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RELATIONSHIP BETWEEN ECONOMIC WELLBEING AND RISKY SEXUAL BEHAVIOUR AMONG 14-35 YEAR OLD WOMEN IN LIMPOPO PROVINCE, SOUTH AFRICA

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0415275H



A Research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg; in partial fulfilment for the degree of

Master of Science in Medicine in Epidemiology & Biostatistics

Johannesburg, 2009

DECLARATION

I Mirabel Nyamboli declare that this Research Report is my own unaided work. It is being submitted for the degree of Master of Science in Medicine in Epidemiology & Biostatistics, in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

_____

Mirabel Akwa Nyamboli

17 September 2009

DEDICATION

In memory of my beloved grandmother

Mama Kien Magdalene Awah

1919 – 2007

Those that live in our hearts never die

****

ABSTRACT

Objective

The study examined the relationship between socioeconomic status (SES) and risky sexual behaviour in young women living in the Limpopo Province of South Africa.

Methods

Quantitative data were drawn from the 2001–2005 Intervention with Microfinance and Gender Equity Study. The analyses were restricted to 705 sexually active young women aged 14–35 years. Logistic regression models were employed to assess the effect of socioeconomic status (estimated from household asset index and employment status, on risky sexual behaviours). Odds ratios (OR), adjusted odds ratios (AOR) and 95% confidence intervals (CI) are reported.

Results

After controlling for the potential confounding effects of wealth perception, age, level of education, marital status, birth control and HIV knowledge; there was no statistically significant association between asset index, or employment status and most of the risky sexual behaviours. However, students were significantly more likely to have experienced first sex at or before age 17 years (AOR: 3.80, 95% CI: 2.63, 6.11), and significantly less likely to have had more than three lifetime sex partners (AOR: 0.47, 95% CI: 0.29, 0.78).

Discussion

Given that age had emerged as a definite predictor of the sexual behaviours that were significantly associated with being a student, and that 75% of the students were aged 14-19 years, it is possible that the associations may be due to an age effect, or a cohort effect. That aside, the results suggest that women in general are equally at risk of HIV infection, hence further research is needed to determine other factors that enhance young rural women's vulnerability to HIV/AIDS.

Conclusion

The study did not show any strong evidence to suggest that socio-economic status is associated with risky sexual behaviour. The findings underscore the need to re-examine the assumption that poverty drives risky sexual behaviour so that efforts to ensure that HIV prevention messages get across all strata of society. However, it is possible that SES as used in this study did not differentiate people well enough to be able to identify factors associated with risky sexual behaviour. It is recommended that more research be done to establish how other major factors besides wealth may enhance the vulnerability of women to HIV/AIDS. The current study however contributes to the growing evidence that the relationship between wealth and HIV/AIDS is either exaggerated or is very complex and should be considered when designing new policies, programs and interventions to alleviate the growing HIV incidence.

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NOMENCLATURE

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
BTC	Belgian Technical Corporation
CI	Confidence Interval
DHS	Demographic Health Survey
DSS	Demographic Surveillance Systems
HIV	Human Immunodeficiency Virus
IMAGE	Intervention with Microfinance for AIDS and Gender Equity
n	Number
OR	Odds ratio
P	Probability
RADAR	Rural Aids and Development Action Research Program
SD	Standard Deviation
SES	Socioeconomic Status
UN	United Nations
UNAIDS	Joint United Nations Program on HIV/AIDS
WHO	World Health Organization
WITS	University of the Witwatersrand

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Chapter 1

INTRODUCTION

1.1 Background

The toll of the acquired immunodeficiency syndrome (AIDS) pandemic has surpassed the worst prediction in Sub-Saharan Africa, home to over two thirds of people living with the human immunodeficiency virus (HIV) worldwide (UNAIDS, 2006). South Africa is amongst the countries worst affected by the HIV/AIDS pandemic. In 1990, the South African national antenatal surveillance data documented an HIV prevalence of 0.7% among women attending public antenatal clinics. By 1993, these prevalence figures had risen to 4%, signalling a dramatic shift in the burden of infection (Tawil *et al*., 1995; Lee and Zwi, 1996; Mann and Tarantola, 1996).

Over the years that followed, the epidemic rose sharply with the prevalence among pregnant women doubling every two years (UNAIDS, 1999; Waldo and Coates, 2000; Sumartojo, 2000; Sumartojo *et al*., 2000). In 2001, it was estimated that about 4.8 million people in South Africa were infected with HIV, with about 1700 new HIV infections occurring on a daily basis (Ramkisson *et al.*, 2004). By 2002, there were more people living with HIV in South Africa than in any other country in the world. The number of people living with the HIV virus in South Africa was 5.5 million as of 2005, with almost 1000 deaths occurring every day (UNAIDS/WHO, 2006). Accordingly, average life expectancy in South Africa dropped dramatically from 64 to 51 years due to HIV/AIDS (Dorrington *et al*., 2006). These devastating figures paint a picture now all too familiar to many countries

in sub-Saharan Africa - one that raises serious questions about the effectiveness and impact of current intervention strategies.

1.2 Problem Statement

Studies in developed countries suggests that people still engage in risky sexual behaviour despite their knowledge of the risks associated with spreading and/or contracting HIV (e.g. McDonald *et al*., 1996; Rhodes, 1997), however, such studies are limited in the South African context. The adoption of safe sex practices such as the ABC ("Abstain, Be faithful, Condomize") of prevention can significantly reduce the spread of HIV/AIDS (Cleland and Ferry, 1995; Dodoo and Ampofo, 2001). Yet, such strategies have had a limited meaningful role to play in preventing the spread of HIV/AIDS. Such messages assume that sexual behaviour is a matter of rational individual choice, when in reality sexual behaviour itself is influenced by a range of factors, which include social, cultural, economic, political and technological factors. These factors further determine the extent to which people can access and use methods of HIV prevention, such as condoms, abstinence, and mutual faithfulness (van Donk, 2002). Several studies confirm that sexual behaviour involves complex dynamics e.g., it has been argued that condom use is not an easy option for many people in Africa, especially women (Bujura, 2000; Mill and Anarfi, 2002).

In view of the aforementioned, it follows that pertinent information about sexual behaviour is essential in the design and assessment of interventions to improve sexual health. The need to predict and prevent transmission of HIV provides a valuable impetus to sexual behaviour studies, as it has in the past two decades (Cleland and Ferry 1995; Hubert *et al*., 1998). Importantly too, empirical evidence is needed to correct myths in public perceptions of sexual behaviours (Wellings *et al*., 2006).

1.3 Rationale

It seems that wealthier populations do better than poorer ones on most measures of health status, including nutrition, morbidity and mortality and healthcare utilisation (Kuate-Defo, 1997; Adler and Newman, 2002; Fotso and Kuate-Defo, 2005). Consistent with this findings is evidence of an inverse relationship between SES and the risk of sexually transmitted infections (Holtgrave and Crosby, 2003; Bukusi *et al*., 2006). Now with much of these evidence coming from third world countries, it is reasonable to expect that poverty increases vulnerability to HIV in the same manner in low and middle income countries (Mishra *et al*., 2007).

It has been repeatedly argued that poverty is the root cause of AIDS (e.g. Fitzgerald *et al*., 2000; Fenton, 2004). Fenton (2004) argued that since poverty plays a role in creating an environment in which individuals are particularly susceptible and vulnerable to HIV/AIDS, poverty reduction will undoubtedly be at the core of a sustainable solution to stopping the HIV/AIDS pandemic. Much of the literature on the relationship between poverty and risky sexual behaviour from South Africa derives from studies on young people's sexual behaviour, where early sexual debut and multiple sexual partnerships have been linked to poverty but elsewhere have produced mixed results (Ainsworth and Semali, 1998; Deheneffe *et al*, 1998; World Bank, 1998; Desmond, 2001; Zulu *et al*. 2002; Akwara *et al*., 2003; Richens *et al*., 2003; Wojicki 2005). These results indicate that paradoxically, both wealth and economic disadvantage play pivotal roles in HIV transmission, thus challenging the long held assumptions that poverty reduction is the key to the fight against AIDS (Shelton *et al.* 2005). Accordingly, a better understanding of the risks between poverty and sexual behaviour is important for improving policies and programs to combat the spread of HIV/AIDS.

Several reasons account for the lack of clarity between socioeconomic status (SES), risky sexual behaviour and vulnerability to HIV infection. For example, many cross-country or cross-site comparisons of proof on the associations between SES and risky sexual behaviour are complicated by the different measures used. Composite measures are used to describe risky sexual behaviour (section 1.4.1). Typically, some elements of risky sexual behaviour may be more closely related to wealth status than others; but, a more comprehensive picture may be obtained by examining individual components of risky sexual behaviour. Also, restricting the measure of SES to poverty or standard of living may be reason for this lack of clarity (Mishra *et al.*, 2007). Whereas it is true that a gold standard scale for SES is difficult to visualize, the need to consider multiple distinct domains of SES has been increasingly emphasised (Braveman *et al*., 2005).

1.4 Literature review

1.4.1 Risky Sexual Behaviour

Reminiscent of Sub-Saharan Africa, HIV in South Africa is spread primarily through unprotected heterosexual intercourse (Poku, 2001; Ackermann and Klerk, 2002). Risky sexual behaviour is an important determinant of HIV/AIDS, which contributes substantially to the burden of disease (Ezzati *et al*., 2003, Collumbien *et al*., 2004; Slaymaker, 2004). In the absence of an effective vaccine, making positive changes in risky sexual behaviours remain fundamental to stemming the spread of HIV (Cleland and Ferry, 1995; Hope, 1995; Caldwell, 2000). In order to devise effective policies and measures that will protect both people living with HIV/AIDS and their sexual partners (and ultimately to control the spread of the epidemic), it is imperative to understand sexual behavioural patterns and the

underlying causes of risky behaviour, as this could be essential in curbing the secondary transmission of HIV/AIDS.

In detailing risky behaviours in the sexual domain, Langer *et al*. (2001) defined risk factors of sex-related behaviours as characteristics, conditions, attitudes, and behaviours which significantly increase the possibilities of experiencing undesirable outcomes related to sexual activities. In the same light, many researchers have defined risky sexual behaviours to include but not limited to: having an early sexual debut, the inconsistent or non-use of condoms or other birth control methods with a non-spousal partner, having multiple sexual partners (concurrent or lifetime), the use of alcohol or drugs prior to sexual activity, transactional sex (Langer *et al*., 2001; Kotchick *et al*., 2001; Cooper *et al*., 2003; Gowen *et al*., 2004; Konguy *et al*., 2006). Although many of these definitions are commonly used in literature, hardly any studies use a combination of all of them.

