and are still giving everlasting sympathy and advice to my brother, my sisters, our children and me.

ABSTRACT

Introduction:

Concurrent sexual partnerships are a sexual network pattern that speeds the spread of HIV/AIDS and Sexual Transmitted Infections (1). Multiple and Concurrent Sexual Partnerships (MCP) are part of the behavioral drivers and are playing main role in the increase of HIV incidence (2). The main aim of the study is to identify the possible socio-demographic and behavioral factors that are associated with concurrent sexual partnership in 4 communities of South Africa (SA), so as to inform HIV prevention programmes in designing targeted interventions for addressing this problem in specific communities. The ultimate goal is to reduce the incidence of new HIV infections.

Materials and Methods:

We performed an analytical cross-sectional study based on secondary data from a multi-stage, household survey, which was conducted by Development Research Africa in partnership with Health and Development Africa (HDA) from October to December 2008. From the original survey, the areas of the study were selected by the 4 organizations (Mothusimpilo Organization (Carletonville, Gauteng), Lesedi Lechabile Organization (Welkom, Free State), The Valley Trust Organization (Valley of a Thousand Hills, Kwa-Zulu Natal), The Lighthouse Foundation Organization (Jericho, North West). We used the definition of concurrent sexual partnership (as being amended from UNAIDS definition) as overlapping sexual partnerships, where sexual intercourse with one partner occurs between two acts of intercourse with another partner in the population of age group between 16 and 40 years old during the previous 12 months from date of interview. Possible predictor factors for concurrent sexual partnerships were entered in a logistic regression model. Multiple logistic regression forward models were constructed to identify possible socio demographic and behavioral risk factors statistically associated with concurrent sexual partnerships.

Results:

There were 330(10.5%) individuals with concurrent sexual partners out of all respondents. Factors found to be significantly associated with concurrent sexual partnerships included gender (OR 0.24, 95% CI; 0.17-0.35, P<0.001) where females were 76% less likely to have concurrent sexual partnerships compared to males, those who were aged 25-29 years (OR 0.56, 95% CI; 0.3-0.94, P=0.028) and those who were aged 35-40 years (OR 0.38, 95% CI; 0.2-0.7, P=0.004) were 44% and 62% less likely to have concurrent sexual partnerships compared to those who aged 16-19 years old respectively, having another home elsewhere (OR 1.61, 95% CI; 1.2-2.2, P=0.002), alcohol consumption during the last month compared to those who didn't drink last month (OR 1.55, 95% CI; 1.01-2.4, P=0.046), those who drank once a week (OR 1.69, 95% CI; 1.04-2.7, P=0.033), those who drank several times per week (OR 2.68, 95% CI; 1.6-4.6, P<0.001) were 55%, 69% and 2.7 times, more likely to have concurrent sexual partnerships respectively, the ability to control sexual urges (OR 1.99, 95% CI; 1.4-2.9, P<0.001) where those who said they can't control their sexual urges were almost two times more likely to have concurrency. The respondents who had sexual intercourse under influence of alcohol were 60% more likely to have concurrent sexual partnerships compared to those who had sexual intercourse under no influence (OR 1.6, 95% CI; 1.1-2.2, P=0.008). In compare to respondants who were married, those who were living together (OR 4.08, 95% CI; 1.3-13, P=0.016), had main partners (OR 8.62, 95% CI; 3-25, P<0.001), friends (OR 6.09, 95% CI; 1.9-19.3, P=0.002), in casual acquaintance relationships (OR 17.19, 95% CI; 5.5-54, P<0.001), and who described the sexual relationship as once-off (OR 6.31, 95% CI; 1.2-34.5, P=0.033) were more likely to have concurrent sexual partners. Those who thought that the recent sexual partner had another sexual partner (OR 1.5, 95% CI; 1.4-2.9, P=0.02) were 50% more likely to have concurrent sexual partners.

Factors such as marital status, employment status, race, education level, settlement type, socio-economic status, currently work on mine, condom use, believing on faithfulness and abstinence on

preventing from HIV, were not statistically associated with concurrent sexual partnerships in the adjusted analysis.

Conclusions:

We conclude that there is significant relation between concurrent sexual partnerships and age, gender, having another home elsewhere, thinking of the recent sexual partner has another sexual partner, alcohol use in the last month, the sexual urges, and relationship with the recent sexual partner. These findings could assist organizations who work at the four communities in their control planning activities especially for concurrency among youth between 16 and 19 years old and alcohol use. It is better to investigate in more depth the relationship between concurrency with other possible predictive factors in the national HIV survey so that results can be generalized nationwide.

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My thanks to all my relatives and friend

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LIST OF ABBREVIATIONS

AIDS- Acquired Immune Deficiency Syndrome

HIV- Human Immunodeficiency Virus

HDA -Health & Development Africa

IQR- Inter Quartile Range

JHHESA- John Hopkins Health and Education in South Africa

MCP – Multiple and Concurrent Sexual Partnerships

PEPFAR–US President's Emergency Plan for AIDS Relief

SA- South Africa

SD – Standard Deviation

UNAIDS- Joint United Nations Programme On HIV/AIDS

USAIDS - United States Agency for International Development

1. CHAPTER One: GENERAL INTRODUCTION

This chapter includes a brief introduction about the concurrent sexual partnerships burden in the extension of HIV/AIDS and Sexual Transmitted Diseases. The chapter also contains a problem statement and justification for the study, a literature review from relevant publications, definition of the concurrent sexual partnerships, and the aim and the objectives of the study.

Background:

Concurrent sexual partnerships are a sexual network pattern that speeds the spread of HIV/AIDS and Sexual Transmitted Infections (1). Biological susceptibility during unprotected sex alone is not enough to explain the high levels of HIV prevalence in South Africa.

On the other hand, structural drivers of the HIV Epidemic include marriage status (low levels of marriage in South Africa), wealth inequalities and unemployment (3). Male circumcision is one of the biomedical drivers(3).Also, behavioral drivers of the epidemic are low and inconsistent condom use, transactional sex, high alcohol use and early age of sexual onset.

Multiple and Concurrent Sexual Partnerships (MCP) are key behavioral drivers and play significant role in the increase of HIV incidence (2).

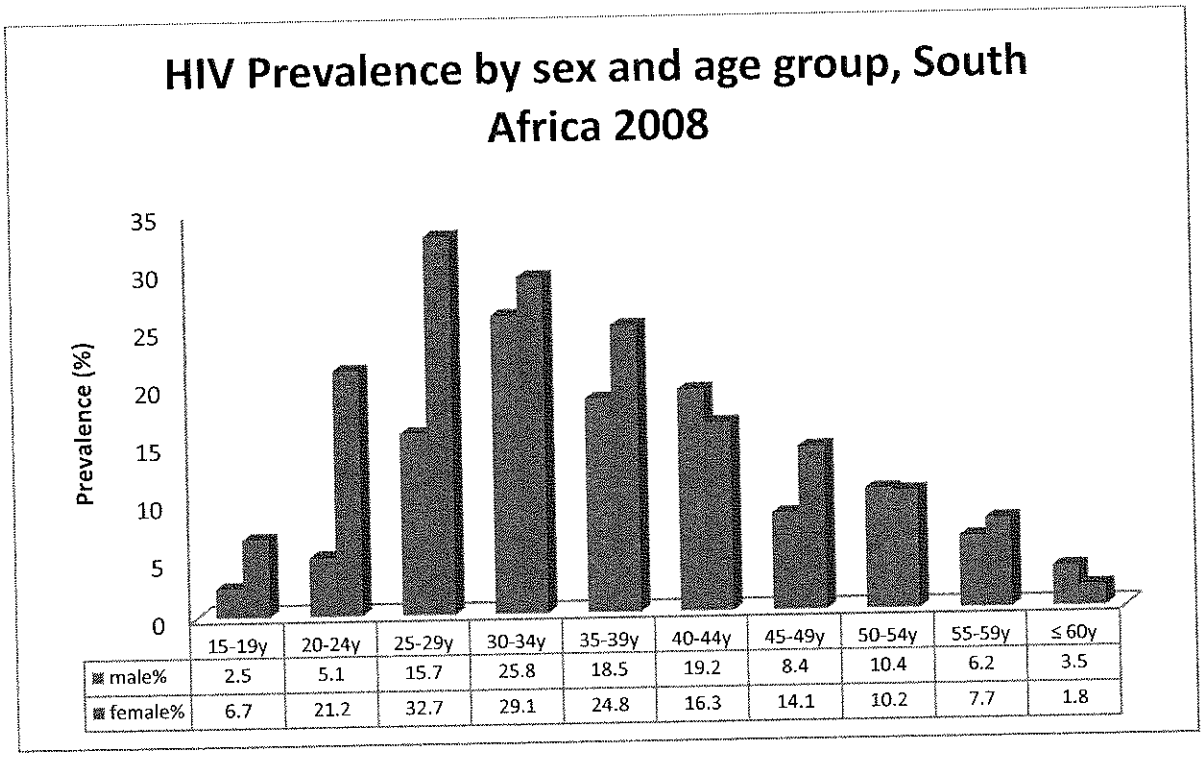
1.2. Problem statement and Justification of the study:

It is known that epidemiology was concerned originally with epidemics of communicable diseases (4). Then it extended to endemic communicable diseases and non-communicable diseases. More recently, epidemiologic methods have been applied to chronic diseases, injuries, maternal-child health, occupational health, and environmental health. Nowadays, even behaviors related to health and well-being like sexual risk behaviors are recognized as valid subjects for applying epidemiologic studies and methods (4).

It is clear that concurrent sexual partnerships, as part of multiple sexual partnerships need more researches, since little is known about the prevalence of concurrent sexual partnerships in high HIV endemic areas in Africa, especially in communities which are worst affected by the HIV epidemic. The 4 communities of the primary study were chosen by Johns Hopkins Health and Education in South Africa (JHHESA), where JHHESA's main partners are located and also due to the high HIV prevalence in these areas. Therefore, it led JHHESA to support organizations to assist in reducing the incidence of the disease and support the already infected and affected communities.

From South African National HIV Prevalence, HIV Incidence, Behavior and Communication Survey, that was conducted in 2005 (5), one of its results stated the problem of unprotected sex with greater numbers of sexual partners, which increases risk of HIV acquisition and this risk is increased in the context of generalized epidemic. It also stated the higher proportion among males (16.3%) having had more sexual partners during the past years than their female counterparts (2.6%), with a negative relationship between the rate of multiple partnership and age of respondents, showing that the younger age groups had more partners than the older groups. In another way, the HIV prevalence amongst two years old and above was estimated to be 10.8%, with a higher prevalence in females (13.3%) than in males (8.2%). The highest HIV prevalence among Provinces was in Kwa-Zulu-Natal (16.5%), then Free State (12.6%), North-West (10.9%), and Gauteng (10.8%), and those provinces

include the four-targeted communities for this study. South African national HIV prevalence surveys in 2002, 2005 and 2008, showed that there was slight increase in the prevalence among those who aged 15 to 49 by 1.3% (15.6%, 16.2%, 16.9%) respectively during the surveys time (6). In 2005 survey HIV prevalence was highest among females aged 25 to 29 years old, similar as in 2008 survey. HIV prevalence among men was highest among the 30-34 year age group where 23.3% of men were found to be HIV positive in 2005 and 25.8% in 2008 (Figure 1.1).



	15-19y	20-24y	25-29y	30-34y	35-39y	40-44y	45-49y	50-54y	55-59y	≤ 60y
male%	2.5	5.1	15.7	25.8	18.5	19.2	8.4	10.4	6.2	3.5
female%	6.7	21.2	32.7	29.1	24.8	16.3	14.1	10.2	7.7	1.8

Figure 1-1-1: The graph shows prevalence of HIV/AIDS by gender and age-groups

Source: South Africa National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey. 2008

Little is known about concurrent sexual partnership and possible predictive factors in sub Saharan and South Africa. Main studies available were qualitative in nature and simulation modeling studies. There are very few quantitative studies. In addition, there is high possibility of getting HIV disease from newly infected sexual partners during the first months, which is most probably due to overlapping between partners and unsafe sex. It is better to investigate the relation between

concurrent sexual partnerships and the socio-demographic and behavioral factors as will be done in this study.

1.3. Literature review:

In a study that was conducted in USA, the researchers Adimora et al (1) found that approximately 11% of men reported concurrent sexual partnerships during the preceding year of the study. In that study, they found that concurrency was associated with being unmarried and race/ethnicity during the past year. Other findings were that men with concurrent sexual partners were also more likely to report drug use or alcohol intoxication during sexual intercourse, and history of sexual intercourse with a man (OR = 1.93; 95% CI (1.09, 3.42)), than those without concurrent partnerships. Adimora et al concluded that the higher concurrency prevalence in various groups, dense sexual networks, and mixing between high-risk subpopulations and the general population may be important factors in the US epidemic of heterosexual HIV infection (1). In another study which was conducted by Darroch et al (7), it was noted that high level of multiple sexual partnerships among American teenagers may help explain their high STD rates.

On the other hand, Gorbach PM et al (8), said that men practiced concurrency to avoid becoming partner-less during partnership disintegration; more women, especially STI patients, reported reactive concurrency, recruiting new partners rather than leaving partners. Concurrency when occurring during separation and transitioning between partners was socially acceptable. Gorbach et al, showed the prevalence of concurrent partnerships in the results, and suggested linkages to individuals' life stage and some social acceptability.

Mah T et al (9), wrote in his study, the role of concurrent sexual partnerships in increasing the transmission of sexually transmitted infections, particularly of heterosexual HIV transmission in Africa. Modeling and empirical evidence suggested that concurrent partnerships compared to serial partnerships could increase the size of an HIV epidemic, the speed at which it infects a population, and its persistence within a population.

In addition, when we take the study that has been conducted by Sandoy et al (10), they examined how the prevalence of parallel relationships changed among men and women aged 15-49 years in Zambia from 1998 to 2003. They used data collected during the Sexual Behavior Surveys in 1998, 2000, and 2003. Thirteen percent of the rural and 8% of the urban men reported more than one ongoing relationship in 1998, and these proportions declined to 8% and 6%, respectively in 2003. The proportion of women reporting concurrent relationships ranged between 0% and 2%. In their study, they found that the most important predictors of concurrency were early sexual debut, early marriage and absence from home. They concluded that the reduction in concurrent sexual partnerships is consistent with reductions in other sexual risky behaviors found in other studies and may have contributed to the recently observed decline in HIV prevalence in Zambia (10).

In his study Parker et al (11), found that concurrent sexual partnerships are common in sexual relationships amongst young people aged 20-30 years in South Africa. He addressed the explanatory factors for concurrency are the relation between socioeconomic and cultural contexts jointly with individual psychological factors related to fatalism.

Mah et al, (12), mentioned that concurrent sexual partnerships are an important behavioral driver of HIV epidemic in Africa. In his study, he examined the prevalence and correlates of concurrency among young adults in the Cape Metropolitan Area in South Africa. He found that 13% reported concurrency during their recent sexual partnerships, with variation by sex and race.

Tanser et al (13) investigated the effect of the concurrent sexual partnerships on rate of the HIV infection in a high prevalence rural South African population in Kwa Zulu Natal. He found that there was no evidence to suggest concurrent partnerships as important driver of HIV incidence. Tanser et

al suggested that in similar sub-Saharan African settings, the relevant sectors has to work in a reduction of multiple sexual partnerships, irrespective of whether there is concurrency or not.

In their findings most of the investigators, especially in the African region, suggested the important role of concurrent sexual partnerships as behavioral driver, in increasing the network of HIV incidence and prevalence. Although Tanser et al, reported findings to the contrary.

From all of these results, we find that there is a real need to investigate the relation between concurrent sexual partnership and socio demographic and behavioral predictor factors in South Africa, which is one of the countries that has highest HIV prevalence. This result will assist in increasing the knowledge for the concurrent sexual partnerships.

Definition of Concurrent sexual partnerships (UNAIDS):

The agreed definition of concurrent sexual partnerships from UNAIDS committee (14), is: overlapping sexual partnerships where sexual intercourse with one partner occurs between two acts of sexual intercourse with another partner. The point prevalence of concurrent sexual partnerships in the adult population is the proportion of adult aged 15-49 reporting more than one ongoing sexual partnership at an instant in time. For this study, the concurrent sexual partnership will be overlapping sexual partnerships where sexual intercourse with one partner occurs between two acts of intercourse with another partner in the population of aged between 16 and 40 years old during the previous 12 months from date of survey interview.