In view of the above, it seems that the criteria for defining risky sexual behaviour largely depends on the study population (e.g. drug use is hardly included in studies on rural populations especially in Africa); and the sources of data e.g. demographic health surveys, census data or data collected for other purposes would limit the kinds of questions asked on issues such as drug and alcohol use, birth control use, exchange of sex for money and vice versa, lifetime sex partners and condom use. Albeit, based on this information and the data available, risky sexual behaviours have been defined for the current study as early coital debut before the age of 17 years, having had two or more sex partners in the previous 12 months, a high frequency of lifetime sexual partners (three or more), non-use of a condom at last sex with a non-spousal partner, and transactional sex. These risky sexual behaviours are described in detail in section 2.6.2.1.

1.4.2 Risky Sexual Behaviour, HIV/AIDS and Rural Poverty

In Africa, substantial resources have been mobilized for research and programme development in efforts to combat HIV/AIDS. Over the past decade, researchers have documented some of the structural factors that facilitate HIV transmission and its concentration within particular geographic areas and populations; most of which can be grouped into three interconnected categories, namely: poverty, mobility and gender inequalities [Zwi 1993; Lee and Zwi 1996; Parker 1996; World Bank 1997). Remarkably, in spite of the uniqueness of each local epidemic, the same general structures and processes can be observed in Africa, Asia, Latin America, as well as certain groups and communities in North America (Parker *et al*., 2000).

According to Burtler (2000), poverty may be a contributing factor, but may not be sufficient for the spread of the HIV epidemic. Following the increasing trend in HIV infections in sub-Saharan Africa, primarily made up of third world or 'poor' countries, the topical public debate on the relationship between poverty and HIV/AIDS has generalised substantial interest in South Africa (Horton, 2000; Makgoba, 2000). "In the early days of HIV transmission, ignorance of the mechanisms of transmission was not associated with poverty" (Burtler, 2000); but, this is no longer the situation. Poverty plays a major part in the large-scale transmission of opportunistic infections such as tuberculosis, which in the HIV/AIDS era has become an important public health concern (Burtler, 2000).

South Africa is a compelling case study in how poverty and economic under-development has fuelled the rapidly growing HIV epidemic. Furthermore, economic crisis has driven many women, either formally or informally, to exchange sex for resources as a means of survival (de Bruyn 1992). As a result, in South Africa as elsewhere, women's economic vulnerability and dependence on men has heightened their vulnerability to HIV

by constraining their ability to negotiate condom use, discuss fidelity with their partners, or leave risky relationships (Roa Gupta 2002). It is the young women who are currently the group at highest risk of infection (UNAIDS 1999; Department of Health 2000). Wherever economic need compels women into earlier sexual debut, to have more sexual partners than they otherwise would, and compromise their ability to negotiate condom use, especially with a non spousal partner, there will be concerns regarding HIV infection.

As well, sexual and reproductive health has an important role in elucidating the persistence of poverty. Lack of awareness, as a consequence of low income, cause people not to invest in education, and contribute to a lack of family planning (Booysen and Summerton, 2002). The resulting overpopulation and large families intensify land shortages, which in turn feeds into low production and productivity; and low income; thus, closing the vicious cycle of poverty and disease (Burkey, 1996). Moreover, the AIDS epidemic is likely to root this vicious cycle (Bonnel, 2000); particularly in South Africa where the HIV prevalence is currently amongst the highest in the world (UNAIDS 2006).

Sub-Saharan Africa remains predominantly rural despite the rapid urban growth (Dodoo *et al*., 2007) and is the only continent where the number of rural dwellers will not decrease before 2030 (United Nations, 1998). Dodoo and Tempenis (2002) described that on the whole, rural areas are considered "bastions of traditional life where as urban centres are influenced heavily by modernization and Westernization". Apparently, rural areas are sheltered from the 'vices' and media representations of such – presumed to be prevalent in urban areas (Dodoo *et al*., 2007). However, people are not as isolated as their urban counterparts because lineage-based supports for example, endorse opportunities for straying from typical 'traditional' behaviours such as extramarital activity (Dodoo *et al*., 2007). The authors further argue that it would not be senseless to assume that even the same economic difficulty might provoke more economic-based deviance in urban than in

rural areas where cash is not as indispensable (Dodoo *et al.*, 2007). Still, the rural poor are exposed to the economic deterioration Africa has experienced over the last three decades. Compounding this is the lack of access to social and health facilities (Zulu *et al.*, 2002). Also, economic stresses are associated with low wages –with women on average earning less than half of what men would earn (United Nations Development Programme, 2002). Unemployment and increasing poverty presumably has caused some women to use sex to generate income for basic needs, provoking early initiation of sexual activity and high incidence of multiple sexual partnerships (Ulin, 1992; Carael and Allen, 1995). These conditions also prompt men to exploit women's economic vulnerability by paying very little for sex (Oppong, 1995; Ezeh and Gage, 2000). In this regard, the health implications of early age at first sex and multiple sexual partnerships related to economic deprivation (Zulu *et al.*, 2002), are potentially as relevant in rural areas. Evidence from other developing countries suggests that poorer women are also more likely to have casual sexual partners, with whom condom use is significantly lower (Hallman, 2004).

1.5 Aim and Objectives

According to Epstein (1981), cultural background does not determine behaviour but it does provide social actors with a framework for making decisions (Epstein, 1981 – as cited in Hargreaves *et al.*, 2002 p 800); and apparently, this also describes well the potential importance of SES as a risk factor for HIV infection (Hargreaves *et al.*, 2002), resulting from risky sexual behaviour. Socioeconomic status is conceptualised as the social standing or class of an individual group (American Psychological Association, 2007). Several studies have shown the HIV epidemic to be different between urban and rural populations

(e.g. van Donk, 2002), and may also be different in terms of SES. HIV has been characterised as a disease of poverty due to its widening diversity in both rich and poor nations (Hargreaves *et al.*, 2002). Several initiatives are in play to address the problem of poverty and HIV (Cameron, 2000) but few studies have investigated the link between SES and HIV infection – due to risky sexual behaviour, especially within the poorest populations (Hargreaves *et al.*, 2002) such as rural communities.

Using data from the Intervention with Micro-finance for AIDS and Gender Equity (IMAGE) study, the current study is an in-depth analysis of the association between two measures of SES and risky sexual behaviours in rural South Africa. It aimed to examine the patterns of risky sexual behaviour among young rural women aged 14-35 years in the Limpopo province of South Africa. The main objectives of the study were:

- To describe the level of risky sexual behaviour in this population
- To examine the relationship between economic status and risky sexual behaviour

Chapter 2

METHODOLOGY

2.1 Methodological Framework

The current study utilizes quantitative data derived from survey questionnaires, which form part of a wider public health intervention: the Intervention with Micro-finance for AIDS and Gender Equity (IMAGE) study. The IMAGE study was conducted in the Limpopo province South Africa, by the Rural AIDS and Development Action Research (RADAR) Programme in 2001. The RADAR programme has been coordinated through the University of the Witwatersrand's School of Public Health since 2001. The IMAGE study was an integrated, prospective, randomized, controlled, community-matched intervention trial. The evaluation program integrated data from participatory, qualitative and quantitative methodologies to investigate the impact of a combined poverty-alleviation/gender-empowerment program on sexual behaviour, gender based violence and HIV infection rates.

Methods used in the IMAGE study are published elsewhere (RADAR, 2002a, 2002b; Hargreaves *et al.*, 2004; Pronyk *et al.*, 2006). Briefly, the study was built around the prospective follow up of three cohorts in eight rural villages. Appropriate comparison groups were recruited from villages where the program was not operating. Thus there were four intervention and four control villages. Participants in the research were fully informed of the nature of the study; including how and why they had been chosen to participate. Informed consent was voluntarily given by all participants before they were allowed to

willingly participate in the study. All data were recorded confidentially and participant anonymity maintained. Quantitative data were collected by trained female facilitators through face-to-face structured interviews. Interviews were concluded by providing local information of HIV counselling and additional support services.

The study was approved by Ethics Committees at both the University of the Witwatersrand, Johannesburg South Africa (protocol number M991108, approved 31 January 2000), and the London School of Hygiene and Tropical Medicine (Reference number 598, approved 6 September 2000).

2.2 The Current Study

The current study utilized cross-sectional data drawn from the baseline survey of the IMAGE study. Through the ongoing data collection ventures, detailed multi-level longitudinal and cross-sectional data, including but not limited to socio-demographic variables, sexual behaviour, HIV knowledge and perception are available.

Permission to use the data was obtained from RADAR (Appendix I). Ethical clearance to perform a secondary data analysis of the IMAGE study was granted by the Human Research Ethics Committee (Medical) at the University of the Witwatersrand, Johannesburg, South Africa (approved 25 January, 2008; protocol number: M071148), (Appendix II).

2.3 Study Context

The IMAGE study is set in eight rural villages in the Sekhukhuneland region of South Africa's rural Limpopo province. A map of the study region is shown below in Figure 2.1.