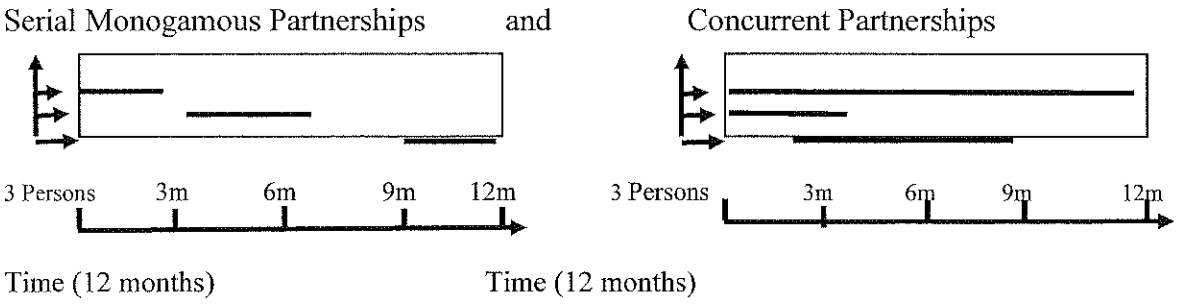


Figure 1-2: Comparison of serial monogamous sexual partnerships and concurrent partnerships for three persons by months

The 1st chart showed that one person had three serial sexual partnerships in different times, while the second chart showed that person had three sexual partnerships within the same times around the third month.

1.4. Aim and objectives of the study

1.4.1. The Aim:

The main aim of this study was to identify the socio- demographic, structural and behavioral factors that are associated with concurrent sexual partnership in South Africa communities, to inform HIV prevention programmes in the specific communities. The ultimate goal is to reduce the incidence of new HIV infections.

1.4.2. Study objectives:

1.4.2.1. General objective:

To identify the socio-demographic, structural and behavioral factors associated with concurrent sexual partnerships among sexually active people (16-40 years) in Carletonville - Gauteng, Welkom - Free State, Valley of a Thousand Hills - Kwa-Zulu Natal, and Jericho - North West Provinces in South Africa, 2008.

1.4.2.2. Specific objectives:

1. To describe the population characteristics in the four communities under study in terms of:
    a) Socio-demographic and structural factors: age, sex, marital status, education, migration (in and out of the country), settlement type, race, socio-economic status and employment.
    b) Behavioral factors: condom use, faithfulness, alcohol use, sexual partnership patterns, control sexual urges and having sexual intercourse under influence of alcohol.
2. To determine the prevalence of concurrent sexual partnerships in the four communities under study.
3. To investigate the relationship between concurrent sexual partnerships and socio-demographic, structural and behavioral factors in the population of age group between 16 and 40 years in the 4 communities under study.

2. CHAPTER Two: METHODOLOGY

In this chapter study population, study area, data processing, data management including data analysis and variables definitions are covered,

2.1. Study design:

This is a cross-sectional study based on secondary data from a multi-stage, clustered household survey, conducted by Development Research Africa in partnership with Health and Development Africa (HDA) from October to December 2008. For the original survey, the areas of the study were selected by the 4 organizations. Mothusimpilo Organization had conducted the survey in Carletonville in Gauteng, Lesedi Lechabile Organization in Welkom in Free State, The Valley Trust Organization in Valley of a Thousand Hills in Kwa-Zulu Natal, and The Lighthouse Foundation Organization in Jericho in North West. In each community, he wards were identified through discussions with key staff members. Random sampling was conducted in all the wards served by each organization. The survey was designed to be representative of 16-40 year old individuals residing in each area. Parental consent was sought from respondents who were aged less than 18 years old in addition to assent from the child. A probability based sampling technique was adopted, whereby all possible respondents have equal of selection from each area. The sample universe was all households in the wards in which the organizations were active. Based on this, a geographically representative sample was drawn of persons, between the ages 16 and 40 years, for each of the four areas served by the partner organizations as set out above. All households in the study areas were included in the sampling frame irrespective of number of members and nationality of these members. It was important for cross-sectional purposes, that a similar and comparable methodology be applied across the four sites. Face-to-face interviews were conducted with randomly selected persons in each randomly selected household.

2.2. Study area:

The study areas were: Carletonville town in Merafong city Local Municipality in Gauteng Province, Welkom town in Matjhabeng and Masilonyana Local Municipalities in Free State Province, Valley of a Thousand Hills area in eThekwini metro Municipality in Kwa-Zulu Natal Province, and Jericho town in Madibeng Local Municipality in North West Province. These areas were selected by John Hopkins Health and Education in South Africa (JHHESA), due to the highly prevalence of HIV in these areas. JHHESA supported the 4 organizations to work in the selected communities (Mothusimpilo (Carletonville, Gauteng), Lesedi Lechabile (Welkom, Free State), The Valley Trust (Valley of a Thousand Hills, Kwa-Zulu Natal) and The Lighthouse Foundation (Jericho, North West). Johns Hopkins Health and Education in South Africa (JHHESA) approached Health and Development Africa (HDA) to design and undertake formative evaluations in these areas. That resulted in the primary surveys being conducted in 2008 Africa (3).

Carletonville town community in Merafong City- Gauteng Province is characterized by high level of poverty and unemployment, and a well established sex worker industry (15)-(16).

The townships surrounding Welkom, Virginia and Odendaalsrus in Free State Province; are Thabong, Meloding and Kutlwanong

The Valley of 1000 Hills Kwa-Zulu Natal Province, is a picturesque area near Durban, and home to approximately 300 000 people. The Valley (as it is commonly referred to by the locals) is made up of eight peri-urban and rural tribal areas. The Valley Trust provides comprehensive primary health care to these communities and is most active in 5 tribal areas having the strongest reach in KwaNyuswa, Qadi, Ncolosi, Molweni, KwaXimba which fall under the eThekwini and Msunduzi districts of Kwa-Zulu Natal.

Jericho Village is a rural settlement located in Madibeng Local Municipality within the Bojanala District of the North West Province. It is situated 40 kilometers from the small town of Brits in the North West Province and is ruled by a traditional tribal authority called Bakwenaba Mogopa. Jericho is the largest village that serves as the hub for services and local area management. The estimated number of households in Jericho is 13 200. The Lighthouse Foundation program currently operates in 13 villages and plans to expand its work to 10 more villages in the Madibeng Local Municipality. The area has two community owned pre-schools, one middle school, three primary schools, one special school for children with disabilities and two high schools. The majority of people living in the communities around the Valley of 1000 Hills live in poverty, with high levels of unemployment and low literacy levels.

2.3. Study population

Data for all individuals who were included in the primary survey was extracted for this secondary data analysis. The study population are those who were living, at that time of the survey, in the four communities and of age group between 16 and 40 years.

Carletonville town in Merafong City- Gauteng Province has a population of approximately 210,000 people(17). The population size in the townships surrounding of Thabong, Meloding and Kutlwanong(148 202; 48 335; 58 964 respectively) in Free State Province. The Valley of 1000 Hills Kwa-Zulu Natal Province is home to approximately 300 000 people.

2.4. Inclusion criteria of the secondary study:

Any participants who were included on the data set of the primary study, were of age group between 16 to 40 years, and were living in households during the survey time during October and November 2008 in the specified areas of the four Provinces.

2.5. Exclusion criteria of the secondary study :

The missing, refuse to answer, not applicable, don't know data records were excluded. The missing dates of the concurrent outcome from the five partners were also excluded. Those who were less than 16 years old or more than forty years old were excluded from analysis.

2.6. Study sample:

Considers the inclusion/exclusion criteria, the sample size of the study for the secondary analysis was 3156 participants which on average showed a variation of 757 to 874 survey participants per area in one Province.

2.7. Data collection tools:

Questionnaires were used to collect the data from the primary study database

2.8. Study limitation:

Secondary data based studies, have problems with missing data. Primary data is also affected by reporting bias e.g. reported frequency of the sexual partners could be more among males than females due to faithfulness impression of the females and power impression in males. The limitation in the selected age range between 16 and 40, contrary to what UNAIDS advices between 15 and 49 years old.