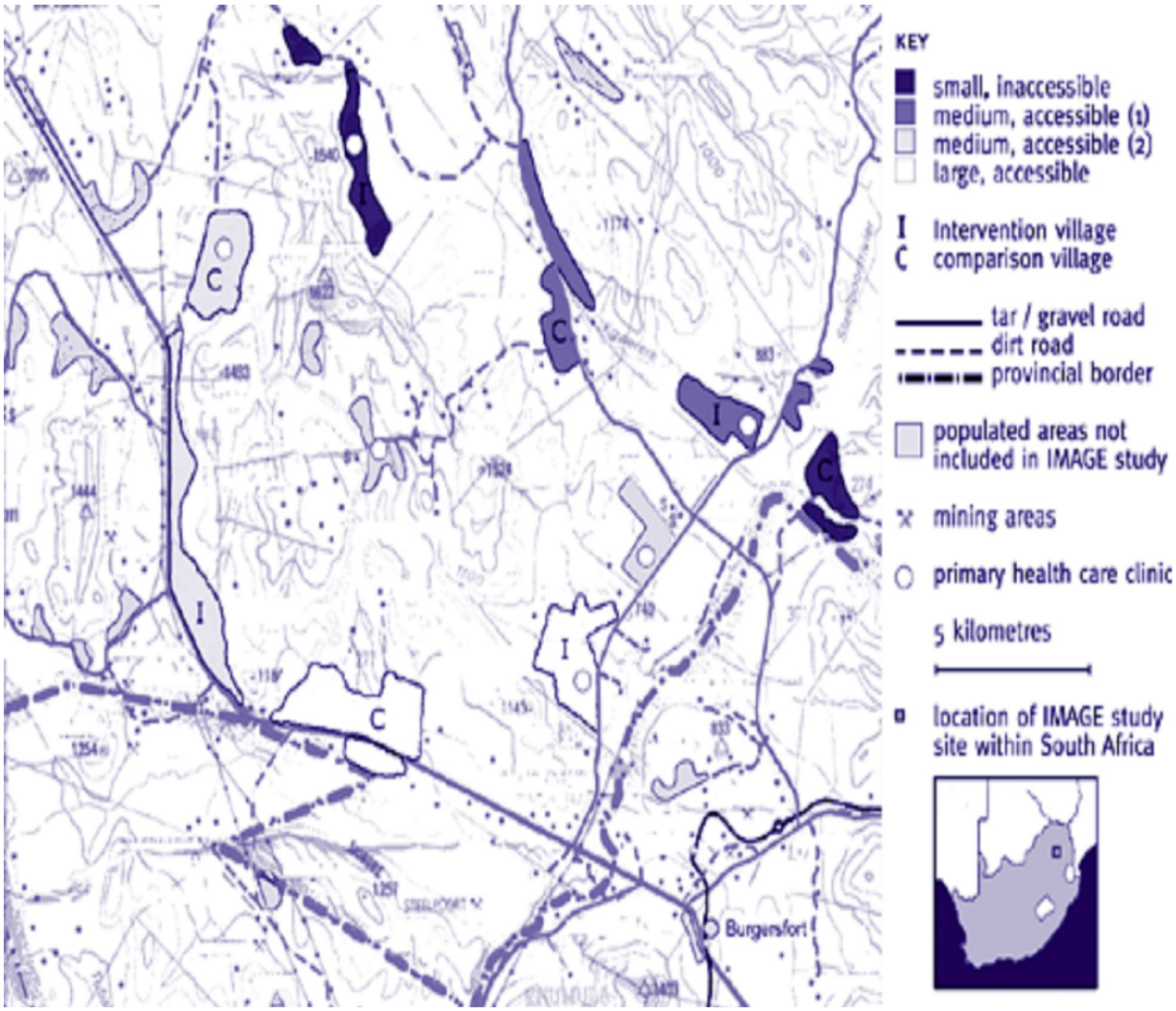

Fig 2.1: <u>Map showing location of villages included in the IMAGE study</u>

Source: (RADAR 2002a)

Limpopo Province is amongst the most deprived provinces in the country (McIntyre, *et al*., 2002). With an estimated 9500 households and a total population of over 50,000 people, the population characteristics of the Sekhukhuneland region mirror conditions throughout rural South Africa, as well as other rural regions of Southern and sub-Saharan Africa. HIV prevalence amongst women attending antenatal clinics in the region was estimated at 21.5% [95% CI: 18.5 – 24.6] in 2006 (Department of Health, 2006). Access to health care

facilities and education and life expectancy are consistent with other regions of South Africa. Nearly 50% of the population is under 15 years of age with a mere 5% aged 64 years or older (Udjo & Lestrade-Jefferis, 2000). Unemployment runs in excess of 40% (Lestrade-Jefferis, 2000), and there are very high levels of labour migration among both males and females. Up to 60% of adult men and 25% of women reside away from home for more than 6 months every year (Kahn *et al*., 2003). Fresh water supply is still problematic, with 47% of households collecting water from taps outside their homes, and even so the supply is irregular (RADAR, 2002a). According to the enumeration data from the 1996 population census supplied by Statistics South Africa, 34% of households reported no cash income and 35% of the adults had no education (RADAR, 2002a).

2.4 Study Sample

The current analyses are restricted to 705 sexually active young women, aged 14-35 years, who were resident in the villages where the IMAGE study was operating in 2001. Normal reproductive age for women is usually 15 – 49 years, but the design of the IMAGE study limited data collection on the variables required for analyses in the current study to the 14 – 35 year old women.

2.5 Definitions

2.5.1 Risky Sexual behaviour

The risk behaviours examined in this study are those that put young people at higher risk of HIV infection, the virus that causes AIDS. These are:

1. Early onset of sexual activity, i.e. coital debut at or before 17 years of age.

2. Had two or more sexual partners within the previous year
3. Had more than three life time sexual partners
4. Non use of a condom at last sex with a casual partner
5. Provided sexual favours in exchange for money or gifts (transactional sex).

Some of the keywords used to describe sexual behaviour in the context of the current study are defined as follows:

a) Coitus, sex or sexual intercourse:

This refers to either vaginal or anal intercourse

b) Partner types:

i) A spouse is someone the respondent was married to, or living with as though they were married.

ii) A non-spouse, referred to in this study as a "casual partner" is anyone else the respondent had had sex with. Accordingly, the partners of all respondents not classified as "married" or "living as married" are classified as casual.

c) Lifetime sexual partners:

This is the total number of different people a respondent ever had sexual intercourse with. These are both spousal and casual partners, including partners with whom the respondent had had coerced, forced or consenting sex with, even if only once.

d) Condom use:

i) In the affirmative, condom use in this study refers to the actual use of a condom as reported by the respondents. It does not exclude situations where the condom

was defective (e.g. had expired, had been stored improperly, such that the quality was compromised, was of poor quality, was broken etc); or used improperly (e.g. inside out, slipped off during intercourse, reused, was put on after pre-ejaculation, etc).

ii) Similarly, in the negative, condom use refers to a situation in which a condom was not used at all, even if the respondent had intended to, or attempted to use one but ended up not doing so.

e) Condom use at last sex:

This refers to the last sexual encounter in which a condom was or was not used. If for example a respondent had sex on three occasions in the same night, and used condoms during the first two occasions but not in the last one; regardless of whether or not it was the same partner, condom use at last sex in this situation is negative. But, if a condom had been used on the last occasion, even if the respondent had never used a condom before in her entire life, then condom use at last sex in this case is affirmative.

f) Birth control

It is defined in this study as any action a respondent may have resorted to in order to delay or avoid a pregnancy. Birth control methods could be pills/tablets, injectables, implants/norplants, IUD/loop, diaphragm/foam/jelly, calendar/mucus method, female/male sterilization, condoms, withdrawal method or herbs.

g) Transactional sex

These are sexual relationships in which the giving of gifts or services (such as money or material goods) is an important factor. It is different from prostitution in that the

transactional sex provides only a portion of the income of person providing the sexual favour.

2.5.2 Socioeconomic Status (SES)

2.5.2.1 The Household Asset Index as a proxy for SES

An asset index was created with variables that measure household ownership of consumer durables (e.g., household assets such as TVs, radios, fridges, cars etc); and aspects of housing infrastructure (e.g., dwelling details such as water/electricity supply, ablution facilities etc). Scoring factors for each of these variables were then estimated with the aid of iterated principal factor analysis as described by Filmer (1998).

The statistical technique of deriving weights is referred to as a principal component analysis (PCA). This technique summarises information contained in a set of variables to a smaller number by creating a set of mutually orthogonal components of the data. Intuitively, the first principal component is that linear index of the underlying variables that captures the most common variation among them (Filmer and Pritchett, 1998). Mathematically put, the asset index for asset variables 1 to n was represented as

$A_j = f_1 * (a_{j1} - m_1) / (s_1) + f_n * (a_{jn} - m_n) / (s_n)$ (Filmer, 1998)

Where:

A: represents the asset index,

f is the scoring factors or coefficients for each asset,

a is the household's score on a particular asset,

m is the mean of each asset variable

s is the standard deviation of each asset variable.

Young women in this study were assigned the score in the asset index for the particular household to which they belonged. For comparative purposes, scores on the asset index were divided into three equal classes of wealth based percentiles (Method adapted from Booysen, 2002) as follows:

i. less than 33.33rd percentile (low SES: very poor)
ii. 33.33rd to 66.66th percentile (middle SES: poor)
iii. more than 66.66th percentile (high SES: least poor)

2.5.2.2 Employment Status as a proxy for Socioeconomic Status

To get a measure of SES using employment status, the women were classified in to four groups as follows:

i. Employed full time
ii. Employed seasonally
iii. Unemployed
iv. Students

2.6 Statistical Analyses

2.6.1 Data Management

The IMAGE Data had been captured in Microsoft Access files, but were converted and analysed using STATA SE "version 9" statistical software.

Data on household assets, demographics, wealth perception and food security, age, marital status, level of education, employment status, sexual behaviour (including age at

sexual debut, birth control use, spousal/co-habiting and casual sexual partners, condom use), and HIV knowledge were extracted from the IMAGE database for the current analyses. Data analyses were then limited to 14 – 35 year old sexually active women, giving a total of 705 women.

2.6.2 Variables

2.6.2.1 Outcome (Dependent) variables

Risky sexual behaviours are the outcome/dependent variables. These are defined as:

i. Early age (17 years or less) at coital debut
ii. Have had two or more sexual partners within previous 12 months
iii. Having more three lifetime sexual partners
iv. Not using condoms at last sexual encounter with a casual partner in the past year
v. Ever received money or material goods in exchange for sex

(* The cut-off point for age at coital debut and for the number of lifetime sex partners were based on the median values reported by participating women).

2.6.2.2 Explanatory (Independent) Variables

i. Household Asset Index

Following the principal component analysis, the young women were grouped into three categories of SES: 1–Very Poor, 2–Poor, 3–Least Poor

ii. Employment Status

The women were grouped into four categories of SES as follows: 1– Employed full time, 2– Employed seasonally, 3– Unemployed, 4– Student

iii. Age

Age was determined as at time of interview and then categorised into year age bands: 1– (31-35 years), 2– (26-30 years), 3– (20-25 years), 4– (14-19 years) to account for the different age cohorts.

iv. Marital Status

Marital status was defined as 1– Married or living as married, 2– Never married, 3– Separated/divorced or widowed.

v. Birth Control

Whether a respondent had ever used any form of birth control to delay or avoid a pregnancy in the past was dichotomized as 1 – No, 2 – Yes.

vi. HIV Knowledge

HIV knowledge was based on two questions. The correct response for either of these questions is yes. The responses were categorized into 1– Yes, and 2– No or Don't Know

- Can a healthy looking person be infected with HIV, the virus that causes AIDS?
- Can an HIV-infected pregnant woman transmit the virus to her unborn child?

2.6.3 Data Analyses

Data analyses were limited 705 sexually active women aged 14 – 35 years. Values for categories of the socio-demographic variables were expressed as absolute numbers and

percentages. Unadjusted logistic regression analyses were carried out to investigate the relationship between each socio-demographic variable and the risky sexual behaviours. Multiple logistic regression analyses were then carried out to verify which of the characteristics were collectively associated with risky sexual behaviour.

In the logistic regression models, the dependent variables were the risky sexual behaviours (early age at coital debut, having had two or more sex partners in the previous year, having had over three lifetime sex partners, non-use of a condom at last sex with a casual partner, and having engaged in transactional sex). The independent variables were SES estimated from the household asset index and education attainment, age (by age groups), employment, marital status, birth control and HIV knowledge. All the categories denoted as '1' (section 2.6.2) are the reference groups in the logistic regression models. Every significance test was two-tailed and statistical significance was defined at the alpha level of 0.05.