2.9. Data processing methods and data analysis plans:

2.9.1. Data management:

Data was entered in Epi Info program (Version 3.5.1) and cleaned through check codes and verification process in EP Info. Thereafter, data was transferred to STATA program (Version 11) for the analysis. All missing, don't know, not applicable, refuse to answer data within the variables were treated as missing data. New variable of concurrency was generated from the data of up to five sexual partners per respondent, depending on the first date of sex and last date of sex with the current partner. The dates were cleaned in excel sheet, and the incorrect dates were managed to be either missing, so as not to give wrong result in overlapping implying concurrency. In addition, episode of concurrency variable was generated. Every variable was checked by range, frequency and missing data.

2.9.2. Data analysis:

Descriptive statistics: First, simple descriptive statistics for sample population was tabulated. The tabulations described the main outcome variable (concurrent sexual partnerships) and predictor factors. A detailed sexual calendar asking sexual behavior questions of up to five partners, regarding the first date and last date of sexual practice to every partner variables were used to measure concurrent sexual partnerships. Examples include number of current partners, the first and last time of having sex with the partner. Frequency and percentages were presented for categorical variables such as concurrent sexual partnership, sexual habits, condom use, alcohol consumption, relationship (married, living together, casual, main partner, one nightstand, and friendship), employment status, education status and others. Continuous variables like age and frequency of sexual activity were presented by means and standard deviation if normally distributed or median and inter quartile range if not normally distributed.

Univariate analysis was conducted between each predictive factor and the main outcome. T-test was used to test the association between continuous variables (age and frequency of sexual activity) and the main outcome variable (concurrent sexual partnership). And, a chi-square test was used to test the association between categorical variables like sexual habits, condom use, alcohol consumption, marital status or employment against the main outcome variable (concurrent sexual partnership), and a p-value was calculated for both tests. A 5% significant level was used for the above statistical analysis where as a conservative 20% level was used to be the cut off point for a variable to be selected for multiple logistic regression analysis.

Analytical statistics: Variables that comply with the significant criteria (20% significance level or less were considered for a multivariable analysis. Multiple logistic regression was used for the outcome variable "the concurrent sexual partnership". The presence of concurrency was coded 1, and no concurrency was coded 0. Then, after that forward modeling logistic regression model was ran to measure the association between the main outcome and factors significant at univariate analysis. Factors known to be important as found in the literature were also included in the model if have p-value <20%. Thereafter, the model was refined by calculating the likelihood ratios for the variable and excluding the non-significant ones. The final model showed the association between the explanatory variables and the outcome was measured by calculating the Odds Ratios, and the statistically significant tested by either p-value of equal to or less than 0.05, or confidence interval ranges not including one.

Variables definition:

The outcome variable:

The concurrent sexual partnership in the study was defined as overlapping sexual partnerships where sexual intercourse with one partner occurs between two acts of sexual intercourse with another partner in the population of age group between 16 and 40 years old during the previous 12 months.

The episodes of concurrent sexual partnership relation was divided according to the number of the sexual partners: 1 episode of concurrency sexual partners at the same time during the previous 12 months, 2 episodes of concurrency sexual partners at the same time, and 3 or more episodes of concurrency sexual partners at the same time.

The explanatory variables:

Other explanatory variables followed the primary survey definition. These independent variable factors were collected (as per flow chart figure 2.1 shown below)

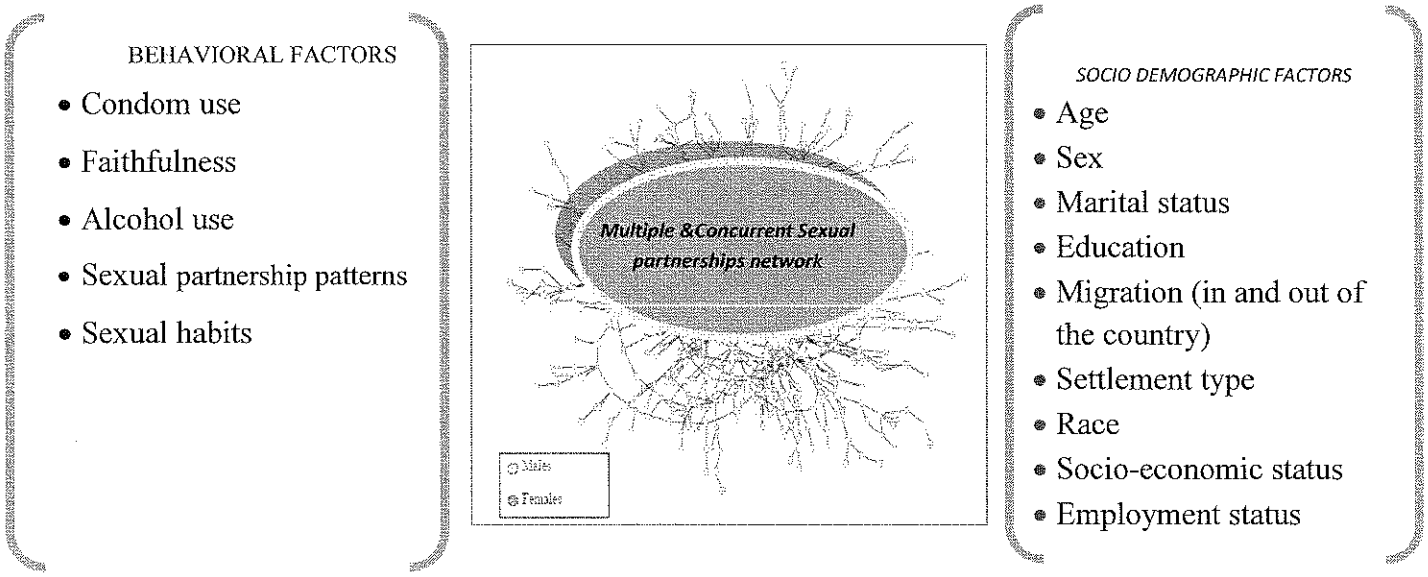


Figure 2.1: Socio Demographic and Behavioral Factors in relation with the Multiple Concurrent Sexual Partnerships Network Flow chart (adopted from Warren Parker Sexual partner

Condom use means using condom during last sex, faithfulness definition means ability to refuse the temptation of having sex with others outside the sexual relationship, alcohol use means having ever alcohol drink,

2.10. Ethical Approval:

The post graduate Committee and the Research Ethics Committee, Faculty of Health Sciences, University of Witwatersrand approved the study, with clearance certificate number: M10942. The primary survey also was approved from Witwatersrand University Research Ethics committee.

3. CHAPTER Three: RESULTS

3.1. Population Characteristic:

There were 3156 respondents participated in the survey.

3.1.1 Socio-demographic factors (table 3.1):

One thousand six hundred sixty eight (53%) of the respondents were female. The median age for the females were 26 years (IQR: 20, 32) and 24 years (IQR: 19, 30) for males. Most of the respondents were black 3067 (97%), 2% colored and the remaining distributed between white and Indians.

Married respondents were only 427 (14%). Those who completed primary school or less were 451 (15%), more than half of the respondents completed secondary school 1701 (54%), 27% completed matric, 4% tertiary and others. Almost half 1515 (48%) were unemployed, 873 (28%) were employed, 734 (23%) students and 16 (less than 1%) have living with disability or grant. Three percent of the respondents were working in mines at the time of the interview. Where 69% of them had work at only one mine, and the remaining had worked from two up to eight mines.

Around 119 (4%) of the respondents were from outside South Africa, 105 (3%) were from Mozambique and Lesotho, and 14 (1%) were from Swaziland, Angola and Zimbabwe. Within those who were from South Africa, 2419 (77%) considered their home provinces same as their current living provinces. Ninety seven percent of those who were living in Kwa-Zulu Natal considered that it is their home province, 83% from Free State, 76% of North West and only 48% of those who were living in Gauteng considered it as their home province. Thirty one percent of the respondents reported that they had another home

elsewhere, and 6% of respondents had their husband, wife, boyfriend or girl friend at that home. Eleven percent sent money home monthly.