Chapter 3

RESULTS

3.1 Socio-Demographic Characteristics

A total of 1,456 young persons aged 14-35 years were successfully interviewed at baseline in the IMAGE study; 883 (60.7%) of whom were young women. Seven hundred and five (79.8%) of the 883 women were sexually experienced at the time of the study. All statistical analyses performed were restricted to the 705 sexually experienced young women. All results reported below, unless otherwise indicated, are based on the analyses of the 705 women.

More than half of the 705 women i.e. 432 (61.3%) had lived in their villages since birth. Of the 705 women, only two (0.3%) were of Mozambican origin, with the rest (99.7%) being of South African nationality. The majority of the women, i.e. 650 (92.2%) spoke Sepedi, while a few i.e. 55 women (7.8%) spoke Tsonga or some other language as their first language.

Selected socio-demographic characteristics of the study sample are shown in Table 3.1 below. Many of the women were quite young, up to 60.3% of them were 25 years of age or younger. The mean age of all women was 23.9 years (standard deviation [SD] 5.5 years). The majority of women (79.6%) had never been married; the rest (17.6%) were married, 2.1% were separated or divorced and less than 1% was widowed (0.7%). The mean age of the 124 married women was 28 [SD: 4.7] years. Their mean age at marriage was 21 (SD: 3.7) years, range (15-34 years). About three quarters of the women (71.6%)

had at least one child; the mean parity of these 505 mothers was 1.9 (SD 1.2) children. Almost three quarters (70.3%) of the 705 women had attained at least some secondary education. Unemployment amongst the women was in excess of fifty percent.

Table 3.1: Characteristics of 705 sexually experienced 14-35 year old women who participated in the 2001 IMAGE study

Characteristic	Number (percentage)
Age group (in years)	
14-19	187 (26.4)
20-25	238 (33.8)
26-30	166 (23.6)
31-35	114 (16.2)
Employment	
Employed full time	117 (16.6)
Employed occasionally	26 (3.7)
Unemployed	386 (54.8)
Student	175 (24.9)
Marital status	
Never married	561 (79.6)
Married or living as married	124 (17.6)
Separated or divorced	15 (2.1)
Widowed	5 (0.7)
Level of Education	
No Schooling	14 (2.0)
Attended/completed primary (standard 5)	114 (16.2)
Attended some secondary (standard 6-9)	495 (70.3)
Completed secondary (standard 10)	63 (9.0)
Attended some tertiary	18 (2.5)

The young women were asked to describe their own perception of their household wealth status. These results are presented in table 3.2 below. Compared to the wealth status of other households, 415 (64.5%) of the women considered their household wealth to be worse off than most people. In comparison to previous years, 455 (65%) of the women indicated that financially things had been going badly. When asked how easy it would be for the household head to get R50 to pay back an official body by month for the household, 355 (51%) of the women reported it could be done with great difficulty, while up to 204 (29%) admitted it would be virtually impossible.

Table 3.2: Perception of own wealth, outlook for the future and recent crisis of 705 sexually experienced 14-35 year old women who participated in the 2001 IMAGE study

Wealth perception	Number (percentage)
Description of own household wealth relative to other households within the village	
A bit better than most people	95 (13.7)
About the same as most people	151 (21.7)
A bit worse off than most people	415 (64.6)
How things have been going financially in the last year compared to other years	
Going well	90 (13.0)
Going normally	153 (22.0)
Going badly	455 (65.0)
How easy it is for the Household Head to get R50 if desperately needed to pay back an official body by month end for the household	
No problem	66 (9.4)
Possible but inconvenient	75 (10.7)
Possible with real difficulty	355 (50.7)
Impossible	204 (29.2)

Fig 3.1 below indicates that most of the women had food security problems. In the previous month preceding the study, almost half (46%) of the women had frequently eaten a meal consisting of pap (a traditional porridge made from corn meal) alone, bread alone or worse – nothing, while over a third (37%) had repeatedly gone without food for an entire day due to food shortage!

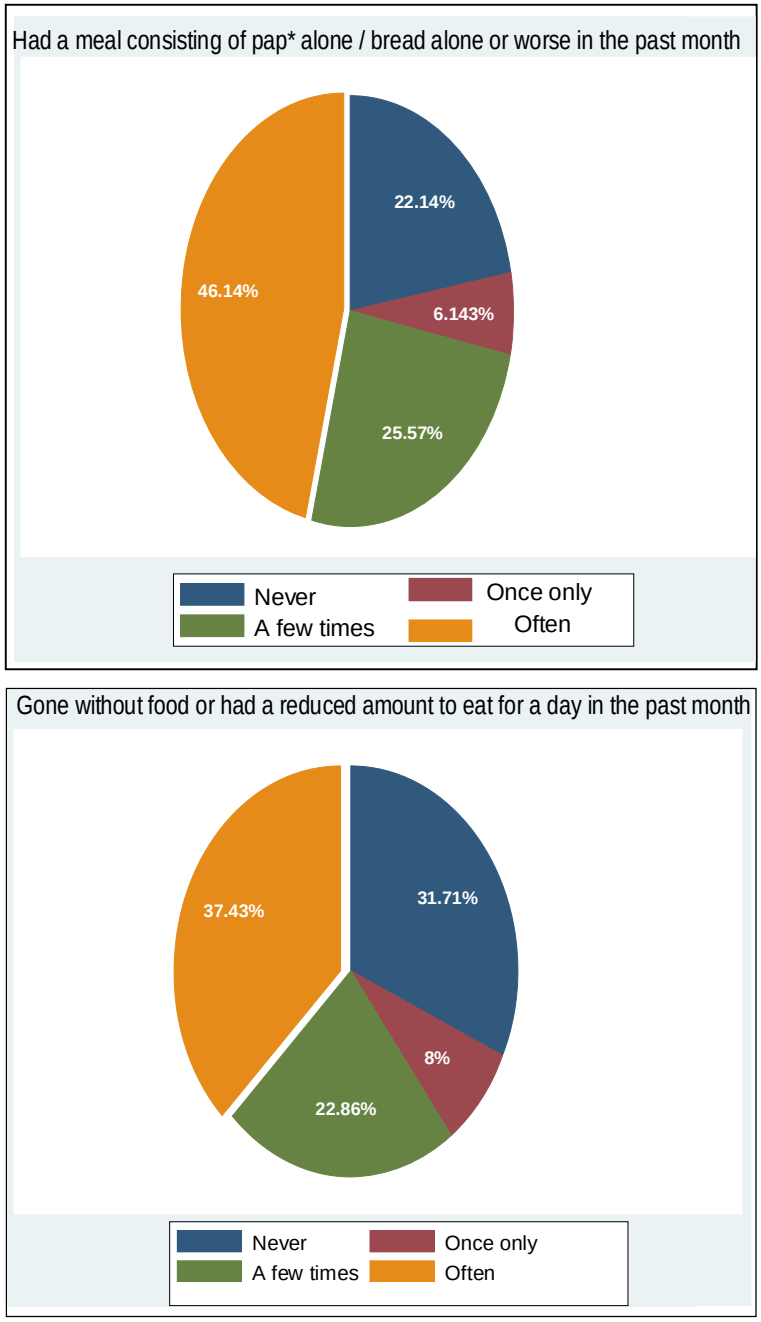

Fig 3.1: Food security experience of 14-35 year old women of the 2001 IMAGE study

Table 3.3: Sexual Behaviour Characteristics and HIV Knowledge of 705 sexually experienced 14-35 year old women who participated in the 2001 IMAGE study

Characteristic	Proportion (percentage)
Mean Age at coital debut (all women)	16.8 (SD 2.0) †
Age at coital debut	
10 – 17 years	451 (64.0)
17 – 25 years	254 (36.0)
Number of sexual partners in last 12 months	
0-1	652 (92.5)
2-4	53 (7.5)
Mean Number of lifetime sex partners (all women)	2.8 (SD 1.9) †
Number of life time sex partners	
1 – 3 life time sex partners	507 (73.8)
4 – 22 life time sex partners	180 (26.2)
Condom use at last casual sex within the previous 12 months	n = 531 *
Condom use = Yes	141 (26.6)
Condom use = No	390 (73.4)
Ever received money and or material goods in exchange for sex	n = 531*
Yes	67 (12.6)
No	464 (87.4)
Ever used birth control to delay or avoid pregnancy	
Yes	528 (75.1)
No	175 (24.9)
HIV knowledge	
A healthy looking person could be infected with HIV	
Yes	431 (61.1)
No or don't know	274 (38.9)
A pregnant woman who is HIV positive could pass the virus to her unborn child	
Yes	629 (89.2)
No or don't know	76 (10.8)

† Data are mean and SD (standard deviation)
* n = 531 because data on condom use and transactional sex was only for the last 12 months preceding the study, thus excludes women who did not report any sexual activity in the previous 12 months.

The sexual behavioural characteristics of the study sample are illustrated in Table 3.3 above. While well over half of the young women (64.0%) had experienced first sex at

or before age 17, almost all (94.8%) had done so at or before age 20. The age at coital debut of 18 women was the same as that at marriage. About a quarter of the 705 women (26.2%) had had four or more sex partners in their life time. Of the 531 women who reported at least one casual sex partner in the previous 12 months, nearly three quarters of them did not use a condom at last sex with their most recent casual sex partner. Furthermore, 67 of the 531 women (12.6%) had received some form of payment paid for sex, while 75% of the 705 women reported having used birth control in the past. Only about half (56%) of the 705 women knew that an HIV infected pregnant woman could pass the virus unto her unborn child, and that a healthy looking person could be HIV positive (combined data for HIV not shown in table above).

3.2 Characteristics of Study Sample by Socioeconomic Status

Tables 3.4 and 3.5 below, show the distribution and comparisons of socio-demographic characteristics, sexual behaviour, and HIV knowledge by household asset index and employment status respectively.

There were no statistically significant differences in socio-demographic and sexual behaviour between SES groups in all comparisons except for level of education and own perception of wealth (Table 3.4).

Women who had completed secondary education (46%) were significantly more likely to be least poor, compared to those who had not (8%, P <0.001) completed secondary education. The women who described their household wealth as worse off than other households (42%) were significantly more likely to be very poor compared to those who said their household wealth was better off than most within the village (20%, P < 0.001).

Employment status was also used as a crude proxy for SES (Table 3.5). There were significant differences between all variables compared by employment status, with the exception of HIV knowledge, number of sex partners within the previous year, and lack of condom use at last casual sex.

The women aged 31-35 years (45%) were significantly more likely to be employed compared to those aged 26-30 years (26%), those aged 20-25 years (8%) and those aged 14-19 years (3%), ($P < 0.001$).

Women who had never been to school (71%) were significantly more likely to be unemployed, compared to those who had completed secondary education (54%), ($P < 0.001$).

Those who had described their household wealth as worse off than most households (57%) were significantly more likely to be unemployed, compared to those who indicated their household wealth was better off than most in the village (52%), ($P = 0.005$).

Women who had used contraception in the past were significantly more likely to be unemployed (57%), significantly more likely to be employed (18%), and significantly less likely to be students (21%), compared to those who had not (51%, 11%, and 36% respectively); ($P < 0.001$).

Women who had engaged in early first sex (48%), compared to those who had delayed their coital debut till after 17 years (68%), women who had had over three lifetime sex partners (63%) compared to those who had had three or less (52%), and women who had engaged in transactional sex (56%) compared to those who had not (38%), were all significantly more likely to be unemployed ($P < 0.001$, $P = 0.001$ and $P = 0.033$ respectively).

Table 3.4: Socio-Demographic and Sexual Behaviour characteristics of 625 young women who participated in the 2001 IMAGE by Household Asset Index

Characteristics	Low SES (Very Poor) n = 210	Medium SES (Poor) n = 208	High SES (Least Poor) n = 207	P-value
Age group (years)				
14-19	53 (33.5)	46 (29.2)	59 (37.3)	0.242
20-25	63 (28.9)	76 (34.9)	79 (36.2)	
26-30	59 (39.3)	51 (34.0)	40 (26.7)	
31-35	35 (35.4)	35 (35.4)	29 (29.2)	
Level of Education				
No schooling	10 (76.9)	2 (15.4)	1 (7.7)	<0.001*
Attended/Completed Primary	45 (46.4)	23 (23.7)	29 (29.9)	
Attended Secondary	142 (32.4)	155 (35.2)	142 (32.4)	
Completed Secondary	13 (17.1)	28 (36.8)	35 (46.1)	
Marital status				
Never married	160 (32.0)	168 (33.6)	172 (34.4)	0.425
Married or living as married	45 (41.3)	34 (31.2)	30 (27.5)	
Separated/divorced or Widowed	5 (31.3)	6 (37.4)	5 (31.3)	
Description of own household wealth relative to other households within the village				
A bit better than most people	18 (19.8)	28 (30.8)	45 (49.4)	<0.001
About the same as most people	27 (19.4)	45 (32.4)	67 (48.2)	
A bit worse off than most people	165 (42.1)	132 (33.7)	95 (24.2)	
Ever used birth control to delay or avoid pregnancy				
Yes	151 (32.0)	159 (33.7)	162 (34.3)	0.303
No	58 (38.4)	49 (32.5)	44 (29.1)	
HIV knowledge				
A healthy looking person could be infected with HIV				
Yes	123 (32.4)	124 (32.6)	133 (35.0)	0.451
No / don't know	87 (35.5)	84 (34.3)	74 (30.2)	
HIV-infected pregnant woman could pass the virus to her unborn child				
Yes	180 (32.2)	191 (34.2)	188 (33.6)	0.093
No / don't know	30 (45.4)	17 (25.8)	19 (28.8)	
Mean age at coital debut †	16.8 (SD 2.2)	16.9 (SD 1.9)	16.9 (SD 1.9)	
Age at coital debut				
≤17 years	135 (34.4)	130 (33.2)	127 (32.4)	0.823
>17 years	75 (32.2)	78 (33.5)	80 (34.3)	
All sex partners in past 12 months				
0 - 1	198 (34.3)	190 (32.9)	189 (32.8)	0.422
2 – 4	12 (25.0)	18 (37.5)	18 (37.5)	
Mean number of lifetime sex partners †	5.4 (SD 14.4)	4.5 (SD 11.9)	5.5 (SD 15.7)	
Total Number of lifetime sex partners				
1 - 3	153 (34.0)	148 (33.0)	148 (33.0)	0.852
3 – 22	51 (32.1)	56 (35.2)	52 (32.7)	
Did not use a condom at last casual sex ‡	n = 154	n = 157	n = 158	
Yes	18 (34.8)	114 (33.6)	107 (31.6)	0.213
No	36 (27.7)	43 (33.1)	51 (39.2)	
Ever received money and or material goods in exchange for sex ‡	n = 154	n = 157	n = 158	
Yes	14 (25.5)	22 (40.0)	19 (34.5)	0.399
No	140 (33.8)	135 (32.6)	139 (33.6)	

* P is significant at alpha level of 5%
† Data are mean and SD (standard deviation) of the mean
‡ Data are for 469 women; n for each category of SES I is as indicated in the table

Table 3.5: Socio-Demographic and Sexual Behaviour characteristics of 704 young women who participated in the 2001 IMAGE by Employment Status

Characteristics	Unemployed n = 386	Employed full time n = 117	Employed occasionally n = 26	Student n = 175	P-value
Age group (years)	50 (45.6)	5 (2.7)	0 (0.0)	131 (70.4)	<0.001*
14-19	175 (73.5)	18 (7.6)	6 (2.5)	39 (16.4)	
20-2	109 (66.1)	42 (25.5)	9 (5.5)	5 (3.0)	
26-30	52 (13.5)	51 (44.7)	11(9.7)	0 (0.0)	
31-35					
Level of Education	10 (71.4)	4 (28.6)	0 (0.0)	0 (0.0)	<0.001*
No schooling	66 (57.9)	17 (14.9)	4 (3.5)	27 (23.7)	
Attended/Completed Primary	266 (53.9)	77 (15.4)	11 (2.2)	141 (28.5)	
Attended Secondary	44 (54.3)	19 (23.5)	11 (13.6)	7 (8.6)	
Completed Secondary					
Marital status	305 (54.6)	67 (12.0)	14 (2.5)	173 (31.0)	<0.001*
Never married	72 (58.1)	40 (32.3)	10 (8.1)	2 (1.6)	
Married or living as married	9 (45.0)	9 (45.0)	2 (10.0)	0 (0.0)	
Separated/divorced or Widowed					
Description of own household wealth relative to other households within the village	49 (51.6)	13 (13.7)	7 (7.4)	26 (27.4)	0.005*
A bit better than most people	76 (50.7)	24 (16.0)	12 (8.0)	38 (25.3)	
About the same as most people	256 (56.8)	78 (17.3)	7 (1.6)	110 (23.4)	
A bit worse off than most people					
Ever used birth control to delay or avoid pregnancy	197 (56.5)	98 (18.4)	22 (4.2)	110 (20.9)	<0.001*
Yes	89 (50.9)	19 (10.9)	4 (2.3)	63 (36.0)	
No					
HIV knowledge					
A healthy looking person could be infected with HIV	234 (54.4)	76 (17.7)	17 (4.0)	103 (24.0)	0.720
Yes	152 (55.7)	41 (14.7)	9 (3.3)	72 (26.4)	
No / don't know					
HIV infected pregnant woman could pass the virus to her unborn child					
Yes	346 (55.2)	107 (16.9)	24 (3.8)	151 (24.1)	0.476
No / don't know	40 (52.6)	10 (13.2)	2 (2.6)	24 (31.6)	
Mean age at coital debut †	17.1 (SD 2.1)	16.7 (SD 2.2)	17.5 (SD 1.9)	16.0 (SD 1.5)	
Age at coital debut					
≤17 years	215 (47.7)	77 (17.1)	14 (3.1)	145 (31.2)	<0.001*
>17 years	171 (67.9)	39 (15.5)	12 (4.8)	30 (11.9)	
All sex partners in past 12 months					
0 - 1	357 (54.7)	107 (16.2)	25 (3.8)	165 (25.3)	0.706
2 – 4	29 (58.0)	10 (20.0)	1 (2.0)	10 (20.0)	
Mean number of lifetime sex partners †	3.0 (SD 2.1)	3.1 (SD 1.8)	3.1 (SD 2.1)	2 (1.4)	
Total Number of lifetime sex partners					
1 - 3	262 (51.9)	78 (15.5)	16 (3.2)	149 (29.5)	0.001*
3 – 22	114 (63.3)	32 (17.8)	8 (4.4)	26 (14.4)	
Did not use a condom at last casual sex ‡	n = 284	n = 70	n = 15	n = 161	
Yes	217 (55.9)	54 (13.7)	10 (2.6)	108 (27.8)	0.147
No	67 (47.5)	16 (11.4)	5 (3.6)	53 (37.6)	
Ever received money and or material goods in exchange for sex ‡	n = 284	n = 70	n = 15	n = 161	
Yes	259 (55.9)	55 (11.9)	13 (2.8)	136 (29.4)	
No	25 (37.9)	15 (21.2)	2 (2.0)	25 (37.9)	0.033*

* P-values are significant at an alpha level of 5%
† Data are mean and SD (standard deviation) of the mean
‡ Data are for 530 women; n is as indicated in the table for each category of Employment status,

3.3 Logistic Regression Analyses

Univariate and multiple logistic regressions were carried out to determine which characteristics were associated with the risky sexual behaviours. In all the logistic regression models, the dependent or outcome variables were the five risky sexual behaviours: having experienced coital debut at or before 17 years of age, having had two or more sexual partners in the previous 12 months, having had four or more lifetime sexual partners, non-use of a condom at last sex with a casual partner, and having engaged in transactional sex. The main independent or explanatory variables were SES (estimated from household asset index and employment status). Other explanatory variables included in the analyses were age, marital status, contraceptive use and HIV knowledge. Five of the 705 women were widowed, thus were included in the separated/divorced category. This did not affect the results significantly.

3.3.1 Univariate Analyses

Results of the univariate logistic regression analyses are presented in Table 3.6. Though not significant, there were slight indications that the least poor compared to the very poor women, were less likely to have initiated early sex (OR: 0.88, 95% CI: 0.59, 1.31), were less likely to have used a condom at last casual sex (OR: 0.64, 95% CI: 0.39, 1.06) and more likely to have engaged in transactional sex (OR: 1.37, 95% CI: 0.66, 2.83).

Compared to unemployed women, those employed on a full time basis were significantly more likely to have initiated sex at an early age (OR: 1.57, 95% CI: 1.01, 2.42), and also significantly more likely to have engaged in transactional sex (OR: 2.64, 95% CI: 1.29, 5.39). Though not significant, the employed women were more likely to

have had two or more partners within the previous year (OR: 1.61, 95% CI: 0.55, 2.4), slightly less likely to have had over three lifetime sex partners (OR: 0.94, 95% CI: 0.59, 1.50) or to have used a condom at last casual sex (OR: 1.02, 95% CI: 0.55, 1.94), in comparison to the unemployed women.

When evaluated against women who described their household wealth as worse off than most households, the women who perceived their households to be better off than others within the village were less likely to have engaged in either of the risky sexual behaviours. These omen who thought their households to be better off than others were also less likely to have engaged in early first sex (OR: 0.88, 95% CI: 0.56, 1.39), to have had two or more sex partners in the previous 12 months (OR: 0.68, 95% CI: 0.26, 1.79), significantly less likely to have had over three lifetime sex partners (OR: 0.51, 95% CI: 0.29, 0.93), less likely to have failed to use a condom at last sex with a casual partner (OR: 0.61, 95% CI: 0.35, 1.06), and less likely to have engaged in transactional sex (OR: 0.81, 95% CI: 0.35, 1.89).