Table 3-1: Socio-demographic characteristics of the respondents from the 4 communities, 2008:

Characteristics	Number (%)
Age-group	
16-19	741 (23.5%)
20-24	770 (24.5%)
25-29	662 (21.0%)
30-34	484 (15.3%)
35-40	491 (15.6%)
Province	
Free State	767 (24.3%)
North West	758 (24.0%)
Kwa-Zulu Natal	874 (27.7%)
Gauteng	757 (24.0%)
Gender	
Male	1488 (47.1%)
Female	1668 (52.9%)
Race	
Black	3067 (97.1%)
White	22 (0.7%)
Indian	2 (0.1%)
Colored	62 (2.0%)
Marital status	
not married	2687 (85.3%)
married	427 (13.6%)
Divorce/widowed	37 (1.2%)
Education	
Primary or less	459 (14.5%)
Secondary	1701 (54.0%)
Matric	842 (26.7%)
Tertiary	137 (4.3%)
Other	17 (0.5%)
Employment status	
unemployed	1515 (48.3%)
employed	873 (27.8%)
student	734 (23.4%)
grant, disability	16 (0.5%)

3.1.2 Behavioral factors (Table 3.2):

Almost 87% of the respondents ever had sex with anyone during their life. The age at first sex for the respondents ranged between 6 to 35 years with mean age of 17. The mean age for females was 18 years (SD: 2.4) and for males was 17 years (SD: 2.8).

Forty four percent of the respondents reported using condoms during their last sex. Eleven percent mentioned that they can't control their sexual urge.

Forty four percent of respondents had never drank alcohol. Of those who drank twenty five percent didn't drink during the last month, twelve percent drank alcohol once a week, nine percent drank once a month, eight percent drank several times per week, and only one percent drank on daily base. Eighteen percent had sexual intercourse under the influence of alcohol, two percent didn't have sexual intercourse, and the remaining weren't influenced by alcohol during their sexual intercourse.

Forty one percent of the respondents reported that abstinence could prevent HIV.

The question for the respondents about their opinions the main reason for a man to have another sexual partner, twenty seven percent answered that they thought because of curiosity and fun, twenty three percent said that men couldn't control their sexual urge, eleven percent suggested the withholding of sex from their main sexual partners, ten percent reported physical distance from their main sexual partners to be the reason, five percent talked of man should have spare partner, another five percent thought that because of anger about something their main partner had done or not done, four percent said that because of getting drunk, and four percent thought because of money or gifts that their sexual partner provided.

Seventy six percent of respondents had at least one sexual partner during the last 12 months. When asking the respondents about their relationship with the recent sexual partner (figure 3.1), forty four percent said that they were their main sexual partner, twelve percent said they were married, ten percent were living together, five percent were friends, three percent were casual acquaintance and less than one percent reported it was being a one night encounter. Three percent of the respondents mentioned that they had provided sex to their sexual partner in exchange for money or resources. Forty one percent of respondents knew their recent sexual partners for more than 6 months, twenty-two percent knew them between 1 to 6 months, nine percent knew them between one to four weeks and three percent knew them only less than one week. Regarding the distance between the respondent and recent sexual partner, twenty-two were in the same house, and only less than 1% were from different countries. In addition, only two percent of the respondents had provided money or resources to their recent partners. Eighteen percent of the respondents thought that their sexual partners had another sexual partners, fifty two percent didn't think that their partners had other sexual relationship, and six percent didn't know if their sexual partners had other partner or not.

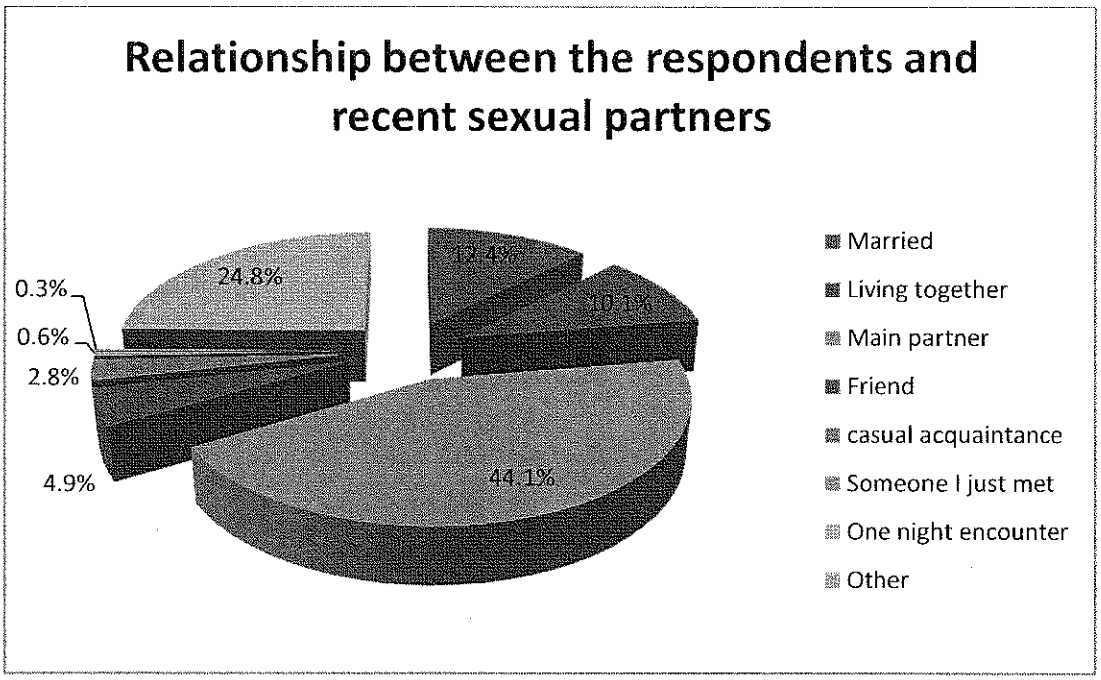


Figure 3-1: Relationship between the respondents and recent sexual partners

Table 3-2: Sexual behavioral characteristics of the respondents from the 4 communities, 2008:

Characteristics	Number (%)
Respondent ever had sex	
Ever had sex	2755 (87%)
Never had sex	395 (13%)
Gender of respondent who ever had sex	
Male	1264 (46%)
Female	1491 (54%)
Condom use during last sex	
Yes	1396 (44%)
No	1748 (56%)
Frequency of having alcohol during the past month	
Never drink alcohol	1382 (44%)
Not drink last month	789 (25%)
Once a month	290 (9%)
Once a week	389 (12%)
Several times per week	250 (8%)
Daily drinking	47 (1%)
Abstain could prevent HIV	
Yes	1293 (41%)
No	1863 (59%)
Opinion of the main reason for a man to have another sexual partner	
Curiosity, fun or variety	848 (27%)
Can't control sexual urge	739 (23%)
Main partner withhold sex	335 (11%)
Physical distance from main partner	315 (10%)
Men should have spare partner	162 (5%)
Angry about something with main partner	160 (5%)
Getting drunk	142 (5%)
Money or gift from other partner	127 (4%)
Other	249 (8%)
Don't know	79 (2%)
Respondent relationship with the recent sexual partner	
Main partner	1393 (44%)
Married	391 (12%)
Living together	318 (10%)
Friend	155 (5%)
Casual acquaintance	89 (3%)
One night encounter	8 (0.3%)
Someone just met	18 (1%)
Not having relationship or others	784 (24.7%)

3.2. Prevalence of concurrent sexual partnership:

There were 330 (10.5%) out of the 3156 respondents who had concurrent sexual partnerships. 267 (17.9%) from all were males compared to 63 (3.8%) from all were females had concurrent sexual partners (Figure 3.2). The median age of those who had concurrency was 24 years (IQR: 20, 29) with no apparent differences by gender. The mean age at first sex for those who had concurrency was 16 years (SD: 2.3) (Figure 3.3).

The number of concurrencies varied from one to ten for the respondents at the same time. Seventy one percent of those who had concurrency had only one concurrency among their sexual partners, five percent had two times of concurrency at the same time, and twenty four percent had three or more times of concurrency at the same moment.