The odds of transactional sex and had two or more sexual partners in the previous 12 months increased with age, while the odds of condom use at last casual sex, and the odds of having had over three lifetime partners decreased inversely with age. Some of these associations were significant. Compared to the 30-35 year old women, those aged 14-19 were significantly more likely to have experienced first sex at or before 17 years of age (OR: 11.22, 95% CI: 5.49, 22.9), significantly more likely to have had two or more sex partners in the previous 12 months (OR: 4.24, 95% CI: 1.43, 2.53), significantly less likely to have had over three lifetime sex partners (OR: 0.24, 95% CI: 0.14, 0.45), more likely to have failed to use a condom at last casual sex (OR: 1.14, 95% CI: 0.59, 2.18), and more likely to have engaged in transactional sex (OR: 2.18, 95% CI: 0.72, 6.57).

There was suggestion of a trend with level of education and risky sexual behaviour. The odds of engaging in either of the risky behaviours decreased with increasing level of education, thus women with no formal schooling were more likely than any of the other women to have engaged in risky sex. However, none of these associations were statistically significant. These women that had never been to school, compared to those who had completed secondary education were more likely to have initiated early first sex (OR: 2.00, 95% CI: 0.58, 6.91), more likely to have had over three lifetime sex partners (OR: 2.20, 95% CI: 0.67, 7.21), more likely to have failed to use a condom at last casual sex (OR: 1.28, 95% CI: 0.24, 6.86), and more likely to have engaged in transactional sex (OR: 2.61, 95% CI: 0.55, 12.4).

In comparison to women that had never married, married women were less likely to have engaged in early first sex (OR: 0.78, 95% CI: 0.52, 1.16), less likely to have had over three lifetime sex partners (OR: 0.77, 95% CI: 0.48, 1.24), but more likely to have not used a condom at last casual sex (OR: 1.47, 95% CI: 0.16, 13.26) to have had at least two sex partners in the previous year (OR: 1.36, 95% CI: 0.23, 3.75), and more likely to have engaged in transactional sex (OR: 1.47, 95% CI: 0.16, 13.26. None of these associations were found to be statistically significant.

Not having used birth control was not associated with early sex (OR: 1.00, 95% CI: 0.70, 1.43), having had two or more sex partners in the previous year (OR: 1.00, 95% CI: 0.52, 1.93), or having used a condom at last casual sex (OR: 1.01, 95% CI: 0.65, 1.59). However, women who had never used birth control were significantly less likely to have had three or more lifetime sex partners (OR: 0.46, 95% CI: 0.29, 0.71), and more likely to have been involved in transactional sex (OR: 1.27, 95% CI: 0.72, 2.25), compared to women who had used birth control.

Although not significant, when evaluated against women who knew that a healthy looking person could be HIV positive, those who did not were less likely to have had two or more sex partners in the previous year (OR: 0.59, 95% CI: 0.31, 1.11), and in their lifetime (OR: 0.79, 95% CI: 0.56, 1.81). These women that were unaware that a healthy looking person could be HIV positive, were also more likely to have not used a condom at last casual sex (OR: 1.22, 95% CI: 0.82, 1.81) and to have involved themselves in transactional sex (OR: 0.87, 95% CI: 0.51, 1.47). When matched against women who were aware that an HIV-infective pregnant woman could pass the virus to her unborn child, those who did not were more likely to have engaged in sex at an early age at or before 17 years of age (OR: 1.53, 95% CI: 0.90, 2.60), more likely to have had two or more sex partners in the previous year (OR: 1.64, 95% CI: 0.74, 3.65), and less likely to have engaged in transactional sex (OR: 0.73, 95% CI: 0.30, 1.77). Still, none of these associations were significant. Moreover, having had over three lifetime sex partners (OR: 1.00, 95% CI: 0.59, 1.13) and having failed to use a condom at last casual sex (OR: 1.02, 95% CI: 0.56, 1.87) were not associated with knowing that an HIV-infected pregnant woman could pass the virus to her unborn child.

Table 3.6: Unadjusted Odds Ratios (OR) of the associations between selected characteristics and sexual behaviours

Characteristic	Coital debut at 17 years or younger (Yes/No)	Had at least two sex partners in the last 12 months (Yes/No)	Had more than three lifetime sex partners (Yes/No)	Did not use a condom at last casual sex (Yes/No)	Transactional sex (Yes/No)
Household Asset Index					
Very Poor	Reference	Reference	Reference	Reference	Reference
Poor	0.93 [0.62, 1.38]	1.01 [0.50, 2.04]	1.14 [0.73, 1.77]	0.81 [0.48, 1.35]	1.63 [0.80, 3.32]
Least Poor	0.88 [0.59, 1.31]	0.95 [0.47, 1.94]	1.05 [0.67, 1.65]	0.64 [0.39, 1.06]	1.37 [0.66, 2.83]
Employment Status					
Unemployed	Reference	Reference	Reference Group	Reference	Reference
Employed full time	1.57 [1.01, 2.42]	1.61 [0.55, 2.46]	0.94 [0.59, 1.50]	1.02 [0.55, 1.91]	2.64 [1.29, 5.39]*
Employed Occasionally	0.92 [0.41, 2.06]	0.49 [0.06, 3.76]	1.15 [0.49, 2.76]	0.62 [0.20, 1.87]	1.59 [0.34, 7.47]
Student	3.84 [0.47, 5.98]*	0.74 [0.36, 1.57]	0.40 [0.25, 0.64]*	0.63 [0.41, 1.07]	1.90 [1.05, 3.44]*
Description of own household wealth relative to other households within the village					
A bit worse off than most people	Reference	Reference	Reference	Reference	Reference
About the same as most people	1.07 [0.72, 1.57]	0.96 [0.48, 1.95]	1.09 [0.72, 1.66]	1.14 [0.69, 1.88]	1.39 [0.76, 2.53]
A bit better than most people	0.88 [0.56, 1.39]	0.68 [0.26, 1.79]	0.51 [0.29, 0.93]	0.61 [0.35, 1.06]	0.81 [0.35, 1.89]
Age group (years)					
31-35	Reference	Reference	Reference	Reference	Reference
26-30	0.72 [0.44, 1.16]	1.21 [0.35, 4.24]	0.86 [0.52, 1.45]	1.79 [0.87, 3.68]	1.89 [0.59, 6.04]
20-25	0.78 [0.49, 1.21]	2.12 [0.70, 6.44]	0.69 [0.43, 1.13]	1.28 [0.67, 2.43]	1.98 [0.66, 5.96]
14-19	11.22 [5.49, 22.9]*	4.24 [1.43, 2.53]*	0.24 [0.14, 0.45]*	1.14 [0.59, 2.18]	2.18 [0.72, 6.57]
Level of Education					
No schooling	2.00 [0.58, 6.91]	0.95 [0.35, 4.54]	2.2 [0.67, 7.21]	1.28 [0.24, 6.86]	2.61 [0.55, 12.4]
Attended/Completed Primary	2.24 [01.22, 4.10]*	0.78 [0.29, 2.12]	0.64 [0.34, 1.21]	1.61 [0.71, 3.63]	0.82 [0.31, 2.13]
Attended Secondary	1.36 [0.84, 2.19]	0.65 [0.29, 1.47]	0.61 [0.36, 1.01]	0.92 [0.49, 1.73]	0.68 [0.31, 1.47]
Completed Secondary	Reference	Reference	Reference	Reference	Reference
Marital status					
Never married	Reference	Reference	Reference	Reference	Reference
Married or living as married	0.78 [0.52, 1.16]	1.36 [0.23, 3.75]	0.77 [0.48, 1.24]	1.47 [0.16, 13.26]	1.81 [0.20, 16.42]
Separated/divorced/widowed	2.18 [0.72, 6.62]	1.80 [0.51, 6.37]	2.00 [0.79, 5.09]	1.59 [0.45, 5.67]	2.41 [0.75, 7.70]
Ever used birth control to delay or avoid pregnancy					
Yes	Reference	Reference	Reference	Reference	Reference
No	1.00 [0.70, 1.43]	1.00 [0.52, 1.93]	0.46 [0.29, 0.71]*	1.01[0.65, 1.59]	1.27 [0.72, 2.25]
HIV knowledge					
A healthy looking person could be infected with HIV					
Yes	Reference	Reference	Reference	Reference	Reference
No / don't know	0.93 [0.68, 1.28]	0.59 [0.31, 1.11]	0.79 [0.56, 1.13]	1.22 [0.82, 1.81]	0.87 [0.51, 1.47]
HIV infected pregnant woman could pass the virus to her unborn child					
Yes	Reference	Reference	Reference	Reference	Reference
No / don't know	1.53 [0.90, 2.60]	1.64 [0.74, 3.65]	1.00 [0.59, 1.73]	1.02 [0.56, 1.87]	0.73 [0.30, 1.77]

Values are Odds Ratios (95% confidence interval); Reference OR = 1

* Odds Ratio is significant at alpha level of 0.05%

Table 3.7: Adjusted Odds Ratios (OR) of the associations between selected characteristics and sexual behaviours