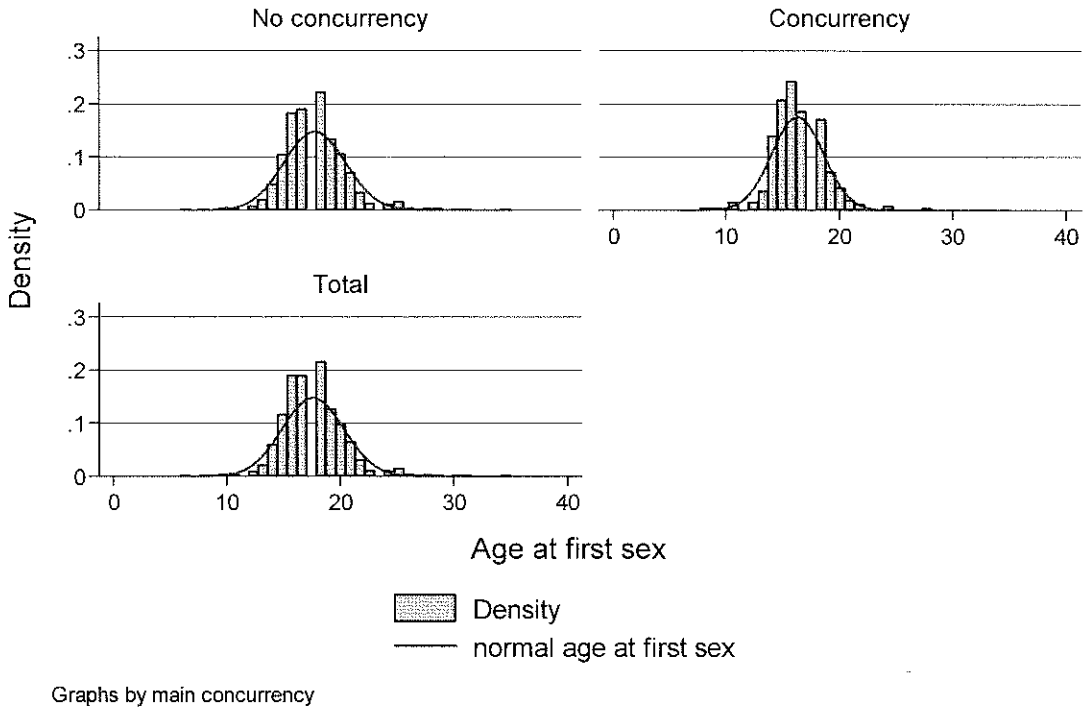


Figure 3-2: Histogram of the frequency of those who had no concurrency, concurrency by age at first sex in the 4 communities, 2008

Figure 3.4 shows the distribution of concurrency by age group and gender. Concurrency was high among individuals aged between 20 to 24 years old, where 90 out of 390 males (23.1%) and 17/380

(4.5%) females reported so, with those aged between 35 and 40 years old reporting the least concurrency. Concurrency was consistently reported higher among males than females, across all age groups.

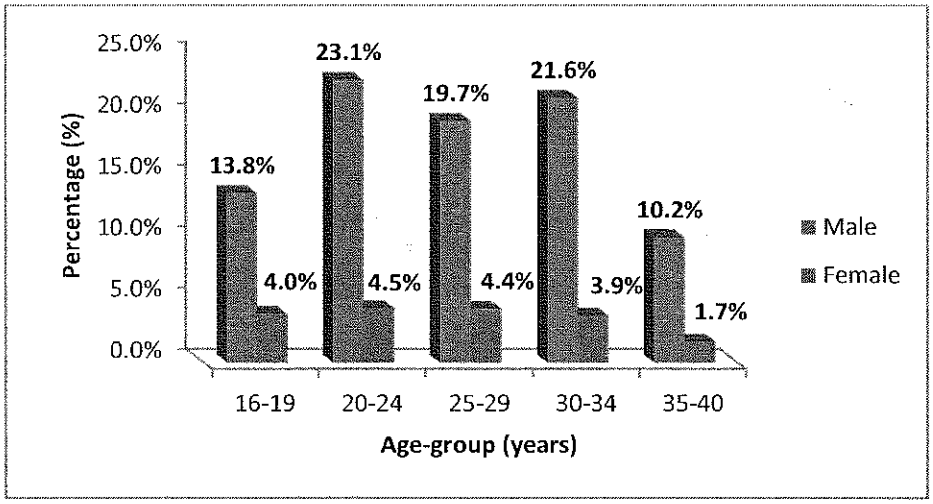


Figure 3-3: Percentage of concurrency by age group and gender

Figure 3.5 shows concurrency by community at the four provinces by gender. The community in Kwa-Zulu Natal Province reported the highest percentage of concurrency 101 (30%) among the 4 communities, followed by Free State Province community, North West community and the least was Gauteng communities. By gender, the highest prevalence of concurrency in the last twelve months was reported from Kwa-Zulu Natal Province, 93/471 (28.2%) males compared to other communities. Females in Gauteng reported the highest compared to ther females in other Provinces. Of the 435 females who participated in Gauteng 24 (7.2%) reported having concurrency. On the other hand, Gauteng reported the least prevalence of concurrency among males and Kwa-Zulu Natal among females.

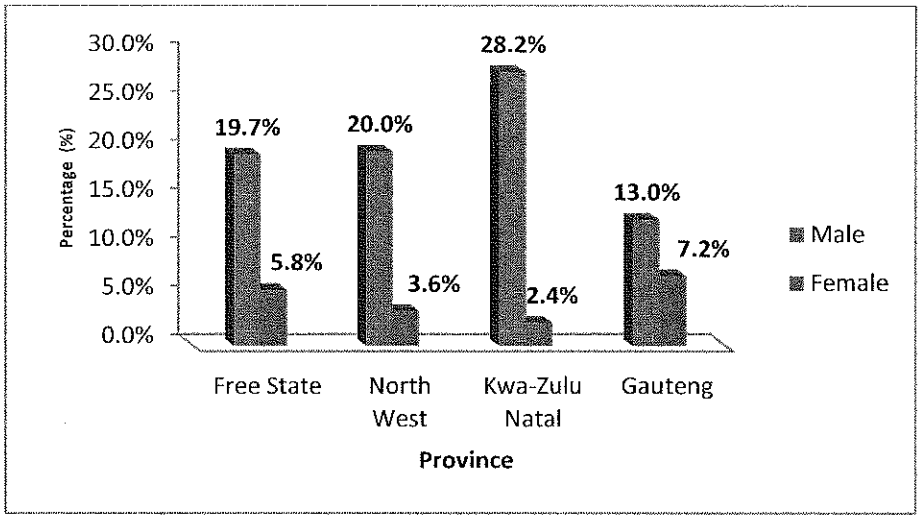


Figure 3-4: Percentage of concurrency by Province and gender

3.3. Measurement of associations (Univariate and Multivariate analysis (Table 3-3):

3.3.1. Univariate analysis:

These following factors were found to be significantly associated with concurrent sexual partnerships on univariate analysis at $P \leq 0.2$. The statistically significant socio-demographic factors were age group, gender, high level of education completed, marital status, employment status, currently work on mine, respondent had another home elsewhere and settlement type. Also, the statistically significant behavioral factors were condom use at last sex, sex after alcohol, abstains and HIV prevention can't control sexual urge, relation with recent sexual partner, thinking of the recent partner having another sexual partner and methods frequency of having alcohol during last month.

3.3.2. Multivariate analysis:

As per (Table 3.3) the following factors were significantly associated with concurrent sexual partnerships in multiple logistic regression analysis at $P \leq 0.2$, adjusting for the effects of each in the model. The final model with ward factor had good fitting compared to previous model without ward factor.

The statistically significant socio-demographic factors included age, where compared to respondents aged 16-19 those who were aged 25-29 (OR 0.56, 95% CI 0.3-0.94, P=0.028) were 44% less likely to have concurrent sexual partnerships, and those who were aged 35-40 (OR 0.38, 95% CI 0.2-0.7, P=0.004) were 60% less likely to have concurrent sexual partnerships. The other remaining age-groups were not statistically significant from the reference group.

Gender: Females were 76% less likely to have concurrent sexual partners compared to males (OR 0.24, 95% CI 0.17-0.35, P<0.001).

Having another home elsewhere: The respondents who had another home elsewhere were about 2 times more likely to have concurrent sexual partnerships in comparing to those who didn't have (OR 1.61, 95% CI 1.2-2.2, P=0.002).

On the other hand, the statistically significant behavioral factors included: the chance of having concurrent sexual partners for those who thought their recent sexual partners had another sexual partners were 50% more than those who didn't believe (OR 1.5, 95% CI 1.06-2.1, P=0.0.02).

frequency of drinking alcohol during last month was measured. In comparing to those who had never taken alcohol, those who used to drink but not drank alcohol last month (OR 1.55, 95% CI 1.01-2.4, P=0.046), those who drank once a week (OR 1.69, 95% CI 1.04-2.7, P=0.033) and those who drank several times per week ((OR 2.68, 95% CI 1.6-4.6, P<0.001) were 0,55, 1.69 and 2.68 times more likely to have concurrent sexual partners respectively.

Respondent ability to control their sexual urges: Compared to respondents who reported that they were controlling their sexual urges, those who agreed that they couldn't control their sexual urge (OR 1.99, 95% CI 1.4-2.9, P<0.001) were almost two times more likely to have concurrent sexual partners.

Respondent relationship with the recent sexual partner: Compared to respondent who were married to the recent sexual partners, those who were living together (OR 4.08, 95% CI 1.3-13.0, P=0.016), were main partners (OR 8.62, 95% CI 3-25, P<0.001), and who were friends (OR 6.09, 95% CI 1.9-19.3, P=0.002) were more likely to have concurrent sexual partners.

Having intercourse when under the influence of alcohol: The respondents who had intercourse under the influence of alcohol were 60% more likely to have concurrent sexual partnerships compared to those who hadn't intercourse under influence of alcohol (OR 1.6, 95% CI 1.1-2.2, P=0.008).

3.4. Assessment of the logistic regression model:

- After comparing the final model that included the community ward number variable (p2) with the previous model (p1) that didn't include the variable, it showed that the chi2 is 18.7 and P< 0.001, then the null hypothesis is rejected at the 5% level that the two models are equal. We conclude that there is significant difference between the two models. The final model (p2) is better than the previous model (p1), because it includes more explained variation (84.1%) than the previous model (81.6%) as per the below figure (Figure 4.1).
- Also when we checked the Hosmer and Lemeshow goodness-of-fit test for the final model, it gave us Pearson chi2: 2120.5 and P value=0.67, we failed to reject the null hypothesis and we conclude that the fitted final model is reliable.

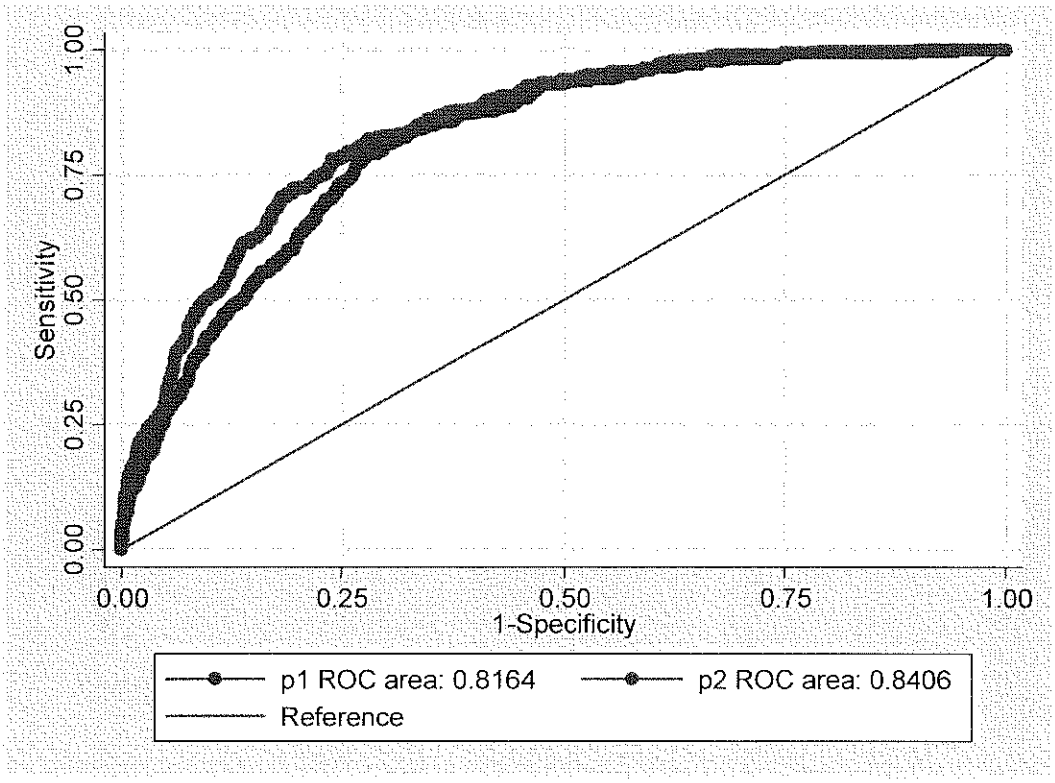


Figure 3-5: Comparison of the final two logistic regression models without (p1) and with (p2) the community ward number variable per sensitivity and 1-specificity

Summary of the results:

From the multivariate logistic regression analysis of the possible risk factors for concurrent sexual partnerships, the study has shown that the age of respondent, gender, having another home elsewhere, thinking of the recent sexual partner had another sexual partner, alcohol use in the last month, inability to control sexual urges, and relationship status with the recent sexual partner were statistically significant factors associated with the concurrent sexual partnerships. There was no significant difference in the relation between concurrent sexual partnerships and the following factors: marital status, education level completed, employment status, settlement type, abstinence and condom use in last sexual intercourse.

Table 3-3: Univariate and multiple logistic regression analysis for association between the socio-demographic and behavioral risk factors and Concurrent sexual partnership

Factor	Level	No. (%)	Univariate analysis		Multivariate analysis	
			OR	(P value, 95% CI)	OR	(P value, 95% CI)
Age-group	16-19	741 (23.5)	1		1	
	20-24	770 (24.5)	**1.6**	**(0.004, 1.2-2.2)**	0.72	(0.2, 0.5-1.1)
	25-29	662 (21)	1.3	(0.18, 0.9-1.8)	**0.56**	**(0.03, 0.3-0.94)**
	30-34	484 (15.4)	1.2	(0.26, 0.9-1.8)	0.68	(0.2, 0.4-1.2)
	35-40	491 (15.6)	**0.6**	**(0.013, 0.3-0.9)**	**0.38**	**(0.004, 0.2-0.7)**
Gender	Male	1488 (47)	1		1	
	Female	1668 (53)	**0.2**	**(<0.001, 0.1-0.2)**	**0.24**	**(<0.001, 0.17-0.35)**
Marital status	not married	2687 (85.3)	1		1	
	married	427 (13.5)	**0.3**	**(<0.001, 0.2-0.6)**	1.75	(0,2, 0.7-4.4)
	divorced/widowed	37 (1.2)	0.4	(0.26, 0.1-1.8)	2.2	(0.3, 0.4-11.4)
Education	Primary or less	459 (14.5)	1		1	
	Secondary	1701 (53.9)	**1.5**	**(0.034, 1.03-2.3)**	1.26	(0.4, 0.8-2.1)
	Martric	842 (26.7)	**2.1**	**(0.001, 1.4-3.2)**	1.44	(0.2, 0.8-2.5)
	Tertiary	137 (4.4)	**2.7**	**(0.001, 1.5-4.9)**	2.06	(0.059, 0.97-4.4)
	Other	17 (0.5)	**4.4**	**(0.014, 1.4-14.3)**	2.3	(0.3, 0.5-10.3)
Employment status	Unemployed	1515 (42.2)	1		1	
	employed	873 (27.9)	**1.5**	**(0.002, 1.2-2.0)**	1.02	(0.9, 0.7-1.5)
	student	734 (23.4)	0.9	(0.42, 0.6-1.2)	0.85	(0.5, 0.5-1.3)
	grant/disability	16 (0.5)	_	_	_	_
Settlement type	Urban formal	1208 (38.3)	1		1	
	Urban informal	491 (15.5)	0.7	(0.078, 0.49-1.03)	1.00	(0.999, 0.5-2.1)
	Peri-urban	271 (8.6)	0.6	(0.078, 0.4-1.1)	0.79	(0.06, 0.3-1.9)
	Tribal settlement	988 (31.3)	1.1	(0.37, 0.9-1.5)	1.08	(0.9, 0.5-2.5)
	Farming	198 (6.3)	0.7	(0.22, 0.4-1.2)	1.52	(0.5, 0.5-4.8)
Currently work on mine	No	3057 (96.9)	1		1	
	Yes	99 (3.1)	**1.96**	**(0.012, 1.2-3.3)**	1.36	(0.4, 0.6-2.9)
Has another home elsewhere	No	2165 (68.6)	1		1	
	Yes	990 (31.4)	**1.4**	**(0.002, 1.1-1.8)**	**1.61**	**(0.002, 1.2-2.2)**
Condom use in last sex	No	1748 (55.6)	1		1	
	Yes	1396 (44.4)	**2.4**	**(<0.001, 1.9-3.1)**	0.83	(0.25, 0.6-1.1)
Frequency of having alcohol during the last month	Never drink alcohol	1382 (43.9)	1		1	
	Never drink last month	789 (25.1)	**2.4**	**(<0.001, 1.7-3.4)**	**1.55**	**(0.046, 1.01-2.4)**
	Daily	47 (1.5)	**5**	**(<0.001, 2.3-10.9)**	2.02	(0.18, 0.7-5.6)
	Several times per week	250 (7.9)	**7.3**	**(<0.001, 5-10.7)**	**2.68**	**(<0.001, 1.6-4.6)**
	once a week	389 (12.4)	**5.1**	**(<0.001, 3.6-7.3)**	**1.69**	**(0.033, 1.04-2.7)**
	once a month	290 (9.2)	**3.3**	**(<0.001, 2.2-5.0)**	1.57	(0.1, 0.9-2.7)
Abstinence	No	1863 (59)	1		1	
	Yes	1293 (41)	**0.8**	**(0.032, 0.6-0.98)**	0.79	(0.13, 0.6-1.1)