Characteristic	Coital debut at 17 years or younger (Yes/No)	Had at least two sex partners in the last 12 months (Yes/No)	Had more than three lifetime sex partners (Yes/No)	Did not use a condom at last casual sex (Yes/No)	Transactional sex (Yes/No)
Household Asset Index					
Very Poor	Reference	Reference	Reference	Reference	Reference
Poor	0.97 [0.63, 1.49]	1.93 [0.83, 4.47]	1.22 [0.77, 1.97]	0.84 [0.47, 1.43]	1.59 [0.74, 3.44]
Least Poor	0.89 [0.57, 1.39]	0.88 [0.88, 5.09]	1.03 [0.63, 1.70]	0.64 [0.39, 1.11]	1.47 [0.66, 3.30]
Employment Status					
Unemployed	Reference	Reference	Reference Group	Reference	Reference
Employed full time	1.44 [0.89, 2.34]	1.35 [0.58, 3.18]	0.74 [0.42, 1.28]	0.84 [0.41, 1.70]	2.97 [1.19, 7.35]
Employed Occasionally	0.85 [0.36, 2.01]	0.48 [0.06, 4.05]	1.39 [0.53, 3.63]	0.61 [0.18, 2.05]	1.67 [0.13, 9.66]
Student	3.80[2.63, 6.11]*	0.65 [0.23, 1.83]	0.47 [0.29, 0.78]*	0.55 [0.30, 1.03]	1.64 [0.17, 3.73]
Description of own household wealth relative to other households within the village					
A bit worse off than most people	Reference	Reference	Reference	Reference	Reference
About the same as most people	1.25 [0.80, 1.96]	0.88 [0.38, 2.05]	1.17 [0.72, 1.88]	1.28 [0.73, 2.24]	1.33 [0.65, 2.71]
A bit better than most people	0.95 [0.57, 1.57]	0.79 [0.28, 2.26]	0.50 [0.27, 0.95]*	0.72 [0.39, 1.32]	0.75 [0.28, 2.00]
Age group (years)					
31-35	Not included in model	Reference	Not included in model	Reference	Reference
26-30		0.68 [0.26, 1.75]		2.27 [1.05, 5.09]	9.21 [1.29, 65.47]
20-25		0.37 [0.14, 0.98]*		2.06 [0.95, 4.52]	13.85 [1.88, 101.84]
14-19		0.28 [0.08, 1.00]		2.10 [0.84, 5.30]	9.62 [1.15, 80.52]
Level of Education					
No schooling	2.77 [0.68, 11.36]	1.54 [0.65, 5.79]	1.92 [0.51, 7.22]	0.74 [0.13, 4.25]	4.31 [0.78, 24.68]
Attended/Completed Primary	1.73 [0.88, 3.40]	1.30 [0.41, 4.11]	0.76 [0.37, 1.56]	1.18 [0.47, 3.00]	1.06 [0.34, 3.36]
Attended Secondary	1.00 [0.59, 1.70]	0.87 [0.35, 2.15]	0.73 [0.41, 1.30]	0.74 [0.36, 1.52]	0.68 [0.27, 1.68]
Completed Secondary	Reference	Reference	Reference	Reference	Reference
Marital status					
Never married	Reference	Reference	Reference	Reference	Reference
Married or living as married	1.02 [0.65, 1.61]	0.68 [0.23, 4.57]	1.83 [1.06, 3.17]*	0.73 [0.07, 7.64]	5.79 [1.05, 15.22]
Separated/divorced/widowed	2.10 [0.64, 6.90]	0.87 [0.20, 3.82]	2.24 [0.65, 7.64]	2.03 [0.4, 8.49]	7.68 [1.13, 15.35]
Ever used birth control to delay or avoid pregnancy					
Yes	Reference	Reference	Reference	Reference	Reference
No	0.85 [0.56, 1.27]	2.56 [1.28, 5.12]*	0.43 [0.26, 0.71]*	1.10[0.67, 1.83]	1.36 [0.68, 2.70]
HIV knowledge					
A healthy looking person could be infected with HIV					
Yes	Reference	Reference	Reference	Reference	Reference
No / don't know	0.85 [0.60, 1.21]	0.59 [0.29, 1.19]	0.82 [0.55, 1.22]	1.22 [0.80, 1.91]	0.72 [0.39, 1.34]
HIV infected pregnant woman could pass the virus to her unborn child					
Yes	Reference	Reference	Reference	Reference	Reference
No / don't know	1.38 [0.76, 2.49]	2.25 [0.92, 5.49]	1.50 [0.83, 2.73]	0.91 [0.47, 1.78]	0.81 [0.28, 2.29]

Values are Odds Ratios (95% confidence interval); Reference OR = 1

* Odds Ratio is significant at alpha level of 0.05%

3.3.2 Multiple Logistic Regression Models

Table 3.7 above shows the adjusted odds ratios (AOR) and 95% CI from the multiple logistic regression models. All multiple logistic models had household asset index, employment status, perception of household wealth, age (age group), level of education, marital status, birth control, and HIV knowledge included. However, age was not included in the regression models where early age at coital debut and having had more than three lifetime partners were the outcome variables since both are a function of age.

Having adjusted for all other variables, the least poor women, compared to very poor women were less likely to have initiated early sex (AOR: 0.89, 95% CI: 0.57, 1.39) or had over one sex partner in the previous year (AOR: 0.88, 95% CI: 0.86, 5.09), less likely to have failed to use a condom at last casual sex (AOR: 0.64, 95% CI: 0.39, 1.11) and more likely to have been paid for sex (AOR: 1.47, 95% CI: 0.66, 3.30). Having had over three lifetime sex partners was not associated with SES, measured from the household asset index (AOR: 1.03, 95% CI: 0.63, 1.70).

When compared to unemployed women, those employed full time, were less likely to have had over three lifetime sex partners (AOR: 0.74, 95% CI: 0.42, 1.28) and also less likely to have not used a condom at last casual sex (AOR: 0.84, 95% CI: 0.47, 1.43); but were more likely to have initiated sex at an early age (AOR: 1.44, 95% CI: 0.89, 1.49), more likely to have had two or more partners in the previous year (AOR: 1.35, 95% CI: 0.58, 3.18), and also significantly (up to 7.35 times) more likely to have engaged in transactional sex (AOR: 2.97, 95% CI: 1.19, 7.35). Nonetheless, besides transactional sex, none of the other associations were statistically significant.

When matched against women who described their household wealth as worse off than most households, those who perceived themselves as better off than most households

within the village were significantly less likely to have had over three lifetime sex partners (AOR: 0.50, 95% CI: 0.27, 0.95); and though not significant, they were also slightly less likely to have engaged in early sex at or before 17 years of age (AOR: 0.95, 95% CI: 0.57, 1.57), less likely to have had two or more sex partners in the previous year (AOR: 0.79, 95% CI: 0.28, 2.26), less likely to have engaged in transactional sex (AOR: 0.75, 95% CI: 0.28, 2.00), and less likely to have not used a condom at last casual sex (AOR: 0.72, 95% CI: 0.39, 1.32).

Compared to the 31-35 year old women, 26-30, 20-25, 14-19 year old women were all less likely to have had two or more sexual partners in the previous 12 months, and this association was significant for the 20-25 year old women (AOR: 0.37, 95% CI: 0.14, 0.98) Also, compared to the 31-35 years age group, the women aged 14-19, 20-25 and 26-30 years were all about two times more likely to have to have failed to use a condom at last casual sex, and over nine times significantly more likely to have engaged in transactional sex.

In contrast to women that had completed secondary education, those that had never been to school had a higher odds of having had first sex at or before 17 years of age (AOR: 2.77, 95% CI: 0.68, 11.36), were more likely to have had two or more sex partners in the previous year (AOR: 1.54, 95% CI: 0.65, 5.79), and to have had over three lifetime sex partners (AOR: 1.92, 95% CI: 0.51, 7.22); and had over four times the odds of having had transactional sex (AOR: 4.31, 95% CI: 0.78, 24.7); but these women were less likely to have not used a condom at last casual sex (AOR: 0.73, 95% CI: 0.07, 7.64). Yet, none of these associations were statistically significant.

Married women, compared to those who had never married, were significantly more likely to have had over three lifetime sex partners (AOR: 1.83, 95% CI: 2.24); and though not significant, married women were also more likely to have engaged in transactional sex

(AOR: 5.79, 95% CI: 1.05, 15.22) and used a condom at last casual sex (AOR: 0.73, 95% CI: 0.07.64), but less likely to have had two or more partners in the previous year (AOR: 0.68, 95% CI: 0.23, 4.57).

In comparison to women who had used birth control, those who had not were significantly more likely to have had two or more sex partners in the previous year (AOR: 2.56, 95% CI: 5.12), but significantly less likely to have had over three lifetime sex partners (AOR: 0.43 95% CI: 0.26, 0.71); and though none of the following associations were not significant, women who had never used birth control were also less likely to have had early sex at of before 17 years (AOR: 0.85, 95% CI: 0.56, 1.27), but more likely to have not used a condom at last casual sex (AOR: 1.10, 95% CI: 0.67, 1.83), and to have engaged in transactional sex (AOR: 1.36, 95% CI: 0.68, 2.70).

HIV knowledge was not significantly associated with either of the risky sexual behaviours. Women who did not know that a healthy looking person could be HIV positive were less likely to have initiated sex at of before 17 years of age (AOR: 0.85, 95% CI: 0.60, 1.21), had two or more sex partners in the previous year (AOR: 0.59, 95% CI: 0.29, 1.19) or over three lifetime sex partners (AOR: 0.82, 95% CI: 0.55, 1.22), and less likely to have engaged in transactional sex (AOR: 0.72, 95% CI: 0.39, 1.34), even though they were more likely to have not used a condom at last casual sex (AOR: 1.22, 95% CI: 0.80, 1.91). Women who knew that an HIV-infected pregnant woman could pass the virus to her unborn child, compared to those who did not, were those who did not were more likely to have engaged in early first sex at or before 17 years of age (AOR: 1.38, 95% CI: 0.76, 2.49), more likely to have had two or more partners in the previous year (AOR: 2.25, 95% CI: 0.92, 5.49) and over three lifetime sex partners (AOR: 1.50, 95% CI: 0.83, 2.73), but were less likely to have failed to use a condom at last casual sex (AOR: 0.91, 95% CI: 0.47,

1.78) and less likely to have engaged in transactional sex (AOR: 0.81, 95% CI: 0.28, 2.29). As well, none of these associations were statistically significant.

The key findings are discussed in chapter 4.

Chapter 4
DISCUSSION & LIMITATIONS

4.1 Discussion

The current study examined the relationship between socioeconomic status (SES) and risky sexual behaviour among young rural South African women aged 14-35 residing in the Limpopo province of South Africa. Data on SES and HIV risk-related sexual behaviours for 705 sexually active women were examined for significant associations while controlling for other variables.

In the univariate logistic regression analyses, the variable – age, emerged as a definite predictor of early first sex at or before 17 years of age and having had over three lifetime sex partners. It is not clear whether the association between age and these two risky sexual behaviours, was due to a cohort effect or an age group effect. Consequently, the variable age, was not included in the adjusted models where the two afore-mentioned risky sexual behaviours were the outcome variables.

In the adjusted logistic regression models, keeping all other variables in the models constant, there was no statistically significant association between SES and most of the risky sexual behaviours. There was a non-significant indication that the least poor compared to the very poor women, were less likely to have engaged in the risky sexual behaviours. The least poor women were less likely to have initiated early sex, had two or more sex partners in the previous year, and less likely to have failed to use a condom at last casual sex; but they were also more likely to have been paid for sex. Similarly, compared to unemployed women, those employed on a full time basis were less likely to have engaged

in transactional sex, while unemployed women were more likely to have not used a condom at last casual sex. But the women employed on a full time basis were more likely to have initiated sex at or before 17 years of age, had two or more partners in the previous year but were less likely to have had over three lifetime sex partners. As well, none of these associations were statistically significant. However, students were significantly more likely to have initiated early sex and significantly less likely to have had more than three lifetime sex partners, compared to the unemployed women.

Overall, the results indicate that SES did not correlate with risky behaviour on all aspects. Nonetheless, there was some weak indication that higher SES women in this study (the least poor and the employed women) had the highest odds of engaging in transactional sex, but were most likely to have used a condom at last casual sex. It could be inferred that higher levels of economic wellbeing places one at increased risk of HIV infection by exhibiting risky sexual behaviours like transactional sex. This contradicts the long held belief that it is the lower SES women who engage more in risky sexual behaviours. Some authors have argued that having a higher SES may make it possible to afford sexual relationships with many partners (e.g. Kongyuy *et al*, 2006; Msisha *et al*., 2008). This explanation would make sense for other risky sexual behaviours such as multiple partners, but not for transactional sex, which in this study is defined as having ever had sex in exchange for money or material goods, thus the respondents in this study are not paying for, but rather are being paid for sex. This leads one to suppose that the higher SES women exhibiting such behaviour, may have became financially better off because they were getting paid for sex, which could also explain why they had more lifetime sex partners. Also, high SES women were less likely to have not used a condom at last casual sex compared to low SES women. This result points to the ability of high SES women to afford condoms (due to their employment status), or that they know about where to get condoms

(due to a higher education status); or may use condoms because they engage in these risky sexual behaviours. This is in keeping with other studies that have found similar results (Kapiga and Lugalla, 1996; Bloom *et al*., 2002).

Low SES groups were also associated with early age at marriage, poor HIV knowledge, and non-use of birth control. Some researchers have found similar results in other settings (Hargreaves *et al*., 2002; Shelton *et al*., 2005; Fenton, 2004; Kongyuy *et al*., 2006). Such sexual behaviours will remain important risk factors for infection in a widespread generalised HIV epidemic (Hargreaves *et al*., 2002). This is particularly true if condom use remains low; and would suggest that those of low SES may be at high risk of acquiring HIV infection (Hargreaves *et al*., 2002).

Other analyses divulged that level of education (which has been used as a proxy of SES in several studies (e.g. Kongyuy *et al*., 2004), whether or not a person was currently a student and own perception of wealth correlated positively with household wealth and employment status. It fits the norm of wealthier persons usually being more educated, and educated people are usually more likely to have better job opportunities, and hence be wealthier. Using household survey data from Demographic Health Surveys from over 44 surveys in 35 countries, Filmer and Pritchett (1998) showed that people of higher SES households were more likely to enrol in school and attain higher levels of education. As well, a study by Hargreaves *et al*. (2008) showed school attendance to be protective against risky sexual behaviours.

When compared, women with good HIV knowledge were more likely to have protected themselves with a condom at last casual sex have, whereas those with poor HIV knowledge were more likely to a have engaged in early first sex at or before 17 years of age, had two or more sex partners in the previous year and have over three life time partners. This finding suggests that knowledge may have been translated into behaviour

change (for condom use). While this may be considered a reassuring finding, it is imperative to use caution when interpreting it. The way these questions were asked during the IMAGE study does not allow one to determine whether the risky sexual encounter behaviour of condom at last casual sex), in fact postdates the acquiring of HIV/AIDS knowledge. Yet, it is plausible that this positive finding is a true reflection of sexual behaviour in the population. A person cannot change when they had their first coital debut; having a new partner is not a rapid occurrence; but having sex with a casual partner, may be a frequent activity. Thus change in sexual behaviour would be more apparent when measured with activities such as condom use that occur more frequently.

Another interesting finding was that regardless of SES, all the women who showed increased odds of having engaged in transactional sex did not necessarily have a high prevalence of sexual partners within the previous year, or lifetime. It seems that transactional sex in this population may be more of a permanent arrangement between the partners, for example, a woman may opt to offer sex for a place to stay, thus this partner would be more permanent, or some women may actually be in more polygamous relationships simply for monetary or material gain.

More differences were noted between comparison groups when the women were classified by employment status compared to when they were classified by the household asset index. Firstly the household as a basic unit of analysis may be inadequate for much of the research on poverty and risky sexual behaviour. It is often the case that households participate in saving schemes and social networks that reach outside the household. In understanding the impact of SES level of risky sexual behaviour, it is necessary to understand these broader networks as well as the adjustments made within households (IUSSP, 2005). Yet it is noteworthy to mention that SES in the communities where the IMAGE intervention is operating was generally the same at baseline. Although one can

range individuals in this group as relatively poor among themselves, this classification may not have differentiated them well enough. It was assumed in this study that relative ranking of individuals in to three SES groups differentiated participants, but it may have been that the individuals in this study were relatively very similar in terms of house hold assets. Employment status seems to have differentiated participants better than the SES groups.

4.2 Limitations of Study

The relationship between economic wellbeing and risky sexual behaviour was explored with reference to various demographic and sexual behaviour characteristics. Such comparative analysis, however, has certain limitations: firstly, because the analyses are mainly descriptive and the design of the survey is cross-sectional, thus cannot be employed in the analyses of the causal relationship between economic wellbeing and risky sexual behaviour; and in the second instance, such analyses have only provided an economic perspective on poverty, and does not include parameters of social exclusion as determinants of socio-economic status (World Bank, 2000; Mwabu, 2001).

Certain questions required respondents to recall past and recent behaviours. The reliability of the responses received can vary between people in important ways. In the current study, condom use in particular had a high proportion of inconsistent responses. Such findings had been earlier reported by Fenton *et al*. (2001a), who reported that the accuracy of recall varied by age, number of sexual partners and how far back participants were asked to remember. In the current study, individuals were asked to recall several events which had occurred over a year ago. Some of the participants included in the current study seemed to have struggled to recall how often they used a condom with their partners and whether a condom was used with all partners. Questions on condom use triggered large

numbers of inconsistencies in the IMAGE data, where for example individuals reported no condom use in the last year but then did report condom use with an individual partner; or in other cases respondents reported having always consistently used a condom yet when asked if they had used a condom at last sex with a non-spousal partner, the responses were negative for up to three partners. Zenilman *et al.* (1995) noted that not only do individuals struggle to recall condom use accurately, but they also may report on "use" rather than "correct use". Consequently, condom breakages or slippages, for instance, which would increase HIV risk of HIV acquisition, would not be reported, thus diluting the strength(s) of any association(s).

Because sexual behaviour requires the provision of personal and often intimate information, some people may be more willing to participate in the research than others. This can lead to participation bias if there are systematic differences, for example in age, sex and social class between those who agree to participate and those who do not (Fenton *et al.*, 2001a). In this study, males were excluded thus sex cannot be counted as a bias. However, age was a potential bias. The 31-35 year old female formed only 16% of the study sample, which is less than half of the 20-25 age group that made up 33% of the study sample. Even amongst those who agree to participate in a study, not all questions will be answered. Item response bias can arise where people who choose not to answer a question, may have engaged in risky sexual behaviours which are systematically different to that of of those who choose to answer it (Fenton *et al.*, 2001a)

Chapter 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The current study did not show any strong evidence to suggest that socio-economic status is associated with risky sexual behaviour. It is possible that women in general (all levels of SES) are at risk of HIV infection, which could attest to the indiscriminate nature of the HIV/AIDS epidemic.

The findings underscore the need to re-examine the assumption that poverty drives risky sexual behaviour so that efforts to ensure that HIV prevention messages get across all strata of society. However, it is possible that SES as used in this study did not differentiate people well enough to be able to identify factors associated with risky sexual behaviour. Furthermore, additional research is required to establish how other major factors besides wealth (such as gender, power, partner violence, beliefs and perceptions etc) may enhance the vulnerability of women to HIV/AIDS.

The current study however contributes to the growing evidence that the relationship between wealth status and HIV acquisition is either exaggerated or is very complex, and should be considered when designing new policies, programs or interventions to alleviate the growing HIV incidence.

5.2 Recommendations

It is recommended that several measures of SES be utilised in studies of this nature, rather than individual proxies. Using composite measures or several indicators of SES would be more robust as a way of sensitivity analysis.

It may be worthwhile to use a clinically ascertained outcome (e.g. HIV status or other sexually transmitted infections) as opposed to using self-reported risky sexual behaviours for ascertaining the social epidemiology of sexually transmitted infections.

It is challenging to coin a standard definition of risky sexual behaviour. For example, how many sex partners should a person have before their behaviour is considered risky? Is it more than one; above three; over five, or ten? Several studies have used very different definitions (e.g. Mertz *et al*., 2000; Fenton *et al*., 2001a, 2001b; Latino, 2002; Jaccard *et al*., 2004; Konguy, 2006 etc). This can make comparisons between studies difficult. A number of definitions of risky sexual behaviour (engaging in coitus at or before age 17; having had two or more sex partners within the previous 12 months; having had over three life time sex partners; non-use of a condom at last casual sex; and having been paid money or material goods for sex) were used in this study. Adopting one, all, or more of these definitions, as with other clinical variables could ensure that when researchers refer to risky sexual behaviour, it is based on the same measure(s).

Sonkin and Hinde (2007) advocated that being able to confidently use a single or combination of measures such as those suggested above would make life easier for researchers and participants. It would also ensure that fewer and less personal questions have to be asked. The authors added that intrusion into one's personal life is really only ethical if it adds substantially to better understanding of the risky sexual behaviours (Sonkin and Hinde, 2007). One would concur with Sonke and Hinde (2007) in that by

simply asking people “Have you been sexually involved with partner A or B… etc?” would give enough information to determine that the person has had sex with that partner rather than probing further into knowing how many times in a month the person has engaged in sexual activity with the partner in question.

In summary, the usefulness of the current study may extend beyond shedding light on the link between economic wellbeing and risky sexual behaviour, and simply adopting a simple uniform measure for risky sexual behaviour. It also expands current understanding of the distribution of the risky sexual behaviour within an important group of people, which can in turn inform program or policy efforts to reduce HIV incidence.

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Appendix I

RADAR
RURAL AIDS & DEVELOPMENT ACTION RESEARCH PROGRAMME

UNIVERSITY OF THE WITWATERSRAND SCHOOL OF PUBLIC HEALTH

P.O. BOX 2 ACORNHOEK 1360 - TELE: +27 13 795 5076 - FAX: +27 13 795 5082 - WWW.WITS.AC.ZA/RADAR

Date: 27 September 2007

To Whom It May Concern:

RE: Permission to use RADAR data for MSC Report.

This letter serves to inform that Mirabel Akwa Nyamboli (Student number – 0415275H) has been granted permission and full access to use RADAR data for her MSC (Epidemiology and Biostatistics) research report. The student should get permission from the PI of RADAR before publishing any work that may arise from this report.

Yours Sincerely

Paul Pronyk (Dr)
RADAR

Appendix II

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Nyamboli

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M071148**
PROJECT	Relationship between Economic Wellbeing and Risky Sexual Behaviour among 14-35 Year Old Women in Limpopo Province, South Africa
INVESTIGATORS	Ms MA Nyamboli
DEPARTMENT	School of Public Health
DATE CONSIDERED	08.01.25
DECISION OF THE COMMITTEE*	Approved unconditionally

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

DATE 08.02.27 **CHAIRPERSON** .....
(Professors PE Cleaton-Jones, A Dhai, M Vorster, C Feldman, A Woodiwiss)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Mr E Marinda

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 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