Factor	Level	No. (%)	Univariate analysis		Multivariate analysis	
			OR	(P value, 95% CI)	OR	(P value, 95% CI)
Can't control sexual urge	Not agree	2787(88.5)	1		1	
	agree	362(11.5)	**2.7**	**(<0.001, 2-3.5)**	**1.99**	**(<0.001, 1.4-2.9)**
Thinking of the recent	No	1643 (68.6)	1		1	
sexual partner has	Yes	574 (24)	**1.77**	**(<0.001, 1.4-2.3)**	**1.5**	**(0.02, 1.06-2.1)**
another sexual partner	Don't know	179 (7.4)	1.04	(0.89, 0.7-1.7)	1.06	(0.8, 0.6-1.9)
Relationship with the	Married	391 (16.5)	1		1	
recent sexual partner	Living together	318 (13.4)	**2.42**	**(0.026, 1.1-5.3)**	**4.08**	**(0.016, 1.3-13)**
	Main partner	1393 (58.7)	**7.46**	**(<0.001, 3.9-14.2)**	**8.62**	**(<0.001, 3-25)**
	Friend	155 (6.5)	**6.3**	**(<0.001, 2.9-13.7)**	**6.09**	**(0.002, 1.9-19.3)**
	Casual acquaintance	89 (3.8)	**34.05**	**(<0.001, 16.0-72.3)**	**17.19**	**(<0.001, 5.5-54)**
	Someone I just met	18 (0.6)	**10.89**	**(<0.001, 3.0-39.0)**	**6.31**	**(0.033, 1.2-34.5)**
	One night encounter	8 (0.3)	**12.7**	**(0.004, 2.3-70.1)**	6.18	(0.09, 0.8-51)
Respondent has had	No	2515 (80)	1		1	
intercourse when under	Yes	580 (18.5)	**4.64**	**(<0.001, 3.6-5.9)**	**1.6**	**(0.008, 1.1-2.2)**
influence of alcohol	Don't have sexual intercourse	49 (1.5)	0.87	(0.81, 0.3-2.8)	1.6	(0.6, 0.3-7.6)

4. CHAPTER Four: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

4.1. Discussion:

In the analysis, we examined the possible predictors for concurrent sexual partnerships in the four communities in South Africa. Three hundred thirty (10.46%) out of the 3156 of the respondents had concurrent sexual partners. Almost eighteen percent of males and 4% of females reported concurrency in the four communities in the four provinces. This variation by gender is similar to that reported in the national HIV Prevalence Survey conducted in 2008 where the relationship between males (aged 15-49 was 19%) and females (4%) in those who had more than one sexual partner (6). This similarity by gender, in this study and other studies (Mah et al, and the national survey study result of the multiple partnerships), could lead us to accept the reports as real information from the respondents and not due to information bias.

From the result, we found that females were less likely to have concurrency same as what was found in study by Mah et al. It is possible that males are searching for concurrent sexual partners more than females. In addition, those who were young were the most age group who were having concurrent sexual partners, and the adults are less likely to have these concurrency relationships, which is similar to Parker et al results to some extent. The young age groups and males in general could be the most target group for awareness by the organizations who are working in the four communities.

In addition, when we compared the prevalence of concurrency in the four communities with the prevalence of HIV in the 2008 survey, we found that there were similarity in rating among both the concurrency and HIV prevalence. For example, Kwa-Zulu Natal province reported the highest prevalence 25.8% of HIV among 15-49 years as per 2008 national survey and during the same period its community reported the highest percentage of concurrency (30.6%) in this study, followed by Free State, North West and at least Gauteng province which had the lowest percentage of HIV of 15.2% in the 2008 survey and also the lowest percentage of concurrency (20.3%) in its community in this study.

These findings could assist the possible role of concurrency in increasing HIV among South African population, and the activities focusing on decreasing the sexual concurrency among Kwa-Zulu Natal community could be more concentrated in comparing to Gauteng communities.

There were only 14% of the respondents in marriage relationships, although more than 87% were sexually active at the time of the study. Moreover, in our analysis, we found that marriage was statistically significant as protective factor from having concurrent sexual partnerships compared to those who were not, but when included in the model, we found that there was no difference between the two groups. We measure the relationship of the recent sexual partner and we found that there were significant protective relationships between those who were said their recent sexual partner was husband or wife comparing to others who were just friends or main partner or casual acquaintance sexual relationship. Adimora et al in USA found in his study that being unmarried within the last year associated with concurrent sexual partner, that is to some extent is similar to this study result. Therefore, encouraging young people to be married could reduce the possibility of having concurrent sexual relations.

The respondents who had home elsewhere other than the current living home were more likely to have concurrent sexual partnerships. A study conducted in Zambia by Sandoy et al. showed similar results. Therefore, it is better to include those special groups who are having homes elsewhere in the intervention activities to reduce concurrent sexual partnerships.

In addition, those who thought their sexual partner had another sexual partner were more likely to have concurrent sexual partnerships than others did not think. This is applicable result and needs to work more in improving the trust between sexual partners to reduce the effect of concurrent sexual partnership in having HIV or and STIs. The other behavioral factor that was significant is not controlling sexual urges. This finding is more likely with males and is playing main role in getting concurrent sexual partnerships.

In addition, there is a positive relation between concurrency and alcohol use. Those who were regular drinkers were more likely to have concurrency, and further those who had sex under influence of alcohol were more likely to have concurrency. This finding is similar to what Adimora et al mentioned in his study.

Although some factors had significant association in the univariate analysis, when included in the multivariate analysis they showed no difference. Those factor included educational status, employment status and marital status. Condom use in last sex was also significantly associated with concurrency in the univariate analysis only. This positive association showed that using condom may give sense of safety from infectious from those sexual transmitted diseases, and could assist in controlling pregnancy. On the other hand, abstinence showed protective association from getting concurrency, but there was no difference in the multivariate analysis.

These findings could be very difficult to say that are representative to the areas since selection of these areas was done because of their high prevalence of HIV. Therefore, we could say that these areas could benefit from the study with some difficulties in generalisabilty to other areas within the province or other provinces.

4.2. Conclusion and Recommendation:

We conclude that, as per this study and previous studies, there is significant relation between concurrent sexual partnerships and some of the socio-demographic structural and behavioral factors. The factors include the age of respondent, gender, having another home elsewhere; thinking of the recent sexual partner had another sexual partner, alcohol use in the last month, the sexual urges, and relationship with the recent sexual partners.

These findings could assist the organizations who work at the four communities in their control planning activities especially for concurrency among youth between 16 and 19 years old and alcohol use. It is better to investigate in more depth the relationship between concurrency with other possible predictive factors in the national HIV prevalence survey so that results can be generalized nationwide.

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

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Dr Muntasir M O Elhassan

CLEARANCE CERTIFICATE	**M10942**
PROJECT	Factors Associated with Concurrent Sexual Partnerships in Four Provinces, South Africa 2008
INVESTIGATORS	Dr Muntasir M O Elhassan.
DEPARTMENT	School of Public Health
DATE CONSIDERED	01/10/2010
DECISION OF THE COMMITTEE*	Approved unconditionally

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

DATE 01/10/2010 **CHAIRPERSON** .....
(Professor PE Cleaton-Jones)

*Guidelines for written 'informed consent' attached where applicable
cc: Supervisor : Dr Tobias Chirwa

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...